The Cambridge Aerospace Dictionary

Second Edition
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Bill Gunston, OBE, FRAeS
Gathering terms for an aerospace dictionary is harder than it looks. I recently studied a list of terms used by the US Air Force to describe the status of each of its component organizations. They explained, ‘These actions are defined in ways that may seem arcane to the non-specialist, but each term has a specific meaning.’ The terms are: Activate, Active list, Assign, Attach, Consolidate, Constitute, Designate, Disband, Disestablish, Establish, Establishment, Inactivate, Inactive list, Organize, Provisional organizations, Re-designate, Re-establish, Relieve from active duty, and Unit. I read their meanings through several times and decided not to include any in these pages.

In a previous edition I was criticised by a reviewer for using words ‘which have no relevance to aerospace’. He cited as an example ‘barrier pattern’, a term which BAe Manchester had asked me to define! My sole objective is to create a useful product. To this end I have included brief entries on such words as ‘generic’, ‘oxygen’ and ‘gasoline’, which are not aerospace terms. Incidentally, while ‘gasoline’ is clearly now a preferred spelling, I have had to write quite an essay on ‘kerosene/kerosine’.

I once had to defend myself against an air marshal who was offended by such rubbish (as he saw it) as ‘hardware’ and ‘software’. Today the explosion of home computing has opened up millions to such previously unfamiliar language. Indeed, in recent years the number of software terms has begun to get out of hand. The JSF programme alone involves more than 40 software acronyms, and I have omitted most of them.

Partly for this reason, this dictionary is centred (centered) at least in mid-Atlantic, if not further west, so we have ‘Petrol Gasoline’, the brief definition appearing under the latter. Cross-references are italicised. I have used US spellings wherever they are appropriate, and in this field they tend to predominate. Note: USA means US Army.

I have attempted to include a brief explanation of aerospace materials, even if they are known by a registered tradename. Also included are the names of many organizations, but, with a few exceptions, not armed forces, airlines, museums or flying clubs, and certainly not the names of manufacturers or particular types of aircraft, though such acronyms as TSPJ – Tornado self-protection jammer – are tempting. On the other hand, there is a grey area in which a company product appears to merit inclusion, an example being Zero Reader. I have had particular trouble with the names of spacecraft and their payloads, but this is a dictionary of aviation, not space flight.

Entries are in strict alphabetical order; thus MW50 appears in the place for MW-fifty. The exception is where an entry has a single alphabetical character followed by a numeral. In such cases it appears immediately after other entries featuring that single character. With a subject as complicated as aerospace, where one finds C, c, c₁, c̅, c̅̅, (c), C* and a host of C+numeral entries, it is difficult to decide which sequence to adopt. Greek terms are listed in Appendix 1, but some – such as Alpha and Beta – merit a place in the body of the dictionary.

On a lighter note, I read an article by Col. Art Bergman, USAF, explaining how to manage the temperamental F100 engine. I had no difficulty with his EECs, UFCs and Plaps, but I was defeated by ‘The F100 needs a lot more TLC than the J79 . . .’ I asked several certified F-15 drivers, and they were all mystified. I called the 527th TFTS, then the European Aggressor outfit. A charming female voice instantly said, ‘Ever think of tender loving care?’ On reflection, I put this meaning in the dictionary. The criterion is
whether or not an aerospace person might be confused without it.

One obvious problem area is at what point one should give up trying to include foreign terms. Some may think I have been over-generous to our Gallic friends, while other countries may think themselves harshly treated by being ignored. It is impossible to say ‘Leave out all foreign terms and acronyms’, because many have become part of the English language. Nobody would expect ‘aileron’ to be omitted, and before long ‘Fenestron’ will probably be just as universally accepted as ‘fenestron’.

At a rough count the number of new entries this time is in excess of 15,000. Almost all the additions are acronyms. There is little point in again saying that acronyms are an infectious disease, especially in the world of aerospace. Whilst admitting that the incentive to abbreviate is often strong, it is self-defeating if the reader has a choice of more than 20 interpretations and does not know which one to pick.

Some acronyms, such as Cardsharp, appear contrived. Another is Tiger – Terrifically Insensitive to Ground-Effect Radar; I had to force myself to include it. In general, I have omitted acronyms which include the name of a company, an example being Caps – Collins adaptive processor system. I have attempted to indicate whether the spoken acronym or spelled-out version predominates. Thus, we have Papi before PAPI. The outstanding exception is NATO. This is always spoken as a word, but the hierarchy in Brussels still insists that it is not written Nato.

Some acronyms bear little resemblance to the actual initial letters of the original words, while a few are quite a mouthful. We have been in particular trouble with the Joint Strike Fighter. This soon spawned JSF-E&MD and JSFPO-AEP, whilst Boeing was awarded a $28,690,212 contract to perform the JSFPICPTD. This means the Joint Strike Fighter Program Integrated Core Processing Technical Demonstration and is something I have omitted. Another non-starter has to be Direct, which the US Air Force tells me stands for Defense IEMATS REplacement Command and Control Terminal, which would be fine were it not for the fact that IEMATS stands for Improved Emergency Message Automated Transmission System. Roger Bacon, the sage of *Flight International*, has drawn attention to Boeing’s ‘no-tail advanced theater transport, tilt-wing super-short takeoff and landing’, which creates the handy name NTATTTTW/SSTOL. Clearly, we need acronyms within acronyms.

It is often difficult to decide when the name of a specific item has become a more general term which has to be included. In the 1970s the AAH (Advanced Attack Helicopter) meant the AH-64 Apache. This is a particular type of helicopter, so it had no place in these pages. However, over the years AAH has become a term applied to several of the AH-64’s later competitors, so exclusion is no longer justified. In the same way Awacs is now a class of aircraft, while, even though there is only one type of AABNCP, that designation is so important it would be unhelpful to omit it.

Both the AAH and AABNCP begin with ‘Advanced’. This is merely a pointless buzzword. Presumably it is intended to imply that something is the very latest, ‘state of the art’ and better than the competition, but – in aerospace at least – I have seldom heard of anybody designing something that was not ‘advanced’. Can these items still be ‘advanced’ after 40 years? To me, another *bête noire* is ‘integrated’. Already we have a zillion AIAIs (advanced integrated acronyms). This is an advanced integrated dictionary.

There is an obvious need for a body with the clout to decree what things shall be called, because the present situation is ludicrous. Did you know that the acronym ATAC can mean ‘Advanced Target Acquisition and Classification’? Fine, but ATDC stands for ‘Assisted Target Detection and Classification’ and also for ‘Automatic Target Detection and Classification’ and also for ‘Automated Target Detection and Classification’. Clearly that is not enough, because ATRC stands for
‘Aided Target Recognition and Classification’ and ‘Automatic Target Recognition and Classification’. I did not myself invent these. And I have just noticed that the USAF, the world’s leading offender, has become dissatisfied with the mere ERT (extended-range tank). It has changed it to ERFCS, extended-range fuel-containment system. Feeble! The name could be made far more complicated!

In the same way, it should be simple to have an agreed abbreviation for an airspace control zone, but we are now confronted by CTLZ, CTR, CTRZ, and CTZ. In the first edition of this work I included FMEA, for which two elucidations were (and are) current: failure modes and effects analysis and failure-mode effects analysis. I now have to add FMECA – failure-mode effects and criticality analysis – and FMETA – failure-mode effects and task analysis. It is inconceivable that the authors of the two new letter-jumbles were unaware of FMEA, and I cannot comprehend the need for the two new identities. If we go on like this I fear for the sanity of whoever takes over this work when I collapse through exhaustion.

Many of the acronyms in these pages already have more than 20 meanings, and are gathering fresh ones all the time. This trend is leading to texts which, even to most aerospace people, must appear mere gobbledegook. There is no more clearly written periodical than *Aerospace*, published by the august Royal Aeronautical Society, and it strives to remain one of the few bastions of good English. They published an article which told us, ‘Currently, BASE is developing a Terprom SEM-E standard card for use in the H764G, a high-accuracy INS with embedded GPS. It has two slots, the second being used by an Arinc, MIL-1553A/B or PANIL interface.’ Many readers were doubtless happy with this, and one was impelled to respond with, ‘May I add something to your characterisation of AQP as “an upgrade of CRM” . . . The human factors elements had to be injected into non-jeopardy Loft and LOE . . . With converging developments in CPL NVQ and recurrent CRM, the AQP may be the shape of things to come in the UK.’

A speaker at a recent conference ‘has sat on EUROCONTROL, ICAO, EUROCAE, RTAC and AEEC. In his current position as Programme Manager CNS/ATM he is involved in the CLAIRE and ISATIS using ACARS, a development study of VDL Mode 2 in France. He is evaluation manager of EOLIA and ASD manager in ProATN.’ And an advertisement tells me, ‘Group IV faxes and PCMCIA cards are only supplied with an ISDN S-Bus interface. The ISDN integration provided by the LES means that a SODA is only required at the mobile end.’ I think I need a whisky with my SODA.

Preface to the Cambridge edition
This updated and enlarged new edition is the first to be published by Cambridge University Press. I would like to thank Phoenix Typesetting for doing a masterful job with mathematics and Greek symbols, and everyone at Cambridge for their diligence and infectious enthusiasm – all too rare these days in book publishing.

Bill Gunston, Haslemere, 2004
I am grateful to the publisher’s excellent team in New York and Cambridge, not least for agreeing that a new edition is needed. The avalanche of new aerospace terms, and especially acronyms, shows no sign of abating. There is little point in my reiterating the questionable value of inventing new meanings for three-letter acronyms when the same three letters already have more than 30 different meanings relevant to aerospace. Of course, common sense shows that these cannot be presented in any particular order of importance.

One correspondent asked, ‘What’s the point of having so many meanings for the same set of letters? It just clutters up your book.’ In my reply I asked him which ones he would delete. I am still waiting for his reply.

Obviously, it is impossible to include everything. I have given GSP a single brief line, though I have one definition of this seemingly harmless letter-combination which extends over 14 pages of text. My first explanation of EPS is ‘Emergency or [confusing] electrical, power system, or supply, or source’. It was impossible to omit any of these, because all are in current use. The reader can be assured that I am not in the business of myself inventing extra meanings; there are too many already.

As far as possible I have (obviously) tried to avoid including an acronym within the explanation of an acronym. I apologise for the fifth translation of Dars. I have offered ‘Deployable ARS12 (NATO).’ The seeker after enlightenment may, in an ill humour, look up ARS12, where he will find it means ‘Air Control Center, recognised air picture production center sensor-fusion post [ACCS] (NATO).’ Quite a mouthful to be represented by three letters.

I have tried to keep down the number of entries by combining two or more in one entry. For example, under DSU 1 offer:

- 4 Data-storage unit; R adds receptacle.
- 5 Defensive system upgrade; P adds program.

I hope that no reader seeking DSUR will angrily say that it is not there. I have also agonised over many names and functions, especially in structural analysis where I have often failed to concoct explanations which are both brief and accurate. A dictionary ought not to try to emulate a textbook.

Just as this edition was closing for press, I received a letter from Dick Gunnell, an Englishman living in the south of France. He drew my attention to a passage on page 41 of Annette Carson’s classic history of aerobatics <i>Flight Fantastic</i>:

At the very same time, quietly and almost unnoticed, it seems, the word “aerobatics” entered the English language. A certain Mr E. L. Gunston wrote the following amusing letter to <i>The Aeroplane</i>, which was published in its edition of 1st January 1914:

“Since bouclie and boucle is a feat which has come to stay, and which apparently is as common as sane flying, these feats performed by Pégoud, Chevillard and certain other scientific gentlemen will have to be called by a distinguishing name. Why not ‘aerobatics’?”

Nice one, Mr Gunston!

My correspondent asks whether Mr E.L.G. was my father (‘there appears to be a similarity in the genes’). Regrettfully I must claim no known close kinship. I wonder if he invented any other terms now to be found between these covers.

Again, I would like to thank Phoenix Typesetting, and everyone concerned at Cambridge University Press, both in Cambridge and New York, for unfailing meticulous attention to detail.

Bill Gunston, Haslemere, 2009
A

1. General symbol for area (see S).
2. Aspect ratio (see As).
3. Amperes.
5. Moment of inertia about longitudinal axis, rolling mode.
6. Anode.
7. Amplitude.
8. Degrees absolute.
9. Amber airway, or light.
10. IFR flight plan suffix, fitted DME and 4096-code.
11. LERTDS code: piloted aircraft, IR or UV radiation.
14. Sonobuoy standard size class, c 1 m/3 ft.
15. Air Branch (UK Admiralty).
22. Aeroplane (PPL).
23. Altitude, followed by digits indicating hundreds of feet.
24. Arm, as distinct from safe.
25. Antarctic (but Tor Bergeron’s classification = Arctic).
27. Weather: hail
28. Arrival chart.
29. Accepted (EFIS or nav. display).
30. Sport-parachuting certificate: 10 jumps, no accuracy demanded.
31. Autotuned (navaid).
32. Magnetic-vector potential.
33. Aircraft category: free balloon (FAI).
34. Cross-section area of wing torsion box.
35. Common but not universal usage for aft-acting aero-
36. 250 h.
37. Margin [e.g., 0.15 or 0.2] above stall speed.
38. Structural resistance to buckling.
39. Wing-secional axial force parallel to chord, per unit span.
40. Angstrom (10^-10m), very small unit of length, contrary to SI.
41. Airframe hook in form of an A; hook at vertex and hinged at base of each leg.
42. Military flying instructor category; 15 months and 250 h.
43. Lift-curve slope for hinged trailing-edge control surface [arguably, also flap], numerically equal to dCL/dα.
44. Lift-curve slope for wing or other primary aerodynamic surface, numerically equal to dCL/dα.
45. Lift-curve slope for hinged trailing-edge control surface [arguably, also flap], numerically equal to dCL/dα.
46. Lift-curve slope for wing or other primary aerodynamic surface, numerically equal to dCL/dα.
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52. Lift-curve slope for hinged trailing-edge control surface [arguably, also flap], numerically equal to dCL/dα.
AA

AA / Anti-aircraft.

1 Airship Association [office, Folkestone CT20 3LG] (UK).

2 Acquisition Aiding, technique for matching EM waveforms (esp for ECM).

3 Air-to-air (ICAO code).

4 Alert annunciator.

5 Antenna array.

6 Airbrokers Association (UK, 1949, became AAB).

AA Air-to-air (radar mode).

AAI / Air-to-air battle management.

AAW / Air-to-air weapon.

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AAEEA

AAEEA Association des Anciens Elèves de l’Ecole de l’Air (F).

AAES 1 Association of Aerospace Engineering Societies (US).

AAE-S 2 American Association of Engineering Societies.

AAEXS Army/Air Force Exchange Service (US, became AAFES).

AAF Army Air Force[s], full title USAAF, (June 1941–1947).

AAFARS Advanced aviation forward-area refuelling system.

AAFBU AAF Base Unit.

AAFC Allied Air Forces Central Europe (NATO, pronounced afsee).

AAFEA Australian Airline Flight Engineers’ Association.

AASFES Army and Air Force Exchange Service (US).

AAFIF Automated air-facility information file, compiled by DMA.

AAFR Association of African Airlines.

AAFS Advanced aerial fire-support system.

AAG, A/AG 1 Air-to-air gunnery.

2 Air Adjunct General (USAF, ANG).

3 Asociación Colombiana de Aviacion Civil General (Columbia).

4 Advanced arresting gear [carriers].

AAGE The Association of Aeronautical Ground Engineers (UK, 1935–).

AAFM Advanced aerial gun, far-field.

AAH Advanced attack helicopter (USA).

AAHIS Advanced airborne hyperspectral imaging system.

AAHM 1 American Airpower Heritage Museum [Midland, TX].

2 Alaska Aviation Heritage Museum [Fairbanks, AK].

AAHIS American Aviation Historical Society [Santa Ana, CA 92704].

AAI 1 Angle-of-approach indicator, or indication (see VASI).

2 Angle-of-attack indicator.

3 Airline Avionics Institute (US).

4 Air aid to intercept (AI was more common).

5 Air-to-air interrogator; see AAIACP.

6 Arrival, or arriving, aircraft interval.

7 Airports Authority of India.

AAIR 1 Air Accident Investigation Branch (DETR, UK).

2 Air Accident Investigation Bureau (Singapore).

AAIC Air Accidents Investigation Commission (US).

AAICP Air-to-air interrogator control panel.

AAII Accelerated accuracy improvement initiative (GPS Navstar).

AAILS Airmedical airborne information for lateral spacing.

AAIM Aircraft autonomous, or acoustic airframe, integrity monitoring.

AAIP Analog autoland improvement program [me].

AAIR AmSafe aviation inflation restraint.

AAIRA Assistant Air Attaché (US, pronounced A-aira).

AAIS Association of Aerospace Industries (Singapore) [2002–].

AAL 1 also a.a.l., Above airfield level.

2 Australian Air League [W. Marrickville, NSW].

AAE Association of Aviation Psychologists [Columbus, OH] (US).

AAAP Aircraft approach limitations, UK service usage specifying minima for aircraft type in association with specified ground aids.

AALAAW Advanced air-launched anti-armour weapon.

AALAE Association of Australian Licensed Aircraft Engineers.

AALB Ailes Anciennes Le Bourget (F).

AALC Antonous approach [and] landing capability (AFRL).

AALS Army Aviation Logistics School [Fort Eustis, VA23604-5414] (US).

AAM 1 Air-to-air missile.

2 Azimuth-angle measuring [unit] (Madge).

3 Archive Air Museum (BAA).

AAMAAssociation des Amis du Musée de l’Air (F).

AAMAE Association of Aviation Medical Examiners (UK).

AAMP 1 Advanced-architecture microprocessor.

2 Advanced aircraft maneuvering program.

AAMPV Advanced anti-materiel/personnel/vehicles (US).

AAMRL Harry G Armstrong Aerospace Medical Research Laboratory (USAF).

AAMS Association of Air Medical Services [Alexandria, VA22314] (US).

AAN Airworthiness approval note.

AANCP Advanced airborne national command post (US).

A&AS Advisory and Assistance Services.

A&D 1 Arrival and departure chart.

2 Aerospace and defense (industry sector).

A&E Airframe and Engine, qualified engineer.

A&F Arming and fuzing (ICBM).

AANDI Airworthiness Assurance Non-destructive Inspection validation center [at Sandia National Laboratory, N.M.] (US).

A&P Airframe and Powerplant qualified mechanic (US).

A&R Assemble and recycle.

AAO 1 Air-to-air operation[s].

2 Airborne area of operation.

3 Air Attack Officer (US Forest Service).

AAM 1 Apollo Applications Program (NASA).

2 Acceptable alternative product (NATO).

3 Aircraft Acceptance Park (RFC/RAF, to 1918).

4 Ass. of Aviation Pilots (Mexico DF).

5 Ass. of Aviation Psychologists [Columbus, OH] (US).

Aap Angle of approach lights.

AAPA Association of Asia-Pacific Airlines.

APPP Airborne auxiliary powerplant.

APPS Advanced aviation protection system (EW).

AAR 1 Aircraft accident report.

2 Air-augmented rocket.

3 Aircraft approach, or autonomous automatic refuelling.

4 Antenna azimuth rate.

5 Airport acceptance rate.

6 Airport arrival rate.

7 Active-array radar.

8 After-action review.

AARA Air-to-air refuelling area.

AARB Advanced aerial refuelling boom.

AARF Aircraft accident report form.

AARGM Advanced anti-radiation guided missile.
AAARL

AAARL  Advanced applications rotary launcher (S adds system).
AAR points  Ground position of intended hookups.
AARS  Auto-altitude-reporting system.
2 Attitude/altitude retention system.
3 Advance [not advanced] airborne reconnaissance system (BAE Systems).
AARTA  Army Aviation research and technology activity (USA).
AASA  1 Airport Advisory Service (FAA).
2 Army Aviation School (USA).
5 Air Armament School (formerly) (UK).
6 Advanced automation system (NAS 2).
7 Aerospace Audiovisual Service [1981–, previously APS, APCs] (USAF).
8 Alternative access to [space] station (NASA).
2 The Airlines Association of South Africa [Springbok, Transvaal].
AASE  Advanced aircraft survivability equipment.
AASF  1 Advanced Air Striking Force [in France, 1939–40] (RAF).
2 Alaskan Aviation Safety Foundation [office, Anchorage, AK99502] (US).
3 Army Aviation Support Facility (USA).
4 Avancement air-sol modulaire (F).
5 Association of Aviation and Space Museums (UK).
6 Association of Aviation and Space Museums [Alexandria, VA] (US).
AASU  Western rendition “aviation army (or armies) of the Soviet Union” [to 1990].
AATS  1 Airworthiness approval tag.
2 Airports Authority of Thailand.
AATA  1 Associación Argentina de Transportadores Aéreos.
2 Animal Air Transport Association [Fort Washington, MD] (Int.).
AATC  1 American Air-Traffic Controllers’ Council.
2 ANG/Afres Test Center (USAF).
3 Alabama Aviation & Technology Campus [Ozark AL36361–1209] (US).
4 ATC/Aviation Applied Technology Directorate (USA).
5 Advanced air-to-surface missile.
2 Armament Support Unit (USAF).
4 Armament air-sol modulaire (F).
5 Association of Aviation and Space Museums [Alexandria, VA] (US).
6 Airworthiness Assurance Working Group.
7 Automatic Aviation Weather Service.
8 Advanced anti-tank weapon system.
AAW 1 Automatic Aircraft Weather System.
2 AEW 2 Access-approval test set [or system].
3 Airborne acquisition test set.
4 Airborne adviser weather system.
5 Flight data communications.
7 Aircraft Assembly Unit (UK, WW2).
8 Association of Aerospace Universities, 21 plus 5 commercial organisations [c/o Coventry University CV1 5FB] (UK).
9 Audio amplifier unit.
10 Active aerosandboxing wing.
11 Aeromedical Air Wing (USAF).
AAWEX  Anti-air warfare exercise.
AAWG  Airworthiness Assurance Working Group.
AAWS  1 Automatic Aviation Weather Service.
2 Advanced air-to-surface missile.
AAW 1 Aircraft Assembly Unit (UK, WW2).
2 Association of Aerospace Universities, 21 plus 5 commercial organisations [c/o Coventry University CV1 5FB] (UK).
3 Audio amplifier unit.
4 Active aerosandboxing wing.
5 Articulated audio unit (threat warning).
6 Assigned amount unit(s) [emissions].
AAUR  All-altitude upset recovery.
AAV  Autonomous aerial vehicle.
AAv  See AAVN.
AAVN  1 Army Aviation (UK).
2 Aerospace Audio-Visual Service (USAF).
AAVS  1 Aerospace Audio-Visual Service (USAF).
2 Aircraft Assembly Unit (UK, WW2).
3 Association of Aerospace Universities, 21 plus 5 commercial organisations [c/o Coventry University CV1 5FB] (UK).
4 Audio amplifier unit.
5 Antenna adaptor unit (IFF).
6 Articulated audio unit (threat warning).
7 Assigned amount unit(s) [emissions].
AAW 1 Anti-air warfare.
2 Active aerosandboxing wing.
3 Aeromedical Air Wing (USAF).
AAWEX  Anti-air warfare exercise.
AAWG  Airworthiness Assurance Working Group.
AAWS  1 Automatic Aviation Weather Service.
2 Advanced anti-tank weapon system.
AAWWS  Airborne adverse-weather weapon system.
AB  Air base (USAF).
AB, AB, ab  1 Airbrake.
2 Airbrake.
As  1 Cross-section area of spar boom.
2 Projected blade area of helicopter rotor.
ABA  American Bar Association; IPC adds International Procurement Committee.
ABA 1 Australian Business Aircraft Association.
ABAC 1 Conversion nomogram, eg for plotting great-circle bearings on Mercator projection.
2 Association of British Aviation Consultants.
3 Association of British Aero Clubs and Centres, formed 1926 as Associated Light Aeroplane Clubs, reconstituted as ABAC 1946, became BLAC 1966.
4 The Association of Balloon and Airship Constructors [San Diego, CA 92169] (US).
ABAG  Associação Brasileira de Aviação Geral (Brazilian NBAA).
ABB  Automated beam-builder (space).
ABBCC  Airborne battlefield control center.
Abbey Hill  ESM for British warships, tuned to hostile air (and other) emissions.
ABC 1 Advance-booking charter.
2 Advancing-blade concept (Sikorsky).
3 Automatic boost control.
4 Airborne commander (SAC).
5 See Airborne Cigar.
6 After bottom [dead] centre.
ABCA  American, British, Canadian, Australian Standardization Loan Programme.
ABCC  Airborne Battlefield Command and Control Center (USAF), upgraded to II and III.
ABCT  Airfields of Britain Conservation Trust (UK).
ABCU  Alternate [ie alternative] braking control unit.
ABD 1 Airborne broadband defence (ECM).
2 See next.
ABD-DR  Aircraft battle damage repair.
Abeam  Across the borders European ATM(7) systems effects (Euret).
Abeam  Bearing approximately 090° or 270° relative to vehicle.
Aberporth

Aberporth Chief UK missile test centre, formerly administered by RAE, on Cardigan Bay, now Parc Aberporth.

aberration Geometrical inaccuracy introduced by optical, IR or similar electromagnetic system in which radiation is processed by mirrors, lenses, diffraction gratings and other elements.

ABE 1 Air-breathing engine [S adds system].
2 Aerodrome beacon.
3 Air 429 bus emulator.

ABET Accreditation Board for Engineering and Technology (US).

ABF 1 Annular blast fragmentation (warhead).
2 Auto beam forming (passive sonobuoys).
3 Advanced bomb family (USN).

ABFAC Airborne forward air controller.

ABFI Association Belge des Flight Instructors [Antwerp B-2140] (Belgium).

ABG Air Base Group (USAF).

ABGS Air Bombing and Gunnery School (RAF).

ABI 1 Advanced[ed] boundary information.
2 Airborne broadcast intelligence.
3 Advanced baseline imager (NOAA).

ABIA Associação Brasileira das Industrias Aeronauticas.

ABICS, Abics Ada-based interception [or integrated] control system.

ABIBS Airborne broadcast intelligence hardware system (hazard avoidance).

ABILA Airborne instrument landing approach.

ab initio Aircraft or syllabus intended to train pupil pilot with no previous experience [literally “from the beginning”].

ABIP Advisory Board of Interested Parties [EASA] (Int.).

ABIS All-bus instrumentation system.

ABIT, Abit ADS-B implementation team.

ABITA Association Belge des Ingénieurs et Techniciens de l’Aéronautique et de l’Astronautique [office, B-1930, Zaventem].


ABL 1 Airborne laser.
2 Atmospheric boundary layer.
3 Armoured box launcher.
4 Allegany Ballistics Laboratory (VS).

ablation Erosion of outer surface of body travelling at hypersonic speed in an atmosphere. An ablative material (ablator) chars or melts and is finally lost by vaporisation or separation of fragments. Char has poor thermal conductivity, chemical reactions within ablative layer may be endothermic, and generated gases may afford transpiration cooling. Main mechanism of thermal protection for spacecraft or ICBM re-entry vehicles re-entering Earth atmosphere.

AB/LD Airbrakes/lift dumpers.

ABM 1 Apogee boost motor.
2 Anti-ballistic missile, with capability of intercepting re-entry vehicle(s) of ICBM.
3 Abeam (ICAO code).
4 Air-burst munition.
5 Aviation business machine.
6 Asynchronous balanced mode.

absolute alcohol Pure ethyl alcohol (ethanol) with all water removed.
**absolute altimeter**

**absolute altimeter** Altimeter that indicates absolute altitude; nearest approach to this theoretical ideal is laser altimeter, closely followed by instruments using longer EM wavelengths (radio altimeter).

**absolute altitude** Distance along local vertical between aircraft and point where local vertical cuts Earth’s surface.

**absolute angle of attack** Angle of attack measured from angle for zero lift (which with cambered wing is negative with respect to chord line).

**absolute ceiling** Usually, absolute aerodynamic ceiling.

**absolute density** Theoretical density (symbol $\rho$) at specified height in model atmosphere.

**absolute fix** Fix (2) established by two or more position lines crossing at large angles near $90^\circ$.

**absolute humidity** Humidity of local atmosphere, expressed as gm⁻³.

**absolute inclinometer** Inclinometer reading attitude with respect to local horizontal, usually by precise spirit level or gyro.

**absolute optical shaft encoder** Electromechanical transducer giving coded non-ambiguous output exactly proportional to shaft angular position.

**absolute pressure** Gauge pressure plus local atmospheric pressure.

**absolute system** Of several ** of units, or for calculating aerospace parameters, most important is reduction of aerodynamic forces to dimensionless coefficients by dividing by dynamic pressure head $\frac{1}{2}pV^2$.

**absolute temperature** Temperature related to absolute zero. Two scales in common use: absolute (°A) using same unit as Fahrenheit or Rankine scale (contrary to SI), and Kelvin (K) using same unit as Celsius scale.

**absolute zero** Temperature at which all gross molecular (thermal) motion ceases, with all substances (probably except helium) in solid state. $0$K = −273.16°C. Food in refrigerator.

**absorbed dose** Energy imparted by nuclear or ionising radiation to unit mass of recipient matter; measured in rad.

**absorption band** Range of frequencies or wavelengths within which specified EM radiation is absorbed by specified material; narrow spread(s) of frequencies for which absorption is at clear maximum.

**absorption coefficient** 1 In acoustics, percentage of sound energy absorbed by supposed infinitely large area of surface or body. 2 In EM radiation, percentage of energy that fails to be reflected by opaque body or transmitted by transparent body (in case of reflection, part of radiation may be scattered). Water vapour is good absorber of EM at long wavelengths. Radiation to unit mass of recipient matter; measured in cm⁻¹.

**absorption process** Chemical production of petrols (gasolines) by passing natural gas through heavy hydrocarbon oils.

**absorption cross-section** Absorption coefficient of radar target expressed as ratio of absorbed energy to incident energy.

**ABT** 1 About (ICAO). 2 Air-breathing threat(s).

**Abta, ABTA** Association of British Travel Agents, [office, London].

**ABTJ** Aferburning turboprop.
ACARE

ACARE Advisory Council for Aeronautical Research in Europe (Int.).

Acars, ACARS Aircraft communications and automatic reporting system; most common interpretation.

2 Airborne communication and recording system.

3 Airborne communications addressing and reporting system.

4 Airline communication and reporting system (Rockwell Collins).

ACAS Air-cycle air-conditioning system.

2 Assistant Chief of the Air Staff.

3 Aluminium core, aluminium skin.

4 Airborne collision-avoidance system.

5 Aircraft collision-avoidance system (ICAO is currently II; 2002).

6 Advisory, Conciliation and Arbitration Service (UK).

7 Airfield chemical-alarm system.

8 Aircraft navigational system (software).

ACASS Advanced close air support system (US).

Acassa Army close air support situation awareness (USA/USAF).

Acat, ACAT Association of Colleges of Aerospace Technology (Weybridge KT13 8TT) (UK).

2 Air Carrier Ab initio Training; MPL adds Multiple crew pilot license (US).

Acatt Army combined arms team trainer (Cobra/Apache/Scout).

ACAVS Advanced cab and visual system.

ACAWS Advisory caution and warning system.

ACBM Additional conventional-bomb module.

ACC Air, or air traffic, or area, or aerodrome, or airfield control centre.

2 Active clearance control.

3 Air Combat Command (USAF, from 1 June 1992, HQ Langley AFB).

4 Air Co-ordinating Committee (US, military/civilian, 1945–60).

5 Axis-controlled carrier.

6 Avionics computer control.

7 Aeronautical Chamber of Commerce (US, 1921 on).

8 Automatic code change (IFF).

9 Aero Club of Canada (Ontario K7C 4L7).

10 Aerobatic Certificate Course (AOPA).

11 Audio control console.

Acct Alloculmus castellanus.

ACCA Air Combat Air Support Situational Awareness (ACASS) system.

ACCE Air Command and Control Element (RAF).

accelerated flight Although aircraft that gains or loses speed is accelerating in horizontal plane, term should be used only for acceleration in plane perpendicular to flight-path, esp. in vertical plane.

accelerated history Test record of specimen subjected to overstress cycling, overtemperature cycling or any other way of ‘ageing’ at abnormally rapid rate.

accelerated mission endurance test An engine or other item is subjected to a non-stop succession of simulated in-service missions.

accelerated stall Stall entered in accelerated flight. As common way of inducing stall is to keep pulling up nose, it might be thought all stalls must be accelerated, but in gradual entry flight path may be substantially horizontal. “High-speed stall” is possible in violent manoeuvre because acceleration in vertical plane requires wing to exceed stalling angle of attack. Stall-protection systems are generally designed to respond to rate of change of angle of attack close to stalling angle, so stick-pusher (or whatever form system takes) is fired early enough for critical value not to be reached.

accelerate-stop Simulation of RTO by accelerating from rest to V1 or other chosen speed and immediately bringing aircraft to rest in shortest possible distance; hence * distance.

accelerating pump In piston engine carburettor, pump provided to enrich mixture each time throttle is opened, to assist acceleration of engine masses.

accelerating well Originally receptacle for small supply of fuel automatically fed into choke tube by increased suction when throttle was opened. Later became small volume connected by bleed holes to mixture delivery passage. Usually absent from modern engines.

acceleration Rate of change of velocity, having dimensions LT–2 and in SI usually measured in m s–2 [reciprocal, 0.3048]. As velocity is vector quantity, * can be imparted by changing trajectory without changing speed, and this is meaning most often applied in aerospace.

acceleration control unit Major element in engine fuel control unit, usually a servo sensing compressor delivery pressure to make fuel flow keep pace with demand for extra fuel to accelerate engine as throttle is opened.

acceleration datum Engine N1, corresponding to typical approach power, used in engine type testing for 2½ min. rest period before each simulated overshoot acceleration (repeated 8 or 15 times).

acceleration errors Traditional direct-reading magnetic compass misreads under linear acceleration (change of speed at constant heading) and in turn (apparent vertical acceleration at constant speed); former is a maximum on E–W headings, increasing speed on W heading in N hemisphere indicating apparent turn to N; Northerly Turning Error (N hemisphere) causes simple compass to lag true reading, while Southerly Turning Error results in over-reading. Simple suction horizon misreads under all applied accelerations, most serious under linear positive acceleration (t–o or overshoot), when indication is falsely nose-up and usually right-wing down (with clockwise rotor, indication is diving left turn).

acceleration manoeuvre High-speed yo-yo.

acceleration-onset cuing Simulator technique in which real acceleration is initially imparted and then reduced, usually to zero, at a rate too low for body to notice; thus trainee can even believe in sustained afterburner takeoff.

acceleration stress Physical deformation of human body caused by acceleration, esp. longitudinal.

acceleration tolerance See g-tolerance.

accelerator 1 Device, not carried on aircraft, for increasing linear acceleration on takeoff; original name for catapult.

2 Software for boosting throughput of digital data, especially for satellite transmission.

accelerator pump Accelerating pump.
**accelerometer**

**Device for measuring acceleration. INS contains most sensitive** *
possible. Usually one for each axis, arranged to emit electrical signal proportional to sensed acceleration. Recording makes continuous hard-copy record of sensed acceleration, or indicates peak. Direct reading * generally fitted in test flying but not in regular aircraft operation.

**Accept** Automated cargo clearance enforcement processing technique, computerised inspection of selected items only, to help identify high-risk items (US customs).

**acceptable alternative product** One which may be used in place of another for extended periods without technical advice (NATO).

**acceptance** One meaning is agreement of air-traffic control to take control of particular aircraft. Hence * rate is (1) actual rate in one-hour period, or (2) the maximum that can safely be handled.

**acceptance test** Mainly historic, test of hardware witnessed by customer or his designated authority to demonstrate acceptability of product (usually military). Schedule typically covered operation within design limits, ignoring service life, fatigue, MTBF, MMH/FH and fault protection.

**acceptance trials** Trials of flight vehicle carried out by eventual military user or his nominated representative to determine if specified customer requirement has been met.

**Access** Assembly concept for construction of erectable space structures.

**access door** Hinged door openable to provide access to interior space or equipment.

**access light** Until about 1940, light placed near airfield boundary indicating favourable area over which to approach and land.

**access panel** Quickly removable aircraft-skin panel, either of replaceable or interchangeable type, removed to provide access to interior.

**accessories** Replaceable system components forming functioning integral part of aircraft. Except in general aviation, term is vague; includes pumps, motors and valves, excludes such items as life-rafts and furnishing. In aviation, term is vague; includes pumps, motors and valves, contents gauges and flowmeters, but not tanks or pipelines.

**accessory drive** Shaft drive, typically for group of rotary accessory units, from main engine, APU, EPU, MEPU or other power source.

**access time** 1 Time required to access any part of computer program (typically $10^{-2}$ to $10^{-5}$ s).

2 Time required to project any desired part of film or roller map in pictorial cockpit display (typically about 3 s).

3 Time necessary to open working section of tunnel and reach model installed (typically about 1,000 s, but varies greatly).

**ACCGS** Air Cadet Central Gliding School (Syerston, UK).

**ACCID** Notification of aircraft accident (ICAO).

**accident** Incident in life of aircraft which causes significant damage or personal injury (see *notifiable*).

**accident-protected recorder** Flight recorder meeting mandatory requirements intended to ensure accurate playback after any crash.

**accident rate** In military aviation most common parameter is accidents per 100,000 flying hours; other common measures are fatal accidents, crew fatalities and aircraft write-offs on same time basis, usually reckoned by calendar year. In commercial aviation preferred yardsticks are number of accidents (divided into notifiable and fatal) per 100 million passenger-miles (to be replaced by passenger-km) or per 100,000 stage flights, either per calendar year or as five-year moving average. In General Aviation usual measure is fatal accidents per 100,000 take-offs.

**accident recorder** Device, usually self-contained and enclosed in casing proof against severe impact, crushing forces and intense fire, which records on magnetic tape, wire, or other material, flight parameters most likely to indicate cause of accident. Typical parameters are time, altitude, IAS, pitch and roll attitude, control-surface positions and normal acceleration; many other parameters can be added, and some ** on transports are linked with maintenance recording systems. Record may continuously superimpose and erase that of earlier flight, or recorder may be regularly reloaded so that record can be studied.

**ACCS** Automated command and control information system (NATO).

**ACCISR** See AC³ISR (alphabetically, AC two...).
ACD

ACD 1 Automatic [or automated] chart display.
   2 Aeronautical Charting Division (NOAA).
ACDA  Arms Control and Disarmament Agency.
ACDAC  Asociación Colombiana de Aviadores Civiles [pilots’ union; Bogotá] (Colombia).
ACDB  Airport characteristics data-bank (ICAO).
AC/DC  Air refuelling tanker able both to dispense and receive fuel in flight (colloq).
ACDO  Air-carrier district office (US).
ACDP  Armament control and display panel.
ACDS  1 Automatic countermeasures [or computer-controlled] dispenser [or dispensing] system.
   2 Assistant Chief of the Defence Staff (UK).
ACF  Air-, or advanced, combat direction system.
ACDTR  Airborne central data tape recorder (now generally called RSD).
ACE 1 Automatic check-out equipment.
   2 Association of Consulting Engineers [London SW1H 0QL] (UK).
   3 Air combat evaluator (CIU software).
   4 Aircrew (or accelerated copilot) enrichment.
   5 Allied Command Europe (NATO).
   6 Association des Compagnies Aériennes de la Communauté Européenne [all EC7 members of IACA; office, B-1530 Zaventem] (Int.).
   7 Advanced crew-station evaluator (helicopter).
   8 Automated center for electronics, computer control of all phases of circuit design, development, assembly and test (Lockheed).
   9 ‘Technical acknowledgement’ (ACARS code).
   10 Actuator control electronics.
   11 Advanced-certification equipment.
   12 Aerospace Committee (BSI).
   13 Aviation capabilities enhancement.
   14 Analysis [and] control element.
   15 Agile control experiment.
   16 Aerobatic certification evaluator.
   17 Aviation Career Education, or Educator (USAF, formerly MAC).
   18 Aviation Combat Element of MEU
   19 Autonomous combat [manoeuvres] evaluation.
   20 Air-combat emulator.
   21 Adaptive-cycle engine.
   22 Association of Cost Engineers [Sandbach, Cheshire] (UK).
   23 Aviation [airport] capacity evaluation (FAA 2002-).
   24 Aviation Centre of Excellence (45 European members).
   25 Aéro Club d’Egypte [Cairo].
   26 Airborne Command Element (Awacs) (US).
   27 Aerial navigation performance
   28 Aircraft (ICAO), also loosely ACFT.
ACEA  Adapting-flight [or pilot] control system.
ACEB  Assistant of Cockpit Design (S adds ‘system’).
ACES 1 Aircraft energy efficiency (NASA).
ACCHGD  Aircraft-hand, General Duties, “lowest form of life” in RAF (WW2).
ACH 1 Aircraft navigation system.
ACSP  Automatic cancellation of extended [radar] target[s].
ACE 2 Advanced concept escape system.
ACER  Air Carriers Enlisted Reserves (USA).
ACE 3 Air-carrier engineering support.
ACET 1 Aircraft computerized equipment support facility (USA).
ACETEF  Air-combat environmental test and evaluation facility (USA).
acetone  CH3.CO.CH3, inflammable, generally reactive chemical, often prepared by special fermentation of grain, used as solvent. Basis of many ‘dopes’ and ‘thinners’.
ACET 2 Affordable capable engine technology, TDP adds technology demonstrator programme [2005-] (UK).
acetate  Compound or solution of acetic acid and alkali.
   * dope is traditionally based upon acetic acid and cellulose; was used for less inflammable properties (see nitrate dope).
ACETS, Acets 1 Air-combat environment transportation system (for post-attack airfields).
ACT 2 Air-combat evaluator.
ACTCS 1 Aircraft Components Flight (RAF).
ACT 3 Air-cooled fuel cooler.
ACTGD  Advanced civil flight deck.
ACTIS 1 Aircraft IS/IS.
ACTS 1 Aircraft IS/IS.
ACTF 1 Aircraft flight-critical.
ACTSF 1 Aircraft fuel cooler.
ACT 2 Aeronautical Charting Division (NOAA).
ACTG 1 Aircraft go-fast.
ACTGR 1 Aircraft go-fast.
ACTU 1 Aircraft手, General Duties, “lowest form of life” in RAF (WW2).
achieved navigation performance  The measure of uncertainty in the position element.
achromatic

Transmitting white light without diffraction into special colours; lens system so designed that sum of chromatic dispersions is zero.

ACI 1 Air Council Instruction (UK).

2 Airports Council International; suffixes denote regions, thus – NA = North America [office, 1215 Geneva 16 (Int.)].

3 Avionics caution indicator.

4 Armament control indicator.

ACID Aircraft identification.

cid engine Rocket engine in which one propellant is an acid, usually RFNA or WFNA.

acid extraction Stage in production of lubricating oils in which sulphuric acid is used to extract impurities.

Acids, ACIDS 1 Automated communications and intercom distribution system.

2 Air conformal ice detection system.

ACI-E Airports Council International – Europe.

ACINT Activo auido intelligence.

Acips Airfoil and cowl protection system.

ACIS 1 Advanced CCD imaging spectrometer.

2 Armament, or advanced, control/indicator set.

3 Advanced cabin interphone system.

ACJ Advisory circular, Joint.

ACJN Adaptive joint C4ISR node.

ACK Acknowledgement of uplink (ACars).

ack Acknowledgement (ICAO).

Ack-ack Anti-aircraft (UK WW1, became passé in WW2).

Ackeret formula There are many, most important being, for thin wing above \( M_{Det} \), regardless of camber, 

\[ C_l = 4\alpha \sqrt{M-1} \]

Ackeret theory First detailed treatment [1925] for supersonic flow past infinite wing, suggesting sharp leading and trailing edges and low t/c ratio; favoured profiles were biconvex or trapezium (parallel double wedge).

acknowledged program A special-access program whose existence is admitted.

acknowledgement Confirmation from addressee that message has been received and understood.

ACL 1 Anti-collision light.

2 Allowable cabin load.

3 Aeronaughtical-chart legend.

4 Altimeter check location.

5 Air Cadet League of Canada.

6 ATC clearance[].

Aclaim Airborne coherent lidar for air inflight measurement.

Aclant Allied Command, Atlantic (NATO).

Aclc Air the Cadet league of Canada [office, Ottawa].

ACLD, ACld Above cloud[].

ACLG Air-cushion landing gear; underside of aircraft is fitted with inflatable skirt to contain ACV type cushion, suitable for all land, marsh, sand or water surfaces.

Aclices Airborne communications location, identification and collection system (USA).

aclinic line Isoclinic line linking all points whose angle of dip is zero.

Aclos, ACLOS Automatic command to line of sight.

ACLs 1 Aircraft carrier landing system (Bell/USN).

2 Aircraft carrier landing system.

ACLT 1 Aircraft-carrier landing training.

2 Actual calculated landing time.

ACLU American Civil Liberties Union (US).

ACM 1 Air-combat manoeuvring, or manoeuvre [US manoeuvre]; EST adds expert-systems trainer, I instrumentation, R range and S simulator.

2 Air-cycle machine.

3 Anti-armour cluster munition.

4 Air Chief Marshal (not normally abbrev.).

5 Air-conditioning module.

6 Advanced cruise missile (USAF).

7 Aircraft-condition monitoring.

8 Aircraft manual.

9 Attitude-control module.

10 Air Commercial Manual (US Bureau of Air Commerce).

11 Aircraft-cabin mattress.

12 Advancing contouring machine.

13 ATC I communications management.

ACMA Advanced concepts and material applications (MoD, UK).

ACMDS Advanced countermeasures dispersing system.

ACME Formerly Advanced core military engine.

ACMF Aircraft-condition monitoring function.

ACMG Air-Cargo Management Group (US).

ACMI 1 Aircraft-manoeuvring instrumentation, or installation.

2 Aircraft, crew, maintenance and insurance.

ACMP Alternating-current motor/pump.

ACMR Air-combat manoeuvring range.

ACMS 1 Avionics, or advanced, control and management system.

2 Aircraft, also airport, condition monitoring system.

3 Armament control and monitoring system.

ACMT Advanced cruise-missile technology.

ACN 1 Aircraft Classification Number (ICAO proposal for pavements).

2 Airborne communications node, C4ISR, now called AICN.

3 Academia Cosmologica Nova (G).

4 Ascension.

ACNA Aéro Club National d’Algérie (Algeria).

ACNDT Advisory Committee for Non-Destructive Testing.

ACNIP Auxiliary, or advanced, CNI panel.

ACNS Assistant Chief of the Naval Staff (UK).

ACNSS Advanced com/nav/surveillance system.

ACO 1 Airspace control, or coordination, order.

2 Airborne Control, or Communications, Officer.

3 Aerosat coordination office.

4 Advanced concepts of applications.

5 Air-combat order.

ACOC Aircooled oil cooler.

Acorn 1 Streamlined body or forebody added at intersection of two aerodynamic surfaces [e.g. fin/tailplane] to reduce peak suction.

2 Streamlined body introduced at intersection of crossing bracing wires to prevent chafing.

3 Steamlined fairing over external DF loop.

Acorn valve Small thermionic valve (radio tube) formerly added to VHF or UHF circuit to improve efficiency.

ACOS 1 Assistant Chief of Staff.

2 Air Crew Officers’ School.
Acoustic impedance

by part of acoustic output impinging upon input.

Acoustic intelligence

sound waves, measured in acoustic[al] ohms.

Acoustic feedback

which acoustic signals circulate (obs.).

Acoustic delay line

Resistive system for imparting known time delay to pulse of energy; typically closed circuit filled with mercury in which acoustic signals circulate (obs.).

Acoustic intelligence

Self-explanatory; in the past has primarily involved underwater warfare.

Acoustics

ASW, sonar and other sensing systems relying on underwater sound; thus * operators, * displays.

Acoustic splitter

Streamlined wall introduced into flow of air or gas, parallel to streamlines, for acoustic purposes. Usually inserted to reduce output of noise, for which purpose both sides are noise-absorbent. Many are radial panels and concentric long-chord rings (open-ended cylinders).

Acoustic tube

Miniature acoustic/electric transducer which has replaced carbon or other types of microphone in aircrew headsets.

Acoustic tuning

Fine adjustment of shape to achieve desired aerodynamics, esp. in separation of stores.

ACP

9 Airborne (or airlift) command post.

2 Anti-Concorde Project.

3 Altimeter check point.

4 Armament control panel.

5 Africa, Caribbean, Pacific.

6 Audio control panel, or convertor processor.

7 Aerosol collector and pyroliser.

8 Aluminium composite propellant.

9 Acquisition Change Programme [2006–] (MoD, UK).

ACP, Acp

Acceptance message.

ACP

Adaptive-controlled phased array.

ACP(C)

Automatic communications processor (control).

ACPI

Atmospheric Cloud Physics Laboratory.

AC-plonk

AC2 (derogatory reference to this low rank in RAF, 1941–50).

ACPRM

Automatic communications processor and multiband radio.

ACP, Acpt

Accepted.

Acquisition

1 Act of visually identifying, and remembering location of, object of interest (specific ground or aerial target).

2 Detection of target by radar or other sensor (plus, usually, automatic lock-on and subsequent tracking).

3 Detection and identification of desired radio signal or other broadcast emission.

4 Act of reaching desired flight parameter, such as heading, FL or IAS, or desired point or axis in space such as ILS G/S or LOC (see capture).

Acquisition round

AAM (1) without propulsion, and usually without wings or fins, carried to provide practice in homing head lock-on.

Acquisition scan window

3-D block of airspace into which a VAV can easily be guided, wherein CARS or UCARS acquires it and feeds it to the RIW.

ACR

1 Aerial combat reconnaissance.

2 Air [or airfield, or approach] control radar.

3 Advanced cargo rotorcraft.

4 Active cockpit rig.

5 Avionics communication[s] router.

6 Aeroklub Ceske Republiky (Czech Rep.).

ACRA, Acra

Airlift Concepts and Requirements Agency (USA/USAF).

ACRB

Aéro-Club Royal de Belgique [B-1000 Brussels] (Belgium).

ACRC

Acre.

2 Old Imperial (FPS) unit of land surface area, equal to 0.40469 ha (1 ha = 2.47105 acres). For covered area (factory buildings etc) usual SI unit is m² (= 0.000247105 acre, so 1-acre plant = 4.047 m²).

Acreage

Superficial area of flight vehicle, especially spacecraft or aerospace craft, as distinct from nose and other parts that need ablative or other special protection.

Ac-Rep

Representative, usually of country of manufacture, accredited to accident investigation.

Aeris

Air control recording and information system.

ACRM

Aircrew resource management.

Acrobatics

Usual term is aerobatics.

ACRP

Airport Co-operative Research Program (TRB).

ACRR

Airborne communications restoral relay.

ACRS

Air Crew Refresher School (RAF WW2).

ACRT

Additional cross-reference table.

ACRV

Assured crew-rescue vehicle.

ACRW

Aircraft [airplane] with circular rotating wing.

Acrylics

Thermosetting plastic[s], usually transparent, based on polymerised esters of * acid; original tradename Perspex (ICI, UK) and Plexiglas (Rohn & Haas, US). Since 1950 improved transparencies result from stretching moulded part prior to setting.

ACS

1 Attitude, or armament, or avionics, or active, or audio, or auxiliary, control system.

2 Aeroflight control system, for use by spacecraft within atmosphere.

3 Air-conditioning system.

4 Air Commando Squadron (USAF).

5 Air Control Squadron.

6 Aircraft Certification Service (FAA).

7 Airframe consumable spares.

8 Advanced crew station.

9 Aerial [ie, airborne] common sensor (USA, USN).

10 Air-combat simulator.

11 Assembly & Command Ship (Sea Launch).

ACSA

1 Allied Communications Security Agency (NATO).

2 Aero Club of S Africa.

3 Aeronautical Safety for Central America (Belize, Costa Rica, El Salvador, Guatemala, Honduras).

ACSC

Air Command and Staff College (USAF, Maxwell AFB).

ACSE

Access control and switching, or signalling, equipment (Aerosat ground station).
**ACSG**

ACSG 1 Armament computer symbol generator.
2 Aeronautical communications sub-group.

**AcSt.** Alcochulus standing lenticular.

**ACSM** 1 Advanced conventional standoff missile.
2 Assemblies, components, spare parts and materials (NATO).

**ACSR** 1 Active control of structural response.
2 Aeroklub Ceskoslovenske Socialistické Republiky (Prague).

**ACSS** 1 African Centre for Strategic Studies.
2 Aircraft collision surveillance system.

**ACSSB** Amplitude-commanded single-sideband.

**ACSSU** Air Combat Service Support Unit(s) [EAW] (RAF).

**ACU** Air-Combat Support Unit. [as above].

**ACT** 1 Actual temperature; ISA ± deviation.
2 Active-control technology.
3 Air-combat tactics.
4 Anti-communications threat.
5 Atlas composing terminal.
6 Airborne crew trainer.
7 Advanced composite technology.
8 Additional centre tank.
9 Advanced-coverage tool.
10 ASR crew trainer.
11 Active, activated, activity.
12 Analysis control team.
13 Allied Command Transformation, strategic force created 2003 in NATO with HQ in US.

**ACTAU, Actau** Asociación de Controladores de Transito Aereo del Uruguay.

**ACT** See ACT 11.

**ACTC** Air Commerce Type Certificate (US 1934–38).

**ACTD** Advanced-concept technology demonstrator, or demonstration.

**ACTE** Association of Corporate Travel Executives (Int.).

**ACTEW, Actew** Acoustic charged transport electronic warfare, low-cost decoy system in which signals are slowed as they pass across GaAs.

**ACTI** Air-combat tactics instructor.

**ACTIFT, Actift** Advanced cockpit technology and instrument-flying trainer.

**actinic ray** EM radiation, such as short-wave length end of visible spectrum and ultraviolet, capable of exerting marked photochemical effect.

**actinometer** Instrument measuring radiation intensity, esp. that causing photochemical effects, eg sunlight; one form measures degree of protection afforded from direct sunlight, while another (see pyrogeometer) measures difference between incoming solar radiation and that reflected from Earth.

**action** Principal moving mechanism of automatic weapon; in gun of traditional design typically includes bolt, trigger, rear, bent, striker, extractor and ammunition feed.

**Actions** Air-combat training interoperable with NATO systems, integrated with *Raid* (see Units).

**action time** Duration in seconds of significant thrust imparted by solid-propellant or hybrid rocket. Several definitions, most commonly the period between the point at which thrust reaches ten per cent of maximum (or average maximum) and that at which it decays through same level. This period is always shorter than actual duration of combustion, but longer than burn time. Symbol $t_a$.

**action time average chamber pressure, or thrust** Integral of chamber pressure or thrust versus time taken over the action time interval divided by the action time; symbols $P_t$, $F_t$.

**Actis** Advanced compact thermal-imaging system.

**Activ** Air-combat training instrumented virtual range.

**activate** To translate planned organisation or establishment into actual organisation or establishment capable of fulfilling planned functions.

**activated carbon** Organically derived carbon from which all traces of hydrocarbons have been removed; highly absorbent and used to remove odours and toxic traces from atmospheres; also called activated (or active) charcoal.

**ACTIVE, Active** Advanced control technology for integrated vehicles.

**Active** Aircrew collective training through immersive virtual events (UK, MoD).

**active** 1 General adjective for a device emitting radiation (as distinct from passive). Also see *mulation*.
2 The runway(s) in use.

**active aerodynamic braking** Reversed propulsive thrust.

**active aeroelastic wing** Instead of trying to prevent flexure and twist the AAW seeks to exploit it. Special F/A-18 works by LE flap control.

**active air defence** Direct action against attacking aircraft, as distinct from passive AD.

**active clearance control** Technique for maintaining an extremely small gap between fixed and rotating components of a machine (for example, by blowing bleed air around a turbine casing in a gas-turbine engine).

**active controls** Flight-control surfaces and associated operative system energised by vertical acceleration (as in gust) and automatically deflected upwards and/or downwards, usually symmetrically on both sides of aircraft, to alleviate load; thus active ailerons or tailplanes operate in unison to reduce vertical acceleration.

**active countermeasures** Countermeasures requiring friendly emissions. Subdivisions include microwave, IR and electro-optical.

**active decoy round** Rocket-launched parawing carrying an EW jammer.

**active electronically scanned array** Radar, especially for fighter, whose antenna is fixed; scanning is achieved by a progressive phase-shift from one side of the antenna to the other (or from bottom to top), the greater the shift the larger the steering angle $\theta$. Normally slight upward tilt deflects head-on main-lobe reflection to enhance stealth characteristics.

**active guidance** Active homing guidance.

**active homing guidance** Guidance towards target by sensing target reflections of radiation emitted by homing vehicle.

**active jamming** ECM involving attempted masking or suppression of enemy EM signals by high power radiation on same wavelengths.

**active landing gear** One in which the full suspension force is subject to control.

**active loading** LO (Stealth) generates signal to cancel that detected by hostile radar.
active magnetic bearing

**active magnetic bearing**  One which holds shaft in position by electromagnetic field, with no physical contact.

**active material**  Many meanings: eg 1, phosphor, such as zinc phosphate or calcium tungstate, on inner face of CRT; 2, parts of electric storage battery that participates in electrochemical reaction.

**active missile**  Fire-and-forget missile carrying its own active guidance.

**active model**  A computer-generated [e.g., CAD] model able to demonstrate the full range of system function.

**active munition**  One having immediate effect (as distinct from a mine, which is passive).

**active noise control**  Noise-suppressing or countering systems triggered by noise itself and using sound energy against itself.

**active pilot**  On long-haul, the pilot fully alert to FMGS, navigation and other inputs.

**active runway**  Runway currently in use (implied that flying operations are in progress).

**active satellite**  Satellite with on-board electrical power sufficient to broadcast or beam its own transmissions.

**active stealth**  Reduction in signature by generating tailored emissions.

**active visual camouflage**  See counter-illumination.

**activity factor**  See blade activity factor.

**ACTF**  Advanced Computer Technology Project (UK).

**ACT-R**  Air-combat training, rangeless.

**Actram**  Advisory committee on transport of radioactive material.

**ACTS**  Advanced communications technology satellite.

**ACT-Tilt**  Active control technology for tilt-rotor.

**ACT-TO**  Actual time and fuel state at takeoff.

**actual ground zero**  Point on surface of Earth closest to centre of nuclear detonation.

**actuator**  Device imparting mechanical motion, usually over restricted linear or rotary range and with intermittent duty or duty cycle.

**actuator remote terminal**  Connects the powered flight-control unit in a distributed flight-control system, databus feeding through digital processor to close pilot analog loop and provide redundancy.

**AC2**  Aircraftman, 2nd Class (RAF, most numerous WW2 rank).

**ACISRC**  Aerospace Command and Control Intelligence, Surveillance, Reconnaissance Center (USA).

**ACU**  Gas-turbine acceleration control unit.

**Ad**  Analog/digital.

**ADA**  Airworthiness Directive (national certifying authorities).

**ADA**  Advisory area.

**AD**  Air defence.

**ADAC**  Air Display Association Europe (Dunston, Lincs., UK).

**ADAMS**  Air Display Association DAF, (US).

**ADAMS**  Air Display Association Europe (USA).

**ADAMS**  Air Display Association DAF, (US).

**ADAMS**  Air Display Association Europe (USA).

**Ad**  Airworthiness Directive (national certifying authorities).

**ADA**  Airborne digital automatic collection system.

**ADAC**  Aircraft data acquisition, analysis and processing system.

**ADAB**  Air Defence Authority Board.

**ADAMS**  Airborne digital automatic collection system.

**ADAMS**  Air Display Association Europe (USA).

**ADF**  Air Display Association Europe (USA).

**ADAMS**  Aircraft data acquisition, analysis and processing system.

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Adams
Adams 1 Aircraft dispatch and maintenance safety (Int.).
2 Allied deployment and movements system (NATO).
ADAP 1 Aircraft Development Aid Program (US DoT).
2 Air-defence air picture.
Adaps Automatic data acquisition and processing system.
Adapt Air traffic [services] data acquisition, processing and transfer (ATC Switzerland).
adapter Interstage device to mate and then separate adjacent stages of multi-stage vehicle. Often called skirt, especially when lower stage has larger diameter.
adaptive bus Digital data highway to which (almost) any number of inputs and outputs may be connected.
adaptive control system Control system, esp. of vehicle trajectory, capable of continuously monitoring response and changing control-system parameters and relationships to maintain desired result. Adapts to changing environments and vehicle performance to ensure given input demand will always produce same output.
adaptive-cycle engine Variable-geometry turbofan providing high specific thrust for acceleration and economical high BPR for subsonic cruise.
adaptive logic Digital computer logic which can adapt to meet needs of different programs, environments or inputs.
adaptive nulling See. Adams.
adaptive optical camouflage Active, self-variable form of camouflage which, chameleon-like, alters emitted wavelengths to suit varying background tones.
adaptive radar Usual [not only] meaning is antenna automatically alters gain, sidelobes and directivity according to received signal.
Adapts Adaptive diagnostics and personalised technical support.
ADAR Air-deployed active receiver (ASW).
Adario Analog/digital adaptive recorder input/output.
Adars Automatic antenna receiver system; antenna (aerial) provides gain towards desired signals arriving from within a protected angle while nulling those arriving from outside that angle.
ADAS 1 Airborne data-acquisition system.
2 Auxiliary (or airborne) data-annotation system (for reconnaissance film, linescan or other hard-copy printout of reconnaissance or ECM mission).
3 Airfield damage assessment system (USAF).
4 Air-deliverable acoustic sensor.
5 Aeronautical-data access station (AFTN).
6 Advanced digital avionics system (STA.6).
7 Automated weather-observing system data-acquisition system.
ADat-P3 Automatic data-processing [standard]-3 (NATO).
Adats 1 Air-defense [and] anti-tank system (US).
2 Airborne digital avionics test system.
ADAU Air-, or analog-, or auxiliary-, data acquisition unit.
ADAV VTOL (F).
ADAWS Action-data automated weapon system.
ADAZ Air-defence zone.
ADB 1 Automatic driving balloon.
2 Apron-drive bridge.
3 Aircraft discrepancy book (USN).
ADC 1 Air-data computer.
address selective

2 Air Defense Command (USAAF, 27 March 1946), see next.
4 Advanced design conference.
5 Analog/digital converter.
6 Aircrew dry coverall (helicopter sea rescues).
ADCA Advanced-design composite aircraft (USAF).
Adcap Advanced capability, or capabilities.
ADCC 1 Air Defence Cadet Corps (UK 1939–41, became ATC).
2 Air-defence, or direction, control centre.
ADCF Aligned discontinuous carbon fibre.
ADCIS Air-defence command information system (UK).
ADCN Aeronautical, or aircraft, data communications network.
Adcock aerial Early radio DF; avoided errors due to horizontal component by using two pairs of vertical conductors spaced ½-wavelength or less apart and connected in phase opposition to give a figure-8 pattern.
ADCoPP Air-defence command-post processor.
ADCP Advanced-display core processor.
ADCS Air-data computer system.
ADCTS Advanced distributed combat training system.
Adeclos Advise Customs.
Adecs, ADCUTS Advanced computerised ultrasonic test system.
ADCV Active destination-coded vehicle (baggage).
ADD 1 Airstream direction detector (stall protection).
2 Long-range aviation (USSR VVS strategic bombing force).
3 Allowable, or acceptable, deferred deficiency, or defect.
ADDCA Air-defence data, or direction, centre (UK).
ADDAR Air-defence data dictionary (UK, a mathematical model).
Addison-Luard Large hand-held aluminium-body computers, Type B for triangle of velocities and D for adding fourth vector, eg motion of aircraft carrier etc (c1928–40).
additive Substance added to fuel, propellant, lubricant, metal alloy etc to improve performance, shelf life or other quality.
additive drag $D_{add}$ total drag at inlet to a jet engine, mass flow times difference between inlet and free-stream plus inlet area times difference between inlet and free-stream pressures. These terms should be close to zero.
ADDL Aerodrome (or airfield) dummy deck landings; pronounced ‘addle’.
ADDN, Addn Addition, additional.
add-on contract Extension of existing contract to cover new work in same programme.
ADDPB Automatic diluter-demand pressure breathing.
ADDR Aeroklub der Deutschen Demokratischen Republik.
address Electronic code identifying each part of computer memory, each bit or information unit being routed to different *.
address selective Adsel.
ADDS

ADDS 1 Airborne-decoy [or advanced digital] dispensing system.
2 Aerial delivery dispersal system.

add time 1 Time required for single (binary) addition operation in computer arithmetic unit.

ADE 1 Automated drafting (drafting) equipment.
2 Aeronautical Development Establishment (India).

ADEG 1 Air traffic services data-exchange requirements group (ICAO).

ADEL 1 Automatically deployable emergency locator transponder, or transmitter.

ADG 1 Aircraft directed-energy laser applications (AFRL).

AEG 1 Air defence gun sight.

AEGS 1 Air-ground equipment.

AEGS 1 Automated diagnosis engine (see AUTODIAG).

AEGS 1 Aircraft Establishment Establishment (India).

AEGT 1 Aircraft operations guidance system.

ADEU 1 Aircraft automatic data-entry system.

ADEF 1 Automatic digital electronic fire control system.

ADFK 1 Aircraft Defence Forces, (A adds Academy).

ADPL 1 Advanced digital engine control system.

ADEX 1 Air defence exercise.

ADEXP 1 ATS (1) data-exchange presentation message format.

ADFT 1 Automatic direction-finding or finder.

ADF 1 Automatic direction-finding or finder. Airborne radio navaid tuned to NDB or other suitable LF/MF broadcast source. Until 1945 aerial was loop mounted in vertical plane and rotated by motor energised by amplified loop current to rest in null position, with plane of loop perpendicular to bearing of ground station. Modern receivers fed by two fixed coils, one fore-and-aft and the other transverse, suppressed flush with aircraft skin (usually on underside).

2 Australian Defence Force; (A adds Academy).

3 Air-dominance fighter.

4 Anti-icing/de-icing fluid.

5 Automated draughting (drafting) equipment.

ADFC 1 Grounded system (RAF).

ADFG 1 Auxiliary drive generator.

2 Air-driven generator.

3 Auxiliary drive generator.

4 Aircraft delivery group (USAF).

5 Aircraft design group (FAA).

ADGF 1 Aircraft Direct Ground Functioning System (RAF).

ADGE 1 Aircraft direct-energy laser applications (AFRL).

ADGE 2 Aircraft electronic guidance system (RAF).

ADGE, Adge 1 Air defence ground environment, or air defence, or defense, identification zone.

ADGF 1 Aircraft defence ground-based system (RAF).

ADGIS 1 Air defence docking guidance system.

ADI 1 Air data indicator.

2 Aircraft data interchange system (FAPA, from 1961).

3 ADS (5) data-link system (Australia).

4 Aviation data link system (NASA/ATCC).

ADIT 1 Aircraft data interchange (FAPA).

5 Aircraft data transport (FAPA).

ADIT 1 Automatic data transport (FAPA).

2 Airplane design group (FAA).

ADJ 1 Aircraft data transport (FAPA).

2 Adjacent.

3 Adjacent channel 1 Nearest frequency above or below that on which a radio link is working; can interfere with carrier or sidebands, but ** simplifies minimises this.

4 Adjustable propeller 1 One whose blades can be set to a different pitch on ground, with propeller at rest.

ADJ 5 Armament datum line.

6 Authorised data list.

ADL 1 Aircraft data-link system.

2 Air data-link system (FAPA).

3 Anti-detonant injection, such as cylinder-head injection of methanol/water, for high-compression piston engine.

4 Armament datum line.

5 Armament datum line.

6 Authorised data list.
ADLF

5 Aeronautical data-link.
6 Advanced distributed learning.

ADLFP
Air-deployed low-frequency projector [Adsid].

ADLGP
Advanced data-link for guided platforms.

ADP
1 Aircraft data-link processor.
2 Airborne data-link protocol.

ADLS
1 Aeronautical data-link services.
2 Automatic drag-limiting system.

ADLT
Advanced discriminating, or discriminatory, laser technology.

ADLY
Arrival delay.

ADM
1 Air-decoy or defense missile (USAF).
2 Atomic demolition munition.
3 Airport Duty Manager.
4 Air-data module[s].
5 Asynchronous data modem.
6 Advanced development, or demonstration, model.
7 Aeronautical data management.
8 Admiral (not UK usage).
9 Aircraft Design Memorandum.
10 Aeronautical decision making.

ADMA

ADMC
Actuator drive and monitor computer.

Ad-Me
Advanced metal evaporated.

administrative loading
Loading transport vehicle (eg, aircraft) for best utilisation of volume or payload, ignoring tactical need or convenience.

Admiral's barge
Aircraft assigned to Flag Officer (FAA, colloq.).

Admit, ADMT
Air distributed mission trainer.

admittance
In a.c. circuit, 1/Z, reciprocal of impedance, loosely 'conductivity'; made up of real and imaginary parts; symbol Y, unit siemens.

ADMS
Airline data-management system.

ADMU
Air-distance measuring unit.

ADN
Ammonium dinitramide.

ADNC
Air-defence notification centre.

ADNL
Additional.

ADNS
Arinc data-network service.

ADO
1 Advanced development objective.
2 Automatic delayed opening (parachute).
3 Assistant Deputy for Operations.

ADOC
Air Defence Operations Centre (UK).

Adoc, ADOCS
1 Advanced digital optical control system.
2 Automated deep-operations co-ordination system (DoD, especially used by Norad).

Adora
Analysis and definition of operational requirements for ATM(7) (Euret).

ADP
1 Acoustic, or air, data processor.
2 Automatic, or airport, data processing.
3 Air-driven pump [usually means bleed air].
4 Engine aerodynamic design point; determined by cycle parameters.
5 Altitude delay parameter.
6 Aéropoires de Paris.
7 Airport development program.

ADPA
American Defense Preparedness Association [office, Arlington, VA].

ADPCM
Adaptive differential pulse-code modulation.

ADPE
Automated [radar] data-processing equipment.

ADPEO
Ashless dispersant piston-engine oil.
ADSI

system in which saturation in dense traffic is avoided by interrogating each aircraft (once acquired) only once on each aerial rotation instead of about 20 times. Transponders reply only when selected by discrete address code, reducing number of replies and mutual interference and opening up space for additional information (such as rate of turn) helpful to ATC computers (see DABS).

ADSI Air-defense systems integrator (UAV).


Aadid Air-delivered seismic detection sensor.

ADSK Air-droppable, or air-dropped, survival kit.

ADSL Aerosuisse Dachverband der Schweizerischen Luftfahrt [aeronautical society; CH-3001 Bern] (Switzerland).

ADSM Air defence suppression missile.

adsorption Removal of molecules of gas or liquid by adhesion to solid surface; activated carbon has very large surface area and is powerful adsorber.

ADSP 1 Advanced digital signal processor.

2 Automatic dependent surveillance panel.

3 Aeronautical Data and Safety Service (Inmarsat).

ADSSA Aeronautical decision support system, providing instant paperless access to manuals, maps and emergency procedures.

2 Automatic dependent surveillance system.

3 Aeronautical Data and Safety Service (Inmarsat).

ADSU 1 Air-data sensor unit.

2 Automatic dependent surveillance unit.

ADT 1 Approved departure time.

2 Automatically deployable transmitter.

3 Air-data transducer.

4 Air-data [or advanced, or alphanumeric, display] terminal.

5 Automatic detection and tracking.

6 Active-denial technology.

7 Accessories drive train.

8 Ada development toolkit.

ADT1, ADT3 Air defence tactical training theatre.

ADTC Armament Development Test Center (USAF, Eglin AFB).

ADTN Administrative data-communication network.

ADTS 1 Air-defence threat simulator.

2 Approved departure times.

ADTU Air-data transfer unit.

ADU 1 Alignment display unit (INS).

2 Auxiliary display unit.

3 Avionics [or annotation] display unit.

4 Audio display unit.

5 Actuator drive unit, in digital FCS.

6 Audio distribution unit.

7 Activity display unit (ESM).

8 Air Disarmament Unit (RAF).

9 Aircraft Delivery Unit (UK).

ADV 1 Arbeitsgemeinschaft Deutscher Verkehrsflughaf en eV [Federal German Airports Association; D-70624 Stuttgart] (G).

2 Air-defence variant.

ADV, Adv 1 Advise, or advisory area.

2 Advance (UK usage).

3 In piston engine, to cause ignition spark to occur earlier in each cycle.

3 Forward movement of propeller (see propeller pitch).

4 angle of See propeller pitch.

5 Generalised (overworked) adjective meaning new, complicated and typifying latest technology.

6 Aerodynamics Flight manoeuvres with no limits apart from airframe/pilot limits.

7 Airfield, base Base or airfield, usually with minimal facilities, in or near objective area of theatre of operations.

8 Advanced aviation training device Synthetic trainer for procedures [FAR Pts 61 and 141] and various instrument and system checks.

9 Advanced common flightdeck Retrofit, initially on FedEx DC-10s, based on MD-11.

9 Advanced flow-control procedure Any of six theoretical or experimental techniques for ATC in high-traffic airspace.

9 Advanced high-frequency material New coatings [currently classified] for LO aircraft which eliminate the need for laborious maintenance between missions.

9 Advance/diameter ratio Ratio between distance aircraft moves forward for one revolution of propeller(s), or helicopter rotor, under specified conditions, and propeller diameter. Expressed as

\[
J = \frac{V}{nD}
\]

where V is TAS, n rotational speed and D diameter.

9 Advanced stall Stall allowed to develop fully, yet usually with some lateral control. Many definitions claim longitudinal control must remain, but nose-down rotation is invariably automatic (see g-break, stall).

9 Advanced tactical targeting Air-to-air system using Link-16, SADL and other links from TTNT to share information about surface emitters (USAF).

9 Advanced trainer Former military category, more powerful and complicated than ab initio/primary/basic trainer and capable of simulating or performing combat duties when fitted with armament.

9 Advance ratio See advance/diameter ratio.

9 Advancing blade In rotary-winged aircraft in translational flight, any blade moving forward against relative wind. Each blade advances through 180° of its travel, normally from dead-astern to dead-ahead.

9 ADVCAP Advanced capability.

9 Advection Generally, transfer by horizontal motion, particularly of heat in lower atmosphere. On gross scale, carries heat from low to high latitudes.

9 Advection fog Fog, generally widespread, caused by horizontal movement of humid air mass over cold (below dew point) land or sea.

9 Advent Adaptive versatile engine technology (USAF).

9 Adversary aircraft Fighter specially purchased and configured to act role of enemy in dissimilar air-combat training.

9 Adverse rudder Inputs rolling moment opposite to that commanded by lateral-control system.

9 Adverse sideslip Sideslip resulting from kinematic coupling.

9 Adverse yaw Negative yawing moment due to roll at high Cl, problem with sailplanes.

9 Adviser Airborne dual-channel variable-input severe environment recorder (RCA).
Advisor

Advisory Formal recorded helpful message repeatedly broadcast from FAA AAS centre to all local aircraft. Abb: ADVY, ADZ, ADZY.
advisory circular The printed form of information for pilots (FAA).
advisory light Displayed by aircraft (esp. carrier-based) to show LS0 status (gear, hook, wing, speed and AO).
advisory route Published route served by Advisory Service, but not necessarily by ATC (1) or separation monitoring and usually without radar surveillance.

Advisory Service FAA facility to provide information on request to all pilots, and advice to those who need it. Abb: ADYS, ADV.

Advisory light

Advisory route

Advisory Service

Advisor Annotated digital video for intelligent surveillance and optimised retrieval (EC aviation security).

Advisory

Formal recorded helpful message repeatedly

lance and optimised retrieval (EC aviation security).

Advisor AER

Advisory Service

monitoring and usually without radar surveillance.

Advisory Service, but not necessarily by ATC (1) or separation

ADWES Air-defence weapons-effects simulation, or

1

ADW 1 Area-denial weapon.

2 Agent-defeat warhead.

ADWC Air Defense Weapons Center (Tyndall AFB),

ADVES Air-defence weapons-effects simulation, or simulator.

2

ADZ Advise (ICAO).

1

AE 1 Aviacion del Ejército [army aviation] (Peru, etc). 

2 Augmentor ejector.

3 Aluminium-epoxy [paint].

4 Atmosphere, or atmospheric, explorer.

5 Avionics environment.

Av. Effective area of antenna aperture.

AEA 1 Aeronautical Engineers Association.


3 Association of European Airlines [office, B-1050 Brussels (Int.).

4 Aircrew equipment assembly.

5 Aerial Experiment Association (US, 1907–09).

6 Airborne electronic attack (V adds Variant).

7 All-electric airplane/aeroplane.

AEAF Allied Expeditionary Air Force (WW2).

AEB 1 Avionics equipment bay.

2 Air Efficiency Board (UK).

AEC 1 Atomic Energy Commission (USA, 1946–74).

2 Automatic exposure control.

3 Aviation Executives Club [Miami Springs, Fl].

AECB Arms Export Control Board (UK).

AECC Aeromedical Evacuation Control Centre

AECF Aéro Club de France [F-75116 Paris] (F).

AECM Active ECM.

AECMA Association Européenne des Constructeurs de Matériel Aérospatial (Int., in April 2004 merged into ASDS).

AéC Aéro Club de Suisse.

AECU Audio [or advanced] electronic control unit.

AED 1 Alphanumeric entry device.

2 Air Engineering Department (TAG).

3 Automated [or automatic] external defibrillator.

4 Algol extended for design.

5 Aviation Environmental Divisions [1 to 4] (DETR, UK).

AEDC Arnold Engineering Development Center (USAFA, mainly air-breathing propulsion systems, at Tullahoma, Tenn).

AEDO Aeronautical engineering duty officer (USN).

AEDS Atomic energy detection system (global, run by AFTRAC).
AER/A

cross-sections at start of diffuser to down-stream end at first bend.
AER/A  Ailerons, elevators, rudder.
AERA 1 Association pour l’Etude et la Recherche Astronautique et Cosmique (F). 2 Automated en-route ATC.
Aerad Commercially published but universally used flight guide and chart system (UK).
Aerall Association d’Etudes et de Recherches sur Aéronefs Allégés (F), since 2003 Air and Space:
aeration Contamination of fuel by bubbles of gas, e.g., air.
AERC Aviation Education Resource Center (US).
AERE Atomic Energy Research Establishment (UKAEA, Harwell).
aerial 1 Pertaining to aircraft, aviation or atmosphere. 2 Part of radio or radar system designed to radiate or intercept energy, with size and shape determined by wavelength, directivity and other variables (US = antenna).
aerial array Assembly of aerial elements, often identical, usually excited from same source in phase and dimensioned and positioned to radiate in pencil beam or other desired pattern (not necessarily phased-array).
aerial common sensor Next-generation airborne sensor for tactical reconnaissance, Imint and Sigint (USA).
aerial survey Use of aerial cameras and/or other photogrammetric instruments for the making of maps, charts and plans.
aerial swimming vehicle A micro air vehicle with major dimensions not exceeding 150 mm (6 in), able to cruise at c10 m s⁻¹ propelled by aft-mounted reverse-camber flapping wings. Generally synonymous with delphipontor.
aerial work General aviation for hire or reward other than carriage of passengers or, usually, freight; includes agricultural aviation, aerial photography, mapping and survey, cable and pipeline patrol and similar duties usually not undertaken to full-time fixed schedule.
aerial work platform Small railed platform for one or two occupants, mounted on vehicle by Z-type [less often scissors] elevating linkage and often providing electric or hydraulic power for occupants.
AERO Air Education and Recreation Organisation (UK, office Camberley).
aero Concerned with atmospheric flight.
aeroacoustics Science and technology of acoustics caused by, and effect upon, aerospace systems. A more general definition is interaction between sound and gas flow, esp. sound generated by the flow.
aeroballistics Science of high-speed vehicles moving through atmosphere in which both ballistics and aerodynamics must be taken into account. Often asserted aerodynamics and ballistics are applied separately to different portions of flight path, but both act as long as there is significant atmosphere present.
Aerobatic catalogue Derived from Aresti, simplified scheme for planning and scoring aerobatic routines (FAI).
aerodynamic balance Multiple scavenge ports round all engine bearing chambers leading back to tank in which synthetic gravity is maintained by rapid rotation.
aerobatics Precise and largely standardised manoeuvres, unnecessary in normal flight, executed to acquire or demonstrate mastery over aircraft, for entertainment, or for competition (US = aerobatics). BS: “Evolutions voluntarily performed other than those required for normal flight”, which would include a gentle 360.
aerobic propulsion Requiring oxygen.
aerobiology Study of distribution and effects of living matter suspended in atmosphere (small insects, spores, seeds and micro-organisms).
aerobrake 1 Aerodynamic brake for use in extremely low-density atmospheres at Mach numbers of 5 to 25. Typically can be deployed as a saucer shape, concave side facing direction of travel. 2 Deceleration by holding nose high after landing.
Aero-C Message and data-reporting satellite service for satcom aircraft.
aerocapture Technique harnessing drag of atmosphere of planet (especially Mars) to slow spacecraft to planetary orbital speed.
aeroclinoscope Instrument with semaphore-like arms for indicating wind direction [and, roughly, atmospheric pressure] (obs.).
aerocryptography Representation of aerobatic manoeuvres by 2-D symbols.
aerodone Basic aerodyne, glider relying upon natural stability and having no moving control surfaces. Examples are paper dart and chuck glider, most simple free-flight models, and aeroplanes which continue to fly after being abandoned by their crews.
aerodonetics Science of gliding flight, with or without use of control surfaces.
aerodontalgia Toothache caused by major changes in ambient atmospheric pressure.
aerodontia, aerodontology Branch of dentistry dealing with problems of flying personnel.
aerodrome BS.185, 1940: ‘A definite and limited area of ground or water (including any buildings, installations and/or equipment) intended to be used, either wholly or in part, in connexion with the arrival, departure and servicing of aircraft.’ Becoming archaic (see airfield, airport, air base, strip, etc.).
aerodrome elevation Airfield elevation.
aerodrome FIS Airfield FIS.
aerodrome traffic zone Airspace up to 2,000 ft (609 m) a.a.l. and within 2.5 nm of centre of longest runway or 2,000 ft/609 m of boundary (general aviation). Permission req’d for entry, and for maneuvering within*.
aerodynamic axis Imaginary line through aerodynamic centres of every longitudinal element in solid body moving through gaseous medium. In wing, runs basically from tip to tip, but in swept or slender delta can be an acutely curved, kinked line often having little practical application.
aerodynamic balance 1 Method of reducing control-surface hinge moment by providing aerodynamic surface ahead of hinge axis (see Frise aileron, horn balance). 2 Wind-tunnel balance for measurement of aerodynamic forces and moments.
aerodynamic-balance panel

**aerodynamic-balance panel** Shelf fixed to control surface ahead of the hinge axis, contained inside fixed structure.

**aerodynamic braking** 1 Use of atmospheric drag to slow re-entering spacecraft or other RV.
2 Use of airbrakes or parachute (drag chute) in passive **.

**aerodynamic centre** In two-dimensional wing section, point about which there is no change of moment with change in incidence; point about which resultant force appears to rotate with change of incidence. In traditional sections about one-quarter back from leading edge (25% chord) and in symmetrical section lies on chord and thus coincident with CP. Also called axis of constant moments. Abb. a.c. ac or (incorrectly) AC.

**aerodynamic chord** Reference axis from which angle of attack of two-dimensional aerofoil is measured. Line passing through (supposed sharp) trailing edge and parallel to free-stream flow at zero lift at Mach numbers appreciably below 1 (see chord, geometric chord, MAC).

**aerodynamic coefficient** Aerodynamic force (lift or drag, or moment) may be reduced to dimensionless coefficient by dividing by characteristic length (which must be same parameter for all similar bodies, and in a wing is invariably area) and by dynamic head (symbol ρ). Traditional divisor is \( \frac{\rho}{2} \sqrt{V^2 - S^2} \), where \( \rho \) is air density, \( V \) velocity and \( S \) area, ensuring that units are consistent throughout; if area is \( m^2 \) then \( V \) must be \( m/s \). The \( \frac{\rho}{2} \sqrt{V^2} \) term, difference between pitot and static pressure, is accurately only at low speeds; if \( M^2 \) (square of Mach number) is too large to ignore, a different expression must be found for dynamic head, such as \( H-p \) (pitot minus static). (See force coefficients, moment coefficients, units of measurement.)

**aerodynamic damping** In flight manoeuvres rotation of aircraft (about e.g. or close to it) changes direction of relative wind to provide restoring moment which opposes control demand and arrests manoeuvre when demand is removed. As altitude increases, combination of increasing TAS (for given EAS) and reduced airflow deflection angles results in ** being progressively decreased, although control demand moment and aircraft inertia do not change. Thus at high altitude pilot must apply greater opposite control movements to arrest rotation.

**aerodynamic disturbance** Generalised euphemistic term in SR-71 and similar flight reports covering inlet unstarts and related phenomena.

**aerodynamic efficiency** Most common yardstick is lift/drag ratio (L/D). In general ** maximised when resultant forces are as nearly as possible perpendicular to direction of motion; tend to be reduced as speed is increased, since lift-type forces may be presumed to remain substantially constant while drag-type forces may be presumed to increase in proportion to square of speed.

**aerodynamic force** Force on body moving through gaseous medium assumed to be proportional to density of medium \( \rho \), square of speed \( (u^2 \text{ or } v^2) \), characteristic dimension of body (such as length \( L' \) or area \( S \) and \( R_p \) (Reynolds number raised to power n). This broad relationship sometimes called Rayleigh formula. Body assumed to be wholly within homogenous gas, reasonably compact and streamlined (eg not a sheet of paper) and to have smooth surface.

**aerodynamic heating** As speed of body through gaseous medium is increased, surface temperature increases roughly in proportion to square of speed. Effect due variously to friction between adjacent molecules in boundary layer, to degradation of kinetic energy to heat and to local compression of gases. Maximum temperature is reached on surfaces perpendicular to local airflow where oncoming air or gas molecules are brought to rest on surface. At Mach 2 peak stagnation temperature is about 120°C and at Mach 3 about 315°C; at hypersonic speeds temperature can swiftly rise to 3,000 or 5,000°C in intense shockwave around nose and other stagnation points, causing severe radiation heating, ionisation and dissociation of flow. Adiabatic temperature rise is approximately given by \( \Delta T = \left( \frac{V}{S} \right)^3 \), where \( V \) is speed in mph; alternatively a poorer approximation is \( 41 \times M^2 \) where \( M \) is Mach number.

**aerodynamic mean chord, AMC, MAC, c** Chord that would result in same overall force coefficients as those actually measured. Essentially, but not necessarily exactly, same as mean of aerodynamic chords at each station; very nearly same as geometric mean chord.

**aerodynamic overbalance** Excessive aerodynamic balancing of control surface such that deflection will immediately promote runaway to hard-over position.

**aerodynamic pitch** The distance a propeller blade would move forward in one revolution if slip were zero, symbol λ.

**aerodynamic twist** Variation of angle of incidence from root to tip of aerodynamic surface, to obtain desired lift distribution or stalling characteristic (see wash-in, wash-out).

**aerodynamics** Science of interactions between gaseous media and solid surfaces between which there is relative motion. Classical * based upon Bernoulli’s theorem, concept of boundary layer and circulation. Reynolds number, Kármán vortex street, turbulent flow and stagnation point. High-speed * (M^2 too large to be ignored) assumes gas to be compressible and introduces critical Mach number, shockwave, aerodynamic heating, and relationships and concepts of Prandtl, Glauert, Ackeret, Busemann, Kármán-Tsien and Whitcomb. At Mach numbers above 4, and at heights above 80 miles (130 km), even high-speed * must be modified or abandoned because of extreme aerodynamic heating, violent changes in pressure and large mean free path (see superaerodynamics).

**aerodynamic trials** Flight tests to clear a modification which changes the shape of a vehicle.

**aerodyne** Heavier-than-air craft, sustained in atmosphere by self-generated aerodynamic force, possibly including direct engine thrust, rather than pure buoyancy. Two major categories are aeroplanes (US = airplanes) and rotorplanes, latter including helicopters.

**aerelasticity** Science of interaction between aerodynamic forces and elastic structures. * deflections are increased by raising aerodynamic forces, varying them rapidly (as in gusts and turbulence) and increasing aspect ratio or fineness ratio. All * effects tend to be destabilising, wasteful of energy and degrading to structure.

**aeroembolism** Release of bubbles or nitrogen into blood and other body fluids as a result of too-rapid reduction in ambient pressure. May be due to return to sea-level from much increased pressure (‘caisson sickness’, ‘the bends’).
aeroflight mode

or from sea-level to pressure corresponding to altitude greater than 30,000 ft (about 10,000 m). Potentially fatal if original, increased, pressure is not rapidly restored.
aeroflight mode Atmospheric flight, by aerospace vehicle (eg, Space Shuttle).
aerofoil (US = airfoil) 1 Solid body designed to move through gaseous medium and obtain useful force reaction other than drag. Examples: wing, control surface, fin, turbine blade, sail, windmill blade, Flettner rotor, circular or elliptical rotor blade with supercirculation maintained by blowing. Some authorities maintain * must be essentially 'wing-shaped' in section.
2 A specific meaning is a gas-turbine rotor blade, without root, for fusion to a ring or disc.
aerofoil section Traditionally, outline of section through aerofoil parallel to plane of symmetry. This must be modified to 'parallel to aircraft longitudinal axis' in variable-sweep and slew wings, and 'perpendicular to blade major axis' in blades for rotors, turbines and propellers. None of these sections may lie even approximately along direction of relative wind, although usually assumed to. Also called profile.
aerofoil boat Wing-shaped surface-effect marine craft (or low-altitude aircraft).
aerogel Colloid comprising solution of gaseous phase in solid phase or coagulated sol (colloidal liquid).
aerograph Airborne meteorological recording instrument; aerometeograph.
aero-H Long-haul cockpit and pac communications, telephony (9.6 kbps), fax (4.8) and data (2.4). H + offers voice codes and better multichannel performance for oceanic use.
aero-I Short-/medium-haul and corporate communications, telephony (4.8 kbps) and fax/data (2.4).
aero-isoclinic wing Aerofoil which, under aeroelastic distortion, maintains essentially uniform angle of incidence from tip to tip.
aero-J Medium-gain satcom service for continental use.
aeroljumble Aeronautical artefacts in jumble sale.
aero-L Low-gain satcom service, two-way data exchange at 0.6 kbps.
aerolite Trade name, low-density bonded sandwich structure based on phenolic-resin-bonded flax fibres (Aero Research, later CIBA).
aerolite Stony meteorite, richer in silicates than metals.
aerology Study of atmosphere (meteorology) other than lower regions strongly influenced by Earth’s surface.
aerol strut Early oleo strut relying for energy absorption and damping upon both air and oil.
aero-M Single-channel satcom service.
aerometeograph, aerometeorograph Airborne instrument making permanent record of several meteorological parameters such as altitude, pressure, temperature and humidity.
aerometer Instrument used in determining density of gases, esp. atmosphere.
aero mission gear Video and data communications package for helicopters.
aeronaut Pilot of aerostat.
aero Mini-M Service for small corporate and GA, 2.4 kbps data, fax and voice.
aeronautica Aeronautical artefacts, esp. those in auction sale.
aeroplane (US = airplane)
aeroplane (US = airplane) BS 185, 1940: ‘A flying machine with plane(s) fixed in flight’. Modern definition might be ’mechanically propelled aerodyne sustained by wings which, in any one flight regime, remain fixed’. Explicitly excludes gliders and rotorplanes, but could include MPAs, VTOLs and convertiplanes that behave as * in translational flight.
aeroplane effect Error in radio DF caused by horizontal component of fixed aerial or tilt angle of wire (arch.).
aeropulse Aeronautical message switching system.
aerosonar Resonant air-breathing pulsejet.
aeros Aeronautical, plural of aero. (colloq.).
aerosat Aeronautical satellite.
aeroservoelasticity Study of aeroelasticity in aircraft with automatic control systems.
aeroshell High-drag aerodynamic-braking heatshield for returning spacecraft or planetary lander.
aerosol Colloid of finely divided solid or liquid dispersed in gaseous (esp. air) continuous phase. Natural examples: smokes, dustclouds, mist, fog. In commercial product active ingredient is expelled as aerosol by gaseous propellant.
aerospace Essentially limitless continuum extending from Earth’s surface outwards through atmosphere to farthest parts of observable universe, esp. embracing attainable portions of solar system.
aerospace craft Vehicle designed to operate anywhere in aerospace, and especially both within and above atmosphere.
aerospace data miner Analyses fleet performance (eg of all aircraft of one type).
aerospace forces National combat armoury capable of flying in atmosphere or rising into space, including all satellite systems and strategic ballistic missiles.
aerospace medicine Study of physiological changes, disorders and problems caused by aerospace navigation. Among these are high accelerations, prolonged weightlessness, vertigo, anoxia, ionising radiation, Coriolis effects, micrometeorites, temperature control, recycling of material through human body, and possibility of developing closed ecological systems to support human life away from Earth.
aerospace plane Colloquial term for space vehicle which can re-enter, manoeuvre within atmosphere and land in conventional way on Earth’s surface. Generally assumed to be manned and to include some air-breathing propulsion.
aerospace relay mirror system Mirror[s] suspended under airship at 65,000 ft (19.8 km) to relay beam from ground-based laser to track and possibly kill objects in space (AFRL).
aerospace warfare Conflict within and above atmosphere.
aerostat Lighter-than-air craft, buoyant in atmosphere at a height at which it displaces its own mass of air. Major sub-groups are balloons and airships. In airships aerodynamic lift from hull can be significant, but not enough to invalidate classification under this heading.
aetb aetb
AETC
Air Education & Training Command (USAF, Randolph AFB, established 1 July 1993).

AETE
Aerospace Engineering and Test Establishment (Cold Lake, Alberta).

AETG
Aircrew Environment Task Group [2004–] (Balpa).

AETMS
Airborne electronic terrain mapping system (3-D colour-coded in real time, plan or elevation).

AETW
AET (2) washed.

AEU
1 Airborne, or antenna, electronics unit.
2 Auxiliary equipment unit.

AEW
1 Airborne early warning.
2 Air [or airborne] electronic warfare.
3 Air Expeditionary Wing (USAF).
4 Aircraft empty weight.

AEWC, AEW&C, AEW + C Airborne early warning and control.

AEW/EW
Airborne early warning and electronic warfare.

AEWF
Air Force RCS Warning Force (NATO).

AEWS
Airborne electronic-warfare system; hence AEWS’ means system of systems.

AEWTF
Aircrew Electronic-Warfare Tactics Facility (NATO).

AF, a.f.
1 Audio frequency, sounds audible to average human ear (20 to 16,000 Hz). In simple radio communications RF carrier is modulated so that it “carries” AF superimposed upon basic waveform.
2 Aerodynamic force.
3 Auto-flight.
4 Airframe facilities.

aff
1 Airfield.
2 Airframe.

AF
Anti-fire fighting foam.

AFA
1 Air Force Association [office, Arlington, VA 22209–1198 (US)].
2 Air Force Act (UK).
3 Aircraft Finance Association [office, Washington DC (US)].
4 Association of Flight Attendants [office, Washington DC 20005–4006 (US)].
5 Audio-frequency amplifier.
6 Air Force Academy [Colorado Springs, Est. 1 April 1954] (USAF).
8 Academia de Fuerza Aérea (Brazil).

AFAA
1 Air Force Audit Agency (1 July 1948, Norton AFB, later Washington DC).
2 Airline Flight Attendants’ Assoc., Buellton CA.

AFAC
Airborne forward air controller.

AFADS
Air Force Air Demonstration Squadron (USAF Thunderbirds).

AFAES
Aviation facilities and aircraft engineering support (MoD, UK).

AFAF
Australian Federation of Airfreight Forwarders [office Sydney].

AFAFC
Air Force Accounting and Finance Center (Lowry AFB).

AFAITC
Armed Forces Air Intelligence Training Center (Denver).

AFAL
Air Force Armament Laboratory ( Eglin AFB).

AFALC
Air Force Acquisition Logistics Center ( Wright-Patterson AFB).

AFAMC
See AMC (5).

AFAMRL
See AAMRL.

AFAP
Australian Federation of Air Pilots [office South Melbourne, Vic. 3205] (Australia).

AFAPD
Air Force application[s] program, or protocol, development.

AFB
Air Force Base (USAF).

AFBCA

AFBM
Air Force Ballistic Missile Division, became BMO.

AFCC
1 Air Force Communications Command (HQ Scott AFB, formed from AFCS 15 November 1979, became AFWC 28 May 1993).
2 Office of the Chief of Staff (USAF).

AFC
Automatic control + C. See AFC + C.

AFCAS
Automatic flight control augmentation system.

AFCC
1 Air Force Communications Command (HQ Scott AFB, formed from AFCS 15 November 1979, became AFWC 28 May 1993).
2 Office of the Chief of Staff (USAF).

AFCCCA
See AFC + C.

AFC
Automatic flight control equipment, linked Norden bomb sight to autopilot.

AFCEA
Armed Forces Communications & Electronics Association, [office, Fairfax, VA 22033–3899]; [European office, Brussels B-1140] (US, Int.).

AFCEE

AFCENT
Allied Forces, Central Europe (Brunssum, Netherlands).

AFCESA
Air Force Civil Engineer Support Agency (Tydall AFB, established 1 August 1991).

AFC + C
Air Force communications, C, Control, Communications and Computer Agency (Scott AFB, established 28 May 1993).

AFCI
Arc-fault circuit interruption.
AFCLC
AFCLC Air Force Contract Law Center (Wright-Patterson AFB).

AFCMC
AFCMC Air Force Contract Maintenance Center (Wright-Patterson AFB).

AFCMD
AFCMD Air Force Contract Management Division (Kirtland AFB, was part of AFSC).

AFCMR
AFCMR Air Force Court of Military Review.

AFCO
AFCO Armed Forces Careers Office (UK).

AFCOMS
AFCOMS Air Force Commissary Service, became Defense Commissary Agency (Kelly AFB).

AFCPMC
AFCPMC Air Force Civilian Personnel Management Center (Randolph AB).

AFCR
AFCR Air Force Cambridge Research Labormis became part of ESC.

AFCSC
1 Automatic flight-control system.
2 Air Force Communications Service, became AFCC, then part of AFCO.
3 Active-facility control system.

AFCWC
AFCWC Air Force Combat Weather Center (Hurlburt Field, FL).

AFD
1 Air Force Department (UK, MoD).
2 Adaptive flight display.
3 Advanced flight deck.
4 Autopilot flight director.

AFD
Airport/facility directory (US).

AFDAC
Association of Finnish Defence and Aerospace Industries (1994–).

AFDAS
Aircraft fatigue-data analysis system.

AFDC 1 Autopilot flight-director computer; S adds system.
2 Automatic formation drone control (USN).
3 Air Force Doctrine Center (Langley AFB, Va, established 21 July 1993).

AFDFK
After dark.

AFDMR
Director of Military Requirements (USAAF).

AFDPS
Automated flight-processing system.

AFDS 1 Autopilot [and] flight-director system.
2 Air Fighting Development Squadron (RAF, WW2).
3 Advanced flight-deck simulator.
4 Autonomous-flight, or freeflight, dispenser system.

AFDTC
Air Force Development Test Center (Eglin AFB).

AFDX
1 Avionics full duplex, or fast-switched, Ethernet.
2 Avionics full duplex, or fast-switched, Ethernet.

AFEC
Air Force Electronic Warfare Center (USAF).

AFEE

AFEI
Airframe flight hours.

AFEL
Air Fighting Development Squadron.

AFEM
Automatic, or automated, flight following.

AFF
1 Autonomous formation flight.
2 Airmet fax forecast.
3 Automatic, or automated, flight following.

AFFF
Aqueous film-forming foam.

Affinity group
Collection of people having a common interest, that interest often being solely an ** charter, at an attractive fare.

Affirmative
R/T response meaning ‘yes’ [replaced by a-confirmation].

Afford
Aeromate [i.e., alternative] fuel facility for military operations.

Affordable moving surface target engagement
Fuses multiple GMTI and SAR to give accurate direction to inexpensive air/ground munitions.

AFFS
1 Airborne firefighting system [replaces Maffs].
2 Aircraft flight-following system [satellite].

AFIFSA
Air Force Inspection Agency (Kirtland AFB, established 1 October 1991).

AFFAA
Air Freight Forwarder Association of America (office, Wash. DC).

AFFMA
Air Freight Forwarder Association of America [AFB, established 1 October 1991).

AFFMA
Air Force Flight Dynamics Laboratory (Andrews AFB, MD20331–7002) (US).

AFFTC
Air Force Flight Test Center (Edwards AFB from 1948).

AFG
1 Aerospace focus group.
2 Airfoil group (LGB).
3 Arbitrary-function generator.

AFGE
American Federation of Government Employees.

AFGL
Air Force Geophysics Laboratory (Hanscom AFB).

AFGS
Autonomous flight-guidance system.

AFGWC
Air Force Global Weather Center.

AFH
1 Above field height.
2 Airframe flight hours.
3 Advanced fibre heater.

AFHF

AFHR
Air Force Historical Research Agency (at AFHR, Maxwell AFB, established 12 September 1949).

AFHTO
Air Force History Support Office (Bolling AFB, Washington DC, established 30 September 1994).

AFI 1 Assistant flying instructor.
2 Authorised Flying Instructor, proposed by FAA 1995 to succeed CFI(2).
3 Authority format identifier.
4 Africa/Indian Ocean region.

AFT
1 Air Force Inspection Agency (Kirtland AFB, established 1 August 1991).
2 Aerial Firefighting Industry Association (US).

AFIC
AFI(1) course.

AFIFSA
Australian Federation of International Forwarders [NSW 2035] (Australia).

AFIG
Aviation Fuels International Group [part of AFTC] (Dubai).

AFIL
Airfiled [after takeoff] flight plan.

AFIO
Association of Former Intelligence Officers (US).

AFIRMS
Air Force integrated readiness measurement system.
AFIS

AFIS  1  Airfield/aerodrome/airport automatic flight-information service; O adds officer.
  2  Air Force Intelligence Service (Washington DC).
  1  Airborne, or airline, flight-information system [= VHF datalink].
  4  Automated fingerprint identification system.
  5  Airline inFlight Information System.
AFISC  Air Force Inspection and Safety Center (Norton AFB).
AFISDO  Air Force Information Systems Doctrine Office (Keesler AFB).
AFISQ  AFIS(1) officer.
AFIT  Air Force Institute of Technology (Wright-Patterson AFB, administered by AU, Maxwell).
AFITAE  Association Française des Ingénieurs et Techniciens de l’Aéronautique et de l’Espace (F).
AFIWC  Air Force Information Warfare Center.
AFK  Aramid-fibre composite (G), also called Sik.
AFL, afl  Above field level.
AFLC  Air Force Logistics Command (Wright-Patterson AFB).
AFL-CIO  American Federation of Labor, Congress of Industrial Organizations.
AFLM  Air Force Logistics Management Center (AU, Gunter Annex).
AFLMIA  Air Force Logistics Management Agency (Maxwell AFB, established 30 September 1975).
AFLO  Airborne force liaison officer, stationed at departure airfield.
AFLSA  Air Force Legal Services Agency (Bolling AFB, established 1 January 1974).
AFLSC  Air Force Legal Services Center (Washington DC, became LSA).
AFM  1  Air Force Medal (AF and Commonwealth air forces).
  3  Aircraft/airplane/approved flight manual.
  4  Atomic-force microscopy.
  5  Airfield friction meter.
  6  Affirmative.
  7  Aircraft fleet management.
  8  Note, USAF Museum is The Air Force Museum (TAFM).
AFMA  1  Armed Forces Management Association (US).
  2  Anti-fuel-misting additive.
AFMC  1  Aluminium-filled metal ceramic.
  3  Auxiliary fuel-management computer.
AFMF  The AF Museum Foundation Inc (WPAFB).
AFMEA  Air Force Management Engineering Agency (Randolph AFB, established 1 November 1975).
AFML  Air Force Materials Laboratory.
AFMOA  Air Force Medical Operations Agency (Bolling AFB, established 1 July 1992).
AFMPC  Air Force Military Personnel Center (Randolph AFB, TX).
AFMS  1  Automatic, or advanced, flight-management system.
  2  Auxiliary fuel-management system.
AFMSA  Air Force Medical Support Agency (Brooks AFB, established 1 July 1992).
AFMSQ  AFMS(1) officer.
AFMSS  Air Force mission-support system (aircraft, UAVs, guided munitions, many armed forces worldwide).
AFN  1  Automated facilities notification.
AFNA  Air Force News Agency (Kelly AFB, established 1 June 1978).
Afnor  Association Française de Normalisation [standardization] (F).
AFnorth  Allied Forces Northern Europe.
AFnorthwest  Allied Forces NW Europe (High Wycombe, UK).
AFNWS  Air Force nuclear-weapons surety plan.
AFO  1  Aerodrome/airport fire officer.
  2  Announcement of [space] flight opportunities.
AFOS  Air Force Office of Special Investigation.
A-FOD tyre  Tyre designed to avoid picking up material causing FOD.
AFOSI  Air Force Office of Security Police (Kirtland AFB).
AFOTC  Air Force Office of Special Investigations (Bolling AFB, established 1 August 1948).
AFOSP  Air Force Office of Security Police (Kirtland AFB).
AFOTEC  Air Force Office of Scientific Research (Bolling AFB).
AFOVRN  Air Force over-run, standard 1,000 ft of approach lights (USAF).
AFP  1  Alternative flight plan.
  2  Air Force Publication.
  3  Acceleration along flight path.
  4  Area forecast panel.
AFPA  Automatic flight-plan association (an electronic system).
AFPC  1  Air Force Personnel Center (Randolph AFB, established 1 October 1995).
  2  Advanced Fighter Pilot Course.
AFPCA  Air Force Pentagon Communications Agency (Washington DC, established 1 October 1984).
AFF  costs  All flight personnel.
AFP  1  Air Force Program Executive Office (Washington DC, established 1 January 1974).
AFPB  Armed Forces Pay Review Body (UK).
AFPR  Air Force Medical Operations Agency (Randolph AFB, TX).
AFPRB  Armed Forces Pay Review Body (UK).
AFPRO  Air Force Plant Representatives Office.
AFPS  Air Force Personnel Office (Allied Forces NW Europe).
AFRA
- 3 AF Reserve is called Afrs.
- 4 AESA-fed reflector.
AFRA 1 Active front-end receiver assembly.
AFRAC 2 Aircraft Fleet Recycling Association (US + European countries).
AFRAC 3 African Airlines (Int.).
AFRATC 4 African Air Traffic Conference (Int.).
AFRBA 5 Air Force Review Boards Agency (Andrews AFB, established 1 June 1980).
AFRCC 6 Air Force Reserve Command: (U adds Unit).
AFRCC 7 Air Force Rescue Co-ordination Center.
AFRCU 8 Air/fuel ratio control unit.
AFREA 9 Air Force Real-Estate Agency (Bolling AFB, established 1 August 1991).
AFRES 10 Air Force Reserve (Robins AFB, established 14 April 1948).
AFRFW 11 Air Force Research Flying Wing[s].
AFRL 12 Air Force Research Laboratory.
AFROC 13 Air Force Requirements Oversight Council.
AFROTC 14 Air Force Reserve Officers Training Corps.
AFRP 15 Aramid-fibre reinforced plastic[s].
AFRPL 16 Air Force Rocket Propulsion Laboratory (Edwards AFB).
AFRS 17 Auxiliary flight-reference system.
AFRSI 18 Advanced flexible reusable surface insulation (Shuttle).
AF/RTL 19 Auto-flight rudder-travel limit.
AFS 20 Aeronautical fixed service (ICAO).
AFS 21 Auxiliary Fire Service (UK, WW2).
AFS 22 Aerodrome/airport/airfield fire service.
AFS 23 Auxiliary Fire Service (FAA to 1962).
AFS 24 Airborne file server.
AFS 25 Aviation Flight Standards (FAA division).
AFSA 26 Air Force Services Agency (San Antonio, TX, established 5 February 1991).
AFSACF 29 Air Force Satellite Control Facility (global network).
AF/RTL 30 Automated flight service station.
AFSTC 31 Air Force Technical Applications Center (Patrick AFB, established 1 May 1960).
AFTAC 32 Arabian Fuels Technology Centre [especially concerned with aviation] (Dubai).
AF/RTL 33 Avionics fault-tree analyser.
AF/RTL 34 Advanced fuels testing [and] analysis.
AFTAC 35 Aft-fuselage trainer.
AFTAC 36 Airframe fatigue test.
AFTAC 37 Aft-fuselage trainer.
AFTC 38 Arabian Fuels Technology Centre.
AFTEC 39 Air Force Tactical exploitation of national capabilities.
AFT 40 Advanced flying training.
AFT 41 Airframe fatigue test.
AFT 42 Aft-fuselage trainer.
AFTEC 43 Active flutter-suppression system.
AFTEC 44 Advanced fire-support system.
AFTEC 45 Air Force Security Service.
AFTEC 46 Automated flight service station.
AFTEC 47 Air Force Space Technology Center (Kirtland AFB).
AFTEC 48 Air Force Tactical exploitation of national capabilities.
AFTEC 49 Aft-fuselage trainer.
AFTEC 50 Airframe fatigue test.
AFTEC 51 Aft-fuselage trainer.
AFTEC 52 Air Force Space Division, usually called SD, formed as unit of AFSC 1960, incorporated into AFSPC 1982.
AFTEC 53 Airframe, or aircraft, full-scale development.
AF/RTL 54 Airplanes fast-switched Ethernet.
AF/RTL 55 Air Force Space Information and News Center (Kelly AFB).
AFS 56 Audio frequency-shift keying.
AFSOC 58 Air Force Space Command (Peterson AFB, established 1 September 1992).
AFSOC 59 Association Française des Salons Spécialisés.
AFSOC 60 Active flutter-suppression system.
AFSOC 61 Air F - 75082 Paris (Kirtland AFB, estab-
AFSOC 62 AF Reserve is called Afres.
AFSOC 63 Aircraft Fleet Recycling Association (US + European countries).
AFSOC 64 African Air Traffic Conference (Int.).
AFSOC 65 Air Force Review Boards Agency (Andrews AFB, established 1 June 1980).
AFSOC 66 Air Force Reserve Command: (U adds Unit).
AFSOC 67 Air Force Rescue Co-ordination Center.
AFSOC 68 Air/fuel ratio control unit.
AFSOC 69 Air Force Real-Estate Agency (Bolling AFB, established 1 August 1991).
AFSOC 70 Air Force Reserve (Robins AFB, established 14 April 1948).
AFSOC 71 Air Force Research Flying Wing[s].
AFSOC 72 Air Force Research Laboratory.
AFSOC 73 Air Force Requirements Oversight Council.
AFSOC 74 Air Force Reserve Officers Training Corps.
AFSOC 75 Aramid-fibre reinforced plastic[s].
AFSOC 76 Air Force Rocket Propulsion Laboratory (Edwards AFB).
AFSOC 77 Auxiliary flight-reference system.
AFSOC 78 Advanced flexible reusable surface insulation (Shuttle).
AFSOC 79 Auto-flight rudder-travel limit.
AFSOC 80 Aeronautical fixed service (ICAO).
AFSOC 81 Auxiliary Fire Service (UK, WW2).
AFSOC 82 Aerodrome/airport/airfield fire service.
AFSOC 83 Auxiliary Fire Service (FAA to 1962).
AFSOC 84 Airborne file server.
AFSOC 85 Aviation Flight Standards (FAA division).
AFSOC 86 Air Force Services Agency (San Antonio, TX, established 5 February 1991).
AFSOC 89 See AFSA.
AFSOC 90 Association Française des Salons Spécialisés.
AFSOC 91 Aircraft Fleet Recycling Association (US + European countries).
AFSOC 92 African Air Traffic Conference (Int.).
AFSOC 93 Air Force Review Boards Agency (Andrews AFB, established 1 June 1980).
AFSOC 94 Air Force Reserve Command: (U adds Unit).
AFSOC 95 Air Force Rescue Co-ordination Center.
AFSOC 96 Air/fuel ratio control unit.
Agent Defeat

AFWL  Air Force Weapons Laboratory.
AFWR  Atlantic Fleet Weapons Range.
AFWWS  Air Force Weather Weapon System.
AG  1 Air gunner.
   2 Availability guarantee.
   3 Assault glider (US, WW2).
   4 Reconnaissance Wing (G).
   5 Antenna group.
   6 Adjutant-General (USA).
   7 Arrester gear.
AG  Air-to-ground.
   A  Minimum resolvable area within patch illuminated by radar.
AGA  1 Airfields, ground aids and routes, main output of AIP(1).
   2 Air/ground/air communications.
AGCAS  Automatic ground-to-air communication system [= data-link], not yet achieved.
Agard, AGARD  Advisory Group for Aerospace (formerly Aeronautical) Research and Development (NATO).
AGAQ  Association des Gens de l’Air du Québec.
Agurs  Advanced general-aviation research simulator (at CAI [1]).
AGAS  Affordable guided airdrop system.
Agate  Advanced general-aviation-transport experiments (NASA/industry).
Agatha  Air/ground anti-jam transmission from helicopter or aeroplane (F).
AGATMS  Action Group for Air Traffic Management Safety (Europe).
AGB  Accessory gearbox.
AGBR  Affordable ground-based radar.
AGC  1 Automatic gain control, property of radio receiver designed to vary gain inversely with input signal strength to hold approximately constant output.
   2 Affinity-group charter.
   3 Adaptive gate centroid (radar tracking algorithms).
   4 Active generalised control, digital protected FBW system of Rafale.
   5 Active geometry [or geometric] control.
AGCAS  Automatic ground collision-avoidance system.
AGCS  1 Advanced guidance and control system[s].
   2 Air/ground communication system.
AGCU  APU(1) generator control unit.
AGD  1 Axial-gear differential.
   2 Air generator drive (ie, windmill).
AGDA  Air-sport association (Guatemala).
AGE  1 Aerospace ground equipment (military inventory category).
   2 Auxiliary ground equipment (Sigint).
   3 Automated ground equipment (space).
A-gear  Arrester gear.
age-hardening  Many metal alloys, especially highstrength aluminium alloys, need time to harden after heat treatment, usually in order that partial precipitation may take place; preferably accomplished at room temperature or chosen higher value.
aging (US = aging)  Time-dependent changes in microstructure of metal alloys after heat treatment. Some merely relieve internal stress but most improve mechanical properties.
Agent Defeat  Programme to create an air-delivered 

after-flight inspection

or mixture before admission to cylinders of highly blown PE designed for operation at high altitudes.

after-flight inspection  Post-flight inspection.

afterglow  1 Persistence of luminosity from CRT screen, gas-discharge tube or other luminous device after excitation removed (of importance in design of many radar displays).
   2 Pale glow sometimes seen in western sky well after sunset due to scattering of sunlight by fine dust in upper atmosphere.
   3 Transient decay of plasma after switching off EM input power.
Aftern  AFTN terminal.
aft-fan engine  Turbofan in which the fan is a free-running assembly behind the core, driven by a turbine linked only by the gas flow.
aft flap  Auxiliary curved flap mounted behind USB (Coanda) flap to complete turning of USB flow to beyond aft flap linked only by the gas flow.
aft flight deck  Rear area of aircraft flight-deck floor where this is at upper level above main floor. Not necessarily occupied by aircrew.
AFTI  Advanced fighter technology integration.
AFTIL  Airways Facilities Tower Integration Laboratory (FAA).
aft limit of CG  Rearmost position of CG permitted in flight manual, pilot’s notes, certification documentation or other authority. That at which stability in yaw and/or pitch, and static and manoeuvre margins, are still sufficiently good for average pilot to handle most adverse combination of circumstances in safety. CCV concept is leading to revolution in which much reduced, or negative, natural stability is held in check by AFCS.
aft-loaded wing  Supercritical wing, in which centre of pressure is exceptionally far aft because of lift generated by cambered trailing edge.
AFTN  Aeronautical Fixed Telecommunications Network (Int. from 1970).
AFTNS  Aircraft flight-track and noise system, displays 3-D position and noise of all aircraft near airport.
AFTS  1 Advanced Flying Training School.
   2 Air/fuel test switch.
   3 Aerobatics Training School (Compton Abbas, UK).
aft wing  In oblique-(slew-)wing aeroplane, wing pointing rearward.
AFU  Advanced Flying Unit.
AFUC  Average flyaway unit cost [see unit cost].
AFV  1 Armoured fighting vehicle.
   2 Automatic flyback vehicle.
AFVA  Association Française de la Voltege Aérienne.
AFW  Active flexible wing.
AFWA  Air Force Weather Agency (Offutt AFB, Nebraska).
AFWAL  Air Force Wright Aeronautical Laboratory.
AFWRC  Air Force Wargaming Center (established 1986 at Maxwell AFB).
AGEPL

weapon able to destroy chemical and biological agents without causing their dispersal (DoD).

AGEPL Association Général des Elèves Pilotes de Ligne (F).

AGES Air/ground engagement system [also AGES II]; (AD adds air defense).

AGETS, Agets Automated ground engine-test system.

AGFS Aviation gridded forecast system (demo 1995).

AGI 1 Advanced [or, post 1995, authorized] ground instructor (FAA).

2 ADNS/GDNS interface.

Agilitile camera Hand-held, for photographing surface targets, especially ships (RAF).

AGIFORS, Agifors Airline Group, International Federation of Operational Research Societies [Int., offices, Frankfurt-am-Main, G, and Harmondsworth, UK].

AGIL Airborne general illumination light.

Agile 1 Aircraft ground-induced loads excitation (simulates rough runways).

2 Airborne gyrostabilized IR light equipment.

3 Advanced garment integrated life-support ensemble.

Agile manufacturing Rapid response to fluctuation in demand.

Agility Agile information transfer ability, active Satcom antennas.

agility 1 Loosely, manoeuvrability, esp. of air-combat fighter.

2 In particular, ability of fighter to change state quickly, to fly different mission.

AGIMS Air/ground information-management system.

AGINT, Agint Air/ground intermediate system.

AGIS Air/ground intermediate system.

AGL, agl 1 Above ground level.

2 Airborne gun-laying (radar).

3 Airfield ground lighting.

4 Automatic grenade launcher.

5 Arbeitsgemeinschaft Luftwaffe [D-31675 Bückeburg] (G).

AGLT Airborne, or aircraft, gun-laying turret.

AGM 1 Air-to-ground guided missile (inventory category, USAF, USN).

2 Missile range instrumentation ship (US code).

AGMA American Gear Manufacturers’ Association (US).

AGMC Aerospace Guidance and Metrology Center (AFSC).

AGN Again.

AGNA Advisory Group of National Authorities (EASA).

Agnis Azimuth guidance for nose-in stands; also rendered as approach guidance nose-in to stand or aircraft guidance nose-in system.

AGO 1 Air-to-ground operator [also ago].

Agone line Line joining all points on Earth’s surface having zero magnetic variation. Two ** exist, one sweeping in curve through Europe, Asia and W Pacific, and other roughly N–S through Americas.

AGOS Department of aviation, seaplanes and experimental construction (USSR).

Agpanz Agricultural Pilots’ Association of New Zealand.

AHC

Agplane Agricultural aircraft (colloq).

AGPO Angle gate pull-off (radar).

AGPPE Advanced general-purpose processor element, a USAF common module.

AGR Air/ground router.

Agra Automatic-gain ranging amplifier.

ugravitic Hypothetical environment without gravitational field. Unrelated to weightless free-fall in gravitational field, or to possible points where net gravitational field of all mass in universe is zero.

ugravitic illusion Apparent movement of human visual field in weightless flight due to minute displacements of structure in inner ear.

AGREE Advisory Group on Reliability of Electronic Equipment (DoD/NATO).

AGRI Air/ground radar imaging.

agricultural Colloq., of hardware, essentially primitive and crude, but not necessarily ineffective or obsolescent.

agricultural aircraft Aircraft designed or converted for agricultural aviation.

agricultural aviation Branch of general aviation concerned with agriculture, specific crop spraying, dusting, top dressing, seeding, disease inspection and, apart from transport, work with livestock.

AGRMS Air/ground router management system.

AGRRM Air/ground router regional manager.

AGS 1 Airborne ground, or air-to-ground, surveillance.

2 Aeronautical ground station (satcom).

3 Aircraft Generation Squadron (POMO).

4 Air Gunnery School.

5 Aircraft General Stores (spare parts).

6 Alliance [airborne radar] ground surveillance (NATO).

AGSS 1 Aerial gunner and scanner simulator.

2 Acars ground-system standard (AEEC).

AGS Stn Air/ground station.

AGTA Airline Ground Transportation Association Inc. (US).

AGTV Frequency agility.

AGU 1 American Geophysical Union [Washington DC20009] (US).

2 Airlink gateway unit (satcoms).

3 Airborne guidance unit (UAV).

AGV 1 Automated guided vehicle, part of most FMS (6); S adds system.

2 Avion à grande vitesse [ = hypersonic] (F).

AGWCP Advanced guided-weapons control panel.

AGZ Actual ground zero.

Ag-Zn, Ag/Zn Silver/zinc electrical storage battery.

AH 1 Artificial horizon.

2 Or $\alpha$, attitude hold.

Ah, A-h Ampere-hour.

AHA Aviation and hazard analysis.

AHFRA Association of Hong Kong Air Freight Agents (Kowloon).

AHARS Airborne heading/altitude reference system.

AHH Attack Helicopter Battalion (USA).

AHC 1 Assault Helicopter Company (USA).
AHD
2 Attitude/heading computer.

AHD Ahead.

AHE Aerospace Hardware Exchange.

Ahead 1 Attitude, heading and rate of turn indicating system.
2 Advanced hit efficiency and destruction, programmable gun submunition.

AHF Air-cooled, heavy fuel.

AHFM Alternate [ie, alternative] or advanced h.f. material [Northrop Grumman].

AHI Aviation Health Institute (UK).

AHIP Army helicopter improvement program (USA).

AHM 1 Anti-helicopter mine.
2 Airplane health management.
3 Aircraft heavy maintenance.

AHMOS Active health-monitoring system.

AHMS Advanced health management system.

AHWS Armed-helicopter weapon system.

AHMR Aircraft health-monitor recorder.

AIIP Army heliport (USA).

AHI Air headquarters.

AHRMS Attitude/heading reference system pronounced A-hars.

AHRU Attitude/heading reference unit.


AHSNZ Aviation Historical Society of New Zealand, Inc. [office, Wellington].

AHSW Aural high-speed warning.

AHT 1 Automated hover trainer.

AHTI Airborne Interception [radar].

AHTC Automated horizontal-tail retrimming after landing.

AHU Aircraft Holding Unit, for military aircraft temporarily surplus to requirements; also said to mean Aircrew HU.

AHWG Aviation Health Working Group (UK Parliamentary Committee 2002).

AJ 1 Airborne interception (radar).
2 Artificial intelligence.

AJD 1 Altering item drawing.
2 Attitude indicator.

AJR Alternative interrogator.

AIA 1 Aerospace Industries Association of America Inc. [Washington, DC20005–3924] (US).

AIAA 1 Associazione Industrie Aerospaziali [see AIAD].
2 Associazione Italiana di Aerotecnica.

AIC 1 Aeronautical Information Circular (CAA).
2 Advanced industrial countries.

AICG 1 Aircraft health-management recorder.

AICM 1 Air-inlet controller, or computer.
2 Aluminum/iron/cerium.
3 Automatic integrity check (MLS).

AICMA Associazione Italiana Costruttori Amatori d’Aerei (homebuilders).

AICBM Anti-ICBM.

AICC Aviation Industry CBT Committee (Int.).


AICT Association of International Air Courier and Express Services (office UK).

AICS Association Internationale des Constructeurs de Matériel Aérospatial.

AICQ Associazione Italiana Cultura Qualità [member of IAQGI].

AID Airborne integrated communications system.

AIDB Automatic hover trainer.

AIB 1 Accidents Investigation Branch [from 1988 AAI[B] (UK).
2 Aeronautical Information Bureau.
3 Airfield, or aerodrome, identification beacon.

AIBU Advanced interface blanker unit.

AIAA 1 Associazione Italiana di Aerotecnica [philately]; office, I-20148 Milan] (Italy).

AIAE All-India Aircraft Engineers Association.

AIAH Advanced integrated avionic, or aircrew, helmet.


AIE 1 Associated Electric Co. (Australia).

AIEC Advanced electronic integrated computer.

AIEF Air Intelligence Exploitation Facility (USAF).

AIEG 1 Airborne aircraft/automatic/advanced integrated data system/suite.
2 Acoustic-intelligence data system.

AIF Advanced identification friend or foe.

AIF 1 Air Intelligence Agency (USAF, Lackland AFB, 5 Aircrew HU).
2 Airfield, or aerodrome, identification beacon.

AIG 1 Aircraft/airframe/automatic/advanced integrated data system/suite.

AII Advanced identification friend or foe.

AIIAI Advanced identification friend or foe.

AIIA 1 Associated Electric Co. (Australia).

AIIA 1 Airborne aircraft/automatic/advanced integrated data system/suite.
AIFS
Advanced indirect fire system[
AIG
Acas implementation group.
Aigasa
Associazione Italiana Gestori Aeroporti e Aeroportuali.
AIGT
Aerospace Innovation and Growth Team
AIL
Anti-icing/anticing inhibitor.
AIDED
Active integrated inlet duct engine demonstra-
tion.
AIFS, AFS
Advanced IR imaging seeker.
AII
Airworthiness Information Leaflet.
AIR
Aeronautical Instrument Laboratory (USN, from
1943).
AIL
Aileron.
AILA
Airborne, or automatic, instrument landing, or
instrumented low, approach; S adds system.
ailator
Control surface functioning as aileron and
elevator (see elevator).
aileron
Control surface, traditionally hinged to outer
wing and forming part of trailing edge, providing control
in roll, i.e., about longitudinal axis. Seldom fitted to aircraft
other than aeroplanes and gliders, and in recent years
supplemented or replaced by spoilers, flap-erons, elevons
taileron, while in some high-speed aircraft
contentional* are mounted inboard to counter * reversal.
2 Effects of lateral-control system, as in phrase
‘to run out of *’.
aileron centring device
Another name for a wing leveller. Typically incorporates two springs, able to overcome friction and air loads.
aileron drag
Asymmetric drag imparted by aileron deflection, greater on down-going aileron (see differential
* Frise *).
aileron droop
Rigging of manual ailerons so that in
neutral position both are at a positive angle relative to the
wing.
aileron reversal
As aircraft speed increases, deflection of
aileron can twist wing sufficiently to reduce, neutralise
and finally reverse rolling moment imparted to aircraft.
Many aircraft designed for Mach numbers higher than 0.9
either have no traditional outboard ailerons or else lock
these except at low speeds.
aileron reversal speed
That at which pilot input is reduced to zero.
aileron roll
See slow roll.
aileron wedge
See wedge.
AILS
Airborne information for lateral spacing.
AIM
Aeronautical [until 1995 Airmen’s] Information
Manual (FAA).
AII
Aeroplane, or aircraft, information-management
system.
AIMS
Académie Internationale de Médecine
Aéronautique et Spatiale [also IAASM; office, Montreal].
aim-bias
Error between aiming point and centre of
dispersion area of statistically valid number of projectiles.
AIMD
Aircraft intermediate maintenance department.
aim dot
Basic command reference symbol in gunsight or
HUD: can show where bullets would hit if gun fired, but
usually also gives other indications.
AIMDS
Aircraft integrated monitoring and diagnostic
system.
AIME
Autonomous integrity monitored extrapolation.
AIMES
Avionics integrated maintenance expert system
(McDonnell Douglas).
Aim/Far
Aeronautical Information Manual, Federal
Aviation Regulations.
AIMIS, Aimis
Advanced integrated modular instru-
mentation systems (USN).
aim-off
Angular allowance when firing at moving target
with unguided projectile, usually because of sightline spin
resulting in target changing apparent position during
projectile’s flight, but in air-to-air combat possibly
because of lateral air drag (eg, in firing at aircraft abeam
at same speed and heading, when sightline spin is zero).
AIMS
Attitude indicator measurement system.
AIR
ATCRBS, IFF, Mk 12 transponder, System.
AIR
Aircraft identification monitoring system (DoD,
interceptors).
AIR
Automated integrated manufacturing system.
AIR
Airplane, or aircraft, information-management
system [reports problems to maintenance staff].
AIR
Airborne integrated management system.
AIR
Airport information management system [vast
range of data].
AIR
Advanced imaging multispectral system.
AIR
Aircraft integrated monitoring system [accident-
related and life data].
AIR
Advanced integrated MAD system.
AIR
11 Airspace information monitoring system [major
airports, GI].
AIRMV
Aluminium/iron/molybdenum.
AIR
Air intercept missile evaluation (USAF/USN).
AIR
Airline identification number.
AIR
11 INS with prefix advanced, aided, area or
airborne.
AIR
2 Associazione Internazionale Nomo nello Spazio (I).
AIRC
Aeronautical industry modernisation programme.
AIR
Action information organization (mainly
warships, in relation to aircraft).
AIR
Aviation Insurance Offices Association [ office,
Guildford GU2 5QJ] (UK).
AIR
Aeronautical Information Publication[s], or
package.
AIR
Asars, [1], improvement program.
AIR
Anti-surface-warfare improvement program[me].
AIR
Air-independent propulsion.
AIR
Aircraft integrated monitoring and diagnostic
system.
AIR
Automated image-processing terminal.
AIR
French aerospace material specification code.
AIR
Air intercept[or] rocket (inventory category, USAF).

air

\textit{J} Air-inflatable retarder (similar to ballute).
\textit{#} Air-intercept radar.
\textit{5} Advanced integrated recorder.
\textit{6} Aerospace Information Report (SAE).

\textbf{air} Air near Earth’s surface usually taken to be (% by volume): nitrogen 78.08; oxygen 20.95; argon 0.93; other gases (in descending order of concentration, carbon dioxide, neon, helium, methane, krypton, hydrogen, xenon and ozone) 0.04. In practice also contains up to 4% water vapour. ISA SL pressure at 16.6°C is 10.332 kg m\(^{-2}\) = 761.848 mm Hg and density 1.2255 kg m\(^{-3}\).

\textbf{air} abort Abort after take-off.

\textbf{Airac} Aeronautical information regulation and control, system for disseminating air navigation information (Notams).

\textbf{Airad} Airmen advisory (local).

\textbf{Airaid} Airborne interception radar, carried by fighter for finding and tracking aerial targets.

\textbf{Air Adviser} RAF officer charged with assisting commander of a multiservice Task Force [e.g. Falklands 1982].

\textbf{air attack} An experienced firefighter who not only provides the IC(8) with an overview but also knows how best to allocate resources.

\textbf{air-augmented rocket} Usual form of this propulsion system is for first stage of combustion, or primary rocket propellant or gas-generator, to yield fuel-rich range of products which then combine in second stage of combustion with atmospheric air (normally induced through ram intake). Objective is to increase specific impulse, by using oxygen from atmosphere, and also burn time and vehicle range.

\textbf{air bag} Rapidly inflated flexible bag to cushion VL of UAV or other object.

\textbf{airband} Those frequencies used for aeronautical voice communications.

\textbf{air base} 1 Loosely, military or general-aviation airfield (term used mainly by popular media).
2 In photogrammetry, line joining two air stations.
3 Length of (2).

\textbf{scale distance between adjacent perspective centres as reconstructed in plotting instrument.}

\textbf{air bearing} Gas bearing using air as working fluid.

\textbf{air-bearing table} Table supported on single spherical air bearing and thus free to tilt, without sensible friction, to any attitude within design constraints.

\textbf{air-blast switch} Electrical circuit-breaker in which arc formed on breaking circuit is blown away by high-velocity air jet.

\textbf{air-blast transformer} In this context, as in some other electric and electronic equipment dissipating large heat flux, air-blast signifies forced air cooling.

\textbf{air bleed} See Bleed (2).

\textbf{air block} Rectilinear volume of atmosphere between designated FLs over published geographical area.

\textbf{airblown seal} A seal between two rotating assemblies, usually of labyrinth type, fed with air at pressure slightly higher than surroundings, thus excluding oil or other contaminants.

\textbf{airborne} Sustained by atmosphere or vertical component of propulsion thrust. Implication is that vehicle is not above sensible atmosphere; term not normally used in connection with spaceflights not involving aerodynamically supported vehicles, but applicable to wingless jet-lift devices.

\textbf{airborne alert} Generally, long-duration mission flown by strategic bomber, in all respects ready to make real attack, to reduce reaction time and remove possibility of destruction by ICBM or SLBM attack on its base. Until World War 2 `air alert' was method of deploying interceptor (pursuit) forces, keeping them on sustained flight in likely combat area under ground vector control.

\textbf{Airborne Cigar} Powerful transmitters on which RAF bombers broadcast misleading instructions to German night fighters in WW2.

\textbf{airborne early warning, AEW} Use of aircraft to lift powerful search radar to greatest possible height to extend line-of-sight coverage (very approximately, LOS radius in statute miles is square root of 1.5 times observer’s height in feet). Modern AEW can give a PPI covering 170,000 sq miles, throughout which two low-level aircraft in close formation can be individually distinguished against ground clutter.

\textbf{airborne fog blind} Translucent blind or hood admitting light to cockpit or flight deck whilst removing external visual cues.

\textbf{airborne force} Force constituted for airborne operations.

\textbf{airborne gunlaying turret, AGLT} Bomber-defence gun turret incorporating automatic provisions for aim-off and other corrections when engaging aerial targets.

\textbf{airborne interception, A1} Use of aircraft to find, and close with, another aircraft; specifically, use of fighter to intercept, challenge by IFF and, if dissatisfied, destroy another aircraft.

\textbf{airborne operation} Movement of combat forces and logistic support into combat zone by air.

\textbf{airborne radio relay} Use of airborne relay stations to increase range, flexibility or security of communications.

\textbf{airborne target handover system} Coded data-link enabling aircraft to hand over target (usually on ground) to a friendly station, without voice.

\textbf{Air Box} Air Ministry (RAF, colloq.).

\textbf{airbrake} Passive device extended from aircraft to increase drag. Most common form is hinged flap(s) or plate(s), mounted in locations where operation causes no significant deterioration in stability and control at any attainable airspeed. Term not normally applied to flaps, drag chute or thrust-reverse systems.

\textbf{air-breathing} Aspiring air, specifically aircraft propulsion system which sustains combustion of fuel with atmospheric oxygen. Imposes constraints on vehicle speed and height, but invariably offers longer range than rocket system for same vehicle size or mass.

\textbf{airbridge} 1 Elevated metal ‘bridges’ linking logic gates on an integrated circuit chip.
2 See bridge.

\textbf{Air Britain} Despite name, international enthusiast body, formed 1948, now has (Historians) added to title [office Dunstable, UK].

\textbf{Airbrokers Association} Formed 1949, became BAC1 [office London].

\textbf{airburst} Detonation of explosive device well above Earth’s surface. Almost all nuclear weapons are programmed for optimised airburst height, which varies with weapon and target.
AIRC

AIRC Airline[s] Industrial Relations Conference [Washington, DC (US)].

air carrier Organization certificated or licensed to carry passengers or goods by air for hire or reward.

air cartography Aerial survey, esp. photographic purpose for mapmaking.

Air Cavalry Helicopter-borne attack/reconnaissance ground troops (USA).

AIRCMMI Advanced infra-red countermeasures munition.

aircom Traffic on an Acars link (SITA).

AIRCON Air communications network, specif. serving US air carriers. Characterised by wide geographical extent, very large information flow, ‘on-line, real time, full-time’ storage, and computer-compatible electronic switching.

air conformal ice detection system Measures thickness and characteristics by scattering of light from fibre optics.

air controller In military operations, an individual trained for and assigned to traffic control of particular air forces assigned to him within a particular sector.

air control team Team organised to direct CAS3 strikes in the vicinity of forward ground elements.

air-cooled Heat-generating device, esp. piston engine, maintained within safe limits of temperature by air cooling. Invariably cooling is direct, in case of piston engine by radiating heat to air flowing between fins around cylinder head and barrel, or around hot rotor casing(s) of RC engine.

air corridor Defined civil airway crossing prohibited airspace.

2 Restricted air route in theatre of military operations intended to afford safe passage for friendly air traffic.

aircraft Device designed to sustain itself in atmosphere above Earth’s surface, to which it may be attached by tether that offers no support. Two fundamental classes are aerodynes and aerostats. Aircraft need have no means of locomotion (balloons are borne along with gross motion of atmosphere, while kites are tethered and lifted by motion of atmosphere past them), or any control system, nor means for aerodynamic or aerostatic lift (e.g., jet VTOL aircraft need be no more than jet engine arranged to direct efflux downwards). Free-falling spacecraft qualifies as aircraft if, after re-entry, its shape endows it to direct efflux downwards). Free-falling spacecraft qualifies as aircraft if, after re-entry, its shape endows it with sufficient L/D ratio to glide extended distance, irrespective of whether or not it can control its trajectory.

aircraft cabin mattress Unpacked from storage bag, converts two facing seats + intermediate table into foam bed.

aircraft cable Specially designed tensile cable, usually either solid wire or any of eight built-up constructions, used for operating flight control and other mechanical systems.

aircraft carrier Marine craft, traditionally large surface vessel, designed to act as mobile base for military aircraft.

aircraft categories 1 For genealogical purposes, family tree of possible classifications.

2 For certification purposes, subdivision of aeroplanes (most important family of aircraft) on basis of performance. In UK aeroplanes certificated before 1951 are categorised as No Performance Group Classification; after 1951 subdivided into Performance Group A, large multi-engined; Performance Group C, light multi-engined; and Performance Group D. Also Group X for large multi-engined aeroplanes built outside UK before specified date.

aircraft certificate In US all aeroplanes (airplanes) and most other aircraft except models are categorised and licensed according to four classes of certificate, each having status of legal document: airworthiness, production, registration and type.

aircraft commander See commander.

aircraft communications and automatic reporting system Monitors and records many parameters, mainly engine data.

aircraft container See container.

aircraft dispatcher In US air transport, official charged with overseeing and expediting dispatch of each flight. Traditional post analogous to train dispatcher of US railways. Today duties include provision of met. information, flight planning, arranging unloading and loading, stocking with consumables, apron servicing and other turnaround tasks, calling for large staff.

aircraft dope See dope.


aircraft fuel See gasoline, kerosene.

Aircraft Holding Unit Accepted new aircraft off production or in-service aircraft after major overhaul or repair, and tested them before allocation to operating unit (RAF, RN).

aircraft integrated data system Supplements ‘black box’ by monitoring and recording many additional engine and system parameters.

aircraft lifting bag Usually made of stout neoprene woven fabric, inflated to assist recovery of disabled or crashed aircraft; among other terms are pneumatic elevator and pneumatic aircraft jack.

aircraft log One or more volumes recording detailed operating life of individual aircraft, listing daily and cumulative flight time, notifiable irregularities or transient unserviceability of any part, all inspections, overhauls, parts replacement, modification and repair.

Aircraftman, Aircraftwoman RAF/WRAF non-commissioned rank, with junior and senior grades, having no bearing on trade in which rank-holder is qualified.

aircraft management simulator Essentially the same as a pre-1960 simulator, equivalent to a modern FFS but without 6-axis motion or synthetic external scenes; capable of training on all cockpit instruments and systems.

aircraft missile Missile launched from aircraft.

aircraft mover Apron vehicle for towing or pushback.

aircraft network interface unit Provides link between aircraft systems and passenger [or possibly crew] PCs.

aircraft pallet See pallet.

aircraft performance monitoring Software calculates deviation(s) from specific range caused by aerodynamic deterioration of airframe.

aircraft prepared for service See weight.

aircraft rocket Missle launched from aircraft.

aircraft system controller Avionics subsystem performing flight engineering control and monitoring functions to automate hydraulic or electric or fuel or ECS or other system.

aircraft unit-load device See Unit load.

aircrew Crew required to operate aircraft in flight, esp. crew, numbering more than one, of military aircraft.
aircrew equipment assembly

Large civil aircraft normally operated by flight crew and cabin crew; * is not used.

aircrew equipment assembly Standard modular fitting incorporating PEC and various other items carried on flying clothing, forming single ‘umbilical’ for military flight-crew member.

air cushion Volume of air at pressure slightly above local atmospheric, trapped or constantly replenished by suitably arranged air jets (possibly issuing from base of flexible skirt) to support ACV.

air data Parameters derived from measurements of the air mass surrounding the aircraft.

air-data computer Digital computer serving as central source of information on surrounding atmosphere and flight of aircraft through it. Typical ADC senses, measures, computes or transmits (to AFCS and other aircraft systems) pressure altitude, OAT and total temperature, Mach number, EAS, angle of attack, angle of yaw and dynamic pressure. All are corrected for known errors and converted into signals of form required by supplied systems. ADC may have 60 to 90 output channels, most used throughout each flight.

air defence Defence against aerial attack, ie attack by aircraft, atmospheric missiles and RVs entering atmosphere from space.

air defence identification zone Defined airspace within which all traffic must be identified, located and controlled (ADIZ).

air defence operations area Geographical area, usually large, within which air and other operations are integrated.

air defence region Geographical subdivision of an AD area.

air defence sector Geographical subdivision of an AD region.

Air-Dep PSP (1), a US registered name.

air despatcher Person trained to supervise release or ejection of cargo or parachutists from aircraft in flight.

air distance Distance flown through the air, ie with respect to atmosphere.

air distributed mission trainer Features Ro-Ro cockpit to enable aircrew to receive individual or networked training on various aircraft types.

Air Division Largest administrative unit in USAF below Air Force.

air dominance Unquestioned military supremacy in aerospace.

air drag Drag.

air drill 1 Training or display by group of military aircraft which repeatedly change formation or perform manoeuvres.

2 Drill driven by high-pressure air.

air-driven horizon Artificial horizon in which gyro is driven by one or more high-speed air jets, usually arranged to impinge on cups machined in periphery. In most, instrument case is connected to vacuum line, often generated by venturi, and jets are atmospheric air. Performance reduced at altitude and by contamination by foreign matter blocking or penetrating filter.

airdrome Incorrect corruption of aerodrome.

airdrop Delivery of personnel or cargo from aircraft in flight, usually by parachute.

airdrop platform Platform designed to carry large indelible loads for airdrop or LAE.

AIRE Atlantic Interoperability initiative to Reduce Emissions [2007–, FAA, EC] (Int.).

Airep Air report, in plain language, either spoken weather report by airborne aircrew or written air weather report.

Airex Patented low-density polyetherimide foam.

air exchange Release of a proportion of the air in closed-circuit tunnel on each pass and its replacement by fresh cooler air from atmosphere; hence, * system, control doors, cooling etc, and * rate expressed as % of tunnel airflow. Purpose is to regulate tunnel temperature and overall static pressure level.

air expeditionary force Multi-arms force quickly assembled to meet needs of a local commander and sent to a crisis point within hours (US).

airfield Land area designated and used, routinely or in emergency, for takeoff and landing by full-scale aerodyne(s). Definition excludes aerostats and model aircraft, but admits VTOLs and RPVs. No facilities need be provided.

airfield elevation Height above MSL, usually of highest point on runway or other used surface.

airfield FIS Flight-information service provides information to, but not control of, aircraft using that airfield.

airfield surface movement indicator Airfield surveillance radar.

airfield surveillance radar Radar on or near airfield with scanner well above ground level rotating continuously to give fine-definition PPI display, especially showing aircraft on ground and vehicles.

air-filed Flight plan sent by aircraft in flight.

airflow Air flowing past or through body. For immersed solids moving through air, major factors are speed (IAS, EAS, CAS, TAS), angle of attack or yaw, dynamic head, OAT and total temperature. For turbine engine, * normally mass flow, ie mass per unit time passing through engine.

airfoil Aerofoil.

air force station Usually means location of an air force unit where there is no airfield.

airframe BS.185/1940: ‘A flying machine without the engines’, today BS.185 has added ‘power driven’. Better definition is: assembled structure of aircraft, together with system components forming integral part of structure and influencing strength, integrity or shape. Includes transparency, flush aerials, radomes, fairings, doors, internal ducts, and pylons for external stores. In case of ballistic rocket vehicle would not include thrust chambers of liquid-propellant engines, nor separable solid motors, but could include payload fairings. Items where argument exists include: RVs; MAD booms; rigid refuelling booms; mission equipment carried demonstrably outside structure proper (eg, AWACS aerial); and podded engine cowlings. Airframe usually includes landing gear, but not systems, equipment, armament, furnishings and other readily removable items.

airframe attachable Accident or notifiable incident caused by defect or malfunction in airframe.

airframe parachute Large parachute deployed from aerodyne in emergency to provide ground impact at not over 30 ft/s.

airframer Loosely, company or other organization whose primary business is manufacture of aircraft.
airframe tuning

Arguably, includes assembler of aircraft from major sections manufactured by partners.

airframe tuning Modifying the structure to move natural frequencies [especially of the occupied regions of the fuselage] away from the forcing frequencies of the propeller[s] or rotor[s].

air/fuel ratio Ratio by mass of air to fuel in air-breathing engine or other combustion system. With hydrocarbon fuels ratio usually in neighbourhood of 16:1.

air gap 1 Clearance between stationary and moving portions of electrical machine, crossed by magnetic flux. 2 Air space between poles of magnet.

aircraft make round-trip flights to transport large load

air lever

air liaison officer

air/land warfare

Air Maneuver

Air Marshal

Air Marshall

air quality Airmen Advisory

air bag 3 Any great-circle route.

air cargo

air freight

air mail

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Airmen Advisory

Air Marshal Armed Federal officer riding incognito as ordinary passenger on flights by US carriers to deter terrorism. In view of prior existence of RAF rank, confusion would be reduced by standardizing on Sky-Marshal.

air mass Very large parcel of atmosphere which at lower levels exhibits almost uniform characteristics of temperature and humidity at any given level. According to Bergeron classification, grouped according to origin (Arctic, Polar, Tropical, Equatorial), subdivided into Continental or Maritime within each group, and then again into warm (w) or cold (k).

Airmen Advisory Notice to Airmen (see NOTAM)
AIRMET, Airmet

normally issued locally, often verbally during pre-flight or in-flight briefing.

**AIRMET, Airmet** 1 In-flight weather advisory category less severe than SIGMET but potentially hazardous to simple aircraft flown by inexperienced pilot (US).

2 Telephone weather service (CAA UK).

air meter 1 Instrument on testbed [e.g., for engines] for measurement and recording of airflow mass per unit time.

2 Confusingly, a 1935 dictionary offers "A type of portable anemometer," which measures velocity.

air mile 1 Aeronautical mile = nautical mile. One mile flown through the air, following Hdg. at TAS; wind must be added to give distance along Tr. at G/S. Hence * per gallon.

air mileage unit, AMU Mechanical calculating instrument, 1942-55, to derive continuous value for air distance flown. Output, more accurate and reliable than air log, was fed to air mileage indicator (AMI) and often other instruments.

air-minded Of general public, concerned to further aviation for prosperity, defence or sport.

air ministry In many countries, national department charged with administering military (sometimes all) aviation. In UK, replaced by MoD (RAF).

Airmis Airline management information system, EDP for smaller airlines.

airmiss Incident reported by at least one member of aircrew who considers there was "definite risk of collision" between two airborne aircraft (US). See airprox.

airmobile, air-mobile Ground troops equipped and trained for insertion by air, making conventional landing (fixed or rotary wing).

air-mobile band Band of communications frequencies assigned to air-mobile forces.

air-mobile operation Operation by ground forces carried in air vehicles.

Air Mounting Centre Airfield for army traffic (South Cerney, UK).

air movement Military air transport operation involving landing and/or airdrop.

air movement table Detailed schedule of utilisation of aircraft load space, numbers and types of aircraft, and departure places and times.

AIMS Airport interference monitoring system.

Air National Guard, ANG Part-time voluntary auxiliary to USAF equipped with fighter, tactical strike and transport aircraft, organised as self-contained arm by each state.

air nautical mile See air mile.

air navigation Art of conducting aircraft from place of departure to predetermined destination, or along intermediate routes (eg to follow precise tracks in surveying). Originally pure pilotage (contact flying); by 1918 moved into nautical realm of dead reckoning and celestial observation (astro-nav); by 1960 all ** relied upon ground and airborne aids, except in gliders and simple light aircraft.

Air Navigation Commission Body charged with setting standards and operating practice. Reports to the Council, see next.

Air Navigation Council Governing body of ICAO.

air navigation facility Navaid; surface facility for air navigation including ‘landing areas, lights, any apparatus or equipment for disseminating weather information, for signalling, for radio direction-finding, or for radio or other electronic communication . . ’ (FAA). Today add ‘for electronic position-finding.’

Air Navigation Orders Statutory instruments decreeing laws of civil air operations, including flight-crew licensing (UK).

AIRO Airborne IR observatory.

air officer, Air Officer 1 Loosely, officer commissioned in an air force.

2 Specif., officer of Air Rank in RAF.

air/oil strut Telescopic member utilising properties of air and oil to absorb compressive shocks (rarely, tensile) with minimal or controlled rebound.

air operator One who engages in flying for hire or reward, hence * Certificate.

air phone HF air/ground telephony.

airplane Aeroplane (N America).

Airline Design Group Class of aircraft, from I to VI, according to weight, dimensions, turning circle and other factors affecting airport requirement (FAA).

air plot 1 Continuous air navigation graphic plot constructed (usually on board aircraft) by drawing vectors of true headings for lengths equivalent to air distances flown, today archaic.

2 Similar plot constructed for airborne object derived from visual or radar observation of its flight.

3 Automatic or manually constructed display showing position and movements of airborne objects (if in a ship, relative to the ship).

air pocket Sudden and pronounced gust imparting negative vertical acceleration; down-draught. Suggest archaic.

airport Airfield or marine base designated and used for public air service to meet needs of quasi-permanent community. There need be no facilities for aircraft replenishment or repair, customs facilities, nor scheduled service; but there must be facilities for passengers and/or cargo. Community served can be mainly or even exclusively employees of one company (eg at oilfield).

airport advisory area Area within 5 miles of geographical centre of uncontrolled airport which is located FSS so depicted on appropriate sectional aeronautical chart (FAA).

airport advisory service Terminal service provided by FSS located at airport where control tower is not operating.

airport code Three-letter code identifying all commercial airports (eg, LHR, JFK, LAX).

airport commission Board of management of most US airports.

Airport-G Airport integrated research and development project for operational regulation of traffic guidance (Euret).

airport information desk Unmanned facility at local airport provided for pilot self-service briefing, flight planning and filing of flight plans (FAA).

airport marker See marker.

airport movement area safety system Uses surface and airspace radar linked to predictive software to warn of future conflict on runway, taxiway or apron.

airport of entry Airport provided with customs facilities through which air traffic can be cleared before or after international flight.

airport runway configuration Current runways in use for takeoffs and landings, changes notified in advance.
airport surface detection/movement

airport surface detection/movement  See ASDE, ASMI.
airport surveillance radar  Approach-control radar used to display position of all traffic in TMA [up to 60 miles/100 km] providing range/azimuth but not height (FAA).

airport traffic area  Unless otherwise designated (FAR Pt 93), airspace within 5 miles of geographical centre of airport with TWR operating, extending up to, but not including, 3,000 ft AAL (FAA).

airport traffic control service  ATC service provided by airport TWR for aircraft operating on movement area and in vicinity (FAA).

airport traffic control tower  Facility providing airport ATC service (FAA).

air position  Geographical position airborne aircraft would occupy if entire flight was made in still-air; point derived by plotting Hdg. and TAS.

Air Proving Ground Command  USAAF/USAF establishment at Eglin AFB for testing weapons, became AEDTC June 1957.

air-position indicator, API  Instrument which continuously senses Hdg. and TAS (usually not allowing for compressibility error) to indicate current air position.

airprox  Unintended near-miss by two airborne aircraft, considered sufficiently dangerous to be reported (UK term for airmass).

air rage  Anti-social behaviour [usually caused by alcohol or drugs] by airline passenger.

air raid  Aerial attack on surface target, esp. against civil population.

Air Rank  Senior to Group Captain; Air Officer, equivalent to naval Flag Officer.

Air Refuelling Control  Office responsible for planning route [including choice of flight levels] and arranging optimum locations for tankers, if over US including CARF clearance (RAF).

air refuelling control point  Location in space at which boom-type tanker is 1,000 ft higher than receiver, heading on reciprocal 9 to 11 miles away laterally and 22 to 29 miles away longitudinally, whereupon 180° turn inwards is started.

air report, AIREP  Meteorological report sent by aircraft in flight.

air-riding seal  Air or gas seal around a rotating shaft in the form of a [usually refractory] element which in operation lies just clear of the shaft surface and runs on a cushion of air induced dynamically.

air route  Defined airspace between two geographical points, subject to navigational regulations. See airway.

air route surveillance  Surface radar giving display(s) showing geographical position and height of all traffic along designated civil route (usually airway).

air route traffic control centre, ARTCC  Facility providing ATC service to aircraft operating on IFR flight plan in controlled airspace and principally during en route phase (FAA).

air-run landing  Final deceleration in ground effect followed by vertical landing (fixed-wing V/STOL).

air-run take-off  Vertical take-off followed by horizontal acceleration in ground effect (fixed-wing V/STOL).

AIRS, Air  1 Airborne integrated reconnaissance system (USN).

airspeed, air speed

4 Aircrew incident-reporting system.
5 Advanced IR seeker.
6 Atmospheric IR sounder (on Aqua EOS).
7 Airborne IR surveillance.
8 Alliance icing research study (Int.).

Air Safety Report  Filled by crew after a flight in which they encounter an untoward or potentially dangerous situation, which may be partly or entirely of their own making.

Airsar  Airborne synthetic-aperture radar.

airscape  Broad vista of sky, not necessarily including Earth’s surface, from aerial viewpoint.

air scoop  Colloq. ram intake, esp. projecting from exterior profile of aircraft.

airscrew  BS.185, 1951: ‘Any type of screw designed to rotate in air’. Word never common in US, but in UK used in early days of powered flight to denote rotary aerodynamic device intended to impart thrust. From about 1920–30 explicitly denoted tractor device (‘propeller’ being ‘an airscrew joined to the engine by a shaft in compression’). Today redundant. See fan, propeller, rotor, windmill.

airscrew-turbine engine  Turboprop.

air/sea rescue, ASR  Use of aircraft to rescue life in danger at sea, esp. permanently established service for this purpose (UK, RAF: US, USCG).

airship  BS.185 1951: “A power-driven lighter-than-air aircraft”. Thus need not be provided with means for controlling its path, though if *is to be of use such means must be provided. Traditional classes are: blimp, a small non-rigid; non-rigid, in which envelope is essentially devoid of rigid members and maintains shape by inflation pressure; semi-rigid, non-rigid with strong axial keel acting as beam to support load; and rigid, in which envelope is itself stiff in local bending or supported within or around rigid framework.

airshow  A previously publicised event at which aircraft are displayed on the ground and in flight; the public may or may not be admitted, and the principal purpose may be either product marketing or entertainment.

airside  1 All parts of airport containing aircraft.

2 For passengers, beyond departure customs, prior to arrival customs.

air snatch  1 Recovery of passive body from atmosphere by passing powered aircraft, esp. recovery of space payload descending by parachute.

2 Recovery of human being from hostile territory or sea by passing aircraft unable to hover (see Fulton).

air sounding  1 Measurement of atmospheric parameters from sea level to specified upper level by transmitting or recording instruments lifted by rocket or aircraft (esp. balloon).

2 Record thus obtained.

airspace  Volume of atmosphere bounded by local verticals and Earth’s surface or given flight levels. May be controlled or uncontrolled, but always an administrative unit defined by precise geographical or Earth-referred locations.

airspace denial  Military mission flown by fighter to destroy all hostile aircraft entering particular airspace, usually that above friendly troops.

airspeed, air speed  Relative velocity between tangible object, such as raindrop or aircraft, and surrounding air. In most aircraft measured by pitot-static system.
connected to airspeed indicator (ASI) to give airspeed indicator reading (ASIR). When corrected for instrument error (IE), result is indicated airspeed (IAS). When corrected for position error (PE), result is rectified airspeed (RAS). Most ASIs calibrated according to ideal incompressible flow \((\frac{\nu}{\rho V^2})\), so from RAS subtract compressibility correction to give equivalent airspeed (EAS). Finally density correction, proportional to difference between ambient air density and calibration density \((1.225 \text{ gm}^{-3})\), applied to give true airspeed (TAS). This sequence ignores errors, usually transient, due to major changes in angle of attack (eg, in manoeuvres). Some ASIs calibrated to allow for compressibility according to ISA SL, indicating calibrated airspeed (CAS). Confusion caused by fact most authorities now use 'calibrated airspeed' to mean ASIR corrected for IE and PE. CAS thus defined would have to be corrected for density and compressibility. Thus since 1980 CAS must be regarded as ASIR + IE + PE; if allowing for compressibility then at ISA/SL CAS = TAS.

airspeed indicator, ASI Instrument giving continuous indication of airspeed.

airspeed transducer In flight testing, or performance measurement of unmanned vehicle in atmosphere, transducer giving electrical signal proportional to airspeed. In simple systems signal is d.c. voltage.

airsplint Lightweight splint, inflated for rigidity.

airspotting Correcting adjustment of friendly surface bombardment based on air observation.

airspray nozzle Fuel burner in gas-turbine engine which itself mixes fuel spray with primary air, avoiding smoke from fuel-rich combustion and incidentally reducing required fuel feed pressure.

AIRSS 1 Advanced IR suppressor, or suppression, system.

2 Alternative IR satellite system (USAF).

air staging Gas-turbine combustion chamber having variable geometry to redistribute air under different engine operating conditions.

air staging unit Military unit stationed at airfield to handle all assigned air traffic calling at that airfield.

airsairs Passenger and/or crew stairway forming integral part of aircraft and, after use, folded or hinged up and stowed on board.

Airstar Airborne surveillance and target-acquisition radar.

airstart, air start Action of starting or re-starting aircraft main propulsion or lift engines in flight.

air-starter unit Apron vehicle or trailer providing air at 2.8–3.5 bar.

airstream, air stream 1 Moving air mass, esp. that penetrates and divides more stationary mass. 2 Loosely, any localised airflow.

airport, approach and en route ATC Service provided for promoting safe, orderly and expeditious flow of air traffic, including airport, approach and en route ATC service.

air traffic clearing See clearance (1).

air traffic control radar beacon system Beacons along airways which trigger responses from airborne transponders providing identity, location and [usually] FL of equipped traffic. See secondary radar.

air traffic control centre Unit combining functions of area control centre and flight information centre.

air traffic control service Service provided for promoting safe, orderly and expeditious flow of air traffic, including airport, approach and en route ATC service.

air traffic engineer Maintains nav aids and airport communications systems.

air traffic service assistant Provides admin. & support, such as flight-plan acceptance and preflight briefing for pilots.

air train Aerial tug towing two or more gliders in line-ahead.

air-transportable hangar Modular lightweight hangar erected over temporary site, such as crashed repairable aircraft.

air-transportable units Military units, other than
air transportation oversight system  

airborne, whose equipment is all adapted for air movement.

air transportation oversight system  Method of checking air-carrier safety procedures and programmes (FAA).

air transport operation  BS.185 1951: ‘The carriage of passengers or goods for hire or reward’; this eliminates all military air transport, business flying and several other classes of ***.

air trooping  Non-tactical air movement of personnel.

air-tube oil cooler  Oil cooler in which air passes through tubes surrounded by oil.

air turnback  1 Point at which mission already airborne is abandoned, for any reason.

2 Specif., point at which non-Etops aircraft has to abandon planned flight.

air umbrella  Massive friendly air support over surface operation or other air activity at lower level.

air vane  1 Small fin carried on pivoted arm to respond to local changes in incident airflow; arm usually drives potentiometer pick-off sending signal of angle of attack or yaw.

2 Powered surface to control trajectory of ballistic vehicle in atmosphere (see jet vane).

air vector  In DR navigation, Hdg. and TAS (air plot).

air volume  In aerostat, volume of air displaced by solid body having same size and shape as envelope or outer cover. Volume used in airship aerodynamics.

air ward system  Aircraft used for surveillance, fisheries or customs patrol, police duties, reconnaissance and similar tasks.

airway BS.185, 1951: ‘An air route provided with ground organisation’. Most civil air routes are flown along ICAO IFR airways, typically 10 nm wide with centreline defined by point-source radio nav aids spaced sufficiently close for inherent accuracy to be less than half width of airway at midpoint. Each airway has form of corridor, of rectangular cross-section well above Earth. Airspace within is controlled, and traffic separated by corridor, of rectangular cross-section well above Earth. Airspace within is controlled, and traffic separated by corridor, of rectangular cross-section well above Earth.

Aircraft used for surveillance, fisheries or customs patrol, police duties, reconnaissance and similar tasks.

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Alert

Alert 1 Attack [and] launch early response [or reporting] to theater (USAF).
2 Air-launched extended-range transporter.

alert 1 Specified condition of readiness for action, esp. of military unit.
2 Warning of enemy air attack.
3 ATC action taken after 30 min "uncertainty" period (5 min in case of aircraft previously cleared to land) when contact cannot be established.
4 Response by manufacturer and/or certifying authority to unacceptable incidence of service failures by hardware item.

alert area  Airspace which may contain high volume of pilot-training activities or unusual type of aeral activity (FAA).

alerte  Anti-aircraft laser enemy ranging and targeting equipment.

alerting centre  Centre designated by appropriate authority to perform functions of RCC where none exists (BS185).

alerting service  Service provided to notify and assist all appropriate organisations capable of aiding aircraft in need of search or rescue.

alert-level standard  Agreed reliability performance below which special and urgent action must be taken (eg 0.3 IFSD per thousand engine hours).

alerting unit  Encoding-altimeter device which, in potentially dangerous flight conditions, triggers a warning.

alert phase  Aircraft seriously overdue.

alerts  Airborne-laser EW receiver training system.

ALES 1 Autonomous Link-Eleven system.

ALF 1 Auto/lock-follow (target tracker).

Aloft 1 Air-launched extended-range transporter.

Alcatel 1 Advanced light helicopter.
2 Active laser homing.

Alcide 1 Air-launched integrated countermeasure(s), expendable.

Alcide 1 Advanced long-wave IR circuit and array technology.

Alice 1 Air launched integrated countermeasure(s).

alignment 1 To land, esp. of marine aircraft on water.

alignment channel  Part of water aerodrome navigable and cleared for safe alighting or taking off.

alignment gear  See landing gear.

align 1 In INS, to rotate stable platform before start of journey until precisely aligned with local horizontal and desired azimuth.
2 In radio, radar or other equipment having resonant or tuned circuits, to adjust each circuit with signal generator to obtain optimum output at operating frequencies.
3 Normal meaning of word is relevant to erection of airframe jiggings, lasers often being used when structures are large.

aligned mat  Intermediate semi-prepared composite structure in which strong and/or stiff reinforcing fibres (rarely whiskers) are arranged substantially parallel in two-dimensional mat.

alignment time  In INS or guidance system, minimum time required to spool-up gyro's and align platform, preparatory to allowing significant movement of vehicle.

ALIMS  Automatic laser inspection and measurement system.

ALIS, Alis 1 Airline interactive services.
2 Airport luggage identification system.
3 Autonomic logistics information system.

Alithalite  Range of medium-density general-purpose Al-Li alloys (Alcoa).

AlJEAJ, Aljeal  Association of Lawyers, Jurists and Experts in Air Law (Int.).

ALJS  Airborne-laser jamming system.
alkali metal

alkali metal Group of metals in First Group of Periodic Table characterised by single electron in outermost shell which they readily lose to form stable cation (thus, strongly reactive). Lithium, sodium, potassium and caesium (cesium) are important in electrical storage batteries and as working fluids in closed-circuit space power generation.

alkylation Addition of alkyl group (generally, radical derived from the aliphatic hydrocarbons); important in manufacture of gasolines (petrols) having high anti-knock (octane) rating.

ALL Airborne laser laboratory.

ALLA, Alla Allied Long Lines Agency (NATO).

all-black Made entirely of [not necessarily black ] composite material

all-burnt Rocket propulsion system which has consumed all propellant (where there are two, which has consumed all of either); specif., time and flight parameters when this occurs.

all-call Transponder Mode-S broadcast interrogation, thus * address, * reply.

ALLD Airborne laser locator designator.

alleviation Reduction of structural loads (eg wing bending moment) in vertical gusts by active controls.

alleviation factor Numerical multiplier of calculated vertical acceleration or structural load on encountering gust, taking into account fact gust is not sharp-edged and aircraft is already rising before peak intensity is reached. Later refined by making it a function of the ratio of mean chord to gradient distance, aspect ratio and mass parameter.

alleviation lag Time difference between actual and ideal response of a GAC active control system.

alleviation technique Method of reducing heat flux on atmospheric re-entry by controlling plasma sheath surrounding vehicle.

all-flying tail Term formerly used to describe variable-incidence tailplane used as primary control surface in pitch, separate elevators serving merely as additional part of surface or as a means of increasing camber.

Al-Li Aluminium-lithium alloys.

Alliance ground surveillance Programme for reconnaissance aircraft (NATO 1980, approved 1993, operational possibly 2010).

allithium Generic name for aluminium-lithium alloys; also (capital A) trade name.

ALLM Aft-lower-lobe module (AEW radar).

all-moving tail All-flying tail.

all-out Signal signifying glider or other towrope taut, towed vehicle ready for takeoff.

allowable deficiency Missing, damaged, inoperative or imperfectly functioning item which does not invalidate C of A and does not delay scheduled departure (eg, rudder bias system, fuel flowmeter and almost any item not part of structure or aircraft system). In US called despetch deviation or MEI (1).

allowance 1 Intentional difference between dimensions (with tolerances permitted on each) of mechanically mating parts, to give desired fit.

2 Calculated quantity of fuel beyond minimum needed for flight carried to comply with established doctrine for diversion, holding and other delays or departures from ideal flight plan.

along and across

3 In sheet-metal construction, extra material needed to form bend of given inside radius and angle.

alloy Mixture of two or more metals, or metal-like elements, often as solid solution but generally with complex structure. Small traces of one element can exert large good or bad influence. Most aircraft made principally of alloys of aluminium (about 95%), rest being copper, magnesium, manganese, tin and other metals) or titanium (commercially pure or alloyed with aluminium, vanadium, tin or other elements), with steels (alloys of iron) at concentrated loads.

all-shot Aerial target hit by every round from one gunnery pass.

all-speed aileron Lateral-control surface operable throughout flight envelope, as distinct from second aileron group on same aircraft operable at low speeds only.

all systems go Colloq., absence of mechanical malfunction; not authorised R/T procedure.

ALLTV All light-levels TV.

all-up round Munition, especially guided missile, complete and ready to fire.

all-up weight See AW.

all-ways fuzer Fuze triggered by acceleration in any direction exceeding specified level.

tall-weather Former category of interceptor which could not, in fact, fly in **. Strictly true only for aircraft with triplex or quad AFCS and blind landing system plus ground guidance.

all-wing aircraft Aerodyne consisting of nothing but wing. Some aeroplanes of 1944–49 were devoid of fuselage, tail or other appendages, and approached this closely.

ALM 1 Air loadmaster.

2 Air-launched munition[s]; IPT adds integrated project team.

3 Aircraft line maintenance.

4 Air and littoral manoeuvre (DSTZ).

ALMD Airborne laser mine-detection; S adds system.

ALMS 1 Aircraft landing measurement system, typically using IR beams and geophones to produce hard-copy print-out of final approach and touch-down.

2 Air lift management system (software).

ALMV Air-launched miniature vehicle [A-sat].

Ahnico Permanent-magnet materials (iron alloyed with Al, Ni, Co – hence name – and often Cu) showing good properties and esp. high coercive force.

Alnot Alert notice.

ALNZ The Air League of New Zealand Inc. [office, Wellington].

ALO Air Liaison Officer.

ALOC Air line of communication, airlift for spare parts (USA).

Alochrome Surface treatment for light-alloy structure to ensure good key for paint: chemical cleaning, light etching and final passivating.

Alodine Proprietary treatment similar to Alochrome.

Aloft Airborne light-optical-fibre technology.

Alots Active low-frequency towed sonar [H adds helo].

AION, ALON Aluminium oxynitride.

along and across Configuration of track position display unit in which separate windows show continuous reading of distance to go (along) and distance off track (across), usually driven by Doppler.

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alongside

Of a carrier, in port.

ALOS Advanced land-observing, or observation, satellite.

ALOTS Airborne lightweight optical tracking system [precision photograph of ballistic vehicles].

ALP 1 Aircraft landing permit.

Aluminium powder.

AlPA 1 Line Pilots Association [Washington, DC20036] (US, Canada).

Air Line Pilots Association International [Herndon, VA20127-169] (Int.).

Alpas Air Line Pilots’ Association of Singapore.

Alpax Aluminium alloy containing 1.3% Si, for intricate castings (1932).

Alpha Angle of attack of main wing (α, AOA).

Alpha eta rho International aviation fraternity (office at St Louis University, Cahokia IL).

alpha exit The first available runway turnoff.

alpha floor Mainly to protect against windshear, system which automatically applies full power if AOA exceeds preset value, and earlier if rate of change of TAS/GS passes preset thresholds.

alpha hinge 1 Crossed-spring pivot (eg in tunnel balance).

2 Confusingly, drag hinge.

alpha max The maximum attainable AOA with stick fully back.

alphanumeric Character representing capital letter or numeral portrayed in precisely repeatable stylised form either by electronic output (computer peripheral or display) or printed in same form for high-rate reading by OCR system.

alpha particle Nucleus of He atom: 2 protons, 2 neutrons, positive charge.

Alpha prot Short for protection, the maximum attainable stick-free AOA. Auto trim stops there, because there is no reason to maintain this condition.

alpha speed, α-SPD Safe stall-margin speed (auto-throttle mode setting).

alpha vane Transducer measuring AOA.

Alpha Trade name (Alcoa) of sandwich comprising polystyrene foam between two sheets of aluminium.

ALQA Automatic link quality analysis.

ALQDS All quadrants.

ALQR Air-launch quick reach.

ALR 1 Alerting message [S adds Service].

2 Aircraft (or airborne) liferaft.

3 JETDS code: piloted, countermeasure, passive.

4 Arbeitsgruppe für Luft und Raumfahrt (Switzerland).

ALRAM Advanced long-range air-to-air missile.

Alrad Airborne laser ranger and designator.

ALRI Airborne long-range radar input.

Alround Translated = association of aerospace SMEs (G).

ALS 1 Approach light system (FAR Pt 1).

2 Airfield, or aerodrome, lighting system (CAA).

3 Alert-level standard.

4 Automatic takeoff and landing system (RPV).

5 Advanced launch system, HLLV for SDI (US).

6 Air [or airborne] launch system.

7 All-weather landing system, or (Matcals) subsystem.

8 Augmented , or acquisition, logistics support.

altimeter errors

9 Application layer structure.

10 Advanced life support.

ALSC Advanced logistic systems center (ALFC).

ALSCC Apollo lunar-surface close-up camera.

ALSCU Auxiliary level sense control unit [fuel transfer].

ALSEP Apollo lunar-surface experiment(s) package.

ALSF Approach lights, sequenced flashing.

ALSIP Clear.

ALSL Alternative landing ship, logistic (UK RAF).

AL/SL Weapon capable of being air-launched or surface-launched (ie from surface vessel) (USN).

ALSS 1 Air-launched saturation system [missile].

2 Advanced logistic support site(s).

ALSTG Altimeter setting (ICAO).

alt., ALT 1 Altitude [especially barometric], or altimeter.

2 Alternate [i.e., alternative] airfield or destination.

3 Automatic altitude hold.

4 Attack light torpedo.

5 Approach and landing tests (Shuttle).

6 Aircraft, or airborne, link terminal.

7 Amdine laser tracker.


2 Asociacion Latinoamericana de Transportadores Aereos [C adds cargo].

3 Airborne [or advanced] lightweight tactical antenna.

Altair ARPA long-range tracking and instrumentation radar.

ALTBMD Active layered theatre ballistic-missile defence.

alternate 1 Incorrectly, has come to mean “alternative” in flight operations; alternative destination, designated in flight plan as chosen if landing not possible at desired destination.

2 As applied to landing gear, flaps, etc, means using emergency power such as electrically driven pump(s).

alternate hub airport Secondary civil airport at large traffic centre.

alternating light Intermittent light of two or more alternate [correct usage] colours.

Alternative simplified credit Laws enabling companies to claim benefit [currently 12 per cent] on qualified research spending (US).

alternator A.c. generator.

ALTF Automatic launch test facility, carries out confidence check on XPDR as aircraft taxis to runway.

ALTG Air and Land, or Air/Land, Technology Group (UK MoD).

Alt Hold Altitude-hold mode.

altigraph Recording altimeter; generally aneroid barograph, and thus subject to inaccuracy in pressure/height relationship assumed in calibration.

altimeter Instrument for measuring and indicating height. Pressure * is aneroid barometer or atmospheric pressure gauge calibrated to give reading in height. Sensitive * has stack of aneroid capsules, refined drive mechanism to multiply capsule movements with minimal friction or free play, and setting knob to adjust to different SL or airfield pressures (or to read zero at airfield height).

In servo-assisted * mechanism is replaced with more accurate electrical one (see engine *, radio *).

altimeter errors Apart from servo-assisted altimeter, all pressure altimeters suffer significant lag, so rapid reversal
**Altimeter**

serious in large aircraft with pitch control by tail surfaces, not canard, and without DLC.

**Altitude hole** Blank area at centre of radial (eg PPI) display.

**Altitude line** On environmental plot, line joining points of minimum range at which WX main beam intersects ground.

**Altitude power factor** In piston engine ratio of power developed at specified altitude to power at same settings at ISA SL.

**Altitude parallax** In altitude (2), angle between LOS from body to observer (assumed on Earth’s surface) and LOS from body to centre of Earth.

**Altitude recorder** Alitgraph.

**Altitude reservation, ALTRV** Airspace utilisation under prescribed conditions, normally employed for mass movement or other special-user requirements which cannot otherwise be accomplished (FAA).

**Altitude ring** Continuous return across WX display at range equivalent to aircraft’s altitude.

**Altitude sensing unit** Capsule-based unit in engine fuel system sensing aircraft speed/altitude.

**Altitude sickness** Malaise, nausea, depression, vomiting and ultimate collapse, caused by exposure to atmospheric pressure significantly lower than that to which individual is acclimatised.

**Altitude signal** In airborne radar operating in forward search mode, unwanted return signal reflected by Earth directly below.

**Altitude slot** Blank line at origin of SLAR display.

**Altitude switch** Barometric instrument which makes or breaks electric circuit at preset pressure altitude; contacting altimeter.

**Altitude testing** Testing an item [e.g., a gas-turbine engine] in a facility capable of reproducing inlet ram total temperature and pressure appropriate to the test altitude and Mach numbers, and also the appropriate exit static pressure.

**Altitude tunnel** Wind tunnel whose working section can simulate altitude conditions of pressure, temperature and humidity. In view of advantages of high pressure and driest possible air, conditions chosen usually compromise.

**Altitude valve** In some carburettors, progressively closed by aneroid to reduce fuel flow at high altitudes.

**ALTN, Altin** 1 Alternate airfield.

**ATP** Air Line Transport Pilot licence; confusingly, now often called ATPL.

**ALTR** Approach/landing thrust reverser.

**ALTRV** Altitude reservation.

**ALTs** Altimeter setting.

**ALTV** Approach and landing test vehicle.

**ALU** Arithmetic and logic unit.

**Alumel** Ni-Al alloy or coating.

**Alumigrip** Trade name of paint used on airframe exterior.

**Alumilite** Trade name for sulphuric-acid anodizing process for aluminium and alloys.

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**Altimeter**

of climb and descent will give a reading up to 200–300 feet in arrears; called lag or hysteresis. There are errors in drive friction and lost motion. Static pressure sensed is subject to PE(2) and compressibility errors, and to transient excursions during manoeuvres. Most significant, parameter measured depends on atmospheric pressure variation, temperature variation and variation in lapse rate between departure airfield and aircraft height (see altimeter setting).

**Altimeter fatigue** Supposed tendency of aneroid system to become ‘set’ in distorted position in long flight at high altitude; this error, not confirmed by most authorities, is called fatigue or, confusingly, hysteresis.

**Altimeter lag** See altimeter errors.

**Altimeter setting** For safe vertical separation all altimeters in controlled airspace must be set to uniform datum. Standard setting is 1013.25 mb (see ISA) throughout most en route flying. Instrument then registers vertical separation between aircraft and pressure surface 1013.25 mb, usually below local ground level and may be below local SL or MSL. Second common setting is QNH, at which reading is difference between aircraft height and MSL. Third common setting is QFE, at which reading is difference between aircraft height and appropriate airfield height AMSL; thus at that airfield instrument reads zero. Two other settings, QFF and QNL, seldom necessary. See next.

**Altimeter setting region** Geographical area for which the lowest value of QNH is broadcast hourly by control centres.

**Altimeter switch** Triggered by reaching preset altitude, one application to trigger explosive charge.

**Altimetric valve** Device sensitive to increasing cabin altitude (ie, falling pressure) and set to release drop-out oxygen at given level.

**Altitude** 1 Vertical distance of level, point or object considered as point, measured from MSL (normally associated with QNH) (DTI, UK). In this dictionary meanings are given for 17 other measures of altitude ranging from body to observer (assumed on Earth’s surface) and point below it where circle cuts celestial horizon.

2 In spaceflight, distance from spacecraft to nearest point on surface of neighbouring heavenly body (in contrast to “distance”, measured from body’s centre).

3 In aircraft performance measurement and calculation, pressure * shown by altimeter set to 1013.25 mb.

**Altitude acclimatisation** Gradual physiological adaptation to reduced atmospheric pressure.

**Altitude chamber** Airtight volume evacuated and temperature-controlled to simulate any atmospheric level.

**Altitude clearance** Clearance for VFR flight above smoke, cloud or other IFR layer.

**Altitude datum** Local horizontal level from which heights or altitudes are measured (see true altitude, pressure altitude, height).

**Altitude delay** 1 Deliberate time-lag between emission of radar pulse and start of indicator trace, to eliminate altitude hole or slot.

2 See next entry.

**Altitude-delay parameter** Time delay which elapses between pilot nose-up command and establishment of positive climb, esp. during landing approach. ADP
aluminium alloys
Aluminium oxide Al₂O₃, occurring naturally but also manufactured to close tolerance in various densities. Hard, refractory, white or transparent ceramic.
aluminium oxide
Al₂O₃
alumina
Aluminium (N America, aluminium), Al Metal element, density about 2.7, MPt 661°C, BPt 2,467°C, most important structural material in aerospace, commercially pure and, esp., alloyed with other metals (see durallumin).
aluminium alloys
Most important of so-called light alloys; 3,500+ used in aerospace. Most recent families being 2000 Al-Cu, 5000 Al-Mg, 6000 Al-Mg-Si, 7000 Al-Zn and 8000 Al-Li. The strongest are not corrosion-resistant, and need coating with [typically aluminium-epoxy] paint.
aluminium-cell arrester
Lightning arrester/conductor in which insulating film of aluminium plates breaks down and conducts at high applied voltage.
aluminium dip brazing
Method of metallising printed-circuit boards, by closely controlled dipping in molten aluminium.
aluminium oxide
Al₂O₃
alumina
Amdar

Amdar, AMDAR Automated mission data airborne recording.

AMDB Airport-mapping database.

AMDP Air Member for Development and Production (UK, WW2).

AMDS Automatic manoeuvre device system.

2 Anti-missile discarding sabot.

AMDSS Airborne mine-detection and survival system (USN).

AMD Amendment (FAA).

AMDFS Air and missile defense work station (USA, USAF).

AME Authorised medical examiner.

2 Alternate [alternative is meant] mission equipment.

3 Air Mobility Element (USAF).

4 Angle-measuring equipment.

5 Amplitude-modulation equivalent, or equipment.

6 Aircraft, multi-engine [L adds land, S sea].

7 Aviation Maintenance Engineers Association [Fredericton, NB, Canada].

AMEA Aircraft Maintenance Engineers Association (US).

AMEC Advanced multifunction embedded computer.

AMEDas Automated met data-acquisition system (J).

AMEL Active-matrix electroluminescent [D adds display].

2 Aircraft maintenance engineer's licence.

amended clearance Clearance altered by ATC while flight en route, typically requesting change of altitude or hold, to avoid future conflict unforeseen when clearance filed.

American National Family of 60th screw (bolt) threads, basically divided into National Coarse (NC), National Fine (NF) and National Special (N), which have in part superseded SAE and ASME profiles.

AMES Airborne mission-equipment subsystem.

2 Advanced multiple-environment simulator.

Ames Major NASA laboratory, full title Ames Research Center, Moffett Field, Calif., mainly associated with atmospheric flight (from 1939).

AMET Advanced military engine(s) technology.

2 Accelerated mission endurance test.

AMF Allied [Command Europe] Mobile Force [-A adds Air].

2 Arne Marin & Flygfilm (Sweden).

3 Airborne maritime and fixed [radio stations].

AMFA Aircraft Mechanics Fraternal Association [office, St Ann, MO] (US).


AMF-JTRS Airborne and maritime fixed-station joint tactical radio system (USAF/USN).

AMFP Adaptive matched-field processor, or processing.

AMG Antenna mast group.

2 Aero mission gear.

AMGCS Advanced movements guidance control system (airport).

AMHF American Military Heritage Foundation.

AMHMS Advanced magnetic helmet-mounted system.

AMHS Aeronautical message handling system.

AMI Airline modifiable information.

2 Airionics midlife improvement.

AMI Airspeed/Mach indicator.

AMICS Adaptive multidimensional integrated control system.

AMID Airborne mine [field] detection [ARS adds and reconnaissance system, S adds system].

2 Airport management and information display [S adds system].

Amids, AMIDS Advanced missile-detection system.

2 Airport management information and display system.

AMII Air manoeuvre information infrastructure.

AMIK Automatic target-recognition system (Sweden).

AMIMU Advanced multisensor inertial measurement unit.

Amino Group – NH$_2$ which can replace hydrogen atom in hydrocarbon radical to yield amino acids; these play central role in metabolic pathways of living organisms; thus of interest in space exploration.

AMIPS Adaptive multiple-image projector system.

AMIR Air Mission Intelligence Report, detailed and complete report on results of air mission.

2 Anti-missile infra-red.

AMIRS Advanced multilite IR sensor.

AMIS Anti-materiel incendiary submunition.

2 Aircraft-movement identification section.

AMIZ Australian Maritime Identification Zone [up to 1,000 n.m. planned].

AMJ Advisory material joint.

AMK FAA-approved airplane modification kit.

2 Anti-misting kerosene.

AML Adaptive manoeuvring logic.

2 Aeronautical Materials Laboratory (USN, established 1935).

3 Admiralty Materials Laboratory (Holton Heath).

4 Approved model list (FAA).

AMLCD Active-matrix [or advanced multifunction] liquid-crystal display.

AMM Aircraft maintenance manual.

2 Aircraft maintenance and modification.

3 Anti-missile missile.

AMMC Aeronautical materiel management center.

AMMCS Airborne multiservice/multimedia communications system.

AMMM Affordable multi-missile manufacturing [program].

ammo Ammunition (UK colloq.).

Ammod, AMMOD Automatic man-made object detection (UAV).

Ammonal High explosive (AMMONi um nitrate + ALuminium, and often finely divided carbon).

ammonia NH$_3$, gas at ISA SL, pungent, toxic, present in atmosphere of Jupiter (ice crystals and vapour) and more distant planets (frozen solid). Ammonium chloride in ‘dry batteries’, nitrate in many explosives, perchlorate plasticised propellants in large solid rocket motors, sulphate soldering and brazing flux and in dry cells, and several compounds in fireproofing.

AMMP Attack-mission management processing.

AMMTIAC Advanced Materials Manufacturing Training and Information Analysis Center (USAF).
ammunition

ammunition-Projectiles and propellants for guns: increasingly, guided weapons are logistically treated as *but term normally excludes them.

ammunition quality-Coefficient of, symbol r, = \( \frac{P}{m} \) where P is hit probability of each shot, m is mass of projectile and W is required average hits for kill.

ammunition tank-Compartment or container housing ammunition for airborne automatic weapon, usually in form of belt arranged in specified way; reloadable, usually when removed from aircraft.

AMINS-Airborne mine-neutralization system. (USN)

AMNTK Aircraft engine design office (R).

AMO 1 Air Ministry Order[s].

2 Air mass zero, test condition for solar arrays and other space hardware.

3 Approved maintenance organization.

4 Airspace Management Officer.

5 Air and marine operations (US CBP).

AMOC 1 Air & Marine Operations Center (US Customs Service at March AFB).

2 Alternative methods, or means, of compliance (FAA).

AM1 Single-crystal material for HPT blades.

Amors-Airborne multifunction optical radar system.

amortisation-Fiscal process of writing-down value of goods and chattels over specified period. Typically, transport aircraft *over five, seven or ten years, after goods have been delivered to user. Procedure for writing-down value of assets is called depreciation in accounting.

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AMOC 1 Air & Marine Operations Center (US Customs Service at March AFB).

2 Alternative methods, or means, of compliance (FAA).

Advanced multi-purpose display[s].

AMP 1 Assisted maintenance period (aircraft carrier).

2 Avionics master plan (USAF).

3 Advanced management assistant, update of CPGS [A adds aid, S adds system].

4 Audio management panel.

5 Aerospace materials program.

6 Advanced modular processor.

7 Avionics, or aircraft modification, or modernization program[MI].

8 Atomic material program.

9 Application message protocol.

10 Advanced manoeuvre program [me].

11 Air Member for Personnel (UK).

12 Accelerated maturation program.

13 Air mobility platform.

amp-Ampere[s].

AMPA Advanced mission-planning aid.

Ampac-Air-mobility precision-approach capability.

ampere-SI unit of electric current (quantity per unit time), symbol A; named for A.M. Ampère but no accent in unit except in F. Hence: ampere-hour (1 A flowing for 1 h); ampere-turn (unit magnetising force, 1 A flowing round 1 turn of coil).

AMPG, a.m.p.g.-Air miles per gallon, air distance flown per gallon of fuel consumed. UK gallon was Imp gal, distance was statute miles (not “air miles”). In US, st. mi. and US gal (0.83267 Imp gal). New unit must be found; SI suggests air metres per litre, unless fuel measured by mass (see AMPP, NAMP).

amphibian-Aerodynamic capable of routinely operating from land or water. In US occasionally amphibious, i.e. capable of landing on water. See AMPHIBIOUS...

amplification factor-In thermionic valve (radio vacuum tube), ratio of change in plate voltage to change in grid voltage for constant plate current (UK, plate = anode).

amplifier-Device for magnifying physical or mechanical effect, esp. electronic circuit designed to produce magnified image of weak input signal whilst retaining exact waveform.

amplitude 1 Maximum value of displacement of oscillating or otherwise periodic phenomenon about neutral or reference position.

2 Angular distance along celestial horizon from prime vertical (ie due N–S) of heavenly body, generally as it rises or sets at horizon.

amplitude modulation-MCW or AC emission in which AF is impressed on carrier by varying carrier amplitude at rate depending on frequency, and depth of modulation depending on audio amplitude.

amplitude modulation equipment[or equivalent]-Processes info. and carrier separately and reconstructs them to make equivalent AM signal.

AMPP, a.m.p.p.-Air miles per pound (of fuel), air distance flown for each pound avoirdupois of fuel consumed, former measure of specific range (see AMPG, NAMP).

AMPS 1 Advanced multi-sensor payload system.

2 Aviation mission-planning system (USA).

3 Automatic message-processing system.

AMPSS Advanced manned precision strike system.

AMPT 1 Air miles per tonne [of fuel].

2 Advanced missile propulsion technology [generally means airbreathing].

AMPTE Active Magnetospheric Particle Trace Explorer(s).

AMR 1 Airport movement radar.

2 Atlantic Missile Range, military (DoD) range originally run by Pan Am and RCA from Patrick AFB and also serving NASA’s KSC at Cape Canaveral.

Amraam, AMRAAM Advanced medium-range AAM.

AMRC Aerospace Maintenance and Regeneration Center [previously MASDC].

AMRDEC Aviation and Missile RD&E Center [Redstone Arsenal] (USA).

Amrics Automatic management radio and intercom system.

AMRI 1 Aerospace Medical Research Laboratory (USAF).

2 Aeronautical and Maritime Research Laboratory [Melbourne, Vic. 3001] (Australia).

AMRS Advanced maintenance-recorder system.

AMS 1 Aeronautical Mobile Service, radio-communication service between aircraft or between aircraft and ground stations.

2 Air Maintenance Squadron (USAF).

3 Aircraft management simulator [or system].

4 Academy of Military Science (USA).
AMSAA
Advanced manned strategic aircraft.

AMSAA
Army Materiel Systems Analysis Activity (USA).

AMSAR
Aerospace Material Specification(s) (SAE).

AMSA
Advanced missile system (USN).

AMSAR

AMSA
Aircraft Maintenance Standards (CAA).

AMSE
Air Mobility Support Group (USAF).

AMSI
Aircraft Maintenance Standard[s] (CAA).

AMSM
Advanced missile system (USN).

AMS
Aerospace Medicine Training Centre.

AMSTE
Air-to-air, missile target system.

AMSU
Advanced multi-sensor system (EW, SOJ, ANAE).

AMTS
Aerial, or air, moving-target indicator, or indication.

AMU
Air mishap unit.

AMUX
Audio multiplexer.

AMW
Air Mobility Wing (USA).

AMX
Air mobility unit.

AMY
Air maneuvering unit.

AMTD
Aircraft maintenance training device.

AMT
d Accelerated mission testing[es].

d Advanced missile system (USN).

AMT
d Aircraft [or aviation] maintenance technician.

AMT
d Aircrew mission-support system.

AMT
d Automatic message-switching equipment.

AMT
d Auxiliary memory unit.

AMT
d Automated mission test[ing].

AMT
d Automotive navigation system.

AMT
d Automated nav/attack control(s).

AMT
d Antenna-matching unit.

AMT
d Astronaut maneuvering unit.

AMT
d Aircraft maintenance unit; F adds facility.

AMT
d Automatic nav/attack control(s).

AMT
d Antenna-matching unit.

AMT
d Astronaut maneuvering unit.

AMT
d Aircraft maintenance unit; F adds facility.

AMT
d Adjacent memory unit.

AMT
d Ammonia.

AMT
d Accelerated mission testing[es].

AMT
d Aircraft [or aviation] maintenance technician.

AMT
d Advanced metal-tolerant tracker [or tracking system].

AMT
d Air maneuver [and] transport, C–130/C–17 capability plus V/STOL (USA).

AMT
d Association for Manufacturing Technology (US).

AMT
d Aircraft Maintenance Technology [Vincennes University, IN 47591-0086] (US).

AMT
d Aerial, or air-to-air, missile target system.

AMT
d Air-to-air, missile target system.

AMT
d Aircraft maintenance task-oriented support [second S adds system].

AMT
d Adaptive marked-target simulator.

AMT
d Aeronautical message switch.

AMT
d Auxiliary memory unit.

AMT
d Adaptive moving-target detector, detection, or device.

AMT
d Anaglyph Picture, generally photographic but often print-out from some other system, comprising stereoscopic pairs of images, one in one colour (eg red) and other
analog computer

in second colour (e.g. blue). Viewed through corresponding (e.g. blue/red) spectacles, result appears three-dimensional.

analog computer 1 Computational device functioning by relating or operating upon continuous variables (in contrast to digital computers, which operate with discrete parcels of information). Simplest example, slide-rule.

2 Electronic computer in which input data are continuously variable values operated upon as corresponding electrical voltages. Actual hardware can be coupled directly in so that, for example, control response, angular movement and aerelastic distortion of control surface can be investigated in situ and in real time.

analog/digital converter, ADC Device for converting analog output into discrete digital data according to specified code of resolution; also called digitiser and, esp. for linear and rotary movement, encoder.

analog output Transducer signal in which amplitude (typically quasi-steady voltage) is continuously proportional to function of stimulus.

analysed In piston engine installations, device intended to indicate mixture ratio by sampling composition of exhaust gas (hence EGA, exhaust-gas *). Some for static-test purposes depend on chemical absorption of carbon dioxide, but airborne instrument uses Wheatstone bridge to measure variation in resistance due to proportion of carbon dioxide in gas.

analysis Stress analysis.

ANAO Australian National Aerospace Organization [office Yagoona, NSW].
anaprop Anomalous propagation.

ANAB Azerbaijan National Aerospace Agency.


Anazot A resin foam for fuel-tank protection.

ANB 1 Air Navigation Bureau (ICAO).

2 Adaptive narrow beam(s).

ANC 1 Air navigation charges.

2 Air Navigation Commission, or Council (both ICAO).

Army/Navy/civil (US).

4 Aviate/navigate/communicate.

5 Active, or acoustic, noise cancellation, or control.


Ancat Abatement of nuisance caused by air transport.

ANCB Association Nationale Contre les Bangs (supersonic) (F).

anchor-centred Also anchor charge, anchor grain: solid rocket propellant charge in which initial combustion surface has cross-section resembling radial array of anchors, fluxes outward.

anchor light Riding light.

anchor line, cable Cable running along interior of airborne aircraft to which parachute static lines (strops) are secured.

anchor-line extension kit Assembly arranged to extend anchor line to allow airdropping through rear clamshell doors or aperture with such doors removed.

anchor nut Large family of nuts positively securable by means of screwed or bolted plate projecting from base (see nut, nutplate, sttiffnut, stynut).

ANCOA Aerial Nurse Corps of America.

ANCS Active noise control system.

AND 1 Active-nutation damping.

2 Aircraft nose-down.

3 Army/Navy drawing.

ANDA Associazione Nazionale Direttori di Aeroporto (I).

ANDAG Associazione Nazionale Dipendenti Aviazione Generale (I).


Anderson shelter Small air-raid shelter assembled from sheet galvanized-steel pressings in pit and covered with deep layer of earth (UK, WW2).

AND gate Bistable logic function triggered only when all inputs are in ON state; in computers used as addition circuit, performing Boolean function of intersection. Hence AND/OR gate, AND/NOR, AND/NOT.

AND pad Standard Army/Navy drive accessory pad.

ANDR Air, or airborne, navigation data recorder.

androgynous Mating portions of docking system which are topologically identical (eg US and Soviet docking faces).

ANDS 1 Automatic navigation differential station.

2 Accelerate N, decelerate S, mnemonic for NTE (2).

ANDVT Advanced narrow-band digital voice terminal.

anechoic Without echoes; thus, * facility, * room, in which specially constructed interior walls reduce reflections to infinite number of vanishingly small ones. Chamber can be designed to operate best at given wavelength, with sound, ultrasound, ultrasonic energy, microwaves and various other EM wavelengths. Mobile facilities used for boresighting nose radar of combat aircraft.

anemogram Record produced by anemograph.

anemograph Instrument designed to produce permanent record of wind speed (ie recording anemometer) and, usually, direction. Dines * incorporates weathercock vane carrying pitot and static tubes.

anemometer Instrument for measuring speed of wind, usually 10 m (32.8 ft) above ground level. Robinson Cup * has free-rotating rotor with three or four arms each terminating in a hemispherical or conical cup.

anemoscope Instrument for checking existence and direction of slow air currents.


anergic Not spontaneously igniting; thus, most rocket-propellant combinations comprising two or more liquids. Opposite of hypergolic.

aneroid Thin-walled airtight compartment designed to suffer precisely predictable and repeatable elastic distortion proportional to pressure difference between interior and exterior. Most are evacuated steel capsules in form of disc with two corrugated faces which can approach or recede from each other at centre. To increase displacement a stack can be used linked at adjacent centres. Common basis of pressure altimeter, ASI and Machmeter.

aneroid altimeter Pressure altimeter; aneroid barometer calibrated to read pressure altitude.

aneroid altitude Pressure altitude.

ANFCA Associazione Nazionale Famille Caduti e Muitaliti dell’Aeronautica (I).

ANF Anti-navire futur (F).

ANG Air National Guard (US); B adds base.
angels

angels 1 Historic military R/T code word for altitude in thousands of feet; thus, ‘angels two-three’ = 23,000 ft.
2 Distinct, coherent and often strong (40 dB above background) radar echoes apparently coming from clear sky. Probable cause strong pressure, temperature or humidity gradient in lower atmosphere giving even sharper gradient in refractive index.

Aircraft next-generation identification transponder.

angled deck Aircraft-carrier deck inclined obliquely from port (left) bow to starboard (right) stern to provide greater deck space, greater catapult capacity and un-obstructed flight path further from island than with axial deck, with safe parking area towards bow.

angle of attack indicator Instrument served by *** sensing system.

angle of depression Acute angle between axis of oblique camera and horizontal.

angle of downwash Downwash (∆).

angle off Acute angle between own-fighter sightline and longitudinal axis of target aircraft.

angle of incidence indicator Instrument giving continuous reading of angle of foreplane, horizontal tail (especially tailplane where not primary pitch control) or wing, where incidence variable.

angle of view Angle subtended at perspective centre of camera lens by two opposite corners of format.

Anglico Air/naval gunfire liaison company (USMC).

ANGRC Air National Guard Readiness Center.

ANGSA Air National Guard support aircraft.

Angstrom Unit Å or AU, unit of length equal to 10–10 m, formerly used to express wavelengths of light; nearest SI unit is nanometre; 1 nm = 10 Å.

Angular acceleration Rate of change of angular position or axis of rotation at some distance from it (as in axial turbine blade), mass, instantaneous linear velocity and radial distance of CG from axis. Thus, L = Iα = mrω2.

angular resolution Angular distance between LOS from radar, human eye or other “seeing” system to target and LOS from same system to second target which system just distinguishes as separate object; usually only a few mrad, esp. if targets are pinpoints of light against dark background.

angular speed 1 Loosely, angular velocity.
2 Rate of change of target bearing, esp. as seen on PPI.

anharmonic Not harmonic, irregular.

anhydride 1 Negative dihedral, smaller angle between reference plane defining wing (such as lower surface or locus of AMCs) which slopes downward from root to tip, and horizontal plane through root. In early aircraft dihedral considered desirable as means to natural stability, esp. in roll; in some, and many modern gliders, wing flexure converts static * into dihedral under 1 g in flight. Tendency to design modern wing with * to counter excessive roll response to sideslip or side gusts, esp. in high-wing or supersonic aircraft. VG aeroplane angle may be varied with sweep. In the new century the term appears to be dying, replaced by dihedral with a minus sign.
2 Some authorities define as ‘absence of dihedral’ (from Greek root of prefix an = not), and suggest “cathedral” for downward-sloping wing.

ANIAF Associazione Nazionale Imprese Aerofotogrammetriche (I).

Anics = An廚ica Nazionale Imprese Elettrotecniche ed Elettroniche (I).

ANIU Aircraft network interface unit.

ANK Automatic navigation kit.

ANL 1 Auto noise limiter (communications).
2 Automatic noise levelling.
ANLP

ANLP Arinc network layer protocol.
ANLS Automatic navigation launch station.
ANM AFTN notification message.
ANMI Air navigation multiple indicator.
ANMPG Air nautical miles per gallon.
ANMS 1 Aircraft navigation and management system.
2 Automatic navigation mission station (UAV).
3 Automated noise monitoring system.
ANN Applied neural network.
ann Annunciator.
annealing Heat treatment for pure metal and alloys to obtain desired physical properties by altering crystalline microstructure. Usually involves heating to above solid-solution or critical temperatures, followed by gentle cooling in air. General aim to make metal less brittle, tougher, more ductile and relieve interior stress.
anneal around propulsive jet nozzle which in-annulus drag
symmetry almost horizontal.
designed to operate in translational flight with axis of
annular wing
meshing stack, to resist load along axis of symmetry.
load. Sometimes called ring spring, esp. when given
annular spring
revolution to fit around axis of aircraft engine, esp.
annular radiator
alternately for fuel and oxidant.
numerous such orifices spaced around chamber head,
from narrow annular orifice. In bipropellant engine
injector in which liquid fuel and/or oxidant is sprayed
annular injector
one side only of flat or conical disc.
resiliently mounted and torque-reacted by torque-
gear there is no centre, teeth being carried on open ring
teeth project inwards from outer periphery. In annulus
annular gear
Ring gear or annulus, gearwheel in which
teeth project inwards from outer periphery. In annulus
gear there is no centre, teeth being carried on open ring
which in turboprop/turbofan reduction gears may be
resiliently mounted and torque-reacted by torque-
signalling system). When shaft-mounted, teeth usually on
annular combustion chamber In gas-turbine engine, chamber [including flame tube(s) and liners] entirely in
form of body of revolution, usually about major axis of
engine.
annular injector Rocket (or possibly other engine)
injector in which liquid fuel and/or oxidant is sprayed
from narrow annular orifice. In bipropellant engine
umerous such orifices spaced around chamber head,
alternately for fuel and oxidant.
anneal around propulsive jet nozzle which in-
anneallon
ring spring, esp. when given
tapered cross-section and used in multiple, in an
intermeshing stack, to resist load along axis of symmetry.
anneal around propulsive jet nozzle which incom-
annealous
pletely fills base of vehicle, esp. ballistic rocket rising
through atmosphere.
anunciator 1 In gyrocompass (remote compass), indi-
cator flag visible through window of cockpit instrument;
with a.c. supply on and gyro synchronised with compass
detector, indication should hover between dot and cross,
ever settle on either.
2 In aircraft system, esp. on aircraft having flight deck
rather than cockpit, panel or captioned warnings often
distributed on schematic diagram of system.
3 In a CDU, the alpha and numeric keys providing part of
the operator interface.
4 Subsystem of autopilot for auto or manual switching
between compass and directional gyro.
ANO Air Navigation Order, UK statutory instrument
for enactment of ICAO policy defining laws, licensing and
similar fundamental issues regarding aerial navigation
(see ANVR).
anode In electrical circuit (electrolytic cell, valve, CRT),
positive pole, towards which electrons flow; that from
which “current” conventionally depicted as emanating.
anodic treatment See next.
anodising Electrolytic (electrochemical) treatment for
aluminium and alloys, magnesium and alloys and, rarely,
other metals, coated with inert surface film consisting
mainly of oxide(s) as protection against corrosion.
Electrolyte usually weak sulphuric or chromic acid.
ANOE Automated nap of the Earth.
anomalous period Time between successive passages of
satellite through perigee.
anomalous year Earth’s orbital period round Sun, peri-
helion to perihelion: 365 d 6 h 13 m 53.2 s, increasing by
about 0.26 s per century.
anomaly 1 Difference between mean of measured values
of meteorological parameter at one place and mean of
similar values at all other points on same parallel (in prac-
tice, mean of similar values at other stations near same
parallel).
2 In general, deviation of observed geodesic parameter
from norm or theoretical value.
3 Specif. local distortion of terrestrial magnetic field
caused by local concentrations of magnetic material used
in aerial geophysical surveys and ASW (see M4D).
anomaly Air navigation and management system.
ANORAA Association Nationale des Officiers de
Réserve de l’Armée de l’Air (F).
anova Analysis of variance, especially in monitoring
flight-crew performance under different adverse or stress
conditions.
anoxaemia Hypoxaemia, deficiency in oxygen tension
(loosely, concentration) of blood.
anoxia Absence of oxygen available for physiological
use by the body (see hypoxia).
ANP 1 Aircraft nuclear propulsion; general subject and
defunct DoD programme.
2 Air navigation plan (ICAO).
3 Actual [or achieved] navigation performance.
ANPA Aircraft Nuisance Prevention Association (J).
2 Advanced notice of proposed amendment.
3 See APA (13).
ANPAC Association Nazionale Piloti Aviazione
A-NPR, ANPRM

Commerciale (Rome); other Italian associations include ANP/AVA (Assistenti di Volo), ANPC/ADT (Professionali Controllori & Assistenti Traffico Aereo), ANPI (Paracadutisti d’Italia), ANP/IPS (Piloti Istruttori Civili), ANP/Co (Piloti Collaudatori), and ANPSAM (Piloti Servizi Aerei Minori; also API).

A-NPR, ANPRM  Advance notice of proposed rulemaking (FAA).

ANR  Air Navigation Regulation.

ANRA  Association Nationale des Résistants de l’Air; résistant, a tough hard worker; [office F-75996 Paris] (F).

ANRS  Automatic navigation relay station.

ANRT  Association Nationale de la Recherche Technique (F).

ANS  Air Navigation School.

ANSV  Agenzia Nazionale per la Sicurezza del Volo [incident investigation authority] (I).

Ansir  Autonomous navigation sensing experimental research.

ANSI  American National Standards Institution, vital for software.

Answer  Autonomous navigation service (G).

Antenna  Autonomous navigation sensing experimental research.

Answer  Air transportation system.

Antec  Atmospheric motion contrary to Earth’s rotation. Large area of high pressure, generally with quiet, fine weather, with general circulation clockwise in N hemisphere and anticlockwise in S; divided into ‘cold’ and ‘warm’ each group being subdivided into ‘permanent’ and ‘temporary’.

Anti-dazzle panel  Rearwards extension around top of instrument panel or cockpit coaming to improve instrument visibility. anti-freeze

Anti-ballistic missile, ABM  System designed to intercept and destroy hypersonic ballistic missiles, esp. RVs of ICBMs. Speed of such targets, smaller radar cross-section, possible numbers, use of ECM and decoys, ability to change trajectory, enormous distances, and need for 100% interception, make ABM difficult.

Anti-buffeting  Any of many techniques intended to reduce aerodynamic buffet. Almost always auxiliary or locally hinged surface moved out into airflow to reduce buffet which would otherwise be caused by configuration change, eg opening weapon-bay doors. Thus * flap, panel, comb, rake, slot.

Antenna  Device or material intended to prevent ice from forming. See anti-icing.

Anticorrosion  Any of many techniques intended to reduce clutter.

Anti-coning  Device or material intended to prevent ice from forming. See anti-icing.

Anti-drag wire  Bright reflections being visible to crew.

Anti-drag  Bright reflections being visible to crew.

Anti-dust  Bright reflections being visible to crew.

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anti-friction bearing

liquid over more than twice temperature range of water, and freezes not as solid ice but as slush.

anti-friction bearing Loose term applicable to bearing suffering only rolling friction (ball, needle, roller) but esp. signifying advanced geometry and high precision.

antifrosting Measures taken to prevent frost (ice condensing from atmosphere and freezing as layer of fine crystals), esp. on windscreens; typically raise temperature by hot air or fine electrical resistance grids or conductive films.

antig Measures countering adverse effects of severe accelerations in vertical plane. See g-suit.

anti-glare Against optical glare, generally synonymous with anti-dazzle but esp. dull non-reflective painted panels on airframe and propeller blades.

antigravity Yet to be invented mechanism capable of nullifying local region in gravitational field.

anti-g suit See g-suit.

anti-g valve See inverted flight valve.

anti-icing Measures to prevent formation of ice on aircraft; required on small vital areas where ice should not be allowed to form even momentarily (see icing, de-icing).

anti-icing correction Applied to aircraft, esp. advanced aeroplane, performance with various forms of ice-protection operative. Esp necessary when engine air bleed exerts significant penalty in degraded take-off, climb-out, overshoot and en route terrain-clearance calculations. Required numerical values usually given in flight manual as percentage for each flight condition.

anti-icing inhibitor Fuel additive preventing freezing of water precipitated out of fuel at high altitude.

anti-knock rating Measure of resistance of piston engine fuel to detonation (1) (see octane rating).

anti-lift In direction opposite to lift forces, eg loads experienced by wing on hard landing with lift dumpers in use. Thus ** wire (landing wire), structural bracing filament, usually within wing, to resist downloads.

anti-missile Against missiles, specific system intended to intercept and destroy hostile missiles (which may or may not include guided devices, artillery shells, bullets, mortar bombs and other flying hardware). In large-scale defence against ICBM attack, anti-ballistic missile.

anti-misting kerosene Jet fuel chemically and physically tailored so that, on sudden release to atmosphere (from ruptured tanks in a crash), it spreads in the form of droplets too large to form an explosive mixture with air.

antimony Element, abb. Sb, existing in several allotropic forms, most stable being grey metal with brittle crystalline structure. Widely used in aerospace in small quantities: with tin and other metals in bearings and applications involving sliding friction, with lead in storage batteries, as anti-sound projection to infinity of line from Sun through observer.

antimony oxide and, esp. peroxides during long storage.

antinode 1 Points on wave motion where displacement (amplitude) is maximum.

2 Locations in aircraft structure where flexure (due to vibration or aeroelastic excitation) is maximum.

3 Either of two points in satellite orbit where line in orbit plane perpendicular to line of nodes, and passing through focus, intersects orbit (thus, essentially, points in orbit midway between nodes).

anti-oxidant Fuel additive which prevents formation of oxides and, esp. peroxides during long storage.

antipode Point on Earth, or other body, as far as possible from some other point or body; specif. point on Earth from which line through centre of Earth would pass through centre of Moon.

antipodes Regions on Earth diametrically opposite each other.

anti-radiation missile Missile designed to home on to hostile radars.

anti-rolling In rigid airship, measures intended to prevent rolling of any part relative to hull or envelope.

anti-rumal panel Small anti-buffet panel necessary on grounds of noise.

anti-snaking strip In early high-subsonic aircraft, strip of cord or metal attached to one side of rudder or elsewhere to prevent snaking (yawing oscillations).

anti-solar point Point on celestial sphere 180° from Sun; projection to infinity of line from Sun through observer.

anti-buzz panel Small anti-rolling panel necessary on grounds of noise.

anti-sound Sound generated to cancel out unwanted noise.

anti-spin parachute Streamed from extremity of aeroplane or glider to assist recovery from spin; most common location is extreme tail.

antistatic Measures taken to reduce static interference with radio communications, traditionally by trailed ** wire, released from ** cartridge, which serves as pathway for dissipation of charge built up on aircraft. See next.

anti-static additive Fuel additive which increases electrical conductivity and thus speeds up dissipation of static electricity built up during refuelling.

anti-submarine warfare See ASW.

anti-surface improvement program Combines sensors, datalinks and displays presenting integrated precision tactical picture.

anti-surge measures 1 To prevent aerodynamic surging in axial compressor, eg redesign further from surge line, use of variable stators, blow-off valves and interstage bleeds.

2 Valves and baffles in oil cooler to maintain steady oil flow.

anti-torque drift Inherent lateral drift of helicopter due to side-thrust of tail rotor; often countered by aligning main rotor so that tip-path plane is tilted to give cancelling lateral component.

anti-torque pedals Common name for foot pedals of helicopter.

antitake off Vehicle or a jet operated as fast as possible from some other point or body; specif. point on Earth from which line through centre of Earth would pass through centre of Moon.

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Anvis/Hud

**Anvis/Hud** Adds head-up display for safe NOE helicopter flight at night.

**ANVR** Association of travel agents (Neth.).

**ANW** Airborne networking waveform.

**ANZUK, Anzuk** Australia, New Zealand, UK, and SE Asia defence.

**ANZUS, Anzus** Australia, New Zealand and US (1951 defence pact).

**AO** 1 Administrative Operations, major US Federal budget heading.

  2 Artillery observation.

  3 Aircraft operator.

  4 Anti-oxidant.

  5 Airplane, observation (USA 1956–62).

**ANVR** Association of travel agents (Neth.).

**copter flight at night.**

**Anvis/Hud** AOT

**ANVR** Association of travel agents (Neth.).

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**AOA** 1 Aerodrome Owners’ Association (UK 1934–, became central).

  2 Airport Operators Association [London SW1H 9JJ] (UK).

    3 Angle of attack (units, thus “6 AOA”).

    4 Angle of arrival (ECM).

    5 Air Officer i/c Administration (RAF).

    6 Airborne optical adjunct (ABM).

    7 Amphibious operating [or operations] area (DoD).

    8 At or above (FAA).

    9 Abort once around, ie after one orbit.

10 Analysis of alternatives.

**AOAC** Autonomous operation from aircraft carrier (UAV).

**AOB** 1 At or below.

  2 Angle of bank.

    3 Automatic optical bench (for testing optically tracked missiles).

    4 Air Observer (Bombardment).

    5 Angle off boresight.

    6 Air order of battle.

    7 Air-dropped oceanic [or Arctic Ocean] buoy.

**AOC** 1 Air Officer Commanding.

  2 Air Operator’s Certificate (CAA UK).

    3 Autopilot omni-coupler.

    4 Aerodrome, or airport, obstruction, or obstacle, chart.

    5 Assumption of control message (ICAO).

    6 Adaptive optical camouflage.


    8 Airline, Operations Center (US).

    9 Air Operations Command (Vietnam AF) and co-located Air Operations Centers (USAF).

10 Airport [also Airline] Operational Commission (US).

  11 Air/oil cooler.

  12 Aeronautical operational control (Acars).

  13 All other configurations.

  14 Acceleration-onset cueing.

  15 Attitude and orbit control [S adds system].

  16 Airline, or aircraft, operational control, or communications.

17 Air and space Operations Center (US Air Combat Command).

**AOCC** Airline Operation Control Center (US).

AOTD

AOTD Active optical target detector.
AO2 Automated observation from unattended ASOS.
AO2A AO-augmented, from an attended ASOS.
AOU Area of uncertainty.
Aa Area of overlap [twin-rotor helicopter].
AOV All-operators wire [AOT is preferred].
AOY Angle of yaw.
AP 1 Armour-piercing; –DS adds discarding sabot, –E explosive, –F finned, –I incendiary, –T tracer; there are other suffixes.
2 Ammonium perchlorate (solid rocket fuel).
3 Air Publication (UK).
4 Airport (ICAO, Acars).
5 Autopilot.
6 Aviation regiment (USSR).
7 Allied publication (NATO).
8 Advance[d] procurement.
9 Airframe parachute [S adds system].
10 Action Panel [materials R&D].
11 Array processor.
12 Anti-personnel.
13 Anomalous propagation.
14 Approach [apch preferred].
15 Assessment Phase (UK).
16 Automotive [i.e., automatic] picture [transmission].
17 Aeroklub-Polski [Warsaw PL-00-071] (Poland).
18 Aluminised phosphor.
Ap Approach light[s].
A/P 1 Autopilot.
2 Airplane(s).
3 Airport.
4 Aim point.
APA 1 Airline Passengers Association (US).
2 Airport (or airfield) pressure altitude.
3 Allied Pilots’ Association [Fort Worth, TX76155-2512] (US).
4 Army Parachute Association (UK).
5 Autopilot amplifier.
6 Automatic plotting aid.
7 Aerobatic practice area.
8 Accident to private aviation [now Saga].
9 Altitude preselect/alarm[er].
10 Aviation Policy Area.
11 Aerodromes Protection Agency, found necessary to fight closures (UK).
12 Aerial performance analyses.
13 Associazione Pionieri dell’Aeronautica [previously ANPA; pilots with brevet before 2 Aug. 14; I-00192 Rome] (Italy).
14 Airline Professionals Association [pilot union] (US).
APAC Association of Professional Aviation Consultants (UK).
APACCS Aerial-port command and control systems (USAf).
Apacs Atlas prompting and checking system.
APADS Advanced precision air-delivery system.
Apals Autonomous precision/approach and landing system.
APAM Anti-personnel/anti-material (last word often spelt material).
APAMA Asia/Pacific Aviation Media Association.
APAP Approach-path alignment panels.
APapi Abbreviated Papi.
aperture card

aerial, through which all radiation is intended to pass (ie all except diffuse stray radiation).

**aperture card** Standardised unit in microfilm filing, comprising frame of microfilm mounted in card border; stored, retrieved and projected automatically.

**aperture management** Design of radar cavities and apertures to eliminate multiple reflections.

**Apex** 1 Advanced project for European information exchange, linking all major EC airframe companies. 2 Advanced passenger, or purchased, excursion fare, one of many forms of air carrier fare and flight coupon.

**Application Executive.** 3

**apex** 1 Highest point in canopy of parachute in vertical descent. 2 In a plan view of a wing, the point where the projected leading edge cuts the aircraft centreline.


**APFA** Association of Professional Flight Attendants (US).

**APFC** Air-portable fuel container [or cell].

**APFD** Autopilot flight director.

**APFSDS** Armour-piercing fin-stabilized discarding sabot.

**APG** 1 JETDS code: piloted aircraft, radar, fire control. 2 Automatic program generator, requires only component and netlist input. 3 Aberdeen Proving Ground, MD (USA, but used by other US services). 4 Air Platforms Group (DSTL, UK).

**APG** 5 Airframe General [mechanic category] (US).

**APGC** Air Proving Ground Command (USAF, defunct).

**APGM** Autonomous precision-guided missile [or munition].

**APGS** Auxiliary power generation system.

**APHAZ** Aircraft proximity hazard[s], panel investigating airproxes filed by controllers [as distinct from JAWG].

**aphelion** Point in solar orbit furthest from Sun.

**Aphids** Advanced panoramic helmet interface demo system.

**API** 1 Air-position indicator. 2 Armour-piercing incendiary. 3 American Petroleum Institute [office, Washington DC].

**APIA** 4 Associazione Pilote Italiane [women pilots; office, I-00198 Rome] (Italy). 5 Application program[ning] interface.

**APIB** Air-photo interpreter.

**APIR** Airframe/propulsion integration [also A/PI].

**APIP** 8 Aim-point initiative.

**APIR** 9 Ascent-phase intercept.

**APICS** 10 Application programming interface. 11 Application implementation. 12 Advanced[d] passenger information.

**APIRS** Automatic priority interrupt system, for large computer systems with multi-programming.

**APIS** 1 Aircraft piloting inertial reference system, or strapdown sensor. 2 Automatic priority interrupt system, for large computer systems with multi-programming.

**APIS** 3 Aircraft parking information system [docking guidance].

**APIS** 4 Air passenger information system.

**APL** 1 Acceptance performance level. 2 Applied Physics Laboratory of JHU.

**APLA** Asociación de Pilotos de Líneas Aéreas [Arg.].

**APL** 3 Free from spherical aberration.

**APL** 4 Autonomous precision-guided weapon system (USA).

**APL** 5 Aviation de Patrouille Maritime (F).

**APMS** Automatic performance-management system (also, in US, rendered as advanced power management system) or automated performance measurement system.

**APN** 1 JETDS code: piloted aircraft, radar, navaid. 2 Aircraft procurement, Navy (US). 3 Arinc packet network.

**APN** 4 Aircraft pallet net.

**APNA** Association des [female] Pilotes Françaises (F-75015 Paris) (F).

**APPN** Automated priority interrupt system, for large computer systems with multi-programming.

**APP** 1 Approach (DTL, UK).

**APP** 2 Approach control office (ICAO).

**APP** 3 Approach pattern.
APP A

1 Association des Pilotes Privés (F).
2 Association of Priest Pilots (US).
3 Autopilot panel.

APPA
1 Associação de Pilotos e Proprietários de Aeronaves [office, São Paulo] (Brazil).
2 Association des Pilotes Privés Avions (F).

apparent precession Apparent tilt of gyro due to rotation of Earth; vertical component = topple, horizontal = drift.

apparent solar day Length of Earth day determined by two successive meridian passages of apparent Sun; longer than sidereal day by time taken by Earth to turn additional increment to nullify distance travelled in solar orbit during this day. Basis of most human timescales, being divided into 24 h, hour being thus defined.

apparent wander Apparent precession.

APP CON Approach control (FAA).

Apple 1 American pilots participating in local education.
2 Aircraft precise-position location equipment.

Appleton layer F layer (F1 and F2) of ionosphere, most useful for reflection of EM radiation (see F-layer).

Appleyard scale Circular slide-rule.

application-specific integrated circuit Self-explanatory, an ASIC is designed specifically for one application, and expects to be made by the million in order to play its role in what may be a giant system. Of course, the same i.c. may later find other applications.

appliqué Adhesive in the form of thin foils or polymer-based film, usually on aircraft external surface.

APPP, AP3 Airport Privatization Pilot Program (FAA from 1996).

APPR Approach.

approach BS.185: ‘To manoeuvre an aircraft into position relative to the landing area for flattening-out and alighting’. Now subdivided into various categories, each of which needs pages of explanation defining circumstances, clearances and procedure. Following are brief notes. VFR * may be made with no radio at uncontrolled airport or airfield. Visual * may be made in IFR by pilot in contact with runway either not following other traffic or else in visual contact with it, with ceiling at least 500 ft above minimum vectoring altitude and visibility at least three miles. Various types of instrument * are admissible in IFR with radio TWR authorization: straight-in, circling, precision (with g/s and runway centreline guidance) and parallel (two parallel ILS runways, or, in military aviation, two parallel runways, each with PAR). In certain circumstances pilot may receive clearance for contact *, even in IFR. ILS * is most important IFR precision *. If required and available, pilot can be ‘talked down’ in GCA or RCA, his only necessary equipment being primary instruments and operative R/T.

approach area Airspace over designated region of terminal area controlled by approach control unit (in some cases serving two or more airfields).

approach beacon 1 Historically, short-range track beacon (see BABS).
2 Today, beacon giving fix before or after approach gate (rare).

approach control BS.185: ‘A service established to provide ATC for those parts of an IFR flight when an aircraft is arriving at, or departing from, or operating in the vicinity of, an aerodrome’. DTI (Air Pilot): ‘ATC service for arriving or departing IFR flights’. FAA adds ‘and, on occasion, VFR aircraft’.

approach control radar ACR, radar at approach control facility displaying PPI positions (and, in advanced models, height or alphanumeric data) of all aircraft within its range (which is not less than radius of furthest point in the controlled airspace).

approach coupler Electronic linkage between aircraft ILS receiver and autopilot and hence to AFCS; thus aircraft can make ‘hands off’ approach.

approach fix From or over which final approach (IFR) to airport is executed (FAA). On projected centreline 3–5 miles from threshold.

approach glide ‘A glide preliminary to alighting’ (B.S., 1940).

approach gate Point on final-approach course 1 mile beyond approach fix (ie further from airport) or 5 miles from landing threshold, whichever is greater distance from threshold (FAA).

approach indicator Ambiguous: could mean ILS or other cockpit instrument or any of several visual systems on ground indicating angle of approach.

approach lights 1 In modern large airfields, any of several systems of lights extending along projected centre-line of runway in use towards approaching aircraft to provide visual indication of runway location, distances, alignment, glide path slope, and, probably, transverse horizontal.
2 In smaller or older airfields, one or more lights (often green) at, or extending from, downwind end of landing area to show favourable direction of approach.

approach noise Measured on extended runway centre-line 1 nm (one nautical mile = 6.080 ft = 1,853 m) from downwind end of runway, with aircraft at height of 370 ft (112.58 m). [See Noise].

approach operations Flight operations within approach area, esp. those of aircraft arriving or departing, designated as IFR or VFR.

approach plane Approach surface, sloping plane below which no aircraft should penetrate; in UK; ** to grass airfield extends at inclination of 1:30 in all directions from periphery of landing area.

approach plate Flight-planning document relevant to specific airfield, giving details of minimum heights, safe headings and weather minimums (UK = minima), and including horizontal map and often also vertical profile for approach to each instrument runway.

approach power That used on landing approach, often about 38 percent MTO.

approach power compensator Autothrottle, esp. on combat aircraft. The APCS [S adds system] was devised to hold constant AOA (3) during carrier landings.

approach radar See PAR, GCA, SRE.

approach receiver 1 ILS receiver.
2 Historically, radio receiver ‘capable of interpreting the special indications given by an approach beacon installation’.

approach sequence Order in which aircraft are placed while awaiting landing clearance and in subsequent approach. In busy TMA traffic drawn in blocks from alternate landing stacks.

approach speed Usually means IAS.

approach surveillance radar Approach control radar.
approach with vertical guidance

Naval category at present in two classes: APV 1 provides vertical guidance within 20 m (65.6 ft), and includes GPS and WAAS; APV 2 refines this to 8 m (26 ft), and includes Egnos and Galileo (ICAO).

appropriation Act of Congress enabling a Federal agency to spend money for a specific purpose.

approval 1 Of manufacturer of aerospace hardware, approval by delegated national authority to design, manufacture, repair or modify such hardware, subject to specified conditions and inspection.

2 Of item of aerospace hardware, certificate issued by delegated national authority that item is correctly designed and manufactured and will thus be likely to perform within its design limits satisfactorily. In case of complete aircraft, C of A, or Type Certificate.

3 Of flight plan, signature by ATC officer or other responsible person that proposed plan does not conflict with pilot’s qualifications, aircraft equipment, expected met conditions and expected air traffic, and that flight may proceed.

approval flight Required to authorise historic aircraft [usually military] to do one more year flying at airshows.

approval note Issued by importing country to cover aircraft with foreign C of A.

Approved Life The life of a past or functioning item [either total or between overhauls] authorised by the certifying authority.

APPSS Association of Police and Public Security Suppliers.

APPT Air-platform propulsion technology; R adds research.

APQ JETDS code: piloted aircraft, radar, combination of purposes.

APQA Association Québécoise des Transporteurs Aériens Inc. [office, Dorval, PQ; Canada].

APR JETDS code: piloted aircraft, radar, passive detection.

2 Airman performance report.

3 Automatic [or auxiliary] power [or performance] reserve.

4 Air-photo reader.

5 Actual performance reserve.

6 Aerostat programmable radar.

APRA Air Power Association, previously the Air Public Relations Association [1947–, office Milton Keynes] (UK).

APRL Aeronautical Telecommunications Network profile requirements list.

2 Aeroklub Polskiei Rzeczypospolitei Lusowei [aero club, Warsaw] (Poland).

APRO JETDS code: piloted aircraft, radar, passive detection.

2 Airline Public Relations Organization [office, Crawley] (UK).

2 Aerial Phenomena Research Organization [1952–] (Int.).

APRA Air Power Association, previously the Air Public Relations Association (UK, 1947–).

APRL ATN(1) profile requirement list.

APRO Airlines Public Relations Association (UK).

APRO Aeronautical Telecommunications Network profile requirements list.

APRO Aircraft propulsion systems trainer.

Aprodeas Association pour la Promotion et le Développement d’actions de formation pour les Entreprises Aéronautiques et Spatiales (F).

apron 1 Large paved area of airfield for such purposes as: loading and unloading of aircraft; aircraft turnaround operations; aircraft modification, maintenance or repair; any other approved purpose other than flight operations.

2 In engine cowling, any portion hinged down to act as walkway or servicing stand.

3 In ejection seat, lower forward face behind occupant’s lower legs.

4 In vehicle fuelled with corrosive liquid, corrosion-resistant panel surrounding, and especially beneath, relevant supply hose coupling.

5 Fairing round front of main landing gear, forming underside of nacelle in flight.

apron capacity Nominated number of transport aircraft to be accommodated on particular apron area in designated positions.

apron-drive bridge Passenger loading bridge comprising telescopic sections pivoted to terminal; extended and positioned by steerable powered chassis supporting free end. See bridge and next.

apron-drive unit Self-propelled vehicular support for free end of passenger jetty (jetway), usually provided with two heavy-duty wheels steering through at least 180º.

Apt Airport.

APRX Approxi[l]y.

APS 1 Aircraft prepared for service; standard weighing condition, or condition at which weight is calculated: comprises aircraft in all respects ready to take off on mission of type for which it was designed, complete with all stores, equipment (such as passenger reading material), fuel, crew and all consumable items, but with no revenue load.

2 Appearance-potential spectroscopy.

3 JETDS code: piloted aircraft, radar, search and detection.

4 Adaptive-processor system, or sonar, or sonobuoy.

5 Armament practice station (UK).

6 Auxiliary power system.

7 Aerial Port Squadron (USAF).

8 Advanced planning and scheduling.

9 Airborne-platform subsystem.

10 Armament, or air-vehicle, planning system.

11 Advanced fighter-crew protection system.

12 AIS(1) processing system.

13 Airframe/propulsion/steering.

14 Air Pictorial Service, formed 1951, now AAS(6).

15 Airline Pilots Security Alliance (US, 2002–).

16 Aircraft/altitude/attitude position sensor.

17 Autopilot system [also ApS].

18 Advanced polar system [satellite].

19 Advanced passenger screening.

APSA Airline Pilots Security Alliance (gun lobby, US).

APSE, Aps Ada programming support environment.

APSNG After passing.

APSI Aircraft, or airframe, propulsion-system integration.

apsides Plural of apsis.

apsis Extreme point of orbit, apocentre (furthest) or pericentre (nearest).

APSP Advanced programmable signal-processor.


APST Aircraft propulsion systems trainer.

APT 1 Automatically programmed [machine] tool.

2 Automatic picture transmission, datalink from satellite vidicon.
Dimensional tolerance, etc.

To run wheeled vehicle, esp. landing aircraft, out of ground contact, unable to provide steering or is supported wholly by dynamic reaction of water; tyres, over shallow standing water at so high a speed that weight "aquaplane"

"AQP" 330 Sand/water mix for high-velocity striping of markings or sealant from airfield paved surfaces.

AQL 1 Agreed quality level [material specifications, dimensiona tolerances, etc].

AQP 1 Auxiliary power unit; /GCU adds generator control unit.

APC 1 APU controller.

APV 1 Autopiloted vehicle.

AQR Aeronautical quadrature phase-shift keying.

AR 1 Air [aerial, airborne] refuelling.

Aspect ratio.

Arc Ground track of aircraft flying constant DME distance from navaid.
Arcads

Arcads Armament control and delivery system.

Arcal Aircraft, or airborne, radio control of airfield lighting.

Arcan Aeronautical Radio of Canada.

arc and plug See plug aileron.

ARCC 1 Airworthiness, or airframe, Requirements Co-ordinating Committee (UK).

2 Aeronautical Rescue Co-ordination Centre (RAF Kinloss, UK).

ARCH Agricultural remotely controlled helicopter.


archway Airport-gate detector requiring passenger to pass through sensitive magnetic field, usually alongside baggage screening; also called AMD or WTMD.

ARCHI Anti-radiation countermeasures.

Arcmas Automatic real-time cable monitoring and analysis system.

arc-minute, arc-second See angular measure.

ARCO, Arco Airborne remote control officer (RPVs).

ARCJ 1 Air refuelling control point.


ARCS 1 Acquisition radar and control system.

2 Aerial rocket control system.

3 Airline request communication, or computer, system.

ARCSS Autonomous rendezvous and capture sensor system.

Arctic air mass Major class of air mass most highly developed in winter over ice and snow, although surface temperature may be higher than that for Polar masses.

Arctic minimum Deepest of standard model atmospheres assumed in aircraft performance calculation.

Arctic smoke Surface fog essentially caused by very cold air drifting across warmer water.

ARCTS Automated radar-controlled terminal system.

ARD 1 Anti-radar drone.

2 Atmospheric re-entry demonstrator.

3 ATC-related delay.

4 Advanced requirement[s] definition.

ARDC Air Research and Development Command (USAF, established 1 February 1950, became Systems Command 1 April 1961).

ARDC model atmosphere Devised by ARDC, published 1956 (see model atmosphere).

Ardec Armament Research Development and Engineering Center (USA).

ARDF Airborne radio direction-finding.

Arghan Association pour la Recherche de Documentation sur l’Histoire de l’Aéronautique Navale (F).

ARDS Airborne radar demonstration system, links J-Stars, Astor, Orchidée.

ARDU Aircraft Research & Development Unit (RAAF).

ARE 1 Airborne radar extension (surveillance C-130).

2 Altitude-reporting equipment (towed target).

3 Admiralty Research Establishment.

4 Algebraic Riccati equation for LQR [1724].

area SI unit of plane area is square metre (m²); to convert from ft² multiply by 0.092903; from hectares by 10⁶; from sq yd by 0.836127.

are Non-SI unit of area = 10⁻²m².

ARES 1 Area or aerospace surfaces See gross wing *, net wing * disc *, equivalent flat-plate *, control-surface *.

area bombing Bombing in which target occupies large area, such as built-up area of city, with aiming point loosely defined near centre (when expression was current, WW2, marked at night by TIs or TMs).

area defence system In general, anti-aircraft or AAW system capable of providing effective defence over large area (dispersed battlefleet, task force, ground battlefield or large tract of country containing several cities) rather than point target.

area-denial munition Explosive device, usually dispensing cluster bombs each with time-delay fuze, to deny area to enemy ground forces.

area-increasing flap Wing flap which in initial part of travel moves almost directly rearwards to increase wing chord, without significant angular movement.

area loading Mass divided by gross projected area W/S [lifting-body aircraft].

area navigation, R-nav, RNAV Navaid that permits aircraft operations on any desired course within coverage of station-referenced navigation signals or within limits of self-contained system capability (FAA); thus, does not constrain aircraft to preset pathways.

area-navigation route Established R-nav route, pre-defined route segment, arrival or departure route (including RNAV SIDs and STARs). Route, based on existing high-altitude or low-altitude VOR/DME coverage, which has been designated by Administrator and published (FAA).

area ratio 1 In rocket thrust chamber, usually ratio of idealised cross-section area at nozzle to minimum cross-section area at throat; also called expansion ratio. In general, chambers designed to expand products of combustion into atmosphere have ** 10:1 to 25:1; those for use in upper atmosphere may exceed 50:1; SSME for Space Shuttle has ** 157:1.

2 For a wing, S/b², area divided by span squared, reciprocal of aspect ratio.

area rule Formulated by Richard T. Whitcomb at NACA in 1953. For minimum transonic drag at zero lift aircraft should be so shaped that nose-to-tail plot of gross cross-section areas should approximate to that of ideal body for chosen flight Mach number. Thus, addition of wing should be compensated for by reduction in section of body (which gave some early area-ruled aircraft “wasp waists”, which are generally undesirable). Obviously, streamlines cannot be sharply deflected; it is not possible to have perfect area-ruling both with and without bulky external stores. In 1954–55 rules extended to Mach 2 by plotting cross-section area distributions on sloping axes approximately aligned with Mach angle.

area sterilization Seeding part of sky with chaff of such extent and density that radar operation is impossible.

AREF, ARF Air Refuelling Squadron (USAF), also ARS.

Areus A remote control system in which push/pull commands are transmitted by a steel cable tightly surrounded by a guiding coil spring, the whole sliding in a tube.

Arento National telecommunications organisation (Egypt).

ARES 1 Adaptable radar-environment organisation.
Aresa

* Aerial regional scale environmental survey.
  4 Advanced route evaluation system.
  5 Affordable responsive spacelift [Space Command] (USAF).
  * Aresa Association des Radio-Electroniciens de la Sécurité Aérienne (F).
  Aresti International procedures devised by José for governing competitive aerobatics to set formula stipulating competing aircraft, set and free manoeuvres, [rendered graphically], judging and marking, now replaced by Aerobatic Catalogue.
  ARF  1 Air Reserve Forces; suffix PDS adds personnel data systems (US).
  2 Airborne relay facility, or facilities.
  3 Air Reconnaissance Facility.
  4 Airlink risk factor.
  ARFA, Arfa Allied Radio-Frequency Agency (NATO).
  Arfab Allied radio frequency allocation board (NATO).
  ARFAC Australian Royal Federation of Aero Clubs.
  ARFC Aerospace Reconstruction Finance Corporation (US Government).
  ARFF Airfield [or airport or aircraft] rescue and firefighting (vehicle).
  AR NBC hood and respirator (UK, RAF, RN).
  ARFOR Area forecast (Int. Met. Figure Code, ICAO).
  ARG  1 Amphibious Ready Group, with air assets (USMC).
  2 Aeronautics Research Group (ERA). Aeronautical certification authority (R). Armak Aeronautical certification authority (R). Armament Carried on combat aircraft specifically to cause injury, by direct action, to hostile forces. Excludes radars, laser rangers (unless they cause optical injury by intent), illumination devices, detection or tracking devices, defoliating sprays, smoke screen generators and, unless filled with napalm, drop tanks.
  Arn Arm Anti-radar missile, Matra. Armament of primary field by armature current, factor

armature reaction

Aries, ARIES 1 Airborne research integrated experimental system [flight instrumentation] (NASA Langley).
  2 Airborne recorder for IR and EO sensors.
  3 Aeronautical reporting and information-exchange system.
  4 Airborne reconnaissance integrated electronics suite.
  ARINC, Arinc Aeronautical Radio Inc, with subsidiary Arinc Research. Non-profit research organisation responsible for aeronautical radio standards and widespread ground aids, esp. communications, across Pacific and in other regions. The authority publishes numerous specifications for avionics, notably:
  400 Basic design guidelines.
  404A Specifications for packaging.
  429 Initial standard digital data highway [latest version 42913]. See 600.
  500 baseline specifications for analog equipment.
  578 Standards for VOR.
  600 Standards of basic technologies and packaging.
  629 Standards for 2 Mbit/s databases.
  700 Specifications for digital equipment.
  708 Standards for weather radar.
  755 Standards for multimode receivers.

Arinc communications and reporting system VHF link between aircraft systems and ground-based computer, plus messages generated by menu-driven CDU.
  ARIP Air refuelling initial point.
  ARIS Anti-resonance isolation system.
  arithmetic unit Heart of typical digital computer; portion of central processor where arithmetical and logic functions are performed; invariably contains accumulator(s), shift and sequencing circuitry and various registers.
  ARJA Association Suisse Romande des Journalistes Aéro & Astronautique (Switz.).
  ARJS Airborne radar jamming system.
  ARL 1 Aeronautical Research Laboratories (Australia).
  2 Aerospace research laboratories (US, OAR).
  3 AEROSPACE RESEARCH LABORATORIES (NASA).
  AR-L Air [or airborne] reconnaissance-low.
  Arlat Association of Registered and Licensed Aeronautical Technicians [Pretoria, South Africa].
  ARM 1 Anti-radiation missile.
  2 Atmospheric radiation measurement (US Dept of Energy).
  3 Advanced radar mode[s].
  arm 1 To prepare explosive or pyrotechnic device so that it will operate when triggered.
  2 Horizontal distance from aircraft or missile reference datum to e.g. of particular part of it.
  3 See tail arm.
  Armat Anti-radar missile, Matra.
ARMAC  
fundamental to machine design, and speed/voltage regulation.
ARMAC  
Area Regional Maintenance Center.
ARMACM  
Anti-radiation missile countermeasures.
ARMD  
Anti-radiation missile, decoy.
armed  
System switched to function upon command; thus, eg, when pneumatic escape chute (slide) is it extends immediately passenger door is opened.
armed delay  
Aerodynamic vehicle launched by penetrating bomber to generate additional target for hostile radars, send out its own countermeasures and, if it finds hostile aerial target, home on it and destroy it.
armed reconnaissance  
Mission flown with primary purpose of finding and attacking targets of opportunity.
ARMET  
Area forecast, upper winds and temperatures (ICAO).
arming  
Closing an electrical circuit [or in any other way] enabling a device or system to function when required. A typical system is a thrust reverser.
arming vanes  
One name for slipstream-driven windmill used in some aerial bombs, mines and other stores to unscrew safety device or in some other way arm device as it falls.
ARMMMAC  
Active remote maintenance monitoring and control (ILS, VOR etc).
armour  
Typical materials used in airborne armour include thick light alloys, titanium alloys, boron carbide and several filament-reinforced composites.
armourer  
Trade for military ground crew specialising in armament.
arm restraint  
In some types of ejection seat, automatic straps or arms energised during firing sequence to hold occupant’s arms securely against aerodynamic forces until he is released from seat.
ARMS, Arms  
1 Aircraft reporting and monitoring system, combines DMU, FDIU, FDR and AIDS.
2 Airport remote monitoring system.
3 Aviation reconfigureable manned simulator.
4 Airborne reconnaissance and marine surveillance.
5 Aerospace relay mirror system.
ARMSTRONG LINE  
Pressure equivalent to about 63,000 ft, 19,200 m, at which human blood boils.
ARMTS  
Advanced radar maintenance training set.
amy co-operation  
Major elements were: reconnaissance [including photography], artillery observation, contact patrols, supply dropping and, occasionally, tactical co-operation (archaic).
ARN  
Active reduction of noise.
Arnd  
Around.
ARNG, ArNG  
1 Army National Guard (USA).
2 Arrange.
ARNO  
Azimuth/range not operating.
ARNEDC  
Air Engineering Development Center, AEDC  
Large USAF installation in Tennessee charged with aerodynamic development, especially of air-breathing propulsion.
ARO  
1 Air Traffic Services reporting office.
2 Aspheric reflective optics.
3 Airport reservation office, for arranging GA traffic slots.
4 Aerial refueling operator.
5 Aircraft Recovery Officer.
6 Army Research Office (US).
7 Airfield, or airport, reporting office.

arresting gear, arrester gear  
AROD  
1 Aerodrome runway and obstruction data.
2 Airborne remotely operated device.
AROG  
Auto roll-out guidance (after blind Cat 3b landing).
aromatic  
Hydrocarbon petrol (gasoline) fuels containing, in addition to straight-chain paraffins (kerosens), various linked or ring-form compounds such as toluenes, benzenes and xylenes. Some cause rapid degradation of natural or synthetic rubbers.
AROS  
African Regional Organization for Standardization.
AROSYS  
Adaptive-rotor system.
ARP  
1 Air report (written).
2 Aero-Rifle Platoon (infantry section of Air Cavalary).
3 Air raid precautions (UK, WW2).
4 Aerospace, or aeronautical, recommended practice (SAE).
5 Aerodrome reference point (ICAO).
6 Aluminium-reinforced polyimide.
7 Attack reference point (appears in practice to mean IP) (US).
8 Applied research programme.
9 Anti-runway penetrator.
10 Airworthiness review programme.
11 Antenna rotation period.
12 Aviation regulatory proposal (Australian).
13 Anti-rotation period (radar).
14 Air-data reference panel.
ARPA, Arpa  
Advanced Research Projects Agency, created 1958, became Darpa.
ARPC  
1 Air Reserve Personnel Center (USAF, Denver, Colorado).
2 Ascending ring-plane crossover (Saturn).
ARPDD  
Automatic [or airborne] radar periscope detection and discrimination.
ARPES  
1 USAF Aerospace Research Pilots’ School, Edwards AFB, Calif.
2 Advanced radar processing subsystem (AEW).
ARPT  
Airport.
ARPTT  
Air-refueling part-task trainer (USAF).
ARQ  
Automatic error correction [repeat request].
ARR  
1 Arrival message.
2 Airborne radio relay.
3 Air-refueling receiver.
4 Air-traffic-control radar recording.
array  
Transmitting or receiving aerial (antenna) system made up of two or more (often 20 or more) normally identical aerials positioned to give enormously multiplied gain in desired direction.
ARRC  
Allied Command Europe Rapid-Reaction Corps [HQ, D-41179 Mönchengladbach] (NATO).
ARRCOS  
Arrival co-ordination system.
arrested landing  
Normal fixed-wing landing on aircraft carrier, engaging arrestor cable.
arrested-propeller system  
In aircraft with free-turbine turboprop engines, system for bringing one or more propellers to rest and holding them stationary while gas generator continues to run. Should not cause turbine overheating; speeds up turn-round and sustains on-board power without causing danger to passengers or others near aircraft.
arresting barrier  
Runway barrier.
arresting gear, arrester gear  
Fixed to aeroplane landing
arresting hook, arrester hook

area to halt arriving aircraft within specified distance. Many systems qualified for use on aircraft carriers, rough battlefield airstrips (in this case, mainly by light STOL machines) and major military runways. In nearly all cases involves one or more transverse cables traversed by hook on arriving aircraft. Kinetic energy of aircraft dissipated by cable pulling pistons through hydraulic cylinders or rotary brakes, driving fan through step-up gears or towing heavy free chains.

arresting hook, arrester hook Strong hook hinged to some land-based and most carrier-based aeroplanes for engagement of arresting gear; usually released by pilot from flight position to free-fall or be hinged under power to Engage position.

arresting unit Energy-absorbing device on one, or usually both, ends of arrester wire.

ARRGp Aerospace Rescue and Recovery Group (USAF).

arrival 1 In flight planning, calculated time when destination should be reached (see ETA); may be determined by plotting straight line from last waypoint to overhead destination, but professional pilots refine this to take account of approach procedures.

2 Inbound unit of traffic (ie one aircraft approaching destination airfield).

arrow wing Markedly swept wing; in his Wright Brothers lecture in 1946 von Kármán used ** exclusively, and ‘swept wing’ did not become universal until 1948. Modern meaning is wing with inboard section [with subtly curved profile] with LE sweep close to 80° and outer panels of more conventional form, eg sweep 30°-50°.

ARRS Aerospace Rescue & Recovery Service (USAF).

ARRW Aerospace Rescue & Recovery Wing (USAF).

ARS 1 Special air report (written).

2 Atmosphere revitalisation subsystem.

3 Auto-relight system.

4 Attack radar set.

5 Air Rescue Service (from 1996 ARRS).


arsenal

artificial feel

7 Attitude retention system (XV-15 FCS).

8 Automated retrieve system.

9 Aeroplane Repair Shop (RAF 1918–45).

10 Automated radar summary, charts issued hourly showing local echoes.

11 Active ranging system [airborne laser].

12 Air control centre. Recognised air picture production centre, Sensor fusion post [ACC]S [NATO].

13 Active radar seeker.

ARSA 1 Airport radar service area (in US reclassified 1993 as Class C airspace).

2 Apron, or advisable, radar service area.


Arsips Aerial refueling store integrated power system [RAT].

Arsis Aircraft rotation, scheduling and information system.

ARSR Air-route surveillance radar, ARTCC radar to detect and display aircraft en route between TMAs.

ART 1 Actuator remote terminal.

2 Air Reserve Technician (Afres).

3 Airborne-radar technician.

4 Adaptive-resonance theory.

5 Auto reserve thrust.

Artac The Alliance of Independent Travel Agents (UK, office Malborne, Peterborough).

Artads Army tactical data system (USA).

Artas, ARTAS Air-traffic control radar tracker and server.

ARTCC Air-route traffic control center (FAA).

ARTCS Advanced radar traffic control system (FAA).

ARTD Applied research technology demonstrator.

Artes Advanced research in telecommunications (CNES, ESA).

ARTF 1 Alkali-removable temporary finish.

2 Aircraft Recovery and Transportation Flight (RAF and USAF).

Arthur Any AFCS (F. colloq.).

ARTI, Arti Advanced rotorcraft technology integration.

article Generalised term for one aircraft, especially one operated by the CIA.

articulated blade In rotorplane, rotor blade connected to hub through one or more hinges or pivots.

articulated rod In radial piston engine, any connecting rod pivoted to piston at one end and master rod at other.

artificial ageing Ageing of alloy at other than room temperature, esp. at elevated temperature.

artificial feel In aircraft control system, esp. AFCS, forces generated within system and fed to cockpit controls to oppose pilot demand. In fully powered system there would otherwise be no feedback and no “feel” of how hard any surface was working. Simulates ideal response while giving true picture of surface moments infsofar as response curve of each surface and their harmonisation are concerned. System invariably strongly influenced by dynamic pressure q. Generates force for each surface according to optimised law [not necessarily same for all axes] and prevents pilot from damaging aircraft by primary control (but rarely takes into account rapid trimmer movements).
artificial gravity

Artificial gravity Simulated gravitational effects (but not field) in space environment. Obvious method involves rotation about axis, which introduces Coriolis forces.

Artificial horizon 1 Primary cockpit flight instrument which, often in addition to other functions, indicates aircraft attitude with respect to horizon ahead.
2 Simulation of Earth horizon (planet’s limb) for use as uniform and accurate sensing reference in near-Earth spaceflight (Orbital Scanner is programme generating data for this ideal).

Artificial satellite Man-made satellite of planetary body.

Artillery observation Assisting friendly artillery by reporting where shots are falling.

Artima Aircraft reliability through intelligent materials application (Acare).

ARTIP, Artip Advanced radar-technology insertion program (US).

Artist Advanced radar technology integrated systems testbed.

Art. obs. Artillery observation (RFC, RAF, WWI).

ARTIS, Artis 1 Automated, or automatic, radar terminal system (FAA, from 1966).
2 Aircraft-recovery transport system (after belly landing, etc.).
3 Automated remote tracking station.
4 All-round thermal surveillance.
5 All-purpose remote transport system (USAF).
6 Advanced radar target system (UK).

ARTIS Aerial refuelling tank system.

ARTT Above real-time training.

ARU Attitude retention unit (helicopter height-hold).

ARV Air recreational vehicle.

ARW 1 Air Refuelling Wing (USAF).
2 Advanced radar warning: E adds equipment, S system.

AS 1 Aerospace Standard; major standards are 9001 and 9010 (SAE).
3 Air Station, HQ of unit[s] not directly equipped with aircraft (USAF).
4 Anti-submarine; less often, anti-ship (both also A/S).
5 Airlift Squadron (USAF).
6 Anti-skid (also A/S).
7 Air start, pneumatic service vehicle.
8 Attimeter setting.
9 Anti-spoofing.
10 Aerosystems [engineer branch] (RAF).

As 1 Structural aspect ratio.
2 Altostratus.

Asat Anti-satellite.

Asata Asociación de Aviadores de Trabajos Aéreos (Spain).

ASB 1 Air Safety Board (UK, and US 1938–40).
2 American Standard Beam (structural sections).
3 Assembly section breakdown (airframe).
4 Alert service bulletin.
5 Airline Stabilization Board (US).

Asbestos Fibrous silicate minerals once used for thermal insulation and as reinforcement in composites such as Duretosts.

ASBM Air-to-surface ballistic missile, = ASBP.
ASC
ASC 1 American Standard Channel (structural sections).
  2 Aeronautical Systems Center (Wright-Patterson AFB).
  3 Ascend, ascending (ICAO).
  4 Aviation Statistics Center (Ottawa, Canada).
  5 American Society for Cybernetics.
  6 Aircraft-system controller.
  7 Air Service Command (USAAF, defunct).
  8 Air Support Command (RAF, defunct).
  9 Aviation Safety Council (Taiwan).
 10 Airborne strain counter.
 11 Aerospace planning chart.
 12 Airborne surveillance and control.
 14 Alternative simplified credit.
Ascap  Automatic SSR-code assignment procedure.
Ascas  Automated security-clearance approval system.
ASCB  Avionics synchronized control bus; commer-
cial counterpart to MIL-1553B (Sperry).
ASCR  Air Standards Coordinating Committee (US,
  UK, Canada, Australia, NZ).
ASCPC  Air and Space Control Center, run by USN
ASCCA, ASCA  Air and Space Command and Control
  Agency (USAF).
ASCE  American Society of Civil Engineers.
ascending node  Point at which body crosses to north side
  of ecliptic.
ascent  Rise of spacecraft from body other than Earth.
ASCIET  All-Service Combined Identification Evalua-
tion Team (US).
ASCH  American standard code for information inter-
  change, 7-bit plus 8th bit for parity in serial transmis-
sions.
ASCL  Air Standards Coordinating Committee (US,
  UK, Canada, Australia, NZ).
ASCN  Aircraft-sound description system.
ASCPC  Aircraft-system controller.
Assc  Aircraft-to-satellite data relay.
ASDAC  Alternative Space Defence Centre.
ASDC  Armament signal data converter.
ASDCS  Airspace surveillance display and control
  system (WSMR).
ASDE  1 Airport surface, or airfield surveillance, detec-
tion equipment (from 1952).
  2 Air situation data exchange (NATO).
ASDF  Air command and control Simulation and
  Demonstration Facility.
ASDI  Aircraft situation display indicator.
Asdic  Armed Services Documents Intelligence Center
  (US).
asdic  Sonar, from “Anti-Submarine Detection
  Investigation Committee”; UK term originally (1925)
  applied to high-energy sound systems carried in surface
  vessels.
ASDL  Airborne self-defence laser.
ASDRA  Aeronautical satellite data-link.
ASDRI  Avionic systems demonstrator rig.
ASDF  Air support equipment.
ASE  Airplane, single-engine; see ASEL, ASES.
ASEA  Aircraft-plane, single-engine, land.
ASEA  Aircraft-plane, single-engine, sea.
ASET  Aircraft survivability equipment trainer (threat 
simulator).
ASEVA  Aircraft survivability evaluation test system.
ASESNA  Air Avionics facility; see ASES.
ASES  Airplane, single-engine.
ASES  Airplane, single-engine, sea.
ASET  Aircraft survivability equipment trainer (threat 
simulator).
ASEV  Aircraft survivability evaluation test system.
ASES  Airplane, single-engine.
ASES  Airplane, single-engine, sea.
ASET  Aircraft survivability equipment trainer (threat 
simulator).
ASEV  Aircraft survivability evaluation test system.
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ASET  Aircraft survivability equipment trainer (threat 
simulator).
ASEV  Aircraft survivability evaluation test system.
ASES  Airplane, single-engine.
ASES  Airplane, single-engine, sea.
ASET  Aircraft survivability equipment trainer (threat 
simulator).
ASEV  Aircraft survivability evaluation test system.
ASICC  sharing (FAA).

ASHA  not in lattice.

a-Si  (Italy).

ASHPC  and Air-Conditioning Engineers.

ashrae  American Society of Heating, Refrigerating and Air-Conditioning Engineers.

Aft-station HUD monitor.

ASHM  the oil from ashing when overheated.

Lubricating-oil additive which stops

Assault Support Helicopter Company (USA).

ASHC  Assault Support Helicopter Company (USA).

airline

ASGC  Airborne-surveillance ground control.

ASH  1 Advanced, or assault, support helicopter (USA).

2 Active seeker homing.

ASHC  Assault Support Helicopter Company (USA).

ashless dispersant  Lubricating-oil additive which stops the oil from ashing when overheated.

ASHM  Aft-station HUD monitor.

Ashrae  American Society of Heating, Refrigerating and Air-Conditioning Engineers.

Avionics system integration.

11 Associazione Sindicale Intersind [I-00185 Rome] (Italy).

12 Aircraft station interface.

a-Si  Amorphous silicon, atoms arranged haphazardly, not in lattice.

ASIA  Association Suisse de l’Industrie Aéronautique [CH-5400 Baden].

ASIAS  Aviation Safety information analysis and

ASH  aviation safety information analysis and sharing (FAA).

ASIC  Application-specific integrated circuit.

2 Australian Securities and Investment Commission.

ASICC  Australian Space Industry Chamber of Commerce [Sydney, NSW 2001] (Australia).

ASID  Aeronautical Society of India.


ASJ  Automatic search jammer.

a-SID  American Society for Information Display.

ASME  The American Society of Mechanical Engineers [office, New York].

ASMA  Aerospace Medical Association, often

ASMI  American Society for Metals.

ASMR  Automatic shift-keying.

1 Automatic shift-keying.

2 Available seat-km.

ASL  Above sea level (UK = AMSL).

2 Authorised service life.

ASLA  Atmospheric Sciences Laboratory (WSMR).

ASLAG  Aviation Safety Licensing Authority (NZ).

ASLE  Accident Site Investigation Officer.

ASM  Air/surface, or air-to-surface, laser ranger.

1 Air/地面-to-surface missile; NZ has used * to mean anti-ship missile.

Air-to-surface missile.

ASMV  Augmented satellite launch vehicle (India).

ASM  Air-to-surface missile; NZ has used * to mean anti-ship missile.

ASM  1 Available, or aircraft, seat-miles (often a.s.m.).

2 Advanced systems monitor (in cockpit).

ASM  American Society for Metals.

Autothrottle servo-motor.

ASP  Accurate Service-Life Period.

Astron  Airscrew Launching System.

Aviation Safety Information Analysis and

ASFT  Air Supply Mission Technology.

ASMD  Airfield surface movement indicator.

ASMR  Advanced short/medium-range.

AMS  Air-supply mission technology.

ASMU  Airscrew Launching System.

ASN  Abstract syntax notation, protocol for message handling; can be followed by identity number.

ASNA  Aviation Safety and Noise-abatement Act (US).

ASNT  Asphalt pavement performance; can be followed by identity number.

Atmospheric Sciences Laboratory (WSMR).

Accident Site Investigation Officer.

ASMA  Aerospace Medical Association, often

ASME  The American Society of Mechanical Engineers (office New York).

ASLA  Airstaff Instructions (usually plural, ASIs).

ASLO  Accident Site Investigation Officer.

APM  Air-supply mission technology.

ASLV  Augmented satellite launch vehicle (India).

ASLI  Airframe Maintenance Information Library.

ASLM  Anti-ship missile defense (USN).

2 Air, space and missile defense (USN).

ASME  The American Society of Mechanical Engineers (office New York).

ASMT  Airfield surface movement indicator.

ASM  Airscrew Launching System.

Aviation Safety and Noise-abatement Act (US).

ASN  Atmosphere, or atmosphere, launch vehicle (India).

ASM  Air-space management.

ASPO  Aircrew Survival Program Office.

ASM  Air-supply mission technology.

ASIS  1 Authorised Service Life Period.

AMS  Aircrew Survival Program Office.

ASPF  Air-Ground System Performance.

TAM  Airline maintenance equipment.

ASME  The American Society of Mechanical Engineers (office New York).

ASNA  Aviation Safety and Noise-abatement Act (US).

ASNT  American Society for Non-destructive Testing [office, Columbus, OH 43228-0518] (US).

ASNT  Aircraft management information system.

ASMG  Airfield services management.

ASM 作者的姓名，例如 Air Staff Management Aid (UK).

ASM  Advanced agonistic support missile.

ASM  Advanced aerosol systems management.

ASMT  Aircraft maintenance technology.

ASMU  Airscrew Launching System.

ASN  Abstract syntax notation, protocol for message handling; can be followed by identity number.

ASNA  Aviation Safety and Noise-abatement Act (US).

ASNI  Ambient sea-noise indication.

ASNT  American Society for Non-destructive Testing [office, Columbus, OH 43228-0518] (US).

ASNT  Advanced aeronautical ground system technology.

ASND  Airfield noise data.

ASM  Advanced aeronautical ground system technology.

ASNA  Aviation Safety and Noise-abatement Act (US).

ASNI  American Society for Non-destructive Testing [office, Columbus, OH 43228-0518] (US).

ASNT  Authorised service life period.

ASM  Airfield service movement indicator.

ASM  Airfield services management.

ASM  Airfield service movement indicator.

ASM  Airfield service movement indicator.

ASM  Airfield services management.

ASM  Airfield service movement indicator.

ASM  Airfield service movement indicator.

ASM  Airfield service movement indicator.

ASM  Airfield services management.

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ASM  Airfield service movement indicator.

ASM  Airfield services management.

ASM  Airfield service movement indicator.

ASM  Airfield services management.
ASO

ASO 1 Air-support operations, see ASOC.
2 Acoustic-systems, or sensor, operator.

ASOC 1 Air-Support Operations Centre (RAF), Center (GTACS).
2 Air Sovereignty Operations Centre.

Asops Airport-security operational process simulation.

ASOS Automated surface observation, or observing, system; at uncontrolled airfields gives voice readout of useful data.

ASP 1 Armament status panel.
2 Aircraft servicing platform [or pan].
3 Automated small-batch production.
4 Audio selector panel.
5 Airbase survivability program (US).
6 Adaptive, or advanced, or aircraft, or airborne, signal processing, or processor.
7 Aircrf service package.
8 Application service provider.
9 Altimeter setting panel.
10 Airborne surveillance platform.
11 Airfield[s] systems planning (ICAO).
12 Arrival sequencing program.
13 Aircraft systems processor.
14 Antenna scanning[ing] period.
15 AFS(1) planning.
16 Airspace policy.
17 Accelerated share purchase.

ASPA Asociación Sindical de Pilotos Aviadores (Mexico).

Aspare Air-surveillance and precision-approach radar control system (USMC).

ASPC See CSPA.

ASPCU Aur supply/pressurization control unit.

ASPE Speed of sound in EDP.

aspect ratio Changing appearance or signature of reflective target as seen by radar, caused by attitude changes.

aspect change Changing appearance or signature of reflective target as seen by radar, caused by attitude changes.

aspect ratio General measure of slenderness of aerofoil in plan. For constant-section rectangular surface, numerical ratio of span divided by chord, discounting effects due to presence of body or other parts of aircraft. For most wings ** A is defined as b2/S, where b is span measured from tip to tip perpendicular to longitudinal axis (slew or VG wing as nearly as possible transverse) and S is gross area. Structural ** As generally defined as b2sec A or Λ = b2/2A, where Λ is ½-chord sweep angle. Confusingly, A, cos−2 Λ, is now losing ground to Λ, Effective or equivalent ** increased by fitting end-plates (eg horizontal tail surface on top of fin), but there is no universally applicable formula. Optimum ** usually means that giving minimum wing weight, but this is seldom the best overall. Generally, faster aircraft have lower **; shorter field length demands higher **. Sailplanes and powered aircraft need extremely high **, from 20 to 40.

Aspen Aerospace planning and execution network (USA).

Asphalt Asph.

Aspire 1 Advanced supersonic propulsion integration and research (NASA).
2 Asia and South Pacific initiative to reduce emissions.

Aspis Advanced self-protection integrated suite.

ASPJ Advanced, or airborne, self-protection jamming, or jammer.

ASPO 1 Army Space Program Office (USA).
2 Avionics Systems Project Officer (USAF).
3 Aviation Strategic Planning Organization (Australia).

ASPP Airfield [originally aeronautical fixed] Service Planning Panel (ICAO).

ASPR Armed Services Procurement Regulations (US).

Aspro Airborne associate [from “advanced signal”] processor.

ASPS 1 Airborne self-protection system.
2 Advanced self-protection suite.

ASPPS Aircraft self-protection security system.

ASQC American Society for Quality Control.

ASQF Assurance-specific qualification facility, alternative form of PACF for Satnavs (ICAO).

ASRAM, Asraam Advanced short-range AAM.

ASR 1 Air/sea rescue [see ASR apparatus].
2 Aerodrome, airfield, airport, or approach, surveillance radar.
3 Air Staff Requirement (UK).
4 Altimeter setting region.
5 Automatic send/receive.
6 Acceleration, or accelerating, slip reduction.
7 Air Safety Report, of hazardous event.
8 Alternate system[s] review (USAF).

Asrad Advanced short-range air defence.

ASR apparatus Term for that dropped to survivor(s), including 3 canisters containing dinghy, food, radio etc.

ASRC Alabama Space and Rocket Center, Huntsville.

ASRgn Altimeter setting region.

ASRM Advanced solid rocket motor (NASA).

Asroc Anti-submarine rocket.

ASRP Aviation Safety Reporting Program (FAA/NASA, from 1976).

ASRS 1 Aviation safety & reporting system (NASA, 1975–).
2 or ASRS Automatic storage/retrieval system.

ASRT 1 Air support radar team.
2 Autonomous scout rotorcraft testbed (DoD).

ASRTE Avion station relais de transmissions exceptionelles, also redered Astarte (F).

ASRWSP Airport surveillance radar with weather systems processor.

ASS 1 Attitude-sensing system.

ASPP 1 Support subsystem.
2 Air Signal’s School (RAF).
3 Air Signallers’ School (RAF).
4 Anti-shelter submunition.
5 Aviation support ship.
6 Atmospheric sounding system.

ASSA 1 Aeronautical Society of South Africa, more usually in Afrikaans: LKV.

2 Aviation system of systems architecture (US).

ASSAD, Assad Union of aviation-engine producers (R, CIS).

assault aircraft Aeroplanes and/or helicopters which convey assault troops to their objective and provide for their resupply.

assembly 1 Completed subsystem, portion of airframe or other part of larger whole which itself is assembled from smaller pieces.
2 Process of putting together parts of functioning item of equipment, engine, subsystem, portion of airframe or other aerospace hardware (other than complete aircraft,
assembly drawing

buildings, docks, large launch complexes and similar major structures, for which preferred term is erection).

assembly drawing Engineering drawing giving no information on manufacture but necessary for correct assembly; shows geometric relationships, assembly sequence, necessary tooling (jigging), fits and tolerances, and operations required during assembly.

assembly line Essentially linear arrangement of work stations in manufacturing plant for assembly or erection of finished product or major component (eg wing). Modern aircraft produced in such small numbers optimum erection-shop layout often not linear. High-rate production (eg car engines or radio sets) parts travel on belt or overhead conveyor from station to station (see transfer machines).

ASSET Aero-Space Structure Environmental Test; USAF research programme.

Asset Airborne sensor system for evaluation and test (Northrop).

asset Item or group of items from a nation’s military inventory, especially those serving front-line function.

ASSG Acoustic-sensor signal generator.

assigned amount In emissions legislation, the maximum permitted.

Assist Affordable space systems intelligent synthesis technology (USAF/NASA).

assisted takeoff, ATO Aerodynamic takeoff with linear acceleration augmented by accelerator, by self-propelled trolley, by rockets attached to aircraft or by other means not forming part of normal flight propulsion. Criterion is use of external force; mere downward slope, giving component of weight in takeoff direction, does not qualify.

ASSM Anti-ship supersonic missile.

associated (VOR, Tacan) VOR and Tacan/DME facilities either co-located or situated as closely as possible, subject to maximum aerial (antenna) separation of 100 ft in TMAs when used for approach or other purposes requiring maximum accuracy, or 2,000 ft elsewhere.

associative processor Digital computer processor operating wholly as ancillary to another, usually larger, installation. Normally has no parent computer. Future ATC computer installations may use powerful large-memory sequential machine to resolve conflicts and exercise overall control, supplemented by ** working in parallel seeking potential conflicts.

ASSR 1 Airport surface-surveillance radar.

2 Approach-control secondary surveillance radar.

3 Air-security screening records (TSA).

ASSRP Air and Space Scientific Research Program (AFRL).

AS1, ASSS 1 Active-search sonobuoy system.

2 Airport surface-surveillance system.

AST 1 Anti-ship surveillance and tracking, or targeting.

2 Advanced supersonic transport core.

ASSTC Aerospace Simulation and Systems-Test Center.

assured destruction Concept of measurable inevitable damage inflicted on enemy heartlands for purposes of deterrence and arms limitation.

ASSV 1 Alternate-source selectvalve.

ASSW 1 Anti-surface-ship warfare.

2 Associated with (met. report).

Astra, ASTRA

AST 1 Advanced supersonic transport (or technology).

2 Advanced simulation technology.

3 Atmospheric surveillance technology.

4 Air Staff Target (UK).

5 Accelerated service test.

6 Airborne surveillance testbed.

7 Avionics system trainer.

8 Atlantic Standard Time.

9 Applied signal technology.

ASTA 1 American Society of Travel Agents [office, NY City].

2 Airport surface-traffic automation [S adds system] (FAA).

3 Aircrew synthetic-training aid(s).

astable Not having a stable state.

Astamids Airborne standoff minefield-detection system (passive IR).

AST&L American Society of Transportation and Logistics [Lock Haven, PA 17745-1419] (US).

Astar Airborne search/track, or target, attack radar.

Astarte Avion station relais de transmissions exceptionnelles (F).

astatic Without specific orientation or direction.

ASTC Aviation Security Training Centre [B-1931 Zaventem] (Int.).

ASTE 1 Association pour le Développement des Sciences et Techniques de l’Environnement (F).

2 Advanced strategic/tactical expendables [mainly IR sources].

Aste 1 Automation system(s) for terminal and en-route control.

2 Advanced small turbine-engine core.

3 Advanced strategic/tactical expendable(s) [IR decoy].

Aster Advanced spaceborne thermal emission and reflection radiometer.

Asterix All-purpose structure Eurocontrol radar info. exchange.

asteroid Minor planet, esp. fragments (mostly much less than 50 miles across) orbiting between Mars and Jupiter; thus, small body, such as artificial satellite, in solar orbit.

ASTF 1 Aeropropulsion Systems Test Facility (at AEDC, commissioned September 1985).

2 Airspace system task force.

ASTI Airport surface-traffic indicator.

Astia Armed Services Technical Information Agency (US).


ASTO Arab Satellite Telecommunications Organization (Int.).

ASTOL Alternate (alternative is meant) STOL.

Astor Airborne stand-off radar.


Astolv, ASTOVL Advanced Stovl.

ASTP 1 Apollo-Soyuz Test Project (US, USSR).

2 Advanced Space Transportation Program (NASA).

ASTR Attack store; usually (and very confusingly) means which type of AAM is selected, not air/ground weapon.

Astra, ASTRA 1 Applications of Space Technology to Requirements of Civil Aviation (ICAO panel); 1986
Astral
renamed Application of Space Techniques Relating To Aviation, later still Space replaced by Satellite.

2 Air staff training programme.
3 Association in Scotland to Research into Astronautics [office, Anderson, Glasgow G3](UK).
4 Advanced stability training and research aircraft [previously systems training aircraft] (ETPS).
5 Attitude steering turn-rate azimuth.
6 Alternative abb. for Aviation Strategic Planning Organization (Australia).
Astral Air-surveillance and targeting radar L-band.
Astrals Airport surface-traffic awareness system (ICAO), confusion with ASTA[2].
Astraea Autonomous systems technology related airborne evaluation and assessment [UAV] (UK).
Astrid Airborne system for target recognition, identification and designation.
astronics Space electronics.
Astro 1 Air support to regular operations (police helicopters).
2 Autonomous space transport robotic operations, or - and robotic orbiter (Darpa).
astrobiology Science of possible life on planets other than Earth, or elsewhere in space (note, in R means ‘space medicine’).
astrocompass Non-magnetic instrument, gives direction of true North relative to celestial body which must emit light and be of known direction (see astronavigation). 
astrodome Optically transparent dome in roof of large aircraft 1935–50 through which navigator could take astro fixes using sextant.
astro fix Fix obtained by sighting two or more stars of known direction using sextant or astrocompass.
astrogation Navigation in space, suggest colloq.
astro-inertial Navigation by means of inertial system updated or corrected by astro fixes.
astronaut One who navigates in space; ie who travels in space. Specif. [capital A], one selected for space flight by NASA.
astronautics Science of study, design, construction and operation of spacecraft.
astronavigation 1 Navigation of aircraft or spacecraft by measuring declination, right ascension and/or other angular positions of stars and other celestial bodies whose location on celestial sphere is known.
2 Navigation of spacecraft by any means (usage ambiguous).
astronics Astronics.
astronomical twilight Period between day and night when Sun’s centre between 12° and 18° below sea-level horizon (see civil twilight, nautical twilight).
Astronomical Unit, AU, A.U. Unit of linear distance based on mean distance between Earth and Sun; accepted value was 149,598,500 km, but IAU definition is now 1.496×10^11 m.

astronomy Science of celestial bodies other than Earth. Not included in this definition are celestial phenomena, such as polarisation of stellar light and other measures concerned more with radiation than with ‘bodies’. Thus, subdivision radar *, X-ray *, IR *, UV * etc.
astrrophysics Physics of observable universe, esp. states of matter and energy generation and transfer.
astroseismology Study of earthquakes on bodies other than Earth.

asymptote
Asymptote Automatic sextant capable of searching celestial sphere for particular luminous body, identifying it and determining orientation in terms useful for navigation, and of repeating sequence with same and at least one other celestial body. Corrects and updates INS in long-range aircraft.
ASTS 1 Association Suisse pour les Techniques Spatiales (Switz).
2 Advanced screening technology systems.
ASU 1 Aeromedical staging unit.
2 Altitude (or, confusingly, attitude) sensing unit.
3 Approval for service use.
4 Aircraft storage unit (UK).
5 Aircraft starting unit.
6 Acoustic simulation unit.
7 Avionics switching unit.
8 Anti-surface.
9 Analyser sub-unit.
Asupt Advanced simulator for undergraduate pilot training.
ASUW, ASuW Anti-surface [or anti-surface-unit] warfare aircraft category (USN).
ASV 1 Air-to-surface vessel. WW2 airborne search radar. Incorrectly rendered as anti-surface vessel. See ASVW.
2 Aerial swimming vehicle.
ASVEH Air-surveillance vehicle.
AVSR Aircraft-systems verification [now changed to validation] rig.
AVS Airborne separation video system.
AVSW Anti-surface vessel warfare, today’s term.
ASW 1 Anti-submarine warfare [AC adds analysis center, AS area system, DS data system, SOW stand-off weapon and T trainer].
2 Aft-swept wing.
3 Confusingly, also used in US for anti-ship warfare, and in UK (WW2) for air/sea warfare.
4 Acquisition scan window (UAV).
ASWA Aeronautical Society of Western Australia Inc. (Perth South).
ASWAC Airborne surveillance, warning and control [S adds system] (India).
ASWDU Air/Sea Warfare Development Unit (RAF/RN).
ASWE Admiralty Surface Weapons Establishment (Portsmouth, UK).
ASWT Air-to-surface weapons technology.

asymmetric flight Flight by aerodyne in sustained grossly asymmetric condition of lift, weight, thrust or drag, esp. flight by multi-engined aircraft in which at least one engine at substantial distance from axis of symmetry is inoperative.

asymmetric leading Flight by aircraft, esp. aerodyne, in which e.g. is located at substantial distance from vertical line through centre of lift with aircraft in level attitude and trimmed for normal horizontal flight (eg strike aircraft unable to release one of two heavy stores carried on outerwing pylons).

asymmetric warfare Conflict between a high-tech nation and a primitive one.

asymptote Limiting position of tangent to curve, where
asynchronous

lines meet at infinity. Thus, asymptotic, where slope of plotted curve becomes parallel to either x or y axis.

asynchronous

Not synchronised, not in frequency or phase.

asynchronous computer

Electronic computer, usually digital, in which operations do not proceed according to timing clock but are signalled to start by completion of preceding operation.

ASZ

Air surface zone (NATO, USAF).

AT

1 Advanced trainer (USAAF category, 1924–48).

3 Autothrottle [also A/T].

5 Armament trainer (F-22).

7 Air transport (role of tanker).

8 Advanced targeting.

9 Advanced-technology anti-tank.[

See ATTT.

ATA

1 Air Transport Auxiliary, UK ferry organization 1940–45; also the Association, 1946– [office, Chipping Sodbury BS17 6XG].


3 Actual time of arrival.

4 Advanced tactical aircraft.

5 Air Transport Association (UK).

6 Automatic target-acquisition.

7 Aero Testing Alliance (F, G, Neth.).


9 Airport traffic area.

10 Airline-tariff analysis.

11 Advanced testbed[s] for avionics.

12 Aerial tactics area.

13 Air Traffic Alliance [Airbus, EADS, Thales, 2003–] (Int.).

ata

Atmosphere]: pressure; 1 ata [atm in UK] = 101.325 kPa = 14.695 lb/in².

ATAAC

Anti-torpedo air-launched countermeasure[s].

ATAAS

Advanced terminal area approach spacing.

ATAB

Air Transport Allocation [board], joint agency in theatre of operations which assigns priorities to loads.

ATAC

1 Air Transport Association of Canada [office, Ottawa].

2 Applied-technology advanced computer (airborne EW).

3 Air-transportable acoustic communication[s], expandable buoy.

ATACC

Advanced tactical air command center (USMC).

ATACMS

Army tactical missile system[s] (USA).

Ataco

Air Tactical Control Officer.

ATAF

1 Allied Tactical Air Force (NATO).

2 Association Internationale des Transporteurs Aériens [acronym from previous title; F-75008 Paris] (F).

ATAFCS

Airborne target acquisition and fire-control system.

ATAG

Air Transport Action Group, coalition pressuring for better infrastructure [CH-1215 Geneva 15] (Int.).

Atags

Advanced-technology anti-g suit (USAF).

ATAL, Atal

1 Automatic test application language.

2 Appareillage de TV sur aéronef léger (F).

Ataps

Advanced-technology air-refuelling system (USAF).

ATAS, Atas

Air traffic advisory service (FAA).

ATATS

Automatic traffic-advisory and resolution service (UK).

ATB

1 Advanced-bomber.

2 Air-Transport Bureau (ICAO).

3 Aerospace Technology Board.

4 Automated ticket and boarding pass.

5 Advanced-technology blade (HP turbine).

6 Aircraft turn back [mission abandoned while en route].

ATBM

Anti-tactical, or anti-theater, ballistic missile.

ATC

1 Air traffic control; C adds centre.

2 Air Training Corps (replaced ADCC in 1941; HQ Air Cadets, RAF College, NG34 8HB) (UK).

3 Air Training Command (USAF, from 15 April 1946).

4 Air Transport Command, formed from Air Ferrying Command 1 July 1942, became MATS.

5 Approved Type Certificate, first issued (by DoC) in 1927.

6 Advanced-technology component (DoD).

7 Aerospace Technical Council (AIAA).

8 Air transport conference (travel agencies).

9 Automatic [usually EW] threat-countering.

10 After top centre.

11 Acoustic-torpedo countermeasures.

12 Automatic tuning control.

13 Astronomy Technology Centre (Edinburgh, UK).

14 Airport traffic control (US DoC 1938).

15 Auxiliary, or ancillary, terrestrial component. [= CGC].

ATCA

1 Air Traffic Control Association of America [1955–, office Arlington, VA22201] (US).

2 Air Traffic Conference of America.

3 Allied Tactical Communications Agency (NATO, Brussels).

4 ATC Assistant (UK).

5 Advanced tanker/cargo aircraft (USAF).

ATCAC

ATC Advisory Committee (US Congress).

Atcap

1 ATC Automation Panel (ICAO).

2 Air transport (role of tanker).

3 Advanced targeting.

4 Airline-tariff analysis.

5 Approved Type Certificate, first issued (by DoC) in 1927.

6 Advanced-technology component (DoD).

7 Aerospace Technical Council (AIAA).

8 Air transport conference (travel agencies).

9 Automatic [usually EW] threat-countering.

10 After top centre.

11 Acoustic-torpedo countermeasures.

12 Automatic tuning control.

13 Astronomy Technology Centre (Edinburgh, UK).

14 Airport traffic control (US DoC 1938).

15 Auxiliary, or ancillary, terrestrial component. [= CGC].

ATCAL

1 Air Traffic Control Association of America [1955–, office Arlington, VA22201] (US).

2 Air Traffic Conference of America.

3 Allied Tactical Communications Agency (NATO, Brussels).

4 ATC Assistant (UK).

5 Advanced tanker/cargo aircraft (USAF).

2 Air-Transport Bureau (ICAO).

3 Aerospace Technology Board.

4 Automated ticket and boarding pass. 

5 Advanced-technology blade (HP turbine).

6 Aircraft turn back [mission abandoned while en route].

ATBM

Anti-tactical, or anti-theater, ballistic missile.

ATC

1 Air traffic control; C adds centre.


3 Air-transportable acoustic communication[s], expandable buoy.

ATACC

Advanced tactical air command center (USM).

ATACMS

Army tactical missile system[s] (USA).

Ataco

Air Tactical Control Officer.

ATAF

1 Allied Tactical Air Force (NATO).

2 Association Internationale des Transporteurs Aériens [acronym from previous title; F-75008 Paris] (F).

ATAFCS

Airborne target acquisition and fire-control system.

ATAG

Air Transport Action Group, coalition pressuring for better infrastructure [CH-1215 Geneva 15] (Int.).

Atags

Advanced-technology anti-g suit (USAF).

ATAL, Atal

1 Automatic test application language.

2 Appareillage de TV sur aéronef léger (F).
Atcare

2 Army Telecommunications Automation Program (USA).
Atcare ATC analysis and recording environment.
Atcase 1 ATC administration system.
ATCC ATC centre/center (UK/US).
ATC clearance Authorization by ATC for purpose of preventing collision between known aircraft for aircraft to proceed under specified conditions in controlled airspace (FAA).
ATCC, ATC3 ATC Command Center (FAA).
ATCCS 1 ATC communications training system.
A2 ATC control-tower simulator.
ATCE Air training centre of excellence.
ATCEU ATC Evaluation Unit (Hurn, UK).
ATCGS ATC ground segment [of satellite link].
ATCI ATC investigation of airprox.
ATCMFT ATC multifunction trainer.
Atco, ATCO 1 ATC officer.
A2 Air-taxi and commercial operator.
Atcom Aviation and Troop Command (USA).
ATCOMS, Atcoms ATC operations, or and operational, management system[s].
ATCPA Air Taxi & Commercial Pilots Association (office, Washington DC).
ATCPS ATC procedures simulator.
ATCRP ATC procedural trainer.
ATCR 1 Air Training Command Regulation[s] (USAF).
A2 ATC room[s].
ATCRBS ATC radar-beacon system (FAA).
ATCRS ATC radar simulator.
ATCRU ATC radar unit (UK).
ATCS 1 ATC Service (UK), or simulator.
A2 Active thermal-control system, or subsystem.
A2 Automated tower control system.
ATCSCC ATC System (originally Services) Command Center (FAA, Herndon, VA).
ATCSS ATC signalling system (air/ground datalink tested 1958 as alternative to voice).
ATCF ATC (14) tower; S adds simulator.
ATD 1 Actual time of departure.
A2 Airline-, or aviation-, transmitted disease.
1 [translated] Aviation technical division (USSR, R).
A2 Automatic threat detection; S adds system.
3 Applied Technology Directorate (USA).
A2 Along-track distance.
A2 Advanced-technology demonstrator.
ATDA Augmented target docking adaptor.
ATDC Automatic, or assisted, target detection and classification.
ATDI Aviation Training and Development Institute (IATA).
ATDL Advanced, or Army, tactical, or air-transport, datalink (USA).
ATDMA Advanced time-division multiple access.
ATDRR Autonomous airborne tactical data radio relay.
ATDS 1 Airborne tactical data system.
A2 Air-turbine drive system.
ATDU Air Torpedo Development Unit (RAF Gosport 1940–46) later Helston, now defunct.
ATE 1 Automatic test equipment.
A2 Aircraft test and evaluation (UK).

3 Actual time en-route.
1 Advanced technology and engineering (also AT&E).
5 Air traffic engineer [inspects and maintains navaids].
ATEC 1 Aviation Technician Education Council (US).
2 Automatic test-equipment complex.
3 Air[craft] Test & Evaluation Centre [Boscombe Down, previously A&AEE] (QinetiQ).
Ateca, ATECMA Agrupación Técnica Española de Constructores de Material Aeroespacial [E-280015 Madrid] (Spain).
Ategg, ATEGG Advanced turbine engine gas-generator.
Atecs, ATEMS Advanced threat-emitter simulator.
Atepa Asociación Técnicos y Empleados de Protección e Seguridad a la Aeronavegación (Argentina).
ATER 1 Advanced triple ejector rack.
ATES Aircraft Test and Evaluation Sector (QinetiQ/DRA, Boscombe Down).
ATESS 1 Aerospace and telecommunications engineering support services.
A2 Advanced tactics and engagement simulation subsystem.
ATF 1 Advanced tactical fighter.
A2 Aviation turbine fuel.
A2 Actual time of fall.
A2 Amphibious task force.
A2 Adaptive terrain-following.
A2 Altitude test facility.
A2 Air traffic flow.
A2 Aerodrome, or airport, traffic frequency.
A2 Air-transport facility.
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A2 Advanced tactics and engagement simulation subsystem.
ATIC

2 Anti-trust immunity [DoT] (US).
3 Air Technical Intelligence (USAAF, USAF).
ATIC Avionics Test and Integration Complex (Edwards AFB).
ATIF 1 Aeronautical telecommunications network trials infrastructure (ICAO).
2 All-source track and identification fusion.
ATIG Air Technical Intelligence Group, of FEAF (1945–).
Atigs Advanced tactical inertial guidance system.
ATILO Air technical-intelligence liaison officer.
ATIMS Airborne target-information management system.
ATIMU Advanced tactical inertial-measurement unit.
ATIR Air-traffic incident report.
ATIRCM Advanced threat, or theatre, IR countermeasures.
ATIS 1 Automatic, or automated, terminal information service (ICAO, FAA); continuous broadcast of recorded non-control information in selected high-activity terminal areas (to improve controller effectiveness, and relieve congestion by automating repetitive transmission of routine information.
2 Airfield-terminal information system.
3 Air-traffic information service, or server, or system.
ATISD Air Training Information Systems Division (Randolph AFB).
ATITA Air Transport Industry Training Association (UK).
ATITB Aviation and Travel Industry Training Board (Nz).
ATK Aviation turbine kerosene; F adds fuel.
ATKHB Attack Helicopter Battalion (USA).
Atk 1 Available tonne-kilometres.
2 Anti-tank.
ATL 1 Airborne, or advanced, tactical laser.
2 Auto-trim loop.
3 Acquisition, technology and logistics (DoD).
4 Automatic tape layer, or tapelaying.
ATLA Air Transport Licensing Authority (Hong Kong, formerly).
Atlantic Airborne targeting low-altitude navigation thermal imaging and cueing.
Atlass Advanced technology low-altitude surveillance system.
ATLB Air Transport Licensing Board (UK).
Atlls Automatic tracking laser illumination system.
ATLND Automatic takeoff and landing (UAV).
ATM 1 Air-turbine motor.
2 Air transport movement, or management.
3 Air tasking [previously base] message, request for a particular combat mission to be flown (RAF).
4 Anti-tactical missile.
5 Anti-tank missile, or mine, or munition.
6 Asynchronous transfer, or transmission, mode.
7 Airspace, or air, [and] traffic management [C adds centre, MG management group].
8 Aileron trim motor.
9 Air-targeting mode.
Atm Atmospheres pressure (UK usage, see ata).
ATMA 1 Association Technique Maritime et Aéronautique (F).
2 Active tuned mass absorber.
Atmac Air Traffic Management Advisory Committee (RTCA).
ATMDC Air Traffic Management Development Centre [Christchurch BT23 6DF] (UK).
ATMG Arms Transfer Management Group (US DoD).
Atmos Ammunition, toxic material open space.
atmosphere 1 Gaseous envelope surrounding Earth, subdivided into layers (see atmospheric regions, model atmosphere). For composition see Air.
2 Gaseous or vapidue envelope surrounding other planets and celestial bodies.
3 Theoretical model atmosphere providing standard basis for performance and other calculation.
4 Any of group of units of pressure all approximately equal to pressure of atmosphere on Earth at sea level.
5 Most important is Standard * (abb. ata on European continent, atm in UK) equal to 101,325 Nm⁻² = 101,325 Pa = 101.325 kPa = 1,013.25 mb = 1.01325 bars or hectopise = 14.6959 lbf in⁻² = 761.848 mm (29.994 in) Hg at 16.6°C. Second is Metric * (also ata) equal to 0.98642 Standard * and defined as 0.981117 bars (981.117 mb, ie acceleration due to 1 g) or 14.223 lbf in⁻². Third is Technical * (at), usually identical with Metric. Fourth is bar (b), 1,000 mb = 750.07 mm Hg = 14.5038 lbf in⁻². (see pressure).
atmospheric absorption Absorption of EM radiation due to ionisation in atmosphere. Apparent loss of signal or beam power may be much greater, as result of diffraction and dispersion by vapour and particular matter.
atmospheric boundary layer Generally defined as Earth’s surface up to 5,000 ft or 1.5 km.
atmospheric braking Use of air drag, esp. of upper atmosphere on re-entering spacecraft or RV, converting very high kinetic energy into heat.
atmospheric circulation Gross quasi-permanent wind system of Earth, based on bands between parallels of latitude.
atmospheric constituents See air.
atmospheric diffraction Of importance chiefly with sound waves, which can be substantially changed in direction and intensity distribution by changes in air velocity and density. Effect with most EM radiation is small.
atmospheric duct Almost horizontal layer or channel in troposphere apparently defined by values of refractive index within which EM radiation, esp. in microwave region, is propagated with abnormal efficiency over abnormally great distances.
atmospheric electric field Intensity of electrostatic field of Earth varies enormously, but on fine day may be about 100 V m⁻¹ at SL falling to around 5 V m⁻¹ at 10 km height.
atmospheric entry

Air/Earth current continuously degrades ***, believed that thunderstorms reinforce it.

atmospheric entry

Re-entry, or entry of extraterrestrial bodies such as meteors.

atmospheric filtering

Use of upper zones of ionosphere and mesosphere to filter out ICBM decoys from true trajectories, while decoys decelerate more violently, fall behind and burn up.

atmospheric pressure

See atmosphere (4), atmospheric regions.

atmospheric refraction

Bending of EM radiation as it passes through different layers of atmosphere, esp. obliquely. Affects radio and radar, esp. when directionally beamed, visibly manifest in air over, say, hot roadway in sunshine when objects seen through this air ‘shimmer’; in astronavigation ** makes apparent altitude of celestial bodies falsely great.

atmospheric regions

Layers of Earth’s atmosphere differ in different model atmospheres; following notes are based on ISA. Lowerest layer, troposphere, extends from SL to about 8 km (26,000 ft) at poles, to 11 km (36,090 ft) in temperate latitudes, and to 16 km (52,000 ft) over tropics. Throughout this region ISA characteristics of temperature, pressure and relative density are precisely plotted. Assumed lapse rate is 6.5°C km⁻¹ and at tropopause, taken in ISA to be 11 km (36,090 ft), temperature is ~56.5°C. From tropopause stratosphere extends at almost constant temperature but falling pressure to 30 km, stratosphere, above which is mesosphere. Here there is reversed lapse rate, temperature reaching peak of about 10¹⁰°C at 47.35–52.43 km, thereafter falling again to minimum of 180.65°K at mesopause (79.994–90.000 km). Above this is ionosphere, extending to at least 1,000 km, where temperature again rises through 0°C (273°K) at about 112 km and continues to over 1,000°C at 150 km and to peak of about 1,781°C at 700 km. Between 100–150 km lies E (Kennelly-Heaviside) layer; at 200–400 km is F (Appleton) layer, which at night is single band but by day divides into F1 and F2, F2 climbing to 400–500 km on summer day. F and E layers are reflective to EM radiation striking at acute angle. Above ionosphere is open-topped exosphere, from which atmospheric molecules can escape to space and where mean free path varies with direction, being greatest vertically upward. Other ** are based upon composition, electrical properties and other variables.

atmospheric tides

Produced by gravitational attraction of Sun and Moon. Latter exerts small influence, equal to equatorial pressure difference of 0.06 mb, but solar ** has 12 harmonic component (apparently partly thermal) of 1.5 mb in tropics and 0.5 in mid-latitudes.

atmospheric turbulence

See gust, CAT.

ATMRP

Air traffic management research program[me].

ATMS

1. Air-traffic management system[s].
2. Advanced-technology microwave sounder.
3. Aeronautical telecommunications network.
4. Air-traffic network.
5. Air-traffic navigation integration and co-ordination system (USA).
6. Air-traffic network management.
7. ATN(1) panel.

ATNS

Air-traffic [and] navigation services.

ATO

1. Air task, or tasking, order.
2. Assisted takeoff.
3. Abandoned takeoff.
4. Abort to orbit, ie cannot avoid making a complete orbit.
5. Airborne tactical officer.
6. Auto [reporting of] time over[head].
7. Authorization, or authority, to offer.
8. Air Traffic Organization (FAA, November 2003–).
9. ATOA

Air Taxi Operators Association (UK).

Atocs

Allied tactical operations centre(s) (NATO).

A to F

Authority to fly.

ATOL

1. Air travel organiser’s (or operator’s) licence (UK, a major function is to protect passenger after bankruptcy of carrier). 2. See ATOLS.

Atol

Advanced trainer on localizer.

Atoll

Assembly/test oriented launch language.

ATOLS

Automatic takeoff and landing system (UAV).

ATOM

Aileron trim offset monitor.

atom bomb

Colloq., fission bomb; very loosely, any NW (see nuclear weapon).

atomic materialization

Growth of thin-film coating by bombardment with ions and clusters [IR stealth].

atomic number

Symbol Z, number of protons in atomic nucleus or number of units of positive electronic charge it bears.

atomic weight

Mass of atom of element in units each 1/12th that of atom of carbon 12 (refined to 12.01115 on 1961 table). Numerical value for each element is same as atomic mass.

atomising

Continuous conversion of solid or liquid, esp. high-pressure jet of liquid, into spray of fine particles. Also called atomisation.

ATOP

1. Airline training orientation program (US).
2. Advanced Technology [or Technologies] and Oceanic Procedures (FAA, Lockheed Martin).

Atop

Advanced transport operating systems (NASA).

ATOS

1. Automated technical-orders system.
2. Air Transportation Oversight System (FAA).

ATP

1. At time, place.
2. Actual track pointer.
3. Authority, or authorization, to proceed.
4. Aviation technical regiment (USRR).
5. Application transaction program (SNA).
7. Air-transport pilot [ALTP is preferred].
10. Allied technical publication.
11. Attack plot.

ATPAC

Air-Traffic Procedures Advisory Committee (US).

ATPCS

Automatic takeoff power control system.

ATPI

Air Travel Price Index (BTS).

ATPL

Airline [or air] transport pilot’s licence; ALTP licence /H adds endorsement for helicopters [required to be PIC of civil aircraft ≥20,000 kg MTOW].

ATR

Air, or airline, transport radio, Arine system of standardizing dimensions of airborne electronics boxes,
thus ATR, ½ATR, ¼ATR etc; broadly defined by Arinc 404, has also been said to mean air-transport[able] rack[ing].

2 Air Transport Rating.
3 Automatic, or aided, target recognition.
4 Airport terminal resources.
5 Air-traffic requirements.
6 Anti-transmit receive.
7 Analog tape recorder.
8 Advanced tactical radar.
9 Armed turn[around].
10 Attained turn-rate.
11 Advanced threat resolution, a baggage-screen work-station.
12 Automated time-recording.

ATran Automatic terrain recognition and navigation, cruise-missile guidance, Goodyear from 1949.

ATRB Advanced Technology Review Board.

ATRC 1 Air transport, or traffic, regulation center (US).
2 See next.

ATR/C Automatic, or aided, target recognition and classification.

ATRD Active towed radar decoy.

Atrel Air-transportable reconnaissance exploitation laboratory (RAF).

ATRH Advanced tandem-rotor helicopter.

Atrif Air Transportation Research International Forum [office, Sterling, VA20164] (Int.).

ATRJ Advanced threat radar jammer.

ATRP Air-Transport Regulation Panel (ICAO).

ATS 1 Air Traffic Services, thus * route (ICAO).
2 Applications technology satellite, wide research programme.
3 Suomen Avaruustutkimusseura Ry (Finnish astronomical society).
4 Automatic throttle system.
5 Armament training station (UK, WW2).
6 Aircrew training system (USAFA).
7 Automatic test system (or station) for LRU check away from aircraft.
8 Aviation training ship (RN).
9 Air-turbine starter.
10 Acoustic tracking system.
11 Accelerator test stand [U adds upgrade].
12 Agile target system.
13 Auxiliary Territorial Service (UK WW2, became WRAC).
14 Advanced tracking system (radar extractor/tracker).
15 Automated trajectory server.
16 Airborne telephony server.

3 Airline and travel services architecture.
4 Air-Traffic Services Agency (Bulgaria).
5 Air traffic service assistant.

ATSAB Air Transportation Systems Advisory Board [proposed] (FAA).

Atsaw, ATSAW Airborne traffic situational awareness.

ATSB 1 Air Transportation Stabilization Board (FAA).
2 Australian Transport Safety Board [Canberra, ACT].

ATSC 1 Air Technical Service Command (USAAF).
2 Air Traffic Services Cell, or communication (FAA/DoD).

ATSCC Air Traffic Service Command Center.

ATS(1) Advanced threat resolution, a baggage-screen work-station.

ATS(1) geographic filter.

ATS(1) message [P adds processor].

ATSS Air Transport Services outside controlled airspace.

ATS syndrome Air traffic services outside controlled airspace.

ATSU Air-traffic services unit.

ATSy Air Traffic Security Section (RAF).

ATT 1 Automatic attitude hold (AFCS).
2 Advanced tactical [or theater] transport.
3 Advanced theater threat.
4 Automatic target tracking.


ATSOS Air Traffic Safety Oversight Service [monitors AT08] (FAA, 2004–).

ATSS Air Transport Security School (UK, RAF).

ATSSD Air Traffic Services Standards Department (CAA, UK).

ATS air-traffic services unit.

ATS(1) geographic filter.

ATS(1) message [P adds processor].

ATSM Automatic threat resolution, a baggage-screen work-station.

attained turn-rate Attained turn-rate.

attention-getter Prominently positioned caption in air-traffic services outside controlled airspace. Comprises RAS, RIS, FIS and non-radar procedural services.

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Arr Tail-on-tail aerodynamic influence coefficient.

attach To place temporarily in a military unit.

attached shockwave Caused by supersonic body having leading edge or nose sufficiently sharp or pointed not to cause shock to detach and move ahead of it. Critical values of M at which shock will just remain attached; eg for cone of 30° included angle shock will detach below 1.46; for 30° wedge M is 2.55 because wedge exerts larger obstructing effect on airflow. In most supersonic aircraft aim is to keep most shocks attached, especially at engine inlets.

attack aircraft Combat aircraft, usually aeroplane but sometimes helicopter, designed for attacking surface targets of tactical nature; missions include CAS (3) and interdiction.

attack, angle of Angle α between wing chord or other reference axis and local undisturbed airflow direction. There are several ways of measuring this crucial parameter. One is absolute angle of attack. Another is *** for infinite aspect ratio, which assumes two-dimensional flow. Effective *** varies greatly with aspect ratio; modern wings of low aspect ratio have no stall in conventional sense even at α = 40°. Some authorities in UK cause confusion by using ‘angle of incidence’, which already has clear meaning unconnected with angle of incident airflow.

attack avionics Navigation and weapon-aiming systems, often integrated into single ‘fit’ for particular attack-aircraft type.

ATTTC 1 Automatic takeoff thrust control.
2 Aviation Technical Test Center (USA, Ft Rucker).
3 Aircraft Tactics Training Center (USAFA).
attenuation

**attenuation** Loss of signal strength of EM radiation, esp. broadcast through atmosphere, due to geometric spread of energy through volume increasing as cube of distance, loss of energy to Earth, water vapour, and air and possibly ionised E and F layers.

**attenuation factor** Ratio of incident dose or dose rate to that passing through radiation shield.

**ATTG** Automated tactical target graphic[s].

**AT**, **AT3**, **AT-** three

**Antiello flap** Blown flap.

**ATTTR** Air Transport and Travel Industry Training Board (UK).

**attitude** Most, if not all, aircraft * described by relating to outside reference system three major axes OX/OY/OZ (see axes); * of flight relates these mutually perpendicular co-ordinates to relative wind; * with respect to ground relates axes to local horizontal.

**attitude control system, ACS** Control system to alter or maintain desired flight attitude, esp. in satellite or spacecraft to accomplish this purpose in Earth orbit or other space trajectory. Typical *** uses sensing system, referred to Earth’s limb, star or other ‘fixed’ point or line, and imparts extremely small turning moments to structure by means of gas jets or small rocket motors. In some cases passive *** used (PACS), or vehicle stabilized by spin about an axis, with portions despun if necessary.

**attitude gyro** Loosely, gyro instrument designed to indicate attitude of vehicle. Specif., instrument similar to artificial horizon but with 360° freedom in roll and preferably 360° freedom in pitch. Also applicable to conventional horizon with restricted indications of movement in aircraft not intended for aerobatics.

**attitude jet** 1 Reaction jet imparting control moments to aircraft at low airspeed (see RCS).

2 Sometimes applied to small thrusters or attitude motors used for same purpose on spacecraft.

**attitude motor** Small rocket motor used to control attitude of space vehicle (see thruster, reaction control engine).

**attitude reference symbol** Usually an inverted T giving heading and pitch attitude in HUD symbology.

**ATTLA** Advanced technology [or tactical, or theater] training loads agency (US).

**ATTMA** Advanced technology [or tactical, or theater] transport mission analysis.

**ATTN** Attention.

**atto** Prefix, ×10⁻¹⁸, symbol a; thus, 1 am (attometre) = 0.000000000000000000000001 m.

**attributes** Inherent characteristics of a finished part that determine its capability.

**attrition** Wasteage of hardware in operational service, esp. of combat or other military aircraft.

**attrition buy** Additional increment of production run ordered to make good anticipated attrition over active life of system.

**attrition rate** Usually means average [actual or predicted] loss per year.

**attrition ratio** Many meanings, none of which compare losses with those of enemy.

**ATTS** Air-transportable towed system.

**ATTI** Advanced tactical targeting technology.

**ATTU** 1 Atlantic to the Ural’s (NATO).

2 Advanced Tactics and Training Unit (RAF Valley).

**ATU** 1 Antenna, or automatic, tuning unit.

2 Aerial [or aircraft] target unit.

**ATUA** Air Transport User’s Association (UK).

**AUEW** Amalgamated Union of Engineering Workers (UK).
aural high-speed warning as confirmed by pilot’s headset.

Acquisition of target by IR seeker head
aural acquisition
1
AURA
1
AUM
1
Air-to-underwater missile (USA DoD weapon category)
2
All-up mass.
AUP
1
Advanced unitary penetrator.
2
Avionics upgrade program.
3
Airspace use plan.
4
Active unmanned vehicle phenomenology (AFRL).
AUR
1
All-up round.
2
Airplane [aircraft, aeroplane] upset recovery.
AURA
1
Advanced UHF radar.
2
Autonomous unmanned reconnaissance aircraft.

aural acquisition Acquisition of target by IR seeker head as confirmed by pilot’s headset.
aural high-speed warning System triggered by sensed flight speed, usually presented as EAS, significantly above allowable maximum. In transport aircraft typically triggered 10 kt above Vmo and 0.01 Mach above Mmo. Not usually made to do more than warn crew.

aural null Condition of silence between large regions where sound is heard, eg in early radio DF system, in some types of beacon passage (cone of silence) and several ground-test procedures.

Aurora Automatic recovery of remotely-piloted aircraft.

aurora Luminescence in upper atmosphere, esp. in high latitudes, associated with radiation and/or particles travelling along Earth’s magnetic field and at least partly coming from Sun. Exact mechanism not yet elucidated, but 12 classes identified, based on appearance and structure.

AUS Airspace Utilisation Section, part of ATC service (CAA DAP).


Ausac Australian Aviation Council [umbrella organization for aerospace industry].

AUSI Architecture user of system integration.

Ausrire Anglicization of ‘all-union scientific research institute of radio equipment’ (R).

Austafacs Australian automatic command and control system.

austenitic steel Ferrous alloys with high proportions of alloying elements and with microstructure transformed by heat treatment to consist mainly of solid solution of austenite (iron carbide in iron, face-centred). Used to make highly stressed aerospace parts, such as turbine discs.

AutC Autothrottle control.

AUTEC Atlantic Undersea Test and Evaluation Center (USN with UK help, in British territory).

AUTH, Auth Organisation empowered to pronounce authority.

AUST Land and Maritime Joint Standing Committee.

Australia Land and Maritime Joint Standing Committee.

Austere Aircraft with unique characteristics, often with unique equipment.

Australian automatic command and control system

Australian Aviation Council [umbrella organization for aerospace industry].

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Australian Aviation Council [umbrella organization for aerospace industry].

Australian automatic command and control system

Australian automatic command and control system
autoflare

feathering propeller when engine fails to drive it; usually triggered by NTS.

autoflare Flare [1] commanded by autopilot.

autogenic training Psycho-physiological technique carried out by subject according to prescription by qualified therapist, to reduce stress.

Autogiro Registered name of Juan de la Cierva autogyros, 1924–45.

autogyro Rotorplane in which propulsion is effected by horizontal-thrust system, eg propeller, and lift by rotor free to spin under action of air flowing through disc from below to above (ie, autorotating). Some can achieve VTOL by driving rotor in vertical phases of flight, but true STOL.

auto-hover Automatic hover, usually at low altitude, by helicopter or other VTOL aircraft, using radio altimeter and AFCS.

auto-igniting propellant Hypergolic.

auto-ignition 1 Of gas turbine engine, auxiliary system which senses angle of attack or other aerodynamic parameter and switches on igniter circuits before engine is fed grossly disturbed airflow which would otherwise pose combustion-extinguishing hazard. In some aircraft flight in rough air with full flap, or flight at high AOA, can cause intermittent or total flame-extinction, and there are other flight conditions (eg violent manoeuvre) when turbulent flow across intake triggers *, indicated by cockpit lights.

2 Specific meaning, ignition of premix fuel/air because of high compression (OPR 45+).

2 Of combustible material, spontaneous combustion.

auto-ignition temperature At which auto-igniting of high compression (OPR 45+).

fully powered flight-test Flare [1] commanded by autopilot.

automated booster autopilot Automatic boost control, ABC On piston engine servo system which senses induction pressure and so governs boost system that permissible limits of boost pressure cannot be exceeded. These were among first airborne closed-loop feedback systems.

automatic coarse pitch See Automatic pitch coarsening.

automatic dependent surveillance Global system to compensate for lack of radar coverage over oceans and remote areas, involving automatic regular polling of navais of each aircraft so that ATC can always monitor its position and ensure safe separation. Satellites appear to be essential for implementation.

automatic direction finder See ADF.

automatic drag-limiting system Propeller subsystem which, via a torqueometer signal, increases [coarsens] pitch whenever a negative, or predetermined low positive, torque is experienced by the drive shaft, thus preventing excessive drag following engine failure.

automatic extension gear Landing gear which extends by itself, typically by seeing airspeed and engine rpm, should pilot omit to select DOWN.

automatic feathering Autofeathering.

automatic flagman Electronic installation in ag aircraft to provide precise track guidance on each run in conjunction with ground beacons.

automatic flyback vehicle Unmanned shuttle between Earth and spacecraft.

automatic frequency control 1 Radio receiver which self-compensates for small variations in received signal or local oscillator.

2 By different method, self-governing of a time base.

automatic gain control See AGC.

automatic landing Safe, precisely repeatable landing of advanced aeroplane, helicopter or other aerodyne in visibility so restricted that external visual cues are of no assistance to pilot. Basis of present systems is high-precision ILS, approach coupler, triplexed or quad AFCS, autothrottle, autoflare and ground guidance after touchdown.

automatic manoeuvre device system Automatically schedules high-lift devices, especially on variable-sweep aircraft; usually governed by AOA.

automatic manual reversion Fully powered flight-control system may be so designed that no ordinary pilot could control aircraft manually; if not, *** one on two or three axes allows pilot to drive surfaces giving control in those axes after malfunction of powered system can no longer be accommodated by failure-survival.

automatic mixture control In piston engine, subsystem which automatically adjusts flow rate of fuel to counteract changes in air density, or which controls intake airflow by restricting carburettor air-intake duct by amount inversely proportional to altitude until wide open at height usually around 15,000 ft.

automatic observer Self-controlled group of sensors for recovering parameters during flight test.

automatic parachute 1 Parachute pulled from its pack by static line [usual meaning].

2 Parachute opened by barometric device at preset pressure altitude[s].

automatic pilot See autopilot.

automatic pitch-coarsening Facility built into propeller control system causing it to increase pitch automatically, normally from fine-pitch setting to typical cruise angle, when called for by operating regime. This is normally another name for a CSU, and quite distinct from auto coarse pitch.

automatic power reserve Special increased-thrust rating available on commercial turbofan engines only in emergency, and triggered automatically by loss of power in other engine in same aircraft.

76
automatic pull-up

Preprogrammed steep climb by (1) aircraft in TFR flight following failure of one pitch channel, or (2) aerial target at start of parachute recovery. automatic RDF See ADF.

Automatic Recall In a time of extreme tension, this would have come into effect if an attacking bomber carrying NW reached the Go-No-Go Line without having received the PRM (USAF, RAF, 1960–90).

automatic reverse pitch Facility built into propeller control system causing it to reduce pitch automatically past fine-pitch stop through zero to reverse (braking) position, upon receipt of signal from microswitch triggered when main gears compress shock struts on landing. Very rare for reverse pitch to be obtainable without deliberate selection by pilot, though with *** pilot may select in air, leaving auto system to send operative signal. automatic riveter Machine for drilling holes through parts to be joined, inserting rivet and closing (heading) it. automatic roll-out guidance, AROG Steering guidance after automatic landing in blind conditions (ideally extended from runway turnoff to terminal parking). automatic search jammer ECM intercept receiver and jamming transmitter which searches for and jams all signals having particular signatures or characteristics. automatic selective feathering 1 Airborne subsystem which, in the event of engine failure in multi-engined aircraft (invariably aeroplane), decides which engine has failed and takes appropriate action to shut down and feather propeller. 2 Similar system which, when pilot presses single feathering button, routes signal automatically to failed engine and propeller. automatic slat Leading-edge slat pulled open automatically at high angle of attack by aerodynamic load upon it. All slats were originally of this type. automatic synchronization In multi-engined aircraft (invariably aeroplane), subsystem which electrically locks rpm governors of all engines to common speed. automatic terminal information service See ATIS. automatic threat countering Ability of EW system to detect, identify, locate and respond to each hostile aircraft. automatic touchdown release Device incorporated in Kling system for external cargo carried below helicopter or other VTOL aircraft which releases load as soon as sling tension is released. automatic tracking Although this could have meaning in system constraining aircraft to follow preset tracks over Earth’s surface, universal meaning is property of directionally aimed system to follow moving target through sensing feedback signal from it. Applications found in (1) air-superiority fighter, in which essential to lock-on and track aerial target automatically, by means of radar, IR, optics or other system; and (2) ground tracking station, which may need to follow satellite, aircraft, drone target or other moving body in order to sustain command system, interception system, data-transmission system or other directionally beamed link. automatic VHF D/F Ground D/F system in which, instead of requiring manual turning of aerial array to find null position, signal from aircraft causes aerial to rotate automatically to this position, direction being at once displayed as radial line on CRT of the equipment. Also called CRT D/F, CRT/DF. automatic voice advice In terminal ATC, computer-generated voice message broadcast to two or more aircraft warning of potential conflict. Intended primarily for VFR traffic and for all traffic not under immediate control, and intended to relieve controller of function that appears to be safely automated. automatic voice alerting device Uses digitized human voice to warn of impending or hazardous situation, warnings being arranged in order of priority.

autonomous

1 Of aircraft or other vehicle, not needing GSE. 2 Of an SSR, not co-located. 3 Of airborne equipment, not needing external sensors; not linked to other aircraft systems (though possibly under pilot control), eg * reconnaissance pod. autonomous formation flight Saving up to 20% fuel by copying geese and using accurate GPS to place at least one wingtip in tip vortex of preceding aircraft (NASA/Boeing/UCLA). autonomous landing guidance Based on sensors or other devices in the aircraft. autonomous logistics information system Monitors all significant functioning parts of an organism, predicts expected life and gives advance warning of failure. autonomous vehicle Vehicle, especially unmanned aircraft, which completes mission without external help. autopilot Airborne electronic system which automatically stabilizes aircraft about its three axes (sometimes, in light aircraft, only two, rudder not being served), restores original flight path following any upset, and, in modern *, preset by pilot or remote radio control to cause aircraft to follow any desired trajectory. In advanced aircraft * is integral portion of AFCS and can be set by dial, push-button or other control to capture and hold any chosen airspeed, Mach, flight level or heading. In advanced combat aircraft * receives signals from sensing and weapon-aiming systems enabling it to fly aircraft along correct trajectories to fire guns or other ordnance at aerial target or lay down unguided bombs on surface target. autopilot-disconnect Advanced autopilots are automatically disconnected by control overload generated within aircraft and by certain other disturbances likely to reflect wish of pilot, eg triggering of stall-protection stick-pusher. autopilot flight-director computer This governs the AFD system, which controls the trajectory of the aircraft in the horizontal plane. It outputs to the FBW control system. Autoplan Portable EDP which digitises navigation plan and combines output with other CPGS data to provide attack-aircraft pilot with complete nav/ECM/orbital-aiming information. auto power reserve See automatic **. autopsy Searching examination of crashed aircraft to discover cause, esp. to detect fatigue failure. autorotation 1 Loosely, condition in which airflow past aircraft causes whole aircraft or significant part of it to rotate. Propeller in this context is not significant, though windmilling propeller is autorotating. 2 In helicopter, descent with power off, air flowing in reverse direction upwards through lifting rotor(s), causing it to continue to rotate at approximately cruise rpm. Pilot preserves usual control functions through pedals, cyclic...
auto-separation

and collective, but cannot grossly alter steep 'glide path'.
Rate of descent may exceed design ROD for landing gear,
but is reduced just before ground impact by sudden
increase in collective pitch; this increases lift, trading
stored rotor kinetic energy for increased aerodynamic
reaction by blades, and should result in gentle touchdown.

1 In aeroplane, descent in stalled condition, with
general direction of airflow coming from well beyond
stalling angle of attack but in grossly asymmetric con-
dition (see spin).

2 In aeroplane, descent in un stalled condition under
conditions apparently not greatly different from straight
and level but with stabilized spiral flight path (see spiral
dive, spiral stability). Distinct case of * which purist might
argue is incorrect usage.

3 In helicopter flying training, range of manoeuvres
designed to increase confidence and remove fear of power
failure; all power-off descents, but differ in whether they
are NPR (no power recovery) or terminated at height well
above ground by restoring at least partial power. In latter
case * terminated either by run-on-landing (running *),
run-on climb-out or moderate-flare climb-out.

auto-separation

Automatic (often barometric) release of
capaccant from ejection seat.

Autosevocom

Automatic secure-voice communications
(DoD).

autostabilizer

Loose term for autopilot, esp... with
authority on pitch axis only.

Autosyn

Trade name for remote-indicating system in
which angular position of indicator needle precisely
follows rotary sensing device moved by fluid level,
mechanical displacement or other parameter which must
be remotely measured. Sensor and indicator are essen-
tially synchronous electric motors.

autosynchronization

Automatic synchronisation.

autotrottle

Power control system for main propulsion
engines linked electro-mechanically to AFCS and
automatic-landing system so that thrust is vari ed
automatically to keep aircraft on glide path and taken off
at right point in autoflare; in general * will also call for
reverse thrust at full power in conjunction with automatic
track guidance (roll-out guidance), though this may be left
to discretion of pilot.

autotracking

Signal processing technique that enables a
target to be automatically acquired and tracked by means
of its own image, which can be received at any operating
wavelength (usually microwave or optical).

autotrim

Aircraft trim system automatically adjusted by
autopilot or other stabilising system to alter or maintain
aircraft attitude according to pilot demand or changed
distribution of weight or aerodynamic load. Usually
governed by pitch only, the autopilot commanding the
elevator and the autotrim the tailplane (stabilizer).

Autovon

Automatic voice network (USAF
Communications Service).

AU2GN

French designation of R.R.58 alloy.

AUVS

Association for Unmanned Vehicle Systems

AUW, a.u.w.

All-up weight; actual aggregate weight of
particular laden aircraft at moment of weighing. For
generalized equivalent, more precise term should be used
(MRW, MTOW, etc), but AUW has advantage of being
not explicit and thus can be used to mean 'total weight of
aircraft, whatever that happens to be'. Should never be
used to mean MRW or MTOW. If latter are not known,
preferred term meaning 'maximum allowable weight' is
gross weight.

AUWE

Admiralty Underwater Warfare Establishment
(UK).

AUWG

Airspace Users Working Group.

AUX

Auxiliary.

auxiliary bus

Secondary electrical bus serving one or
more devices and often maintained at voltage different
from that of main bus.

auxiliary fin

Generally, small additional fixed fin
carried, not necessarily to enhance directional stability,
well outboard on tailplane.

auxiliary fluid ignition

In rocket engine, use of limited supply of
hypergolic fluid(s) to initiate combustion of
main propellant.

auxiliary inlet, auxiliary intake

Extra inlet to [invariably
gas-turbine] engine to admit extra air when needed
[normally only on takeoff]. Also called supplementary air
inlet and, most commonly, suction-relief door.

auxiliary parachute

Pilot parachute.

auxiliary power unit, APU

Airborne power-generation system other than propulsion or lift engines, carried to
generate power for airborne system (electronics, hydraulics,
air-conditioning, avionics, pressurization, main-engine
starting, etc). In general, term restricted to plant deriving
energy from on-board source and supplying constant-
speed shaft power plus air bleed. This would exclude a
RAT or primitive windmill-driven generator. Some ***
can provide propulsive thrust in emergency (see MEPU).

auxiliary rigging lines

Branching from main parachute
rigging lines to distribute load more evenly around
canopy.

auxiliary rotor

In a classical helicopter [one main rotor],
the rotor provided to counter drive torque and control
fuselage azimuth. This is preferably called the tail rotor.

auxiliary tank

Fuel tank additional to main supply, esp.
that can readily be removed from aircraft (see reserve
tank, external tank, drop tank).

AV

1 Air vehicle.
2 Audio-visual.
3 Alt. vectoring (nozzle mode).
AVA
1 Automatic voice advice.
2 Applied vector analysis.
3 Aeropark Volunteers Association [Derby DE24 0ED]
(UK).

AVAD

Automatic voice alert[ing] device.

AVADS

Autotrack Vulcan air-defense system (USA).

aval, Aval

Available.

availability

1 Symbol A, proportion of time aircraft is
serviceable and ready for use, expressed as decimal frac-
tion over period or as number of hours per day or days per
month. Also expressed as uptime.
2 Period which must elapse between purchase of
aircraft, usually second-hand, and handover to customer.

avalanche

1 Any of several processes involving ions or
electrons in which collisions generate fresh ions or elec-
trons which in turn go on to have their own collisions. In
* tube electrons or other charged particles are accelerated
in electric field to generate additional charged particles
through collisions with neutral gas atoms or molecules. In
semiconductor devices * effect occurs when potential in
excess of critical voltage is applied across p–n junction, enormously multiplying liberation of charge carriers.

2 Aerobatic manoeuvre devised by Ranald Porteous involving rapid rotation about all axes in combined stall turn and flick roll.

AVAQ Association des Villes Aéroportuaires du Québec [office, Montreal].

AVAS Air-vehicle avionics suite.

Avavi Abbreviated Vasi.

AvBatt, AVBATT Aviation Battalion (USA).

AvBM Aviation business machine, PC + com. terminal.

AVC 1 Automatic volume control (see AGC).

2 Automatic variable camber.

3 Active visual camouflauge.

4 Attitude/velocity/control subsystem.

5 Avionics ventilation computer.

6 Active vibration control.

Avcat Originally Aviation Carrier [ship] Turbine, kerosene tailored to raise flashpoint above 60°C, freeze ≤-48°C; US = JP-5, NATO = F43 (F44 with FS11 additive, see kerosene.

Avcatt Aviation combined-arms tactical trainer; -A adds aviation reconfigurable manned simulator (USA).

AvCIR Active vibration control.

AVCS Airborne video-cassette recorder.

AVCS Advanced vidicon camera system (carried by satellites).

AVD 1 Air Vehicles Directorate (AFRL).

2 Atmospheric-vehicle detection.

AVDA Asociación Venezolana de los Deportes Aereos [air sport], (Venezuela).

AVDAZ Abbreviated Vasi.

Avdel Air-vehicle data-acquisition system.

Avdel Trade-name for large range of rivets/fasteners (Trextron).

A-YDV Aviation of airborne forces (USSR).

AVE 1 Airfield visitor enthusiast (PFA).

2 Air-vehicle equipment.

3 Aéron de validation expérimentale (UCAV, F).

AVEN, Aven Axi-symmetric vectoring engine, or axi-symmetric vectoring engine, or (AVEN, Aven) Axi-symmetric vectoring engine, or

AVCS Airborne video-cassette recorder.

AVCS Advanced vidicon camera system (carried by satellites).

AVD 1 Air Vehicles Directorate (AFRL).

2 Atmospheric-vehicle detection.

AVET Adaptive versatile engine technology.

AVG 1 Average (ICAO).

2 American Volunteer Group (China, WW2).

3 Aircraft escort vessel (later ACV, then CVE).

Avgard Additive to JP-1 and other jet fuels to produce anti-misting kerosene (ICI trade name).

Avgas Aviation gasoline, range of piston engine petrols today being narrowed to 100LL (blue, max. 2.4 ml/lmp gal TEL and 115 (purple, max. 5.52 ml/lmp gal TEL).

AVGS Advanced video guidance sensor (MSFC).

AVHRR Advanced very-high resolution radiometer.

AVI Air-vehicle integration; D adds design.
A W O

Automated wing-box assembly.

AWBA, Awba

Automated weather advisory system.

Awas

Advanced warning of active-radar emissions.

AWF

Aeronautical, or aviation, R&D activity

AVRA

Automatic visual-range assessor.

AVR

AVP

Aviation-specification petrol/oil/lubricant.

AVS

Requirements for Aircraft, avionics planning and execution.

Avplex

Avpin

Aviation-specification isopropyl nitrate.

Avpac

Air-vehicle prognostics and health.

Aw, Aw

Additional validation requirement[s].

AVRA

Automatic visual-range assessor.

Avradar

Aeronautical, or aviation, R&D activity (USA).

AVRS

Airborne video-recording system.

AVS

1 Advanced vertical strike.

2 Advanced vision, or visionics, system.

3 Air-vehicle specification.

Avsat

Aviation satellite service.

Avsec, AVSEC
Aviation Security Panel (ICAO).

AVSS

Aviation safety project (NASA).

AvSP

Aviation safety project (NASA).

AVT

1 Automatic video tracker.

2 Augmented, or advanced, vectored thrust.

3 Analog voice terminal.

Avtag

Aviation turbine-engine gasoline, see fuel.

Avtoc

Aviation tactical-operations center, if A2C 2C.

Aw

1 All-weather (usually not literally true).

2 Airway; often A/W, but AWY is preferred.

3 Confusingly, airborne early warning.

4 Air-frame/weapon integration.

5 Airframe/weapon/integration.

6 Airworthiness.

Aaw

Aircraft total wetted area.

AWA

Aviation/Space Writers Association [office, Chester, NJ (US/Int.)].

AWACS

Airborne warning and control system.

AWACS

Advanced band system (NATO).

AWA

Airway; often A/W, but AWY is preferred.

AWEC

Atomic-weapons effects simulator; AWESS = AWE.

AWF

Airworthiness Division (CAA, UK).

AW/CN

Automatic weapon control network.

AWCS

Automatic, or airborne-, weapons control system.

AWD

1 Airworthiness Division (CAA, UK).

2 Air-warfare destroyer (ship).

Awdat

Automatic-weapon, or air-warfare, data-transmission system.

Awdrey

Atomic-weapon detection, recognition and estimation of yield.

AWDS

1 All-weather delivery, or distribution, system.

2 Automated weather [forecast] distribution system.

AWE

1 All-up weight, equipped; generally = OWE.

2 AWE Hunting Brae, previously Atomic Weapons Establishment [Aldermaston, RG7 4PR] (UK).

3 Aircraft/weapon/electronic (AFMSS module).

4 Advanced weapons elevator (CV).

AWES

Atomic-weapons effects simulator; AWESS = signature simulator.

AWFC

Air Warfare Center (USAF).

AWFCs

All-weather flight-control system.

AWG

1 JETDS Code: piloted aircraft, armament, fire-control.

2 Airlines Working Group (CAA, UK).

3 Arbitrary waveform generator.

4 Aural-warning generator.

5 American Wire Gauge.

AWH

All-weather helicopter.

AWI

1 Aircraft weight indicator, on-board system also often indicating c.g. position, usually by sensing deflections of landing-gear shock struts.

2 All-weather intercept.

3 Air weapons instructor.

4 Airframe/weapon/integration.

5 Airframe/weapon/integration.

6 Airframe/weapon/integration.

7 Airframe/weapon/integration.

AWE

7 Atomic weapons effects simulator; AWESS = signature simulator.

AWE Hunting Brae, previously Atomic Weapons Establishment [Aldermaston, RG7 4PR] (UK).

AWF

Airworthiness Division (CAA, UK).

AWGD

Aircraft weight indicator, on-board system also often indicating c.g. position, usually by sensing deflections of landing-gear shock struts.

AWHS

Automatic weather information system.

AWIGWG

Aircraft wing with advanced-technology operation (Airbus).

AWICS

Airborne wireless intercom system.

AWIGWG

Aircraft wire and inert-generator working group.

AWIM

Airport weather information manager.

AWIN, Awin
Aviation weather information system [adds system] (NASA/Boeing).

AWIPS

Advanced weather interactive processing system (FAA).

AWIS

Automatic weather information system.

AWL

Above water level.

AWLS

All-weather landing system.

AWM

1 Average working man (in defining aircrew sleep patterns).

2 Aircraft wiring manual.

3 Aircraft wiring manual.

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80 Aircraft wiring manual.

AWP

Airworthiness Division (CAA, UK).

AWP

American Wire Gauge.
AWPA

AWPA Australian Women Pilots’ Association [office, Crafers, SA].

AWPG Advanced weather products generator.

AWR Airborne weather radar.

AWRA Augmentor-wing research aircraft.


AWRS 1 Airborne weather reconnaissance system (USAF).

2 Automatic weather reporting system.

AWS 1 Air Weather Service (USAF, formerly part of MAC, now an FOA, Scott AFB).

2 Audible (or advanced) warning system.

AVT Automatic wing sweep.

4 Air ward system.

5 Area weather system.

6 Aircraft Warning Service (USA/USN, 1942 – 46).

AWSACS All-weather stand-off aircraft (or attack) control system (USN).

AWSAS All-weather stand-off attack system.

AWSO Aviation-warfare systems operator.

AWT 1 Airborne wideband terminal.

2 Atmospheric wind tunnel.

Awt Tail-on-wing aerodynamic influence coefficient.

AWTA Advise what time available.

AWTSS All-weather tactical strike system.

AWW A-, or alert, weather watch.

AWW Wing-on-wing aerodynamic influence coefficient.

AWX All-weather interceptor.

AY, awy Airway (ICAO, FAA).

AX Advanced X-ray astrophysics facility.

AXB Air- or aircraft- launched bathymathograph.

AXBT 1 Aviation, avionics control (USAF).

2 Int. classes of hot-air balloons, from AX3 [20,000 cu ft, 566 m3] to AX9 [140,000 cu ft, 3,935 m3].

AXAF Advanced X-ray astrophysics facility.

AXBT Air- or aircraft- launched bathymathograph.

Axes Aircraft attitude is described in terms of three sets of axes) and those for tunnel testing.


axial cable 1 In non-rigid airship, main longitudinal member linking supporting cables, in framework carrying crew and engines.

2 In rigid airship, essentially straight cable sometimes linking extreme nose and tail of hull and central fittings of radial or diametral wires.

azimuth control

axial compressor Compressor for air or other fluid with drum-shaped rotor carrying one or more rows of radial blades in form of small aerofoils (airfoils) arranged to rotate around central axis, with row of stationary stator blades (vanes) between each moving row. Compressed fluid moves through alternate fixed and moving blading in essentially axial direction, parallel to axis of rotation, temperature and pressure increased at each stage.

axial cone In rigid airship, fabric cone at front and rear of each gas cell providing flexible gas-tight connection between cell and axial cable.

axial cord In parachute, central rigging line joining apex to eyes formed at lower extremities of rigging lines.

axial deck In ship carrying or serving as operating platform for aircraft, flight deck aligned fore and aft.

axial engine Usually, piston engine in which axes of cylinders are parallel to crankshaft and/or main output shaft. Also, loosely, axial-flow engine.

axial firing Fixed to fire directly ahead (usually on helicopters).

axial-flow engine Gas-turbine engine having predominantly axial compressor, esp. one in which airflow is essentially axial throughout (ie, not reverse-flow).

axial focusing In supersonic wind tunnel, focusing of shockwaves reflected from tunnel wall on to principal axis. Usually condition to be avoided, typically by minimising such reflections or so shaping working section that they are dispersed in different planes.

axial velocity ratio In an axial-flow engine, ratio of axial flow velocity Va to turbine rotor blade velocity U, Va/U. Also called flow coefficient.

axis of rotation In rotorplane, apparent axis about which main lifting rotor rotates: line passing through centre of tip-path circle and perpendicular to tip-path plane. May be widely divergent from mechanical axis on which hub is mounted, especially in articulated rotor.

axis of symmetry Usually aeronautical *** determined by geometrical form, but in some cases dictated by mass distribution.

Ay 1 Direct sideforce, changing heading without bank or sideslip.

2 Any lateral acceleration.

AYY A half-width cargo container for upper deck of a narrow-body aircraft.

Az Generalised symbol, azimuth.

Az-El, Az/El Az/El Radar presentation giving separate pictures of azimuth (PPI display, or chosen sector) and elevation (such as side view of glide path).

azication Azimuth indication.

azimuth 1 Horizontal bearing or direction; thus * angle.

2 Rotation about vertical axis (yaw is preferred term where motion is that of whole aircraft).

3 Bearing of celestial body measured clockwise from true North, often called * angle and qualified true, compass, grid, magnetic or reference, depending on measure used.

azimuth aerial Ground radar aerial rotating about vertical axis, or sending out phased-array emission rotating about such axis, intended to measure target azimuth angles.

azimuth compiler Portion of SSR system, often optional or absent, which provides accurate azimuth information more accurately than the normal plot extractor.

azimuth control In rotorplane, cyclic pitch.
azimuth error  Radar bearing error due to horizontal refraction.

azimuth marker  Scale used on PPI display to indicate bearing, including electronically generated references when display is offset from central position.

azimuth stabilized  PPI display which does not rotate, despite changes in heading of vehicle.

AZM  Azimuth.

az-ran, azran  General term for target tracking or navigational fixing by means of azimuth and range; more commonly called $R\theta$ or rho-theta.

AZRN  Azimuth range.

Azusa  C-band tracking system operating on short baseline and giving continuous signals of two direction cosines plus slant range (and thus giving 3-D fix and instantaneous velocity). From Azusa, Calif.
B

1 Pitching moment of inertia.
2 Blue (ICAO).
3 Base (of semiconductor device).
4 Aircraft category, bomber (USAS, USAAC, USAAF, USAF 1924–), USN 1941–43 and 1962–; UK role prefix).
5 Basic aircraft noise rating (Belgium, Netherlands).
6 Boron.
7 Magnetic flux density, or induction.
8 Prefix for nuclear bombs (US).
9 Degrees Baume.
10 Beginning (precipitation).
11 Hourly cost.
12 Airspace near airport up to 1,000 ft AGL (FAA).
13 Beacon.
14 Rotorcraft category: cannot maintain flight after failure of one engine.
15 Receiver bandwidth.
16 Sport-parachuting certificate: 25 jumps, 10 landing ≤50m of target.
17 Byte(s).
18 Susceptance.
19 Luminance [B for brightness].
20 Bar, or bi-directional [airfield lighting].
21 Helicopter-rotor tip-loss factor.
22 Aircraft category, airship (FAI).
23 Often used for leftward side force [Z-axis component].

B

1 Wing span.
2 Bars (unit allowed within SI).
3 Bars (unit allowed within SI).
4 Engine bleed mass flow.
5 Number of blades in helicopter main motor.
6 Bit(s).
7 Propeller axial slipstream factor.
8 Pitch of stringers or other panel stiffeners.
B

Induced-drag factor.
B, B
1 Graduation ratings from CFS.
2 Used together with b, as coefficients defining density of turbulence in gust calculations.
3 Control-surface hinge moment.
4 Rate of change of surface hinge moment dCH/dε.
B2B
1 Business to business.
B2C
1 Business to consumer.
B,H
1 Diborane rocket propellant, usually combined with O2.
2 Aviation petrol (G, WW2).
B-category
1 Aircraft used as non-flying trainer.
B-class
1 Military and civil prototype or experimental aircraft, not certificated but flown by manufacturer under special rules and with SBAC numerical registration (UK).
2 Terminal or control area near large airport (ICAO 1990, and US 1993).
B-code
1 In flight plan, have DME and transponder with 6+ code without encoding altitude.
B-display
1 CRT or other display in which horizontal axis is bearing and vertical axis is range.
B-licence
1 Commercial pilot’s licence (not ALTP).
B-line
1 90° to the runway.
B-power supply
1 Plate circuit that generates electron current in CRT or other electron tube.
B-rating
1 Twin-engine pilot rating.
B-slope
1 B-display.
B-station
1 In Loran, transmitter in each pair whose signals are emitted more than half a repetition period after next succeeding signal and less than half an r.p. before next preceding signal of other (A station).
B-Staff
1 Hydrazine hydrate (G).
B-vehicles
1 Non-flying vehicles in RAF service.
BA
1 Braking action (ICAO).
2 Budget authority.
B
3 Base Aérienne (air base, F).
4 Breathing apparatus.
5 Formerly the British Association for the Advancement of Science [office, London SW7 5HE; UK).
B-A gauge
1 Bayard-Alpert ionisation gauge.
B-a
1 Buffer amplifier.
BAA
1 The British Airways Authority (1964–86) is today known as BAA plc, not written in full [130 Wilton Road, London SW1V 1LQ] (UK).
2 Broad-area announcement.
3 Base Aérienne Announcement (Darpa).
4 Bombardiers’ Alumni Association (US).
5 See BAeA.
BAAC
1 British Association of Aviation Consultants [office, London SW1V 1EJ] (UK).
2 British Aviation Archaeological Council, concerned with aircraft relics and documents, not with studying archaeological sites from the air; [office Oulton Broad, Suffolk NR32 3NH] (UK).
BAEMS
1 British Association of Airport Equipment Manufacturers and Services [office, High Wycombe, Bucks].
BAAHS
1 Bay Area Airline Historical Society (San Francisco region).
BAAI
1 Balloon and Airship Association of Ireland.
BAAS
1 Broad-area aerial surveillance.
Babbit
1 Family of soft tin-based alloys used to make liners for plain bearings.
Babble
1 Incoherent cross-talk in voice communications system.
Babinet point
1 One of three points of zero polarisation of diffuse sky radiation.
BABOV
1 Bureau Aanleg Beheer en Onderhoud van Vliegvelden (airfield plans and maint.) (Neth.).
Babs, BABS
1 Beam-approach beacon system.
Outmoded secondary radar system which provided fixed-wing aircraft with lateral guidance and distance information during landing approach.
BAC
1 Blood alcohol content.
3 Beryllium aluminium composite.
BACA
1 Baltic Air Charter Association [successor to Air Brokers Assoc., office London EC3A 9BH] (UK).
BACE
1 Basic automatic checkout equipment (USN).
BACEA

BACEA British Airport Construction and Equipment Association.

Bacimo Battlespace atmospheric and cloud impacts on military operations (USAF).

back 1 Of drag curve, aeroplane flight below Vm, in which reduction in speed results in increased drag.

2 Of propeller or rotor blade, surface corresponding to upper surface of wing.

3 Rear cockpit of tandem two-seat aircraft, especially combat type (hence GIB).

back beam In any beam system, especially ILS localizer, reciprocal beam on other side of transmitter.

back bearing Direction observed from aircraft holding steady course of fixed object over which it has recently passed; reciprocal of track.

backboard 1 Multilayer circuit board.

2 Specially narrow stretcher (litter) for carrying injured passengers along aisles.

back burner To be on * = not urgent, temporarily shelved.

back contamination Contamination of Earth by organisms introduced by spacecraft and crews returning from missions.

back course Course flown along back beam, on extended centreline of runway away from airfield.

backdrive Where controlled device drives control input, eg thrust levers in Autothrottle mode, or when active motor [e.g. for tailplane] drives failed unit.

backed-off Jet engine slid out of fuselage on rails for maintenance, ready to be at once re-installed.

backfire Premature ignition of charge in piston engine cylinder such that flame travels through still-open inlet valve(s) and along induction manifold.

backfit Retrofit (US usage).

backgound Ambient (usually supposed steady-state) level of intensity of a physical phenomenon against which particular signal is measured. If signal amplitude never exceeds that of background, it cannot be detected. Thus: * clutter (radar), * count (radiation), * luminance, * noise (this has two meanings: noise in electronic circuit, and ambient level of aural noise at airport or elsewhere). See **background level**.

background check Post – 9/11 investigation of personnel (US Dept. of Justice).

backing In any beam system, especially ILS localizer, reciprocal of track.

backlash Loading dock, using reverse thrust.

backlash (r) Ambience of atmospheric and cloud impacts on military operations (USAF).

backlight Support his products after they reach customer.

backlog Attended by multiple push-in connectors. Most * accommodate 10 boards and have 20 edge connectors.

backplate Fixed disc behind single-sided centrifugal compressor.

back porch In electronic display, esp. TV, brief (eg 6 μ) interval of suppressed video signal at end of each line scan.

back-pressure 1 Pressure in closed fluid system opposing main flow.

2 Ambient pressure on nozzle of rocket or other jet engine or any other discharge from fluid system.

backscatter 1 Backward scatter.

2 Signal received by backward scattering.

back-shop In manufacturing plant, first shop to close on rundown of programme.

backside Moon face turned away from Earth.

backstagger Backward stagger.

backswing Swept.

backwash Linking manoeuvre between tailslide from zero airspeed with fuselage vertical and start of [upright or inverted] down-45 line.

backtell Transfer of information from higher to lower echelon.

backtrack 1 In aircraft operation, to turn through about 180° and follow same track in reverse direction (as allowance must be made for wind, not same as turn on reciprocal).

2 Having landed on runway in use, to turn through 180° and proceed along runway in reverse direction.

back-up 1 Complete programme, hardware item or human crew funded as insurance against failure of another.

2 Type of hardware item which could, even with degraded system performance, replace new design whose technical success is in doubt.

3 System funded to augment one already in operation (thus, BUIC).

4 Information printed on reverse of map or other sheet to supplement marginal information.

backward compatibility The ability of a new or modified system to operate in old [precursor] system.

backward extrusion Extrusion by die so shaped that material being worked flows through or around it in reverse direction to that of die.

backward scatter Electromagnetic energy (eg, radio, radar or laser) scattered by atmosphere back towards transmitter. In some cases whole hemisphere facing towards transmitter is of interest; in radar, attention usually confined to small amount of energy scattered at very close to 180° and detected by receiver.

backward stagger Stagger such that the upper wing of a biplane is mounted further back than the lower.

backward tilt Tilt such that blade tips are to rear of plane of rotation through centroids of blade roots.

backward wave In a TWT, any wave whose group velocity is opposite to direction of electron travel.

backwash Slipstream.

BACM Bootstrap air-cycle machine.

BACN Battlefield airborne communications node.

Bacon cell Hydrogen/oxygen fuel cell.

BAC (I/I) Open signal modulation used by Galileo navsats (EU).

BACS Bleed-air control system.

BAD 1 Boom-avoidance distance; thus * (A) is boom-
BAL objects in space.
Baker-Nunn promote degassing.
bake out plastic.
Trade name for a phenol-formaldehyde resin Bakelite.
Back-course (ILS).
bakes Bairstow number ejection seat.
usually high-pressure gox, attached to aircrew harness or bailout bottle with spacecraft.
esp. in midair, by parachute. Not yet used in connection to abandon dangerously unserviceable aircraft, bail out.
Bailie beam
military hardware to industrial contractor engaged in objective; in particular, loan by owner government of under contract, to facilitate accomplishment of specific To loan aircraft or other possession, freely but bail
BAIG British Aviation Insurance Group.
BAH Belgian Aircraft Homebuilders [office, B-1000 Brussels] (Belgium).
BAF / Bleed-air failure.
2 Incorrectly, Belgian Air Force.
BAFF British air forces in France (1939–40).
baffle / Loosely, any device intended to disturb and impede fluid flow.
2 Shaped plates fixed around and between cylinders of air-cooled piston engine to improve cooling.
3 Surface, usually in form of a ring, plate or grating, arranged inside liquid container to minimise sloshing.
4 In two-stroke piston engine, deflector incorporated in crown of piston.
5 Partial obstruction inside pitot tube to minimise ingress of liquid or solid matter.
BAFO / British Air Forces of Occupation.
2 Best and final offer.
BAG British Airports Group [SBAC, London SW1H 9EU] (UK).
bag See body bag.
baggage Checked-in possessions of a passenger, normal limits ≤900×700×400 mm (36×28×15 in), ≥350×230×150 mm (14×9×6 in), ≤34 kg (75 lb), no trailing cord or loose binding nor sharp projections.
bag tank Liquid container, especially fuel tank, constructed of flexible material not forming part of airframe.
BAH Belgian Aircraft [office, B-1000 Brussels] (Belgium).
BAI / Battlefield air interdiction.
2 Board of Auditors, International (NATO).
BAIG British Aviation Insurance Group.
bail To loan aircraft or other possession, freely but under contract, to facilitate accomplishment of specific objective; in particular, loan by owner government of military hardware to industrial contractor engaged in particular development programme for that government.
Bailie beam Extra-precise Lorenz beam for Babs.
bailout To abandon dangerously unserviceable aircraft, esp. in midair, by parachute. Not yet used in connection with spacecraft.
bailout bottle Emergency personal oxygen supply, usually high-pressure gox, attached to aircrew harness or ejection seat.
Bairstow number Mach number.
bakes Back-course (ILS).
Bakelite Trade name for a phenol-formaldehyde resin plastic.
bake out In high-vacuum technology, heating to promote degassing.
Baker-Nunn Large optical camera used for tracking objects in space.
BAL / Office of air force training (Switzerland).
ballistic camera
2 Bombe à guidage laser (F).
balance / State of equilibrium attained by aircraft or spacecraft.
2 Mechanism for supporting object under test in wind-tunnel and for measuring forces and moments experienced by it due to gas flow.
3 Mass or aerodynamic surface intended to reduce hinge moment of control surface.
balance area In aerodynamically balanced control surface, projected area ahead of hinge axis.
balance beam Large SLAR antenna arranged axially above fuselage on centreline with mass disposed fore and aft of c.g.
balance circuit In a WCS, subsystem which prevents, or warns of impending lateral asymmetry due to unbalanced weapon load.
balanced approach Optimum approach path referred to ground, taking in such factors as noise, ATC routing, cutbacks, land-use planning and preferential-runway rules.
balanced field length / Hypothetical length of runway for which TODa = EMDa (and sometimes, in addition, TORa).
2 Under CAR.4b, unfactored TOD to 50 ft following failure of one engine at V1 = EMD to and from Vc, on dry surface.
balanced modulator Modulator whose output comprises sidebands without carrier.
balanced signature One which achieves optimal matching of IRS and RCS.
balanced support Logistic supply based on predicted consumption of each item.
balanced surface Control surface whose hinge moment is wholly or partially self-balanced (usually by means of mass or area ahead of hinge axis or by tabs).
balance rod Mass distributed along or within leading edge of helicopter rotor blade.
balance station zero Imaginary reference plane perpendicular to longitudinal axis of aircraft and at or ahead of nose, used in determinations of mass distribution and longitudinal balance.
balance tab Tab hinged to, and forming part of, trailing edge of control surface, and so linked to airframe that it is deflected in opposition to main surface, and thus reduces hinge moment. Action is thus similar to that of servo tab.
bale out See bail out.
ball / Small spheroid, or other laterally symmetric shape, in lateral glass tube of ball-type slip indicator.
2 Arbitrary unit of slip, equal to one ball-width.
ball ammunition Bullets of solid metal, containing no explosive, pyrotechnic or AP core.
ballast / In aerodynamics, mass carried to simulate payload, and permit c.g. position to be varied (usually in flight).
2 In aerostats, mass carried for discharge during flight to change vertical velocity or adjust trim.
ballast carrier In transport aircraft, holder for metal ballast weights with locking plungers mating with floor rails.
ball bearing Any shaft bearing in which inner race is supported and located by hardened spheres.
ball inclinometer Ball turn-and-slip.
balistic camera Photographic camera which, by means
ballistic capsule

of multiple exposures on same plate or frame of film, records trajectory of body moving relative to it.
ballistic capsule  Capsule enclosing environment suitable for human crew or other payload and moving in * trajectory.
ballistic flight  Ballistic trajectory; arguably, not flight.
ballistic galvanometer  Undamped galvanometer which, when an electrostatic charge is switched through it, causes large initial swing, taken to be proportional to quantity of electricity passing.
ballistic missile  Wingless rocket weapon which, after burnout or cutoff, follows * trajectory.
ballistic parachute canopy spreader  Device for accelerating deployment of drag canopy in certain types of ejection seat.
ballistic range  Research facility for investigation of behaviour of projectiles or of bodies moving through gaseous media at extremely high Mach numbers; usually comprises calibrated range along which test bodies can be fired, sometimes into gas travelling at high speed in opposite direction.
ballistic recovery system  Large parachute deployed [sometimes fired by rocket] from above e.g. of [usually small] G A aircraft.
ballistic re-entry  Non-lifting re-entry.
ballistic trajectory  Trajectory of wingless body, formerly propelled but now subject only to gravitational forces and, if in atmosphere, aerodynamic drag.
ballistic tunnel  High-Mach tunnel into which free projectiles are fired in opposition to gas flow (see * range).
ballistic vehicle  Vehicle, other than missile, describing a * trajectory. Term usually not applied to spacecraft but to vehicles used in proximity of Earth and at least mainly within atmosphere.
Ballistic Winds  Research into variation of wind with altitude (USAF).
ballistic wind  Theoretical constant wind having same overall effect on a * projectile as varying winds actually encountered.
bailing  Forcing a hard oversized ball through a hole with a small fatigue crack, to bring crack region into compression.
bail lightning  Rare natural phenomenon, materialising during electrical storms, having appearance of luminous balls which often appear to spin, eject sparks, travel slowly and eventually disappear (sometimes with explosion).
bail mat  Standard squares or rectangles of tough flooring containing pattern of protruding freely-rotating balls facilitating omnidirectional movement of containers or pallets.
bailonet  Flexible gastight compartment inside envelope of airship (rarely, balloon) which can be inflated by air to any desired volume to compensate for variation in volume of lifting gas and so maintain superpressure and alter trim.
bailonet ceiling  Maximum altitude from which pressure aerostat with empty bailonet(s) can return to sea level without loss of superpressure.
bailon sonde, ballonsonde  The original French term for a sounding balloon. See registering balloon.
bailon  Aerostat without propulsion system.
bailon barrage  Protective screen of balloons moored by steel cables around target likely to be attacked by enemy aircraft.
band-elimination filter

balloon bed  Area of ground prepared for mooring of inoperative captive balloon.
balloon fabric  Range of fabrics of mercerised cotton meeting specifications for covering lightplanes and, impregnated with rubber, aerostats.
balooning  Colloq., sudden unwanted gain in height of aeroplane on landing approach due to lowering flaps, GCA instruction or, most commonly, flare at excessive airspeed.
balloon master  Person in charge of launch of free-flight balloons, including liaison with ATC.
balloon reflector  In electronic warfare, confusion reflector supported by balloon(s).
balloon tank  Tank for containing liquid or gas constructed of metal so thin that it must be pressurized for stability. Such tanks have formed airframe of large ICBMs.
balloon tyre  Not defined but generally taken to mean tyre of larger than normal section (profile) and less than normal pressure.
hall screwjack  Screwjack in which friction is reduced by system of recirculating bearings interposed between fixed and rotating members.
balls-out  Maximum possible power (colloq.).
hall turn-and-slip  Flight instrument whose means of indicating slip is a ball free to move within liquid-filled curved tube having its centre lower than its ends.
hall turret  Ventral gun turret on certain large aircraft of 1942–45 – notably B-17, B-24 – having part-spherical shape.
ballute  Balloon-parachute; any system of inflatable aerodynamic braking used for upper-atmosphere retardation of sounding rockets or slowing of spacecraft descending into planetary atmospheres.
BALO  Brigade Air Liaison Officer.
Balpa, BALPA  The British Air Line Pilots' Association; 1937-, trade union [office Harlington UB3 5BG] (UK).
balta  Wood of extremely low density (s.g. about 0.13), originally grown in W. Indies and Central America.
Balt, BALT  Barometric altitude.
BaltNet  Monitors airspace over Estonia, Latvia, Lithuania.
BAM  1 Bundesanstalt für Material Prüfung (G). 2 Bird avoidance module.
Bambi basket  Deployed under helicopter, esp. for recovery [esp. from water] of exhausted or injured.
BAMS  1 Brassboard airborne multispectral sensor. 2 Broad-area maritime surveillance (USN).
BAMTRI  Beijing Aeronautical Manufacturing Technology Research Institute.
BAN  Beacon alphanumerics (part of FAA ARCTS).
banana case  The curved casing of an accessory gearbox wrapped around the compressor or fan case of a gas-turbine engine.
band  1 Designated portion of EM spectrum, usually bounded by frequencies used for radio communication. 2 A (usually small) portion of EM spectrum containing frequencies of absorption or emission spectra. 3 Strip of stronger material built into non-rigid aerostat envelope to distribute stress from mooring line, car or other load. 4 Group of tracks on magnetic disc or drum.
band-elimination filter  Filter that eliminates one band of EM frequencies, upper and lower limits both being finite.
Land or sea area under track where super-bang valley bang out flicker control.

between two extreme 'hard-over' positions. Also called exercising control function, which continually oscillates bank and turn indicator are immediately available.

any properly executed turn.

flown with wings or rotor not laterally level. Held during bank spar booms on each side of jet engine or jetpipe aperture. projecting radially in same plane. Typically used to link open ring joined to linear portion (on either or both sides)

sonic flight is permitted (colloq.).

Bang Sound caused by passage of discontinuous pressure wave in atmosphere (sonic bang).

bang-bang Any dynamic system, especially one exercising control function, which continually oscillates between two extreme 'hard-over' positions. Also called flicker control.

bang out To eject (colloq.).

bang valley Land or sea area under track where supersonic flight is permitted (colloq.).

banjo Structural member having form of banjo, with open ring joined to linear portion (on either or both sides) projecting radially in same plane. Typically used to link spar booms on each side of jet engine or jetpipe aperture.

bank 1 Attitude of aerodyne which, after partial roll, is swayed in a considerable extent, or by which sufficient control action is applied to effect a partial roll or otherwise control the attitude of the aerodyne, or both. Bank is generally thought of as positive or controlled bank. 2 To roll aerodyne into banked position.

Fish-ook Structural member having form of banjo, with open ring joined to linear portion (on either or both sides) projecting radially in same plane. Typically used to link spar booms on each side of jet engine or jetpipe aperture.

bank 1 Attitude of aerodyne which, after partial roll, is Projection of one wing relative to other is called bank. 2 To roll aerodyne into banked position. 3 Linear group of cylinders in piston engine. 4 Pool of trained aircrew, esp. pilots, for whom no jobs are immediately available.

bank and turn indicator Turn and slip indicator.

banner cloud Cloud plume extending downwind of mountain peak, often present on otherwise cloudless day.

banner 1 Large fabric strip towed behind aircraft, usually bearing advertising statement readable from both sides.

2 Fabric sleeve placed over propeller blade, usually saying FOR SALE.

banner sleeve Tow target in form of long tube inflated by slipstream, usually called sleeve target.

banner target Air-to-air or ground-to-air firing target in form of towed strip of flexible fabric like elongated flag.

banter Critical comment on a pilot’s performance by his peers who are watching.

BAO Battlefield air operations. Afsoc field kit.

BAOR British Army of the Rhine.

BAP 1 Bomber aviation regiment (USSR). 2 Bank-angle projection.
barometric element

barometric element  Transmitting barometer carried in radiosonde payload, variation in aneroid capsules causing shift in frequency of carrier wave.

barometric fuze  Fuze set to trigger at preset pressure height.

barometric pressure  Local atmospheric pressure.

barometric pressure control  Automatic regulation of fuel flow in proportion to local atmospheric pressure.

barometric pressure gradient  Change in barometric pressure over given distance along line perpendicular to isobars.

barometric tendency  Change in barometric pressure within specified time, usually the preceding three hours.

barometric wave  Any short-period meteorological wave in atmosphere.

barosphere  Atmosphere below critical level of escape.

barostat  Device for maintaining constant atmospheric pressure in enclosed volume.

barostatic relief valve  Automatic regulation of fuel flow by spilling back surplus through relief valve sensitive to atmospheric pressure.

barothermograph  Instrument for simultaneously recording local temperature and pressure.

barotrauma  Bodily injury due to gross or sudden change in atmospheric pressure.

barotropy  Bulk fluid condition in which surfaces of constant density and constant pressure are coincident.

barrage  AA artillery fire aimed not at specific targets but to fill designated rectilinear box of sky.

barrage balloon  Captive balloon forming part of balloon barrage.

barrage jamming  High-power electronic jamming over broadest possible spread of frequencies.

barrel  1 Of piston engine cylinder, body of cylinder without head or liner.

barrel engine  piston engine having cylinders with axes disposed parallel to engine longitudinal axis and output shaft.

barrel rolling  Various methods of using rotating drum filled with abrasive [usually powder] to remove burrs and other surface imperfections from workpiece.

barrel roll  Manoeuvre in which aerodynamic is flown through 360° roll while trajectory follows horizontal spiral such that occupants are always under positive acceleration in vertical plane relative to aircraft.

barrel section  Portion of transport aircraft fuselage added in stretching. Alternatively called plug section (but see barrel (3)).

barrel wing  Wing in form of duct open at both ends and with longitudinal section of aerofoil shape.

barrette  Array of closely spaced ground lights that appear to form a solid bar of light.

barricade  Barrier (USN).

barrier  Net mounted on carrier (1) deck or airfield runway to arrest with minimal damage aircraft otherwise likely to overrun. Normally lying flat, can be raised quickly when required.

barrier crash  Incident involving high-speed entry to with or without damage. Usually applied to carrier operations.

barrier pattern  Geometrical pattern of sonobuoys so disposed as to bar escape of submerged submarine in particular direction.

barring  Slowly turning gas-turbine engine by hand.

bar stock  Standard form of metal raw material; solid rolled or extruded with round, square or hexagonal (rarely, other) section.

Barstur, BARSTUR  Barking Sands Tactical Underwater Range (USN, Kauai, Hawaii).

BAR UK  Board of Airline Representatives in the UK [office, London].

barycentre  Centre of mass of system of masses, such as Earth/Moon system (barycentre of which is inside Earth).

barye  Unit of pressure in CGS system. Equal to 10 N m⁻² = 1 dyne cm⁻² or 1.4503 × 10⁻⁵ lb/in² or 10⁻⁶ bar (hence alternative name of microbar).

BAS  1 Bleed-air system.

2 Base allowance for subsistence (US armed forces).

3 Barrier arresting system.


Basar  Breathing air, search and rescue (for diver in helo crew).

BASE  Cloud base height AMSL (ICAO).

BASE  Battlespace synthetic environment.

base  1 Locality from which operations are projected or supported.

2 Locality containing installations to support operations.

3 In an object moving through atmosphere, any unfaired region facing rearwards (eg rear face of bullet or shell, trailing-edge area of wedge aerofoils, and projected gross nozzle area of rocket engine after cutoff).

4 Substance constructed of ions or molecules having one or more pairs of electrons in outer shells capable of forming covalent bonds.

5 Loosely, substance that neutralises an acid.

base height  Minimum height AGL authorised on low-level training sortie, in peacetime typically 200 ft, 91 m.

base leg  In airfield circuit, extends from end of downwind leg to start of turn on to finals.
base line, baseline

- **base line, baseline** /ˈbeɪs lɪn/ Yardstick used as basis for comparison, specific, known standard of build for functioning system, such as combat aircraft, against which developed versions can be assessed in numerical terms. Hence, *aircraft.

- 2 Geodesic line between two points on Earth linked by common operative system, eg between two Loran, Decca or Gee stations.

  In many types of visual display and pen recorder, line displayed in absence of any signal.

- **base metal** /ˈbeɪs mɛl/ Major constituent of an alloy.

- 2 Metal of two parts to be joined by welding (as distinct from metal forming joint itself, which is modified or added during welding process).

- **base pressure** /ˈbeɪs prəˈsiːər/ Local aerodynamic pressure on base area of body moving through atmosphere.

- **base surge** /ˈbeɪs sɜːr/ Expanding toroid surrounding vertical column in shallow underwater nuclear explosion.

- **base/timing sequencing** /ˈbeɪs ˈtiːmɪŋ sɪˈkwiːnsɪŋ/ Automatic sharing of transponder between several interrogators or other fixed stations by use of coded timing signals.

- **BASF** /ˈbeɪs fɑːs/ Boron-augmented solid fuel.

- **BASH, Bash** Bird/aircraft strike hazard (USAF team).

- **BASH** /ˈbeɪs/ Bureau of Air Safety investigation (Australia).

- **Basic** British American Security Information Council (office DC).

- **basic aircraft** /ˈbeɪs əˈkɑːft/ Simplest usable form of particular type of aircraft, from which more versatile aircraft can be produced by equipment additions. In case of advanced aircraft, such as combat and large transports, ** includes IFR instruments, communications, and standard equipment for design mission.

- **basic cloud formations** /ˈbeɪs klaʊd ˈfɔːrnɪʃənz/ Subdivision of cloud types into: A, high; B, middle; C, low; D, clouds having large vertical development (International Cloud Atlas, 1930).

- **basic commercial pilot's licence** /ˈbeɪs ˈkɒmɜːrsəl ˈpɑːltəl ˈlaɪnsɪs/ Awarded after 220 h including 100 as P1, allows holder to do aerial work producing VFR pleasure passenger flights in aircraft up to 5,700 kg. Suffix (A), aeroplanes; (H), helicopters.

- **basic cover** /ˈbeɪs kəvər/ Aerial reconnaissance coverage of semi-permanent installation which can be compared with subsequent coverage to reveal changes.

- **basic encyclopedia** /ˈbeɪs ɪkˈnɒlədʒɪkəl/ Inventory of one's own or hostile places or installations likely to be targets for attack.

- **basic flight envelope** /ˈbeɪs ˈflɪt ˈɛnvələʊ/ Graphical plot of possible or permissible flight boundaries of aerodynamic of particular type. Cartesian plot with TAS or Mach number as horizontal and altitude or ambient pressure as vertical. Boundaries imposed by insufficient lift, thrust or structural strength and, if appropriate, displaced threshold.

- **basic gross weight** /ˈbeɪs ˈgrɒs wɪght/ Operating weight empty.

- **basic gust envelope** /ˈbeɪs ɡʌst ˈɛnvələʊ/ Specified form of graphical plot for basic gust *of basic aircraft* operating weight empty.

- **basic manoeuvring envelope** /ˈbeɪs məˈnɔːvərɪŋ ˈɛnvələʊ/ V–n diagram with EAS as horizontal and manoeuvring load factor as vertical. See *manoeuvring envelope*.

- **basic operating platform** /ˈbeɪs əˈprəʊtʃ ˈplɑːtform/ See *base*.

- **basic research** /ˈbeɪs ɹɪˈsɛsɛr/ See *pure research*.

- **basic runway** /ˈbeɪs ˈrʌnwaɪ/ Runway without aids and bearing only VFR markings: centreline dashes or arrows, direction number and, if appropriate, displaced threshold.

- **basic weight** /ˈbeɪs wɪght/ Superseded term formerly having loose meaning of mass of aircraft including fixed equipment and residual fluids.

- **basic wing** /ˈbeɪs wɪŋ/ Aerofoil of known section used as starting point for modified design, often with wholly or partly different section.

- **basket tube** /ˈbeɪs tʌb/ Form of construction of liquid-propellant rocket thrust chamber in which throat and nozzle is formed by welded tubes, usually of nickel or copper, through which is pumped liquid oxygen or other cryogenic propellant for regenerative cooling.

- **BASA** /ˈbeɪs ə/ British Airline Stewards and Stewardesses Association.

- **BAT** /ˈbeɪt/ Beam-approach training.

- **Beam-approach technique** /ˈbiːm-əˈprəʊtʃ ˈtekˈnɒlədʒi/ 1 Boom-avoidance technique.

- **3 Beam-approach training.**

- **4 Brilliant anti-tank (submunitions).**

- **6 Blind-approach technique (WW2).**

- **7 See: Bat-Cam.**

- **8 Binary-actuator technology.**

- **BATA** /ˈbeɪtə/ British Air Transport Association, formerly BCASC [office, Artillery House, London SW1P 1RT (UK)].

- **Batap** /ˈbeɪtæp/ B-type application to application protocol.

- **Bat-Cam** Battlefield air targeting-camera autonomous micro air vehicle.
Batco

Batco  The British Air Traffic Controllers’ Association (UK, 1961–).

BATDU  Blind-Approach Training and Development Unit (UK became WIDU).

Bates  Battlefield artillery target-engagement system, UAV-integrated (UK).

BATF  Beam Approach Training Flight (RAF).

bathtub  A Bath-shaped structure of heavy plate or armour surrounding lower part of cockpit or other vital area in ground-attack aircraft.

2 Temporary severe recession in production in manufacturing plant or programme, or between programmes; named from appearance on graphical plot (US, colloq.).

1 Graphical plot of equipment’s service life: burn-in, useful life, wearout.

bathtub fitting  Fishplate (US).

bathtub thermograph  Sonobuoy dropped ahead of others to measure water data at various depths.

Batmav  Battlefield air tactical micro air vehicle.

BATOA  British Air Taxi Operators’ Association.

batonet  Tubular or rod-like toggle forming link between rigging line and band on fabric aerostat envelope.

batonet  Wood or metal strip used in interlinked pairs as ground control lock.

2 Wood or metal strips arranged radially from nose of non-rigid airship to stiffen fabric against dynamic pressure, or, where applicable, mooring loads.

1 Flexible strips used in lofting drawing.

battery  Enclosed device for converting chemical energy to electricity. Most aerospace batteries are secondary (rechargeable), principal families being Ni/Cd (nickel, cadmium), Ag/Zn (silver, zinc) and lead/acid. Fuel cells are batteries continuously fed with reactants.

battery booster  Starting coil.

battle climb  A climb to near ceiling [c 16,000 ft] in the shortest time, routine training for the RAF and other air forces prior to WW2.

battle damage  In-flight damage caused directly by enemy (not, eg, by collision with friendly aircraft).

battlefield air interdiction  Air/ground sortie(s) tasked with restricting enemy’s tactical movement and preventing him bringing up reserves to reinforce battle in progress.

battle formation  Any of several formations characterised by open spacing and flexible interpretation.

battlefield model  Any model or rig used for repeated development testing, usually statically, in which major elements not themselves under test are made quickly and cheaply from ‘boilerplate’ material to withstand repeated use. Thus battlefield tank.

battlefield tank  Tank for liquid propellant for static testing of rocket engines having same capacity and serving same feed system as in flight vehicle but made of heavy steel or other cheap and robust material for repeated outdoor use.
### BBM, BBm
- 2 Bring-back load.
- BBM, BBm Back beam.
- BBMF Battle of Britain Memorial Flight (RAF).
- BBN 1 Basic backup network for future civil nav aids (FRN).
- 2 Baseband node.
- BBOE Billion barrels oil equivalent.
- BBSU British Bombing Survey Unit.
- BBU Battery back-up unit.
- BBW 1 Brake by wire.
- 2 Bring-back weight.
- BC 2 Boron carbide armour.
- 2 Back course.
- 3 Bus (2) controller.
- 4 Bomber Command (RAF, USAAF).
- 5 Basic combat trainer category (USAA, 1936–40).
- 6 Patch(es) [of cloud] (ICAO).
- 7 Bottom of cylinder.
- 8 Become, becoming.

### BCA
- 1 Board of Civil Aviation (Sweden).
- 2 Baro-corrected altitude.
- 3 Best cruise altitude.
- 4 Belgian Cockpit Association, also called ABPNL.
- 5 British Cargo Alliance [carrier pressure group, office, London].
- 6 British Civil Aviation Council.
- BCAC British Columbia Aviation Council.
- BCAM Best cruise altitude/Mach.
- BCAOC Balkan Combined Air Operations Centre (NATO).
- BCARs British Civil Air, or Airworthiness, Requirements.
- BCAS Beacon-based collision-avoidance system.
- BCASC British Civil Aviation Standing Conference, now BATA.
- BCAV British Commonwealth Air Training Plan (1939–45).
- BCBP Bar-coded boarding pass.
- BCBBS Bomber Command Bombing School (RAF).
- BCC Britsh Chambers of Commerce, representing 126,000+ businesses.
- BCD, bcd 1 Binary coded decimal.
  - 2 Bulk chaff dispenser.
- BCE Battlefield control element.
- BCF Bromochlorodifluoromethane (fire extinguishing agent).
- BCFG Fog patches.
- BCFR Bomber Command Forward Relay (RAF).
- BCH Binary coded hammer.
- BCI Battlefield command and control communications and intelligence.
- BCIU Bus control and interface unit.
- BCKG Backing (ICAO).
- BCL Braked conventional landing (VSTOL).
- BCM 1 Basic combat manoeuvring, series of manoeuvres simulating interceptions and close dogfights.
  - 2 Best cruise Mach number.
  - 3 Background clutter matching.
  - 4 Back-course marker.
- BCMG Becoming.
- BCMP Bird control management plan.
- Bcn Beacon.
- BCO, bco Binary coded octal.

### BDS
- BCOB Broken cloud[s] or better.
- BCP 2 Battery command post.
- 2 BIT control panel.
- 3 Breaking cloud procedure.
- BCPL See Basic commercial pilot’s licence.
- BCPR Broad – coverage photo-reconnaissance (USAF satellites).
- BCPT Basic communications procedures trainer, for AEOs.
- BCR 1 European Community Bureau of Reference (co-ordinates R & D).
  - 2 Battle casualty replacement.
  - 3 Bombing, combat and reconnaissance.
  - 4 Business concept review.
- BCRS Back course.
- BCRU Battery charger regulator unit.
- BCS 1 British Computer Society.
  - 2 Beam control system, esp. for laser on platform subject to jitter and atmospheric turbulence.
  - 3 Block check sequence.
- 4 Buoy communication system.
- BCSG Bus-computer symbol generator.
- BCST, bcst Broadcast.
- BCSV Bearing-compartment scavenge valve.
- BCT Brigade Combat Team (USA).
- BCU 2 Bird control unit (on airfield).
  - 2 Bus control unit.
- BCV Belly cargo volume.
- BCW Binary chemical warhead.
- BD 1 Blowing dust.
  - 2 Baud (correct abbreviation is Bd).
- BD Bearing and distance.
  1 Baud.
  2 Baud.
  3 Baud.
  4 Baud.
  5 Baud.
- Bd Candle (unit of luminous intensity), abb.
- BDA Bomb (or battle) damage assessment.
- BDAC Bilateral Defence/Defense Acquisition Committee [being negotiated from 2002 to resolve problems caused by US refusal to disclose information to UK defence partners].
- BDC, b.d.c. 1 Bottom dead centre.
  - 2 Bomb detection chamber.
- BDHI Bearing/distance/heading indicator.
- BDHSI, BDHSI Bearing/distance-horizontal-situation indicator.
- BDI 1 Bearing/distance indicator.
  - 2 Association of defence industries (G).
  - 3 Bomb-damage intelligence.
- BDL Bistable-diode laser.
- BDLI Bundesverband der Deutschen Luft- und Raumfahrtindustrie eV [German aerospace industry association; office, Bonn D–53179] (G).
- BDMM Business data management and invoicing.
- BDOE Barrels per day oil equivalent.
- BDP Bitsync descrambler preprocessor.
- BDR 1 Battle-damage repair.
  - 2 Basic dispatch rate, or reliability [percent].
- BDRY Boundary.
- BDS 1 Comm-B designation subfield.
  - 2 Boost defence segment.
BDTF  J Bypass-duct splitter.

BDTF  Bomber Defence Training Flight (RAF).

BDX  Beacon-data extractor, or extractor.

BE  Business engineering.

Be  Beryllium.

BEA  I British European Airways 1946–72.

BEAB  British Electrotechnical Approvals Board.

beaching  Pulling marine aircraft up sloping beach, out of water to position above high tide.

beaching gear  Wheels or complete chassis designed to be attached to marine aircraft in water to facilitate beaching and handling on land.

beacon  J System of visual lights marking fixed feature on ground (see aeronautical light).

2 Radio navaid (see fan marker, homing beacon, NDB, LFM, marker beacon, Z marker).

J Radar transceiver which automatically interrogates airborne transponders (see radar beacon, ATCRBS).

Portable radio transmitter, with or without radar reflector or signature enhancement, for assisting location of object on ground (see crash locator beacon, personnel locator beacon).

beacon buoy  Self-contained radio beacon carried in emergency kit. Floats on water.

beacon characteristic  Repeated time-variant code of some visual light beacons, esp. aerodrome beacons emitting Morse letters identifying airfield.

beacon delay  Time elapsed between receipt of signal by beacon of transponder type (eg. in DME) and its response.

beacon identification light  Visual light, emitting characteristic signal, placed near visual light beacon (pre-1950) to identify it.

beacon skipping  Fault condition, due to technical or natural causes, in which interrogator beacon fails to receive full transponder pulse train.

beacon steering  Interference by one radar resulting in loss of tracking of aerial target by another.

beacon tracking  Tracking of aerial target by radar beacon, esp. with assistance from transponder carried by target.

bead  J Corrugation or other linear discontinuity rolled or pressed into sheet to stiffen it.

2 Thicker edge to pneumatic tyre shaped to mate with wheel rim and usually containing steel or other filament reinforcement.

J Unwanted blob of weld metal.

braded  See bead 1.

beading  Rolling or pressing sheet to incorporate beads.

beadscrew  Profiled seating on wheel for bead (2), hence * life, on expiry of which wheel must be reprofiled.

bead sight  Ring and bead seat.

Be/Al  Beryllium-aluminium.

beam  J Structural member, long in relation to height and width and supported at either or both ends, designed to carry shear loads and bending moments.

2 Quasi-unidirectional flow of EM radiation.

J Quasi-unidirectional flow of electrons, with or without focusing to point.

4 Loosely, on either side of aircraft; specif. direction from 45° to 135° on either side measured from aircraft longitudinal axis and extending undefined angle above and below horizontal. Hence, * guns (firing on either side), or surface object described as ‘on the port * (90° on left side).

BEAMA  British Electrical and Allied Manufacturers’ Association [London SE1 7SL] (UK).

beam approach  Early landing systems in which final approach was directed by beam (2) from ground radio aid (see BABS, ILS, SB4).

beam attack  Interception terminating at crossing angle between 45° and 135°.

beam bracketing  Flying aircraft alternately on each side of equisignal zone of radio range or similar two-lobe beam.

beam capture  To fly aircraft to intercept asymptotically a beam (2), esp. ILS localizer and glide path.

beam compass  J Drawing instrument based on beam parallel to drawing plane having centre point and carrier for pen or other marker.

2 Panel instrument providing radio and magnetic heading information.

beam direction  In stress analysis, direction parallel to both plane of spar web, or other loadbearing member, and aircraft plane of symmetry.

beam-index display  Full-colour CRT using single gun and no shadow mask, computer switching to illuminate spots of red, blue or green phosphor according to instantaneous beam position.

beam jitter  Continuous oscillation of radar beam through small conical angle due to mechanical motion and distortion of aerial.

beam rider  Missile or other projectile equipped with beam-rider guidance.

beam-rider guidance  Radar guidance system in which vehicle being guided continuously senses, and corrects for, deviation from centre of coded radar or laser beam which is usually locked on to target. Accuracy degrades with distance from emitter.

BEAMS  British Emergency Air Medical Service.

beam slenderness ratio  Length of structural beam divided by depth (essentially, divided by transverse direction parallel to major applied load).

beam softening  Progressive reduction in gain of ILS demand signal.

beamwidth  Angle in degrees subtended at aerial [antenna] between limiting directions at which power [DoD states “RF power”, NATO states “emission power”) of radar beam has fallen to half that on axis. Often defined for azimuth and elevation. Symbol θ. Determines discrimination.

beam counting  Notional procedure of accountants whose sole interest is the balance sheet.

beany hat  Soft brimmed hat, favoured by glider pilots.

Bear  Electronic-warfare officer, usually in defence-suppression aircraft.

beard radiator  Piston engine radiator mounted under the engine.

bearer  Secondary structure supporting removable part such as fuel tank or engine.

bearing  J Angular direction of distant point measured in horizontal plane relative to reference direction.

2 Angular direction of distant point measured in degrees clockwise from local meridian, or other nominated reference. Such measure must be compass, magnetic or true. True * is same as azimuth angle.

J Mechanical arrangement for transmitting loads
bearing chamber

between parts having relative motion, with minimum frictional loss of energy or mechanical wear.

**bearing chamber**  Annular chamber surrounding shaft bearing, in gas-turbine engine as far as possible in cool location and incorporating low-friction sealing.

**bearing compass**  Portable and hand-held, used for determining magnetic bearing of distant objects.

**bearingless rotor**  Helicopter rotor in which all control is effected by flexibility in the blade attachments.

**bearing-only launch**  Missile is launched along approximate known bearing of target and seeker is switched on to search sector ahead, thereafter following various commands depending on whether or not target is acquired.

**bearing plate**  Simple geometric instrument for converting bearings of distant objects into GS (1) and drift.

**bearing projector**  Powerful searchlight trained from landmark beacon or other point towards nearby airfield (obs).

**bearing selector**  See omit.*.

**bearing stress**  In any mechanical bearing, with or without relative movement, load divided by projected supporting area.

**bear pads**  Horizontal plates added to prevent helicopter skid sinking into snow. See, ski pad.

**bear paws**  Short skis [fixed-wing aircraft].

**beat**  1  Vibration of lower frequency resulting from mutual interaction of two differing higher frequencies. Often very noticeable in multi-engined aircraft.

**beat frequency**  Output from oscillator fed by two different input frequencies which has frequency equal to difference between applied frequencies. (Other outputs have higher frequencies, such as sum of applied frequencies.)

**beat-frequency oscillator**  Oscillator generating signals having a frequency such that, when combined with received signal, difference frequency is audible. Such ** is heterodyne, used in CW (1) telegraphy. Another is super-heterodyne, in which local produces intermediate frequency by mixing with received signal.

**beat reception**  Heterodyne reception, as used in CW (1) telegraphy.

**beat-up**  1  Aggressive dive by aircraft to close proximity of surface object.

2  One complete cycle of such interference.

**Breakeven load factor** (BLF also common).

**Belgian Cockpit Association**  (Belgium)

**Belgospace**  (Belgium)

**BELF**  First directional radio stations, using tri-angular loop antennas.

**Bellini-Tosi**  Plane of blades, crossing at 90°.

**Bell-Hiller stabilizer**  Two masses on short arms attached to hub of two-blade main rotor of helicopter in plane of blades, crossing at 90°.

**Beddown**  Process of introducing major new weapon system to combat duty, esp. aircraft (eg B–2) at first operating base.

**BEEF**  Base emergency engineering force (USAF).

**beefing up**  Strengthening of structural parts, either by redesign for new production or by modification of hardware already made. Thus, beef (= added material), beefed (US collog.).

**beehive**  Small formation of bombers with close fighter escort (RAF pre-1945).

**beep box**  Station for remote radio control of activity or vehicle, such as RPV (collog.).

**beeper**  1  Personal radio alerting receiver.

2  RPV pilot.

3  Manual two-way command switch, eg electric trimmer or cyclic-stick thummbswitch for fuel valve control.

**BEES, Bees**  Battle-force electromagnetic interface evaluation system.

**before-flight inspection**  Pre-flight inspection (NATO).

**behavioural science**  Study of behaviour of living organisms, especially under stress or in unusual environments.

**Beier gear**  Infinitely variable mechanical transmission accomplished by stacks of convex discs intermeshing with stacks of concave discs, drive ratio being varied by bringing parallel shafts closer together, for extreme ratios, or further apart.

**bel**  Unit for relative intensity of power levels, esp. in relation to sound. One bel is ratio of power to be expressed divided by reference power, expressed as logarithm to base 10. Numerically equal to 10 decibels.

**BELF**  Breakeven load factor (BLF also common).

**Belgospace**  Trade association for space industry companies and organisations [B-1050 Brussels] (Belgium)

**Belgian Cockpit Association**  (Belgium)

**BELF**  Breakeven load factor (BLF also common).

**Bellini-Tosi**  First directional radio stations, using tri-angular loop antennas.

**bellows**  Aneroid capsule(s).

**belly**  Underside of central portion of fuselage.

**belly-in, belly landing**  To make premeditated landing with landing gear retracted or part-extended; belly-in is a verb.

**below minima**  Weather precludes takeoff or landing.

**BEMT**  Helicopter blade-element momentum theory.

**bench**  Static platform or fixture for manual work, system testing or any other function requiring firm temporary mounting (need not resemble a workshop *).

**bench check**  Mandatory manual strip, inspection, repair, assembly and recalibration of airborne functional parts, made at prescribed intervals and by station and staff certified by airworthiness authority and/or hardware manufacturer.

**bench engine**  For bench testing, not cleared for flight.

**bench test**  Test of complete engine or other functional system on static testbed or rig.

**bend**  To damage an aircraft, especially in a crash, hence bent (UK collog.)
**bend allowance** Additional linear distance of sheet material required to form bend of specified radius.

**bending brake** Workshop power tool for pressing metal sheet without dies.

**bending moment** Moment tending to cause bending in structural member. At any section, algebraic sum of all moments due to all forces on member about axis in plane of section through its centroid.

**bending relief** Design of aircraft to alleviate aeroelastic deflection, especially of main wing (eg, by distributing mass of fuel and engines across span).

**bending stress** Secondary stresses (eg, in wing skins and spar booms) which resist deflection due to applied bending moments.

**bends** Acute and potentially dangerous or lethal discomfort caused by release of gases within a mammalian body exposed to greatly reduced ambient pressure. Thus, a hazard of high-altitude fliers and deep-sea divers (see aerobesity, decompression sickness).

**bent** 1 Feature of many gun mechanisms, engaging in cocked position with sear.

2 Signal code indicating that facility is inoperative (DoD).

3 Transverse frame capable of offering vertical support and transmitting bending moment.

4 Damaged in an accident (colloq.).

**bent beam, bent course** Radio or radar beams significantly diverted from desired rectilinear path by topographic effects, hostile ECM or other cause.

**benzene** Liquid hydrocarbon, C₆H₆, s.g. 0.899, with characteristic ring structure forming base of large number of derivatives. Used as fuel or fuel additive, as solvent in paints and varnishes, and for many other manufactures.

**benzine** Mixture of hydrocarbons of paraffin series, unrelated to benzene. Volatile cleaning fluid and solvent.

**benzo** Benzene C₆H₆.

**BEP** Back-end processor; MS adds management system.

**BER** 1 Beyond economic repair.

2 Bit error rate, also b.e.r.

**BERD** Business enterprise research and development.

**Berline** Single-engined transport aircraft (F).

**Bermuda triangle** Region at base of stiffener bonded to composite sheet subject to high stress.

**Bernoulli’s theorem** Statement of conservation of energy in fluid flow. Basis for major part of classical aero-dynamics, and can be expressed in several ways. One form states an incompressible, inviscid fluid in steady motion must always and at all points have uniform total energy. Basis for major part of classical aero-dynamics, and can be expressed in several ways. One form states an incompressible, inviscid fluid in steady motion must always and at all points have uniform total energy. Thus, if fluid flows subsonically through a venturi, pressure is lowest at throat; likewise, pressure is reduced in accelerated flow across a wing.

**BERP, Berp** British experimental helicopter main rotor programme.

**Berp rotor** RAE 9646 profile inboard, 9645 outboard, broad tip 9634.

**BERR** Business enterprise and regulatory reform.
BF

watch or instrument; esp. rotatable outer ring of pilot’s magnetic compass.

BF 1 Block fuel.
2 Blind-flying; thus * instrument, * panel.
3 Base Flight (USN).
4 Below freezing.
5 Bomber/fighter category (USN, 1934–37).
6 Blue Force [many suffixes].

BFA 1 Balloon Federation of America.
2 Battlefield Airfighter (RAAF).

BFAANN British Federation Against Aircraft Noise Nuisance.

BFCU Barometric fuel control unit.

BFNAS Basic flight-data acquisition system.

BFDK Before dark.

BFE 1 Buyer-furnished equipment [MS adds management system].
2 Basic flight envelope.

BFG British Forces in Germany.

BFL 1 Basic field length.
2 Balanced field length.

BFM Basic fighting/fighter/flight manoeuvring (or manoeuvres).

BFN Beam-forming network [satcoms].

BFO 1 Beat-frequency oscillation, or oscillator.
2 Battlefield obscuration.
3 Bits falling off.

BFOM Basic flight-operations management.

BFOP, BFVO Binocular field of view.

BFP 1 Blind-flying panel.
2 British Flying Permit (ultralights).
3 Best-fit parabola.
4 Blown fuse-plug (tyre).

BFR 1 Biennial flight review, for renewal of pilot licence (FAA).
2 Before.

BFRP Boron-fibre reinforced plastics.

BFS 1 Bundesanstalt für Flugsicherung (= ATC, G).
2 Back-up flight system.

BFT 1 Basic fitness testing.
2 Blue Force Tracking.
3 Basic flying training school.

BFTS 1 Basic flying training school.
2 British Flying Training School (US 1941–44); A adds Initiatives.

BHS Basic Field Length.

BHTS Bomber/Fighter Training System (USAF).

BG 1 Bomb., or Bombardment, Group (USAAC, USAAF, USAF).
2 Bomb glider, aircraft category (USAAC 1943–46).
3 See *lighting.

BGA The British Gliding Association [1929–; office, Leicester LE1 4SE] (UK).

BGN Basic ground instructor.

BGF 1 Bus grant inhibit.
2 Binocular field of view.

BG light Blue/green.

BGM Designation code; multiple launch environment surface-attack missile, = cruise missile.

BGN Begin, begun.

BGP Border gateway protocol.

BGR Best glide-ratio.

BGS 1 Blasting grit, soft, such as Carboblast.
2 Bombing and Gunnery School.
bidirectional cable

Runway emergency arrester cable which can stop aircraft from either direction.

BiDSS, Bids Battlefield [or baggage] information distribution [or display] system.


BIFAP Bourse Internationale de Ret Aérien de Paris.

BIFET Bistable field-effect transistor (gate).

Biff, Biff 1 Battlefield identification friend or foe.

2 British Industrial Fasteners Federation.

bidirectional cable Biological decay

BIDS, Bids Battlefield information distribution system.

bi-filar Suspension of mass by two well separated filaments; mass normally swings in plane of filaments.

BiFOV Binocular field of view.

bi-fuel 1 Bipropellant.

2 More rarely, heat engine which can run on either of two fuels but not both together.

Bi-furcated Rod, tube or other object of slender form which is part-divided into halves; fork-ended.

Bi-furcation 1 Point at which duct [eg jetpipe] splits into two, usually left/right.

2 Analysis of steady states, a * occurring when stability changes from one state to another as an input [eg, control-surface angle] is altered.

Big BLU Proposed large [30,000-lb, 13.6-tonne] deep-penetration bomb (USAF).

big bone Very large indivisible part of airframe structure, such as a spar or monolithic bulkhead.

Big Chop, the 1 Upright cylindrical receptacle, esp. some early gun turrets.

2 Listening with both ears.

binaural Very large indivisible part of airframe structure, such as a spar or monolithic bulkhead.

bilateral Agreement between two parties.

bilateration Position determination by use of AF signal beamed to vehicle, which re-radiates it to original ground station and to second at surveyed location giving known delay path. Can be used for control of multiple vehicles beyond LOS.

Bill, BILL Beacon illuminator, or illuminating, laser (ABL).

billet Rough raw metal material form, usually square or rectangular-section bar, made by forging or rolling ingot or bloom.

bill of material List of raw material and/or parts needed to make something.

billow Inflation of each half of Rogallo wing.

BIM 1 Ballistic intercept missile.

2 Blade inspection method (helicopters).

3 Blade integrity monitor.

# British Institute of Management.

bimetallic joint Joint between dissimilar metals.

bimetallic strip Strip made of sandwich of metals, usually two metals chosen for contrasting coefficients of thermal expansion. As halves are bonded together any change in temperature will tend to curve the strip. Principle of bimetallic switch and temperature gauge.

bi-mono aircraft Monoplane having detachable second wing for operation as biplane.

bin 1 Electronic three-dimensional block of airspace.

biological decay

All airspace in range of SSR or other surveillance radar is subdivided into *, size of which is much greater than expected dimensions of aircraft. Thus presence of an aircraft cannot load more than one (transiently two)* at a time.

2 Upright cylindrical receptacle, esp. some early gun turrets.

BINA British Isles and North Atlantic.

binary actuator Patented technique in which fluid is controlled by valve driven by spring-loaded armature with either of two positions within magnetic field.

binary code Binary notation.

binary munition One whose filling is composed of two components, mixed immediately before release or launch.

binary notation System of counting to base of 2, instead of common base of 10. Thus 43 (sum of 2, 2, 2 and 2) is written 101011. All binary numbers are expressed in terms of two digits, 0 and 1. Thus digital computer can function with bistable elements, distinction between a 0 or 1 being made by switch being on or off, or magnetic core element being magnetised or not.

binary phase modulation Radar pulse-compression technique in which the phases of certain echo segments are reversed.

binary switch Bistable switch.

binoural Listening with both ears.

bind Noun, boring duty; verb, to complain incessantly (RAF, traditional).

BINDT British Institute of Non-Destructive Testing (office, Northampton).

bongo 1 As an instruction, radioed command to aircrew (usually military) to proceed to agreed alternative base.

2 As information, radioed call from aircrew (usually military) meaning that fuel state is below a certain critical level (usually that necessary to return to base). Thus calls *“fuel” or “Below*”. See next entries.

3 In some single-seat aircraft, alarm [usually bell] in headset at * fuel point.

Bingo 1 External tanks are empty.

Bingo 2 At start of what must be last practice engagement.

Bingo 3 Must break off combat area and recover to base, but with margins not present at Chicken.

binor Binary optimum ranging. Binary code modified for range measurement and minimising receiver acquisition time.

BINOCV, BinOve Break[s] in overcast.

BIO Biotechnology Industry Organization (US).

bioastronautics Study of effects of space travel on life forms.

biochemical engineering Technology of biochemistry.

biochemistry Chemistry of life forms.

biodegradable Of waste material, capable of being broken down and assimilated by soils and other natural environments.

biodynamics Study of effects of motion, esp. accelerations, on life forms.

BIOG British Industry Offset Group [DMA, SBAC] (UK).

biological agent Micro-organism causing damage to living or inanimate material and disseminated as a weapon.

biological decay Long-term degradation of material due to biological agents.
biological warfare

Warfare involving use as weapons of biological agents, toxic biological products and plant-growth regulators.

biomedical monitoring  Strictly ‘biomedical’ is tautological, but term has come to denote in-flight monitoring of heartbeat, respiration and sometimes other variables, esp. of astronauts in space.

biometric recognition  Identification of individual humans by their unique features, eg eye iris, fingerprint, hand-print.

bionics  Study of manufactured systems, esp. those involving electronics, that function in ways intended to resemble living organisms.

bio-pak  Container for housing and monitoring life forms, esp. for astronauts in space.

biometry  Geometric measurement of life forms, esp. humans.

bionics  Study of manufactured systems, esp. those involving electronics, that function in ways intended to resemble living organisms.

bio-pak  Container for housing and monitoring life forms, esp. for astronauts in space.

biosensor  Sensor for measuring variables in behaviour of living systems.

biosphere  Location of most terrestrial life: oceans, surface and near-surface of land, and lower atmosphere.

bioterrorism  Loosely, germ warfare; hence bioweapons.

Biot-Savart law  For computing induced velocities in a vortex filament.

biowaste  All waste products of living organisms, esp. humans in spacecraft.

BIP  1 Borescope inspection port.

2 Baggage improvement program (IATA).

biphasic coding  Standard coding for both the 1553B and A629 [which see] data buses, also known as Manchester coding. In this protocol a 1 is signified by a change of signal from positive to negative during the bit period, and a 0 [zero] is signalled by a change from negative to positive.

biplace  Two-seat (US, F usage).

biplane  Aeroplane or glider having two sets of wings substantially superimposed (see tandem-wing).

biplane interference  Aerodynamic interference between upper and lower wings of biplane or multiplane.

biplane propeller  Propeller having pairs of blades rotating together in close proximity, resembling biplane wings.

BIPM  Bureau International des Poids et Mesures.

bipropellant  1 As adjective, rocket which consumes two propellants – solid, liquid or gaseous – normally kept separate until introduction to reaction process. In most common meaning, propellants are liquid fuel and liquid oxidiser, stored in separate tanks.

2 As noun, rocket propellant comprising two components, typically fuel and oxidiser.

BIR  Biennial infrastructure review.

BIRD  Banque Internationale pour la Reconstruction et le Développement.

bird  Any flight vehicle, esp. aeroplane, RPV, missile or ballistic rocket (coloq.).

bird gun  Gun, usually powered by compressed air, for firing real or simulated standard birds at aircraft test specimens to demonstrate design compliance.

BIRDIE  Battery integration and radar display equipment (USA).

birdie  Spurious radar echo, usually from PRF harmonics.

bird impact  Birdstrike; design case for all aerodynamics intended for military or passenger carrying use (see standard bird).

bird ingestion  Swallowing of one or more birds by gas-turbine or other air-breathing jet engine, with or without subsequent damage or malfunction (see ingestion certification).

birdnesting  Tendency of chaff to stick together in tight bundles, hence forming bird(n)s nests.

Birmabright  Trade name of many British alloys of Al, Mg and Mn.

BIRMO  British IR Manufacturers’ Organisation.

birotative  Having two components on the same axis rotating in opposite directions, or in the same direction at different speeds.

BIS  1 British Interplanetary Society [1933–; office, London SW8 1SZ (UK)].

2 Board of Inspection and Survey (US Navy).

3 Burn-in screening.

4 Boundary intermediate system.

5 Biometric identification system.

bis  Second version of product, equivalent to Mk 2 (F, I, R).

BISA  Battlefield Information System Application (GBAD, UK).

Bise  Cold, dry wind in S France.

bi-signal zone  Portions of radio-range beam on either side of centreline where either A or N signal can be heard against monotone on-course background.

BISMS  BIS(4) management system.

BISPA  Bipa British Iron and Steel Producers Association.

BISS  Base and installation security system.

BIST  Built-in self-test.

 bistable  Capable of remaining indefinitely in either of two states: thus, bistable switch is stable in either on or off position (see flip-flop).

bistatic radar  Radar whose transmitter and receiver are at different locations when seen from the target.

BIT  2 Bureau International du Travail (ILO).

bit  Unit of data or information in all digital (binary) systems, comprising single character (0 or 1) in binary number. Thus, capacity in bits of memory is log2 of number of possible states of device. From ‘binary digit’.

Bitching Betty  UAV voice system which reminds operator of fuel state and other important factors.

BITD  Basic-instruments training device.

BITE, bite  Built-in test equipment.

BIT/Fi  Built-in test and fault isolation.
black-body radiation

band from near-IR through visible to far-UV.

temperature. In some cases wavelength is restricted to
reflects no radiation, absorbs all and emits at maximum
black body
directions may differ.

black ball

1

black aluminium

2

Base-line (hyperbolic nav).
3

Bulk loader.
4

Between layers.
5

Blowing [DU adds dust, SA sand, SN snow].

BLA

1

British Laser Association.

BLAC

Operative element of windscreen wiper.

blabbermouth

Traditional form of artificial horizon based

blade activity factor

Non-dimensional formula for expressing ability of blade (1) to transmit power; integral
between 0.1 and 0.5 of diameter of chord and cube of
radius with respect to radius. Loosely, low aspect ratio
means high activity factor.

blade angle

1

In propeller, lifting rotor, axial compressor rotor or
axial turbine. Also see stator *.

blade beam

Radial aerofoil designed to rotate about an axis,
as in propeller, lifting rotor, axial compressor rotor or
axial turbine. Also see stator *.

blade beam

Rigid array of solar cells, especially one having length
much greater than width.

blade beam

Hand tool in form of beam incorporating

blade body

Theoretical material or surface which
reflects no radiation, absorbs all and emits at maximum
rate per unit area at every wavelength for any
given temperature. In some cases wavelength is restricted to
band from near-IR through visible to far-UV.

black-body radiation

EM spectrum emitted by black
body, theoretical maximum of all wavelengths possible for
any given body temperature.

black box

1

Avionic equipment or electronic controller
for hardware device or system, removable as single
package. Box colour is immaterial (colloq.).

2

In particular, flight-data or accident recorder, usually
Day-Glo scarlet or orange.

black box

In TV system, portion of video
signal containing blanking and synchronizing voltages,
which are below black level (with positive modulation)
and prevent electrons from reaching screen.

black hole

1

IRCM design giving engine efflux (esp. of
helicopter) or trick line heat source greatest protection.

2

Approach to land in near-absence of external visual

black hot

TV or IR display mode giving negative picture
(warm ship looks black against white sea).

blackjack

Hand tool for manually forming sheet metal;
has form of flexible (often leather) quasi-tubular bag
filled with lead shot too small to cause local indentations.

Black Label

Hardware used in first-build or prototype
that is not only physically representative but is also
cleared for flight.

black level

In TV system, limit of video (picture) signal
black peaks, below which signal voltages cannot make
electrons reach screen.

black men

Ground crew [Schwarze Männer]
(Luftwaffe).

black metal

See black aluminium.

blackout

1

In war, suppression of all visible lighting that
could convey information to enemy aircraft.

2

Fadeout of radio communications, including
telemetry, as result of ionospheric disturbances or to
sheath of ionised plasma surrounding spacecraft re-
entering atmosphere.

3

Fadeout of radio communications caused by disrup-
tion of ionosphere by nuclear explosions.

4

Dulling of senses and seemingly blackish loss of vision
in humans subjected to sustained high positive accelera-
tion. In author's experience, more a dark red, not very
unlike red-out.

blackout block

Block of consecutive serial numbers
deliberately left unused.

black picture

See black hot.

bladder tank

Fluid tank made of flexible material,
especially one not forming part of the airframe.

Blade

Bristol Laboratory for Advanced Dynamics
Engineering.

blade

1

Radial aerofoil designed to rotate about an axis,
as in propeller, lifting rotor, axial compressor rotor or
axial turbine. Also see stator *.

2

Rigid array of solar cells, especially one having length
much greater than width.

3

Operative element of windscreen wiper.

blade activity factor

Non-dimensional formula for expressing ability of blade (1) to transmit power; integral
between 0.1 and 0.5 of diameter of chord and cube of
radius with respect to radius. Loosely, low aspect ratio
means high activity factor.

blade aerial

Radio aerial, eg for VHF communications,
having form of vertical blade, either rectilinear, tapered or
backswepet.

blade angle

Angle between incident airflow and
blade (1) tangent to mean chord at leading edge at chosen
station.

blade articulation

Attachment to hub of helicopter
lifting rotor blades by hinges in flapping and/or drag axes.

blade back

Surface of blade (1) corresponding to upper
surface of wing.

blade beam

Hand tool in form of beam incorporating
padded aperture fitting propeller or rotor blade; for
adjusting or checking blade angle.

blade centre of pressure

Point through which resultant of
all aerodynamic forces on blade (1) acts.

blade damper

Hydraulic, spring or other device for
restraining motion of helicopter lifting rotor blade about
drag (lag) hinge.

bladed spinner

Zero stage of part-height blades added to
spinner ahead of fan of turbofan; proposed by Rolls-
blade element

Royce. * is unshrouded and not separated from fan by stators, otherwise similar in principle to TF39 of 1966.

blade element 1 Infinitely thin slice (ie having no spanwise magnitude) through blade (1) in plane parallel to axis of rotation and perpendicular to line joining centroid of slice to that axis. Thus, blade is made up of infinity of such elements from root to tip, usually all having different section profile and blade angle. *momentum theory deals with the rotor of a hovering helicopter.

blade face 2 Surface of blade (1) corresponding to underside of a wing. With propellers, called thrust face.

blade inspection method 3 Spars of helicopter main-rotor blades are pressurized, loss of pressure warning of crack (Sikorsky).

blade loading 4 Of helicopter or autogyro, gross weight divided by total area of all lifting blades (not disc area).

blade loading coefficient 5 Helicopter rotor thrust coefficient divided by solidity, $C_{\sigma}$.

blade passing noise 6 Component of internally generated noise of turbomachinery, caused by interaction between rotating blades and wakes from inlet guide vanes and stationary blades. Generates distinct tones at blade-passing frequencies, which in turn are product of number of blades per row and rotational speed.

blade root 7 Loosely, inner end of blade (1).

blade shank 8 Where applicable, extreme inboard end of blade incorporating means of attachment (see blade shank).

Blades 9 Battlespace laser detection system (AEFB/AFRL).

blades 10 Verbal call to pull piston engine through specified number of propeller blades before start.

blade section 11 Shape of blade element.

blade span axis 12 Axis, defined by geometry of root pitch-change bearings, about which blade is feathered.

2 Axis through centroids of sections at root and tip.

blade station 13 Radial location of blade element, expressing as decimal fraction of tip radius (rarely, as linear distance from axis of rotation, from root or from some other reference).

blade sweep 14 Deviation of locus of centroids of all elements of blade from radial axis tangential to that locus at center. Was marked in early aircraft propellers, usually towards trailing edge (ie, trailing sweep); leading sweep, in which tips would be azimuthally ahead of hub, is rare.

blade tilt 15 Deviation of locus of centroids of all elements of blade from plane of rotation. Again a feature of early aircraft propellers, more common form being backward tilt, visible in side view as propeller flat at back and tapered from boss to tip in front.

blade tip grinding 16 Precise grinding of the tips of an assembled axial compressor rotor. In some engines the final trim is by allowing the tips to rub inside the casing.

blade twist 17 Unwanted variation in pitch from root to tip caused by aerodynamic loads.

2 Natural twist which reduces blade angle from root to tip.

blade/vortex interaction 18 Between each helicopter main-rotor blade and the vortex created by its predecessor, a principal cause of slap.

blade width ratio 19 Ratio of mean chord to diameter.

Blugard

BLAGF British Light Aviation and Gliding Foundation (London W8).

BLAM Barrel-launched adaptive munition(s).

blank 2 Workpiece sheared, cut, routed or punched from flat sheet before further shaping.

2 Action of cutting part from flat sheet, esp. by using blanking press and shaped die.

3 Round of gun ammunition without projectile.

4 All-weather cover tailored to engine inlet or other aperture, forming part of AGE for each aircraft type.

blanket 5 Layer of thermally insulating material tailored to protect particular item, typically refractory fibre housed in thin dimpled stainless steel. Term is not normally used for noise insulation.

2 Layer of heating material supplied with electrical or other energy.

blanket cover 7 Fabric cover for aircraft machine-sewn into large sheet, draped over structure, pulled to shape and sewn by hand.

blanketing 8 Suppression, distortion or other gross interference of wanted radio signal by unwanted one.

2 In long-range radio communication, prevention of reflection from F layers by ionisation of E layer.

blanketing frequency 9 Signal frequency below which radio signals are blanketed (2).

blank-gore parachute 10 Parachute having one gore left blank, without fabric.

blanking 11 Using press and blanking die to cut blanks (1).

2 In electron tube or CRT, including TV picture tubes, suppression of picture signal on fly-back to make return trace invisible.

blanking cap 12 Removable cap fitted to seal open ends of unused pipe connections or other apertures in fluid system.

blanking plate 13 Removable plate fitted to seal aperture in sheet, such as unused place for instrument in panel.

blanking signal 14 Regular pulsed signal which effects blanking (2) and combines with picture signal to form blanked picture signal. Sometimes called blanking pulse.

blanks 15 See blank 4,blanking plate.

Blasius flow 16 Theoretically perfect laminar flow.

blast 17 Loosely, mechanical effects caused by blast wave, high-velocity jet or other very rapidly moving fluid.

2 Rapidly expanding products from explosion and subsequent blast wave(s) transmitted through atmosphere.

blast area 18 Region around launch pad which, before final countdown of large vehicle, is cleared of unnecessary personnel and objects.

blast cooling 19 In rotating electrical machines and other devices, removal of waste heat by airflow supplied under pressure.

blast deflector 20 Structure on launch pad or captive test stand to turn rocket or jet engine efflux away from ground with minimal erosion and disturbance.

blast fence 21 Large barrier constructed of multiple horizontal strips of curved section, concave side upwards, which diverts efflux behind parked jet aircraft upwards and thus reduces annoyance and danger at airfields.

blast/fragmentation 22 Warhead, common on AAMs and SAMS, whose effect combines blast of HE charge and penetration of fragments of rod(s) or casing.

BlasGard 23 Proprietary honeycomb materials in which
blasts gate

compartments are part-filled with various foams or expanding materials which attenuate blast and serve as a flame barrier.

**blast gate** See waste gate.

**blast line** Chosen radial line from ground zero along which effects of nuclear explosion (esp. blast effects) are measured.

**blast-off** Launch of rocket or air-breathing jet vehicle; usually, from ground or other planetary surface (colloq.).

**blast pad** Area immediately to rear of runway threshold across which jet blast is most severe. Constructed to surface standards higher than overrun or stopway beyond.

**blast pen** Small pen, enclosed by strong embankments on three sides, but open above, for ground running jet or rocket aircraft or firing missile engines.

**blast pipe** See blast tube.

**blast tube** Refractory tube linking rocket combustion chamber or propellant charge with nozzle, where these have to be axially separated.

**blast valve** Valve in air-conditioning and other systems of hardened facilities which, upon sensing blast wave, swiftly shuts to protect against nuclear contamination.

**blast wave** Shock wave (N-wave) of large amplitude and followed by significant (4 ata; 40 kPA or more) overpressure. Travels at or above velocity of sound and causes severe mechanical damage. Centred on explosions (local ** caused by lightning); attenuation and effective radius depend on third or fourth power of released energy.

**blast-wave accelerator** Concept for launching small payloads into space by accelerating them along an evacuated tube incorporating a long series of circumferential shaped charges pointed towards the muzzle.

**Blaugas** German gas used for airship lift and fuel; mixture of ethylene, ethylene, propylene, butylene, ethane and hydrogen; literal meaning, blue gas.

**BLD** Boundary-layer control, especially gross control of airflow around lifting wing to increase circulation and prevent flow breakaway.

**BLD, Bldg** Building (cloud).

**BLDG, Bldg** Building (cloud).

**BLE** Blind Landing Experimental Unit (Bedford, UK).

**BLF** Breakeven load factor.

**BLG** 1 Laser-guided bomb (F).

**BLI** Belgische Luchtvaart Info.

**BME** Berufsverband Luftfahrt-Personal in Deutschland ev (G).

**Bolt hole** Small screw in tapped hole through other member to which there is no access except through bolt hole.

**blind**

**blind nut**

engine (extra airflow may or may not be induced by ejector effect).

**bleeder resistor** Resistor permanently coupled across power supply to allow filter capacitor charge to leak away after supply is disconnected (see bleed-off relay).

**bleeder screw** Small screw in tapped hole through highest point of hydraulic or other liquid system to facilitate bleeding (4) air or vapour.

**bleeding** 1 Expulsion of every trace of air or other gas from an enclosed liquid system.

2 Extraction of bleed air.

**bleeding edge** Edge of map or chart where cartographic detail extends to edge of paper.

**bleed-off relay** In laser, discharges capacitors when switched off, to render accidental firing impossible.

**blended** Aerodynamic (arguably, also hydrodynamic) shape in which major elements merge with no evident line of demarcation. Thus, aeroplane having * wing/body (see next two entries).

**blended-hull seaplane** Marine aeroplane, generally called in English flying boat, in which planing bottom is blended into fuselage. Involves dispensing with chine, sacrificing hydrodynamic behaviour in order to reduce aerodynamic drag.

**blended wing/body** Aircraft in which wing/fuselage intersections are eliminated. Today important for reasons of stealth.

**blind point** In aerodynamic shapes having rigid and flexible surfaces mutually attached (eg Raevam, variable inlet ducts, flexible Krügers), point in section profile at which flexibility is assumed to start.

**Blew** Blind Landing Experimental Unit (Bedford, UK).

**blind rivet** Non-rigid airship (from ‘Dirigible Type B, limp’, colloq. until made official USN term in 1939).

**blind** 1 Without direct human vision.

2 Without external visibility, eg: in dense cloud.

3 Of radar, incapable of giving clear indication of target (eg see * speed).

**blind bombing** Dropping of free-fall ordnance on surface target unseen by aircrew.

**blind bombing zone** Restricted area (strictly, volume) where attacking aircraft know they will encounter no friendly land, naval or air forces.

**blind fastener** See blind rivet (though need not have rivet-like form).

**blindfire** Weapon system able to operate without visual acquisition of target.

**blind flying** Manual flight without external visual cues.

**blind-flying panel** Formerly, in British aircraft, separate panel carrying six primary flight instruments: ASI, horizon, ROC (today VSI), altimeter, DG and TB (turn/slip).

**blind landing** 1 Landing of manned aircraft, esp. aerodyne, with crew deprived of all external visual cues.

2 Landing of RPV unseen by remote pilot except on TV or other synthetic display.

**blind nut** Nut inserted or attached on far side of sheet or other member to which there is no access except through bolt hole.
blind rivet

blind rivet Rivet inserted and closed with no access to far side of joint. Apart from explosive and rare magnetic-pulse types, invariably tubular.

blind speed effect Characteristic of Doppler MTI systems used with radars having fixed PRF which makes them blind to targets whose Doppler frequencies are multiples of PRF (see staggered PRF).

blind spot 1 Not reached by radio or radar, for whatever reason.

2 Region of airfield hidden from tower.

blind toss Programmed toss without acquisition of target (eg on DR from an offset).

blind transmission Station called cannot talk back.

bling Monolithic bladed ring forming one rotor stage of a compressor or turbine [gas-turbine].

blink 1 Of light or other indicator, to be illuminated and extinguished, or to present black/white or other contrasting colour indication, more than 20 times per minute.

2 In aircraft at night in VFR, manually to switch off navigation lights (typically, twice in as many seconds) as acknowledgement of message.

blinker Light or indicator that blinks (1), eg to confirm oxygen feed. See doll’s eye.

Blip, blip Background-limited IR performance.

blip 2 Visible indication of target on radar display. Due normally to discrete target such as aircraft or periscope of submarine; in ground mapping mode, term used only to denote strong echo from transponder.

2 Spot, spike or other indication on CRT due to signal of interest.

3 To control energy input to early aeroplane by switching ignition on and off as necessary (normally, on landing approach).

4 To operate bang/bang control manually (eg, electric trim).

blip driver Operator of synthetic trainer for SSR or other surveillance radar with rolling ball or other means of traversing system co-ordinates to give desired blip (1) position and movement (colloq.).

blipscan ratio Also written blip scan, an expression for probability of detection of a target by radar.

blank Axial turbine rotor stage (rarely, compressor stage) in which disc [US = disk] and blades are fabricated as single piece of material.

Bliss Bi-level integrated system synthesis.

blister 1 Streamlined protuberance on aerodynamic body, usually of semicircular transverse section and often transparent to selected EM wavelengths.

2 See blister spray.

blister aerial Aerial projecting from surface of aircraft and faired by dielectric blister.

blister hangar Prefabricated and demountable hangar having arched roof and fabric covering.

blister spray Arching sheet of water thrown up and outwards above free water surface on each side of planing hull or float. Compared with ribbon spray, has lower lateral velocity, rises higher, is clear water rather than spray, and is much more damaging.

blister spray dam Strong strip forming near-vertical wall projecting downwards along forebody chine of hull or float.

blivet Flexible bag for transporting fuel, usually as helicopter sling load.

blocking up

BLK 1 Block.

2 Black.

BLM 1 Background luminance monitor.

2 Bureau of Land Management, Federal agency responsible for firefighting in wild regions (US).

BLN Balloon.

BLW Below clouds (ICAO).

blob Local atmospheric inhomogeneity, produced by turbulence, with temperature and humidity different from ambient. Can produce angels (2).

block 1 In quantity production, consecutive series of identical products having same * number. In World War 2 aircraft production a * might number several hundred; with large spacecraft and launch vehicles, fewer than ten.

2 In general, products of two * normally differ as result of incorporation of engineering changes.

3 In research, groups of experimental items subjected to different treatment for comparative purposes.

4 In EDP, group of machine words considered as a unit.

5 In aircraft (usually commercial) operation, chocks (real or figurative) whose removal or placement defines the beginning and end of each flight.

blockbuster Large thin-case conventional bomb [British term for German = land mine, 1940–45] (colloq.).

clock check sequence Cyclic code used as reference bits in error-detection procedure.

block construction Arrangement of gores of parachute such that fabric warp threads are parallel to peripheral edge.

block diagram Pictorial representation of system, other than purely electrical or electronic circuit, in which lines show signal or other flows between components, depicted as blocks or other conventional symbols.

blocker See inlet *.

blocker door In installed turbofan engine, hinged or otherwise movable reverser door (normally one of peripheral ring) which when closed blocks fan exit duct and opens peripheral exits directing airflow diagonally forward.

block fuel Fuel burned during block time.

block-hour cost DOC for one hour of block time.

blockhouse Fortified building close to launch pad for potentially explosive vehicles, from which human crew manage launch operations or perform other duties (eg photography).

block in To park transport aircraft at destination. Term spread from commercial to military transport use.

blocking 1 In wind tunnel, gross obstruction to flow caused by shockwaves at Mach numbers close to 1, unless throat and working section designed to avoid it (see choking).

2 Use of struts and wedges to prevent movement of loose cargo or cargo inside container.

3 Use of form block.

blocking capacitor Capacitor inserted to pass AC and block DC.

blocking layer Barrier layer in photovoltaic (ie solar) cell.

blocking oscillator Any of many kinds of oscillator which quench their output after each alternate half-cycle to generate sawtooth waveform.

blocking up To use shaped masses behind sheet metal being hammered.
block letter

block letter Suffix to aircraft serial number, equivalent to USAF block number (USN).

block number See block (1).

block out To move off blocks, esp. at start of scheduled flight.

block shipment Rule-of-thumb logistic supply to provide balanced support to round number of troops for round number of days.

block speed Average speed reckoned as sector distance divided by block time.

block stowage Loading all cargo for each destination together, for rapid off-loading without disturbing cargo for subsequent destinations.

block template Template for making form block.

block time Elapsed period from time aircraft starts to move at beginning of mission to time it comes to rest at conclusion. Historically derived from manual removal and placement of blocks (chocks). Normally used for scheduled commercial operations, either for intermediate sectors or end-to-end.

block upgrade plan, programme Introduction of successive groups of modifications, each in a particular FY or production block.

Blocktube Patented mechanical control in which command is transmitted by push/pull action of steel cable on which are threaded guidance rings running inside a tube.

blood-albumen glue Adhesive used in aircraft plywood, made from dry cattle blood albumen.

blood chit 1 Form signed by aircraft passenger before flight for which no fare has been paid (eg, in military aircraft) indemnifying operator against claims resulting from passenger’s injury or death (colloq.).

2 Plastic or cloth message, usually in several languages, promising reward if bearer is helped to safety. Often includes representation of bearer’s national flag (colloq.).

blood wagon Ambulance.

bloom 1 Ingot from which slag has been removed, sometimes after rough rolling to square section.

2 Of ECM chaff, to burst into large-volume cloud after being dispensed as compact payload.

blooming 1 In surface-coating technology, to coat optical glass with layer a few molecules thick which improves optical properties (by changing refractive index and/or reducing external reflection).

2 In CRT, defocusing effect caused by excessive brightness and consequent mushrooming of beam.

3 In atmospheric laser operations, defocusing or undesired focusing of pulses or beam caused by lens-like properties in atmosphere (see bash).

BLOS Beyond, or below, line of sight.

blossom effect Sudden apparent growth in size of aircraft on collision course as distance approaches zero.

bloom 1 Rupture in case of solid rocket during firing.

2 Improper escape of gas through breech during firing of gun, due to ruptured case, faulty breech mechanism or other malfunction.

3 Closure, or partial closure, of spoiler or speed brake due to aerodynamic load overcoming force exerted by actuation system.

blowback angle Maximum angle to which a spoiler can be extended under given q (dynamic pressure) without blockback (3).

blowby 1 Loss of gas leaking past piston-engine piston ring.

2 Increasingly used to mean seepage past rings of lubricating oil.

blowdown 1 Pilot input or pfcu force overcome by aerodynamic load on control surface, the latter being either prevented from moving or returned to neutral position.

2 In captive firing of liquid rocket, expulsion of residual propellant[s] by gas [usually nitrogen] after burnout or cutoff.

blowdown period Period in cycle of reciprocating IC engine in which exhaust valve or port is open prior to BDC.

blowdown tunnel Open-circuit wind tunnel in which gas stored under pressure escapes to atmosphere, or into evacuated chamber, through working section.

blowdown turbine Turbine driven by piston engine exhaust gas in such a way that kinetic energy of discharge from each cylinder is utilised.

blower 1 Centrifugal compressor with output (from NTP input) at between 1 and 35 lb/sq in gauge (6.9–240 kN m–2).

2 Centrifugal fan used on piston engine, esp. on radial engine, to improve distribution of mixture among cylinders.

blower pipe In an airship, duct through which propeller slipstream is rammed to pressurize ballonets.

blow-in door Door free to open inwards against spring upon application of differential pressure (eg, in aircraft inlet duct).

blowing Provision for discharging high-pressure, high-velocity bleed air from narrow spanwise slit along wing leading edge, tail surface or ahead of flap or control surface. Greatly increases energy in boundary layer, increases circulation and prevents flow breakdown.

blowing coefficient For jet or blown-flap or blown aerofoil, MVj/qS.

blown 1 Supercharged [piston engine].

2 Failed [electrical fuse].

3 See next.

blown flap Flap to which airflow remains attached, even at sharp angles, as result of blowing sheet of high-velocity air across its upper surface (see boundary-layer control, supercirculation).

blown perimeter Parachute in which part of peripheral hem becomes blown between two rigging lines in another part of canopy, and attempts to inflate inside-out.

blown primer Percussion cartridge primer which blows rearward out of its pocket, allowing primer gases to escape.

blow off 1 Explosive or other enforced separation of instrument pack or other payload from rocket vehicle or other carrier. Hence, ** signal.

2 Controlled reduction [if necessary to zero] of deflection of flap, tab or [rare] control surface because of aerodynamic load.

blow-off valve 1 Safety valve set to open at predetermined dp at chosen point in axial compressor casing to
Blue Flag
warfare C3 management (USAF).

Blue Core
Versatile wireless technology which, with
1953–).

Blue airway
Originally in US, N–S civil airway.

Friendly.

BLUE
BLU
1
Bilinear transform.

BLT
Bilinear transform.

BLU
1 Bande latérale unique, = SSB.

2 Bomb, live unit (US).

BLUE
Friendly.

Blue airway
Originally in US, N–S civil airway.

Blue angels
Principal formation aerobatic team (USN

Blue-line speed.

BLS
Blown snow (ICAO).

Blue-on-blue
Mistaken engagement between friendly fighters.

Blue Paper
Notice of proposed amendment (BCARs).

bluepole
S-seeking pole of magnet.

blueprint
Drawing reproduced on paper by ammonium ferric citrate or oxalate and potassium ferrocyanide to give white lines on blue background. Seldom used today, but word has common loose meanings: any drawn plan; any written plan of campaign or course of action.

Blue room
Toilet, esp. on commercial transport.

Blue sector
That half of ILS localiser beam modulated at 150 Hz (right of centreline).

blue sky
Research considered [perhaps in ignorance] to have no goal.

blue suit
US Air Force; usually in contradistinction to white suit = contractor personnel (colloq.).

Bluetooth
Low-power short-range radio link for mobile [eg pax] devices and for WAN/LAN access points.

blue water
Oceanic, far from land, as distinct from brown.

bluff body
Solid body immersed in fluid stream which experiences resultant force essentially along direction of relative motion and promotes rapidly increasing downstream pressure gradient. Causes flow breakdown and turbulent wake. Broadly, bluff is opposite of streamlined.

BLUH
Battlefield light utility helicopter (UK).

blunt
A trailing edge or rear face of body causes turbulence immediately downstream, but main airflow cannot detect that body or aerofoil has come to an end and thus continues to behave as if in passage over surface of greater length or chord.

blushing
Spotty or general milkiness or opacity of doped or varnished surface, caused by improper formulation, too-rapid solvent evaporation or steamy environment.

BLW
Below (ICAO).

BLZD
Blizzard.

BM
Bus monitor.

1 Bubble memory.

3 Battle management.

41 Back marker.

5 Ballistic missile.

B M, B.M.
Bending moment.

BM
Boom/mask (switch).

BMAA
British Microlight Aircraft Association [office, Deddington OX15 0TT] (UK).

BMIC
1 Basic mean chord.

2 Battle management center.

BM/C
Battle management/command and control.

BM/C
Battle management/command, control and communications [I adds intelligence].

BM/C
As above, plus computers.

BNICE
Base maintenance certifying engineer.

BMD
Basic mass empty.

2 Bulk memory element.

BMEC
Battlespace Management Evaluation Centre, BAES facilities at Farnborough.

BMEP
Brake mean effective pressure.

BMESW
Basic mass empty weight.

BMESWS
Ballistic-missile early-warning system.

BMIF
Ministry of Finance (G).

BMFA
British Model Flying Association [office, Leicester LS2 8RE] (UK).

BMFT
Ministry for research and technology (G).

BMH
Basic mechanical helmet.

BMI
Bismaleimide, high-temperature-resistant resin adhesive.

BMO
Ballistic Missile Office [became BMD] (USAF).

BMN
Bearless main rotor.

BMS
1 Bureau Militaire de Standardization (F).

2 Building, budget, business or battle-management system.
BMTC

Ballistic-missile sensor.

BMTC Basic Military Training Center (USAF Lackland AFB).

BMTOGW Basic mission takeoff gross weight.

BMTS Ballistic-missile target system.

BMUP Block Modification Upgrade Program (USN).

BMV Brake metering valve.

BMVBW Ministry of Transport and Construction [D-53175 Bonn] (G).

BNAE Bundesministerium der Verteidigung [Ministry of Defence; D-53003 Bonn] (G).

BMVT Ministry of Transport, Innovation and Technology (Austria).

BN Night bomber (F, obs).

BN Bombardier/navigator.

BN Beacon.

BN Receiver noise bandwidth.


BNASC Belgian National AIS (1) Centre.

BNB Bid or no bid.

BNEA British Naval Equipment Association.

BNFAAB See BAH.

BN Boosted, not guided.

BNH battery Bipolar nickelhydrogen.

BNK Bureau of new construction (USSR).

BNL Brookhaven National Laboratory.

BN Null-to-null bandwidth.

BNR Binary.

BNRID Basic net radio interface device.

BNS Boundary notation system.

BNSC British National Space Centre, formed 1985 as successor to British Space Development Co. [office, London SW1W 9SS] (UK).

BO Boom operator.

Bo Boundary lights.

BO 2 Boundary lights.

BOA Basic ordering agreement.

BOA 2 Bulle Opérationnelle Aéroterrestre (F).

boarding Noun, one passenger.

boarding card, boarding pass Document issued at check-in which admits passenger to aircraft.

boarding status Current stage reached at gate, ending with “closing”.

boardroom bomber Former WW2 or similar warplane converted for executive use.

boards Speed brakes (colloq.).

boat scaplane Flying boat (US).

boat-tail Rear portion of aerodynamic body, esp. body of revolution, tapered to reduce drag. Taper angle must be gentle to avoid breakaway.

BOB Bureau of the Budget (US).

bobbing Rare fluctuation in strength of radar echoes allegedly due to alternate attenuation and reinforcement of successive pulse waves.

BOBS, Bobs Beacon-only bombing system.

bobweight Mass inserted into flight-control system, usually immediately downstream of pilot’s input, to impart opposing force proportional to aircraft linear or angular acceleration.

BOC Bottom of climb.

BOC 2 Binary offset carrier.

BOC 3 Binary operating code.

BOD 1 Biochemical, or biological, oxygen demand.

2 Beneficial occupancy date.

bo Male of lowly rank (RAF WW2).

bod peaked magnitude and phase angle against system frequency [usually expressed in rad/s].

Bodie Severe test of gas-turbine engine: soak to maximum carcass temperature, slam deceleration to flight idle, then slam to MTO.

body 1 Any three-dimensional object in fluid flow.

2 In most aircraft, central structure: hull of marine aircraft or airship, fuselage of aeroplane or helicopter, * of missile.

3 Any observable astronomical object, esp. within solar system.

body axes Outlined by G.H. Bryan in 1903, orthogonal reference axes, fore/aft or longitudinal [called X], transverse or lateral [Y] and vertical [Z]. Problem: they have their origin at the c.g., which has no fixed location. See other axes: principal, stability, wind.

body bag 1 Occupied by pilot of hang glider, instead of open harness: reduces drag and keeps occupant warm.

2 Container for corpse in transit.

body burden Aggregate radioactive material (not dose received) in living body.

body English Guiding the flight of an aerodyne, usually a glider, by shifting the c.g. of one’s body.

body gear, body landing gear Main landing gear retracting into fuselage.

body lift Lift from fuselage of supersonic aircraft or missile at AOA other than zero.

body of revolution Body (2) having circular section at any station and surface shape described by rotating side elevation about axis of symmetry. Ideal streamlined forms are generally such.

body plan Full-scale elevations and sections of aircraft body in lofting.

body sensor Biomedical sensors worn by astronauts or aircrew to measure parameters such as body temperature, pulse rate and respiration.

body stall Gross flow breakaway from core engine and afterbody in stalled turbofan.

BOE Black-out exit; predicted time in manned re-entry at which communications will be resumed.

boe Barrels of oil equivalent; thus boe/d = boe per day.

boffin Research scientist, esp. senior worker on secret defence project (colloq).

bog To taxi across ground so soft that landing gear sinks in and halts aircraft (see flotation).

bogey Air contact (5) not yet identified, usually assumed to be enemy (UK spelling often bogy).

bogie Landing gear having multi-wheel truck on each leg.

bogie beam Pivoted beam linking front and rear axles of bogie to each other and to leg.

bog in To become stuck in soft airfield surface.

bogey See bogey.

BOH Break-off height.

BOI Board of Inquiry.

2 Basis of issue.

boiler Gas-turbine used as a core engine in high-ratio turbofan, as source of hot gas for tip-drive rotor or fan-lift system or any other application calling for central power source (colloq.).
**boilerplate**

boilerplate Non-flying form of construction where light weight is sacrificed for durability and low cost (see battleship).

boiloff Cryogenic propellant lost to atmosphere through safety valves as result of heat transfer through walls of container (which may be static storage or tank in launch vehicle).

BOK Bureau of special designers (USSR).

BOL 1 Bearing-only launch.

2 Bottom of loop [engine s.f.c.].

2 Blade [of compressor or turbine rotor] overtip leakage.

**bold-face procedures** Emergency procedures, written in flight manual in bold-face type.

bollard Mooring attachment in form of short upright cylinder on marine aircraft hull or float bow.

bollock Sensitive instrument based on temperature coefficient of resistance of metallic element (usually platinum); used to measure IR radiation or in microwave technology (see radiometer).

BOLT Build, operate, lease, transfer.

bolter 1 In advanced airframe structure, usually precision fitted major attachment device loaded in shear.

2 In firearm, approximately cylindrical body which oscillates axially behind barrel feeding fresh rounds, closing breech and extracting empty cases (see breech-block).

bolter 1 In carrier (1) flying, aircraft which fails to pick up any arresting wire and overshoots without engaging barrier.

2 Verb, to perform 1; in the US, boltering.

Boltzmann constant Ratio of universal gas constant to Avogadro’s number; 1.380546 × 10–23 J° K–2.

Boltzmann equation Transport equation describes behaviour of minute particles subject to production, leakage and absorption; describes distribution of such particles acted upon by gravitation, magnetic or electrical fields, or inertia. Boltzmann-Vlasov equations describe high-temperature plasmas.

BOM Bill of material.

2 Burst overspeed margin.

bomb 1 Transportable device for delivery and detonation of explosive charge, incendiary material (including napalm), smoke or other agent, esp. for carriage and release from aircraft.

2 Streamlined body containing pitot tube towed by aircraft and stabilized by fins to keep pointing into relative wind in region undisturbed by aircraft.

bomb aimer Aircrew trade in RAF (formerly) and certain other air forces.

Bomb Alarm System Automatic system throughout Conus for detecting and reporting nuclear bursts.

bombardier Aircrew trade. bomb aimer, in USA and USAF (formerly).

bombardment ion engine Rocket engine for use in deep space which produces ion beam by bombarding metal (usually mercury or caesium) with electrons.

bomb bay In specially designed bomber aircraft, internal bay for carriage of bombs (in fuselage, wings or streamlined nacelles).

bomb-burst Standard manoeuvre by formation aerobatic teams in which entire team commences vertical dive, usually from top of loop, in tight formation; on command, trailing smoke, members roll toward different azimuth directions and pull out of dive, disappearing at low level ‘in all directions’.

**bomb damage assessment** Determination of effects on enemy targets of all forms of aerial attack.

bomb detection chamber Explosion-containment chamber in which objects, such as cargo containers, can be subjected to a complete simulated air-travel environment.

bomb door Door which normally seals underside of bomb bay. Can slide rearwards, sideways and upwards, open to each side or rotate through 180° about longitudinal axis to release stores from its upper face.

bombed out Forced to leave home because of serious damage caused by air attack (UK).

bomber Aircraft designed primarily to carry and release bombs. Term today reserved for strategic aircraft.


Bomber Command Forward Relay Special unjammable v.h.f. and u.h.f. transmitters which would have launched an attack with NW (RAF).

Bomber Controller The individual who, so ordered by the Prime Minister, would have ordered an attack with NW (RAF).

bomber-transport Former category of military aircraft capable of being used for either type of mission.

bomb fall line Bright line on HUD along which free-fall bombs would fall to the ground if they were released.

bomb impact plot Graphical picture of single bombing attack by marking all impact of detonation centres on pre-strike vertical reconnaissance photograph(s).

bombing angle Angle between local vertical through aircraft at bomb release point and line from that point to target.

bombing errors 1 50% circular error: radius of circle, with centre at desired mean point of impact, which contains half missiles independently aimed to hit that point (see CEP (1)).

2 50% deflection error: half distance between two lines drawn parallel to track and equidistant from desired mean point of impact which contain between them half impact points of missiles independently aimed to hit that point.

3 50% range error: half distance between two lines drawn perpendicular to track and equidistant from desired mean point of impact which contain between them half missiles independently aimed to hit that point.

bombing height Vertical distance from target to altitude of bomb release.

bombing run Accurately flown pass over target attacked with free-fall stores.

bombing teacher Primitive classroom rig in which pupil uses actual bomb sight in simulated environment.

bombing up Loading one or more bombers with bombs.

bomblet Small bomb, usually of fragmentation type, carried in large clusters and released from single streamlined container.

bomb line Forward limit of area over which air attacks must be co-ordinated with ground forces; ahead of this air forces can attack targets without reference to friendly ground troops.

bomb park Semi-permanent deck area on carrier
bomb rack

devoted to storage of ordnance, tanks and other stores [today often eliminated].

bomb rack  Formerly, attachments in bomb bay or externally to which bombs were secured; provided with mechanical or EM release, fusing and arming circuits and sometimes other services. Replaced by universal store carriers tailored to spectrum of weapons.

bomb release line  Locus of all points (often a near-circle) at which aircraft following prescribed mode of attack must release particular ordnance in order to hit objective in centre.

bomb release point  Particular point in space at which free-fall ordnance must be released to hit chosen target.

bomb-release safety lock  Manually activated by captain, allowed Nav Radar to release NW [RAF V-bombers].

bombsight  Any device for enabling aircraft to be steered to bomb release point, esp. one in which aimer sights target optically and releases bombs by command.

bomb site  Urban area completely cleared of rubble after WW2 (UK).

bomb trolley  Low trolley for carriage of ordnance from airfield bomb stores to aircraft (and often equipped to raise bombs into position on bomb racks).

bomb truck  Originally [1943–45], bomber engaged in carpet or non-precision bombing. Today, deliverer of ordnance to a target marked by a laser in another aircraft or on ground.

bomb winch  Manual or powered winch for hoisting bombs from trolleys into or beneath racks.

bonding 1  Structurally joining parts by adhesive, esp. adhesives cured under elevated temperature and/or pressure.

2 Joining together all major metal parts of an aircraft, especially an aircraft not of all-metal construction, to ensure low-resistance electrical continuity throughout. Even where metal structures are squeezed together by bolts or rivets a bond of copper strip or braided wire must link them reliably. Bonding is necessary for Earth-return systems and to dissipate lightning strikes and other electrical charges safely with no tendency to arcing or spark formation.

3 Legal agreement linking a pilot to an airline who pays for his tuition.

bonding noise  In older aircraft, radio interference caused by relative movement between metal parts bonded (2) together.

Bondolite  Low-density sandwich of balsa faced with aluminium.

Bone  B-one next enhancement.

bonedome  Internally padded rigid protective helmet worn by combat aircrew (colloq.).

boneyard  Graveyard of unwanted aircraft, usually stripped of potential spares (colloq.). Particularly refers to AMARC, Arizona.

bonker  Small rocket giving high thrust for a fraction of a second designed to impart powerful disturbing blow to extremity of airframe in investigation of aerodynamic/structural damping.

bonnet  Valve hood in aerostat envelope.

BOO  Build, own, operate.

boob  Noun, error; verb, to make mistake (RAF 1935–).

Boolean algebra  Powerful and versatile algebra compatible with binary system and with functions AND, OR and NOT.
brute force, usually by hydraulic jacks. Much simpler and cruder than a powered flying-control system (see servo).

**booster** 1 Boost rocket.

2 Sensitive high-explosive element detonated by fuze or primer and powerful enough to detonate a larger main charge.

3 LP compressor, with from one to five stages, down-stream of an HBPR fan and rotating with it to supercharge the core airflow into the HP spool. In the US such an engine is often called a mixed-twin-spool turbofan.

**booster APU** APU capable, usually in emergency only, of augmenting aircraft propulsion.

**booster coil** Battery-energised induction coil to provide a spark to assist piston engine starting.

**booster magneto** Auxiliary magneto, often turned by hand, for supplying hot sparks during piston engine starting.

**booster pump** 1 Centrifugal pump, often located at lowest point of a liquid fuel tank, to ensure positive supply and maintain above-ambient pressure in supply line. In integrav wing tanks usually mounted outside the tank on back of rear spar web.

2 Auxiliary impeller in cryogenic propellant system to maintain system pressure and prevent vaporization upstream of main pump.

**booster rocket, booster stage** See boost rocket, though *stage* implies a large long-burning stage for a large vehicle.

**booster stages** Booster (3).

**boost/glide vehicle** Aerodyne launched under rocket thrust and accelerated to hypersonic speed in upper fringes of atmosphere, thereafter gliding according to any of various predetermined trajectories over distances of thousands of miles.

**boost motor** See boost rocket.

**boost phase** Initial phase of launch and rapid acceleration of missile or other short-range aerodynamic vehicle fitted with boost rockets.

**boost pressure** See boost (2), international *, override *.

**boost pump** Booster pump.

**boost rocket** Rocket motor, usually solid propellant and sometimes used in multiple, used to impart very large thrust during stages of launch and initial acceleration of missile or other vehicle launched from ground or another aerial vehicle. Almost all kinds of ** burn for a few seconds only, and in some cases for only a fraction of a second. Sometimes case and chamber forms part of vehicle, but most boost rockets are separate and jettisoned after burnout.

**boost rocket impact area** Area within which all ** should fall during launches on a given range.

**boost separation** Process by which boost rocket thrust decays and becomes less than drag, causing rearward motion relative to vehicle and subsequent progressive unlocking, possibly relative rotation, and detachment.

**boost/sustain motor** Rocket comprising fast-burning high-thrust portion followed by slow-burning low-thrust portion.

**boost vehicle** SDI term for space or long-range missile launcher.

**boot** 1 Flat array of flexible tubes bonded to leading edge of wings, fins and other aircraft surfaces to break up ice. Fluid pressure is alternately applied to different sets of tubes in each boot to crack ice as it forms.

2 Shroud or vazor enabling cockpit radar to be viewed in bright sunlight.

**bootie** 1 Protective cover for pitot tube, usually with streamer.

2 Soft fabric overshoe warn before walking on aircraft skin or entering engine duct.

**bootstrap** Noun, hoisting gear to remove disabled engine or lift replacement engine to pylon or [trijet] to tail engine position; and verb, to perform lifting operation. Can also be applied to modules.

**bootstrap exploration** Using each space mission to bring back information to help subsequent missions, esp. in lunar exploration (colloq.).

**bootstrap operation** Dynamic system operation in which once cycle has been started by external power, working fluid maintains a self-sustaining process. A gas turbine, once started, sustains bootstrap operation because the turbine keeps driving the compressor which feeds it. Thus, * cycle *(cold-air unit), * mainstage engine pump (turbine being fed by propellants delivered by pump), etc.

**Boozer** Code name for British ECM [two-colour warning lights] carried by Mosquito aircraft in 1944.

**BOP** 1 Balance of payments, esp. with regard to national participation in multinational programme.

2 Basic operating platform (bare base airfield).

3 Bit-oriented protocol.

**BOPS** 1 Burn-off per sector; fuel burned on each sector, or segment, or stage (all three words are used in flight-planning documents) in commercial transport operation.

2 Beam-offset phase shifter (Aways).

**hops** Billions of operations per second.

**BOR** Basic operational [or operating] requirement.

**Bora** Cold, squally wind (Adriatic, Aegean).

**Boram** Block-orientated random-access memory.

**boresafe fuze** Projectile fuze rendered safe by interrupter until projectile has cleared gun muzzle.

**borescope** Slender optical periscope, usually incorporating illumination, capable of being inserted into narrow apertures to inspect interior of machinery.

**borescope port** Circular ports, fitted with openable caps, through which borescopes may be inserted (esp. in aircraft engines).

**boresight** 1 Verb, to align gun or other device by means of optical sighting on a target.

2 Noun, precise aim direction of gun, directional aerial/antenna, camera, etc.

**boresight camera** Optical camera precisely aligned with tracking radar and used to assist in alignment of aerial [antenna].

**boresight coincidence** Optical alignment of different adjacent devices, such as radar waveguide, reflector, passive interferometer and IR or optical camera.

**boresight line** Optical reference line used in harmonising guns and other aircraft weapon launchers.

**boresight mode** Radar is locked at one chosen angle between dead ahead and –2° or –3°.

**boresight test chamber** Anechoic chamber containing movable near-field test targets and aerials, capable of being wheeled over nose of radar-equipped fighter aircraft.

**BOR** Basic Operational Requirements Group (ICAO).

**boring** Process of accurately finishing already-drilled
valves on their seats.
unawares; to intercept without being seen.
bounce bought it before pre-1914, see comment at end of preface].
looping the loop [anglicised French, boucling the boucle]
piston cannot exert a turning moment on crankshaft.
cylinder, with piston at bottom limit of stroke; at BDC.
formed area to provide support for shaft bearing, threaded connection or other load.
In a casting, locally thickened area to provide support for shaft bearing, threaded connection or other load.
2. Battlefield optical surveillance system.
boss 1. In traditional wooden or one-piece metal propeller, the metal mounting comprising front and rear steel plates joined by numerous bolts passing through the thickened, non-aerodynamic central portion.
2. In a casting, locally thickened area to provide support for shaft bearing, threaded connection or other load.
3. Squadron commander, often initial cap (RAF).
4. Leader of aerobatic team.
BOT 1. Boom-operator trainer.
2. Brakes-off time.
3. Build, operate [or own], transfer.
BoT Board of Trade.
BOTB British Overseas Trade Board.
Bottlang Commercially produced loose-leaf binder describing European VFR airfields.
bottle 1. JATO rocket (filled or empty case) (colloq.).
bottle to throttle Stipulates interval between alcohol and metal filled with mercury, whose radius increases (rotating the centre) with increasing temperature.
bottom dead centre Position in piston engine in which centre of crankpin is precisely aligned with axis of cylinder, with piston at bottom limit of stroke; at BDC.
bottom rudder In aeroplane in banked turn, applying rudder towards lower side of aircraft; among other things this will lower the nose.
bottom shock On underside of supersonic aerofoil.
bottom-up See requirements capture.
boucing the boucle Looping the loop [anglicised French, pre-1914, see comment at end of preface].
bought it Killed (RAF colloq.).
bounce 1. In air combat, to catch enemy aircraft unawares; to intercept without being seen.
2. In piston engine poppet valve gear, elastic bounce of valves on their seats.
boron, Bo hole to precise dimension, usually by using single-point tool.
boron, Bo Element, either greenish-brown powder, density 2.3, or brown-yellow crystals [2.34], MP 2,300°C. Used as alloying element in hard steels, as starting point for range of possible high-energy fuels, and above all as chief constituent of boron fibre.
boron doping Addition, finely divided, to increase I_n of solid rocket motor.
boron/epoxy Composite plastic materials comprising fibres or whiskers of boron in matrix of epoxy resin.
boron fibre High-strength, high-modulus structural fibre made by depositing boron from vapour phase on white-hot tungsten filament. Used as reinforcement in aerospace composite materials.
borsic Boron fibre coated with silicon carbide. Structurally important as reinforcement in matrices of aluminium and other metals.
bort Side, hence * number = serial painted on fuselage (R).
bosom tank Detachable (usually jettisonable) fuel tank scabbard on underfuselage.
boss, BOSS 1. Ballistic offensive suppression system (EW).
2. Boundary-layer bleed Pathway for escape of ** adjacent to engine inlet mounted close beside fuselage wall. Bleed is either open or ducted, and removes stagnant ** which would otherwise reduce ram pressure recovery and propulsion system performance.
boundary-layer control Control of ** over aircraft surface to increase lift and/or reduce drag and/or improve control under extreme flight conditions. BLC can be effected by: passive devices, such as vortex generators; ejecting high-velocity bleed air through rearward-facing slits; sucking ** away through porous surfaces; use of engine slipstream to blow wings or flaps.
boundary-layer duct Duct to carry ** from ** bleed to point at which it can advantageously be dumped overboard.
boundary-layer eneriser Low sharp-edged wall normal to airflow across aerodynamic surface (eg immediately upstream of aileron).
boundary-layer fence Shallow fence fixed axially across swept wing to reduce or check spanwise drift of ** and its consequent thickening and proneness to separation.
boundary-layer noise Major source of noise inside aircraft.
boundary-layer scoops Forward-facing inlets designed to remove thick ** upstream of engine inlet or other object.
boundary-layer separation Gross separation of ** from boundary surface, space being filled by undirected, random turbulence.
boundary light Visible steady light defining boundary of landing area.
boundary marker Markers, often orange cones, defining boundary of landing area.
bound vortex 1. Circulation round a wing.
2. Vortex embracing any solid body or touching a surface.
Bourdon tube Flat spiral tube, either glass filled with alcohol or metal filled with mercury, whose radius increases (rotating the centre) with increasing temperature.
Boussinesq Formula giving distance along uniform tube necessary for laminar, viscous, incompressible flow to become fully developed.

\[ x = \frac{0.26 \cdot 2}{v} r^2 \] = 0.25 \cdot \frac{2}{r}.

where \( v \) is mean velocity, \( r \) tube radius, \( v \) kinematic viscosity and \( R \) Reynolds number.

BOV Blow-off valve.
BOVC Base of overcast.
BOW Basic operating weight [OWE is more precise].
bow Rhyming with cow, nose of airship or marine hull or float.
bow

bow Rhyming with go:
1 Curvature along length of turbine blade or other slender forging, or curvature due to instability in structural compression member.
2 Curved member forming tip of wing or other aerofoil, esp. one with fabric covering.
bow cap Structure forming front end of airship hull or envelope. Alternatively, nose cap.

Bowen-Knapp camera High-speed strip-film camera used in vehicle flight testing.
bowser 1 Airfield fuel truck, roadable and self-propelled; unpropelled, * trailer.
2 Used as adjective, specially modified to contain overload or ultra-long range fuel, hence * wing, * fuselage.

Bow’s notation Conventional system of representing structural forces and stresses by letters and/or numbers in graphical stress analysis (rhymes with low).
bow stiffeners Longitudinal stiffeners arranged radially around nose of aerostate envelope (esp. blimp or kite balloon) to prevent buckling under aerodynamic pressure. Alternatively called battens.
bow wave 1 Shockwave from nose of supersonic body, esp. one not having sharply pointed nose.
2 Shockwave caused by motion of planetary body through solar wind.
3 Form of wave caused by bows of taxiing marine aircraft.
4 Form of wave caused by landplane nosewheels running through standing water.

box 1 Tight formation of four aircraft in diamond (leader, left, right, box).
2 Structural heart of a wing comprising all major spars, ribs and attached skins (often forming integral tankage), but usually excluding leading and trailing edges, secondary structure and movable surfaces.
3 Major sections of fuselage, especially where these are of rectilinear form and thus not describable as barrel sections.
4 Aircraft structure formed from two or more lifting planes (wing or tail), linked by struts and bracing wires. In early aviation no other form could compete for lightness and strength.

Air filter cargo compartment, simplified to basic rectilinear form and dimensioned overall.
6 Above-floor removable cargo container, with various standard dimensions.
7 Container of lights in visual ground guidance system, thus * VASI.

box beam Hollow beam (1) of essentially square or rectilinear cross section.

box connector Multi-circuit connector having four-sided box sockets, with linear pin engagements (2 or 3 rows, up to 240 circuits).

boxer piston engine having two crankshafts and [e.g. four or six] parallel cylinders in rectilinear formation.

box girder See box spar.

boxing Process of assembling major airframe sections in erection jig; includes fuselage box (3) sections.

boxkite Kite in form of rectangular- (often square-) section box, open at mid-section and at ends. Structurally related to early biplanes in form of box (4).

box position Rear aircraft in box (1).

box rib Rib assembled from left and right sides separated by a peripheral member following profile of aerofoil.

box sizing Part of GAMM in which an aircraft fuselage cross-section is selected and optimum cargo box length determined for groupings of vehicles or other large loads.

box spar Spar assembled from front and rear webs separated by upper and lower booms.

box tool Tangential cutting tool incorporating its own rest, used on automatic turning machines.

box wing Diamond wing.

Boyle’s law In an ideal gas at constant temperature, pressure and volume are inversely proportional, so that \( PV = nRT \) or \( P/\rho = \text{constant} \).

BP 1 Bite processor.
2 Bottom plug.
3 Braided pultruded.
4 Boron phosphide.
5 Beam pointing.

b.p. 1 Bypass (jet engine); thus, * ratio.
2 Band-pass filter.

BPA 1 British Parachute Association, successor to British Parachute Club (1956, office Leicester).
2 Blanket purchase agreement.
3 Beam-pointing accuracy.

BPC 1 Gas-turbine barometric pressure control.
2 Benchmark pricing guide.
3 British Purchasing Commission (WW2).
4 Basic primer concept (paint).

BPCU Bus power control unit.

BPDMS Base, or basic, point-defense missile system.

BPE 1 Best preliminary estimate.
2 Bomber penetration evaluation.

B Per T Squadron for testing heavy aircraft (AAEE, WW2).

BPF 1 Band-pass filter.
2 Blade-passing frequency.
3 British Pacific Fleet (WW2).

BPI 1 Boost-phase intercept[or].
2 or bpi, bits per inch (EDP).

BPS Balanced pressure system: buried glycol pipes trigger alarm if stepped on.
2 Bistable phosphor storage.
3 Bytes per second.
4 See next.

BPR Bypass ratio.

BPS Balanced pressure system: buried glycol pipes trigger alarm if stepped on.
2 Bistable phosphor storage.
3 Bytes per second.
4 See next.

Ballistic protection system.

bps Bits per second (EDP).

BPSK Binary phase-shift keying.

Bpt Boiling point.

BP L Union of aircraft maintenance engineers [D-53815 Neunkirchen] (G).

BQ Ground-launched controllable bomb [ie, SSM] (USAAF 1942–45).

Bq Becquerel(s).

BR, Br 1 Bomber-reconnaissance.
2 Mist (Metar code).
braking force coefficient  Coefficient of friction between wheel and fixed surface (whether rolling or sliding).

braking nod  Nose-down pitch of aircraft when wheel-braked, or nose-up pitch when brakes released at full power, esp. maximum angular movement thus imparted.

braking parachute  Parachute streamed from aircraft to increase drag, increase dive angle or reduce landing run. 

braking pitch  Predetermined propeller pitch to give maximum retardation, either windmilling drag or reverse thrust under power.

braking rocket  Retrorocket.

branch  1 In electrical system, portion of circuit containing one or more two-terminal elements in series.

  2 In computer program, point at which * instructions are used to select one from two or more possible routines.

  3 In crystal containing two or more kinds of atom, either of possible modes of vibration, termed acoustic * or optical *.

branch pipe  Pipe conveying exhaust gas from piston engine cylinder to manifold or collector ring.

brass  Alloys of copper with up to 40 per cent zinc and small proportions of other elements.

brassboard  Functioning brassboard model of avionic system; also adjective and verb.

brassed off  See browned off.

BRAT  1 Benchtop reconfigurable automatic tester.

  2 Beyond line of sight reporting and tracking.

Brat  1 Bomb-responsive anti-terrorist.

  2 Graduate of RAF Apprentice School, Halton (colloq.).

Bratt-DaRos  Method of solving problems of inertial coupling.

Bravo exercise  Combat mission called off at point when aircraft ready to taxi.

Brayco  Also Braycote, trade names of turbine fuels and lubricants (BP).

Brayton cycle  Thermodynamic cycle used in most gas turbines: diagram comprises compression and expansion curves joined by straight lines representing addition or rejection of heat at constant pressure. The so-called 'open cycle'.

brazier-head rivet  Light-alloy rivet having head shallower but of larger diameter than round-head.

brazing  Joining metals by filling small space between them with molten non-ferrous metal having a melting point above a given arbitrary value (originally 1,000°F = 538°C).

breadboard  Preliminary assembly of hardware to prove feasibility of proposed system, without regard to packaging, reliability or, often, safety. May be laboratory rig or flyable system. Often adjective or verb.

break  1 Point at which pilot senses stall of wing.

  2 Breakaway (1) (colloq.).

  3 Chief meaning in modern air combat: to make maximum instantaneous turn to destroy hostile fighter’s tracking solution. Used as noun or as verb.

  4 In carrier flying, point at which aircraft turns sharply left across bows and on to downwind leg.

  5 Word inserted by harassed controller to indicate that following words are for a different recipient.

breakaway  1 Point at which aircraft breaks off trajectory directed against another object, such as stern attack on enemy aircraft or gun-firing run on ground target.
breakaway thrust

2 Altitude at which pilot abandons approach in bad weather.
3 In nuclear explosion, point in space or time at which shockfront moves ahead of expanding fireball.

breakaway thrust Engine power needed to initiate movement and reach taxiing speed.

breakdown book Record of physical changes introduced during maintenance, servicing or repair.

breakdown drawing Isometric or perspective drawing showing parts separated from each other by being displaced along one or more axes. Often called exploded drawing.

breakdown potential Dielectric strength.

breaker strip 1 Linear narrow de-icing element, either thermal or mechanical, arranged along leading edge (eg of wing or engine inlet strut) to split ice accretion into two parts.
2 See stall strip.

break-even load factor Load factor at which a particular parts.
wing or engine inlet strut) to split ice accretion into two thermal or mechanical, arranged along leading edge (eg of high-altitude aircraft and spacecraft of being divorced from other humanity.

break-out Point at which flight crew receive first forward visual cues after an approach through cloud.
break-out force Minimum force required to move pilot’s flying controls (each axis considered separately). If not measured at zero airspeed, airspeed must be quoted.

breakout panel One panel in aircraft canopy through which occupant[s] can escape in emergency.

break lock To use ECM or other countermeasure to make hostile tracking system (eg IR or radar) cease to track friendly or own aircraft.

breakoff phenomenon Mental state experienced by crew of high-altitude aircraft and spacecraft of being divorced from other humanity.

break X To break (2) at point of minimum range for launch of own AAM, where X symbol appears on cockpit display.

breather 1 An open pipe connecting interior of device, such as piston engine to atmosphere to dissipate moisture or oil vapour.
2 A centrifuge to which air carrying finely divided lubricating oil is piped at the start of the return circuit; all oil is centrifuged out for re-use, the hot air being expelled.

breathing 1 Flow of air and exhaust gas through piston engine, esp. the way this is limited by constraints of flow path.
2 Flow of air and/or gas into and out of aerostat in course of flight.

break-in, break-in First bench run of new type of engine or other device, or following major overhaul.

breakpoint 1 In system responding to high-frequency input, the corner frequency (as seen on a Bode plot) where \( f = \frac{1}{2\pi\tau} \).
2 In EDP, point in program or routine at which, upon manual insertion of * instruction, machine will stop and verify progress.
3 Sudden change in slope of graphic plot, eg point at which payload has to fall from maximum value in plot against range. Also called knee.

break price Quantity at which unit price changes.

breakthrough propulsion physics NASA project searching for a way to travel at a significant fraction of the speed of light.

break-up Separation of single radar blip into discrete parts each caused by a target.
break-up circuit Electrical circuit linking airborne portions of break-up system.

break-up shot Artillery shot designed to break into small fragments upon leaving muzzle and thus travel only a short distance.

break-up system System designed to break unmanned vehicle, such as ballistic missile, space launcher or RPV, into fragments sufficiently small to cause minor damage if they should fall on inhabited area.

break X To break (2) at point of minimum range for launch of own AAM, where X symbol appears on cockpit display.

breakdown book Record of physical changes introduced during maintenance, servicing or repair.

breakdown drawing Isometric or perspective drawing showing parts separated from each other by being displaced along one or more axes. Often called exploded drawing.

breakdown potential Dielectric strength.

breaker strip 1 Linear narrow de-icing element, either thermal or mechanical, arranged along leading edge (eg of wing or engine inlet strut) to split ice accretion into two parts.
2 See stall strip.

break-even load factor Load factor at which a particular parts.
wing or engine inlet strut) to split ice accretion into two thermal or mechanical, arranged along leading edge (eg of high-altitude aircraft and spacecraft of being divorced from other humanity.

break-out Point at which flight crew receive first forward visual cues after an approach through cloud.
break-out force Minimum force required to move pilot’s flying controls (each axis considered separately). If not measured at zero airspeed, airspeed must be quoted.

breakout panel One panel in aircraft canopy through which occupant[s] can escape in emergency.

break lock To use ECM or other countermeasure to make hostile tracking system (eg IR or radar) cease to track friendly or own aircraft.

breakoff phenomenon Mental state experienced by crew of high-altitude aircraft and spacecraft of being divorced from other humanity.

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breather 1 An open pipe connecting interior of device, such as piston engine to atmosphere to dissipate moisture or oil vapour.
2 A centrifuge to which air carrying finely divided lubricating oil is piped at the start of the return circuit; all oil is centrifuged out for re-use, the hot air being expelled.

breathing 1 Flow of air and exhaust gas through piston engine, esp. the way this is limited by constraints of flow path.
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bridgehead

for arrivals or another for departures. Apron-drive bridges are controlled by steerable powered wheels at the free end, running over the apron surface. A variant is the over-the-wing bridge, which with the more common ADB enables a rear-fuselage door to load/unload from the same terminal walkway. So-called glass walls are becoming popular. Noseloaders are parallel to the parked fuselage and have a fixed outer end provided with a short section at 90° to mate with the aircraft door. Commuter bridges provide covered access at ground level. Other names are passenger-boarding or passenger-loading *, airbridge or jetlink; Jetway is a tradename.

bridgehead End of apron-drive bridge which abuts aircraft; hence * cab.

bridge-type stick In side-by-side cockpit, control columns linked by pivoted connector.

bridle 1 Towing linkage, other than expendable strop, transmitting pull of catapult to two hard points on aircraft.

2 Assembly of electric cables or fluid system pipes which, after disconnection, can be removed from supporting structure (eg. landing gear) as a unit.

3 Rigging attached to two or more points on aerostat, esp. blimp, to distribute main mooring pull.

brief To issue all relevant instructions and information in advance of flying mission (not necessarily military), static test, war game or other operation involving human decision-taking.

bright display Normally, display which can be viewed clearly without a hood in brightest daylight.

brightness control Facility provided in radar, TV and other display systems for adjusting CRT bias to control average brightness.

brilliant Describes munition having both guidance (smart) and programmable software; in practice also means with ability to guide itself to target without external help.

Brinell hardness Measure of relative hardness of solids, expressed as numerical value of load (either 500 kg or 3,000 kg) and resulting area of indentation made by hard 10 mm ball.

bring-back weight Weight at which combat aircraft recovers to airbase or carrier, with remaining fuel and unexpended ordnance.

BRITE 1 Broadcast request imagery technology experiment (satellites).

2 Basic research in industrial technologies for Europe [Int.].

3 Boston rocket ionospheric tomography experiment.

Bright The British Guild of Flight Operations Officers.

British Parachute Association, controlling the sport in the UK (office Leicester).

British Rotorcraft Museum, see IHM.

British Satellite Broadcasting.
BSC

BSC  1 Beam-steering computer (EW).
   2 Bird-scaring cartridge.
BSCU  Brake-system control unit.
BSDH  Bus shared-data highway.
BSI  1 British Standards Institution [formed 1901 as Engineering Standards Committee; office London W4 4AL] (UK).
   2 Bus system interface [U adds unit].
BSN  Alternative for BSI (2).
BSL  1 British Standard family of light alloys.
   2 Base second level (servicing).
BSM  Breakaway support mast.
BSN  Backbone subnetwork.
BSP  1 Barra side processor.
   2 Board support package.
BSPL  Band sound pressure level; sound pressure level in bands each one-third of an octave wide from 50 to 10,000 Hz.
BSPR  Boost/sustainer pressure ratio (rocket).
BSPS  Beam-steering phase-shifter (Awacs).
BSV  1 British Standard Specification.
   2 British Standard family of steels.
BSSM  British Society of Strain Measurement [Surrey Research Park, GU2 5YJ] (UK).
BST  1 British Summer Time.
   2 TSB [French language].
bst  Bosight.
BS/TA  Battlefield surveillance and target attack.
BSTS  Boost-phase surveillance and tracking satellite (or system), for detection of enemy launches, tracking of BVs and PBVs and kill assessment (SDI).
BSU  1 Beam-steering unit.
   2 Bypass switch unit.
   3 Baggage-screening unit.
BSV  Burner staging valve.
BSW  British Standard Whitworth [screwthreads].
BT  1 Burn time (rocket).
   2 Basic trainer (USAAF, USAF category 1930–47).
   3 Bomber/torpedo (USN category, 1942–45).
   4 Bathymetrophraph.
   5 Span of horizontal tail.
BTA  1 Beam transfer Assembly (BC/FC)
   2 Bonus tax allowance (US).
BTB  Bus tie breaker.
BTC  1 Bus tie connector, or contactor.
   2 Before top centre.
   3 Belgocontrol Training Centre, Brussels.
   4 Business Travel Coalition (US).
BTF  Buried-target fuze.
BTH  Beyond the horizon (radar).
BTV  1 Boost [rocket motor] test vehicle.
   2 Ballistic test vehicle.
   3 Brake to vacate.
BTVOR  Weather broadcast terminal VOR.
BTW, BTWN  Between.
BTX  1 Telephone information system (G).
   2 Benzene, toluene, xylene.
BU  1 Break-up, thus a guided-weapon * unit.
   2 Back-up.
   3 Broken up.
BUAA  Beijing University of Aeronautics & Astronautics [subsidiary of AVIC; 100183 Beijing] (China).
BuAer  Bureau of Aeronautics (USN, 1921–59).
BUB  Back-up battery/batteries.
bubble  1 Continuous ovate-blister film of fuel from airspray-type burner at low flow rate.
   2 Region of continuous EW protection.
bubble horizon  Bubble turn and slip.
bubble memory  Computer memory whose bits are distributed among microscopic voids (bubbles) in a 3-D volume of solid.
bubble sextant  Sextant in which local horizontal is established by a bubble device. Often called bubble octant, because arc is usually not greater than 45°, restricting altitude to 90°.
bubble turn and slip  Primitive flight instrument in which lateral acceleration is indicated by sideways displacement of bubble in arched glass tube of liquid.
BUCD  Back-up command destruct.
buck  Dolly or transport frame, with or without wheels and usually making no provision for inverting (rolling over) contents, tailored to carry complete engine or other major equipment item.
bucket  1 In US, a turbine rotor blade.
   2 Principal member of most types of thrust reverser, two buckets normally rotating and translating to block path of efflux and divert it diagonally forwards. Alternative (UK) = clamshell.
   3 Graphical plot having basic U shape resembling *, notably produced by adding one plot of negative slope (eg operating and servicing cost against MTBF) to a related plot of positive slope (eg capital cost against MTBF).
   4 A new [2004] buzzword meaning subdivision or part (USAF).
bucket brigade  Integrated-circuit device, comprising MOS transistors connected in series, serving as shift register by transferring analog signal charge from one storage node to next.
bucket shop  Retail outlet (shop) offering non-IATA passenger tickets at cut prices.
bucking  Repeated succession of stalls and recoveries, deliberate or otherwise.
bucking bar  Shaped bar held against shank in manual riveting.
buckling  Lateral deflection of structural member under
buckling coefficient

compressive load; state of instability or unstable equilibrium, but may be purely elastic.

\( \text{buckling coefficient} \) In an overstressed panel, overall * is given by \( K_E = \frac{\pi^2}{(m/b)^2} \), where \( k \) is the bending radius of each skin/stringer element and \( b \) is stringer pitch.

BUCS Back-up control system.

buddy Aircraft providing preplanned in flight assistance to another, specifically by providing fuel to an aircraft of similar type [as distinct from normal tanker] or by laser-marking a target. Hence *:* refueling.

buddy lasing Designation of a target by one aircraft for attack by another.

buddy pack Flight-refuelling hose reel and drogue packaged in streamlined container for carriage by standard weapon rack; thus, aircraft A can refuel buddy B flying identical aircraft (formerly colloq.).

buffer 1 In radio, low-gain amplifier inserted to prevent interaction between two circuits.

2 Amplifier stage having several inputs, any of which may be connected to output.

3 In EDP, temporary store used to smooth out information flow between devices, esp. between I/O and main processor or core store.

buffer air Air fed under pressure to buffer regions surrounding gas-turbine shaft-bearing compartments to ensure that lubricating oil does not seep away through the labyrinth seals. Hence buffer air seal, buffer compartment.

buffer distance In nuclear warfare, horizontal distance (expressed in multiples of delivery error) which, added to radius of safety, will give required acceptable risk to friendly forces; alternatively, vertical distance (expressed in multiples of vertical error) added to fallout safe height to ensure that no fallout will occur.

buffet Irregular rapid oscillation of structure caused by turbulent wake. * in aeroplanes may be caused by excessive angle of attack (due to low airspeed, extreme altitude or excessive g) or, in subsonic aircraft, an attempt to fly at too high a Mach number.

buffer boundary For any given aircraft and environment, plot of limiting values of speed and altitude beyond which buffet will be experienced in unaccelerated flight. Also defined as condition at which a ‘significant’ region of separated flow appears.

buffer boundary parameter \( \mathcal{M}^2C_L \), product of lift coefficient and square of Mach number, at which buffet becomes unacceptable.

buffer inducer Small projection, usually in form of strake, intended to induce buffet (usually as warning in advance of dangerous buffet affecting major part of aircraft).

buffer margin For any given aircraft and environment, highest vertical acceleration (g) which can be sustained without exceeding given buffet severity (in some cases severity is zero).

buffer threshold For any given aircraft and environment, point at which buffet is first perceptible, expressed in terms of speed, altitude and vertical acceleration (g).

buffing Process for polishing sheet metal by rotary tool of soft fabric impregnated with fine abrasive.

BUFR Binary universal format.

bug 1 Heading marker on navigational instrument.

2 Fiducial index, esp. on flight instrument, having appearance of *. Can be painted, Chinagraph or removable by peeling.

3 Clandestine monitoring device, esp. for audio surveillance.

4 To install and conceal (3).

5 System malfunction or other fault, esp. one not yet traced and rectified; hence, to debug (colloq.).

Bug-E Battlefield universal gateway equipment, translator between SADL and other tactical datalinks (USAF).

bug-eye canopy Small canopy (usually two, left and right) over each projecting pilot’s head in large aircraft (1942–50).

bugged Value marked by bug (2).

bugging Riding a ground vehicle, eg trike unit, pulled by kite.

bugle bug Sick bag (colloq, among cabin crew).

bug out Eject (colloq.).

bug speed Speed at which ASI needle passes bug (2), usually \( V_{REF} \).

BUIC Back-up interceptor control; add-on to SAGE system [see BICP].

build Growth in received radio signal; opposite of fade.

build standard Detailed schedule of all possible variable or unresolved items in aircraft or other complex hardware in stage of development or pre-production. Original ** may list features of airframe, development state of engines, system engineering and, esp. equipment fitted or absent; altered as aircraft is modified.

built-in hold Pre-planned hold during countdown to provide time for defect correction or other activity without delaying liftoff.

built-up section Structural members having section assembled from two or more parts, rather than rolled, extruded, hogged from solid or forged. Reinforced composites are not regarded as built-up; essentially parts should be assembled by joints and could be unfastened.

bulb angle, bulb flange Structural sections, usually used as booms, having circular or polyhedral form. Nearly all were rolled from strip and had eight to 12 faces after assembly, complete ** being built up from one to five segments.

bulk cargo Homogenous cargo, such as coal. Today also means cargo carried loose; has come to mean cargo or baggage not contained in standard container or pallet.

bulk erasure Erasure of complete magnetic tape by powerful field.

bulkhead Major transverse structural member in fuselage, hull or other axial structure, esp. one forming complete transverse barrier. Certain *, such as pressure * in aircraft fuselage and tank * in rocket vehicle, must form pressure-tight seal.

bulk injection In piston engine injection of fuel into induction airflow upstream of distribution to individual cylinders.

bulk loader Self-drive belt conveyor vehicle for loading bulk cargo.

bulkmeter Instrument, esp. in refuelling of aircraft, for measuring liquid flow, typically as mass per second or as summing indication of total mass passed. Some * measure volume and require density correction for each liquid handled.

bulk modulus Elastic modulus of solid under uniform compressive stress over entire surface, as when immersed
bulk out

in fluid under pressure: numerically, stress multiplied by original volume divided by change in volume. **bulk out** To run out of cargo space while still within allowed weight. **bulk petroleum products** Liquid products carried in tankers or other containers larger than 45 gal (55 US gal).

**bullet** I Gun-fired projectile intended to strike target, having calibre less than 20 mm (0.7874 in).

2 Streamlined fairing having form of quasi-conical nose or forepart of body of revolution. If rotating, called spinner.

3 Aluminium or steel peg at top of hot-air-balloon rip line.

**bull gear** Largest gear in train, esp. large gear on which aerial of surveillance radar is mounted.

**bull session** Informal discussion on serious aviation topics, between engineers and/or aviators.

**bull’s eye** I Circular thimble.

2 Ring used to guide or secure rope.

3 Cockade having concentric rings (colloq.).

**bump** I See **Gust** (1).

2 Sensation experienced in flight through gust (1). See bumps.

3 To form sheet metal on bumping hammer.

4 Thrust bump.

5 See bumping.

6 Confusingly, in view of 5, to upgrade a passenger to a higher class.

**bumper** Also called tail*, a strong skid or shock-absorbed wheel unit to protect the underside of the rear fuselage of a nosewheel-type aircraft.

**bumper bag** Padded or inflated bag beneath lowest point of aerostat to absorb shock of ground impacts.

**bumper rocket** Pre-1955, first stage of two-stage launch vehicle.

**bumper screen** On spacecraft, protective screen intended to arrest micrometeorites and other macroscopic solids.

**bumper wheel** Wheeling machine.

**Bumpf** One of earliest of 35 English-language safety mnemonics: brakes, undercarriage, mixture, pitch, fuel/flaps; G added gills/gyros.

**bumping** Practice of denying a fully booked and applied to jet engine inside wing root.

**burn** I Operation of rocket engine, esp. programmed operation for scheduled time. Thus, first *, second *

2 Operation of main flame in burner of hot-air aerostat, Thus, a 20-second *

3 Authorized destruction of classified material, by whatever means.

**burner** I In gas turbine, device for mixing fuel or fuel vapour with swirling primary airflow with minimal axial velocity to sustain stable combustion; generally synonymous with fuel nozzle, fuel injector.

2 Afterburner (colloq., R/T).

3 Incorrectly, though common in US, gas-turbine combustion chamber.

4 In liquid or hybrid rocket, device for injecting and/or mixing liquid propellants to sustain primary combustion; more usually called injector.

5 Stainless-steel vaporizing coil and jet of hot-air balloon.

**burner can** Combustion chamber in engine of canannular type [UK = flame tube].
burn in  /  To enter data in EDP core store so that it will subsequently resist nuclear explosion effects and other hostile action.  
   /  To operate avionic and other electronic equipment under severe overload conditions to stabilize it before operational service and reduce incidence of faults.
burnish  To smooth and polish metal surface by rubbing (usually with lubricant) with convex surface of harder metal.
burn-off  In aeroplane (esp. commercial transport) operation, fuel burned between takeoff and critical position for establishing terrain clearance.
burnout  /  Termination of rocket operation as result of exhaustion of propellants. Also called all-burnt.  
   /  Mechanical failure of part subject to high temperature as result of gross overheating, esp. rocket case or chamber.
burnout plug  In certain rocket motors, esp. storable liquid and hybrid types, combustible plug which, when ignited, releases and fires liquid propellant.
burnout velocity  Vehicle speed at burnout (theoretically, highest attainable for given trajectory).
burnout weight  Mass of vehicle at burnout, including unusable fuel.
burn rate  In solid rocket, linear velocity of combustion measured (usually in millimetres per second) normal to burning surface. Symbol r.  
burn-rate constant  Factor applied to ** calculations dependent upon initial grain temperature.
burn-rate exponent  Pressure exponent n in burn rate law \( r = aP^n \).
burn table  Refractory surface in tail of plume target on which jet fuel is burnt.
burn-through  Operation of radar in face of jamming and similar ECM, esp. by virtue of high transmission power to overcome interference.
burn-through range  Limit of range at which * operation can yield useful information, if necessary in emergency short-life operation at abnormally high power.
burn time  Duration in seconds of rocket motor burn. Burn time starts when chamber pressure has risen to 10% of maximum (or averaged maximum during level portion of thrust curve) and ends when pressure drops to 75%. Alternative criterion is to draw tangents to level portion and descending portion of thrust curve and measure time to point at which curve is cut by bisector of angle between tangents. Symbol \( o \).
burn-time average chamber pressure  Integral of chamber pressure versus time taken over burn time interval divided by burn time. Symbol \( P_e \).  
burn-time average thrust  Integral of thrust versus time taken over burn time interval divided by burn time. Symbol \( F_h \).  
burnup  /  On entry to atmosphere from space, partial or complete destruction due to kinetic heating.  
   /  In nuclear reactor, esp. thermal fission reactor, percentage of available fissile atoms that have undergone fission.
BURR  Basic unscheduled removals rate.
Burro  Broad-area unmanned responsive resupply operations.
burst  /  In colour TV, transmission of small number of cycles of chroma sub-carrier in back-porch period (in military systems this signal not always used).  
   /  One round (payload) of ECM dispensed from attacking vehicle; can be active jammer or flare.  
   /  Period of fire by automatic gun[s].  
   /  See turbulent *.  
   /  Catastrophic failure of a rotating part, especially turbofan fan hub.
burst controller  /  Burst limiter.
burst criteria  Design of fan disc to ensure that it will survive any overspeed condition.
burst diaphragm  Diaphragm sealing fluid system and designed to rupture either upon command or at predetermined \( dP \).
burst height  Height at which nuclear weapon is programmed to detonate.
burst limiter  Preset control of number of rounds to be fired in burst (3).
burst order  Detonation of missile warhead by command.
BUS  /  Break-up system (of unmanned vehicle upon command).  
   /  Backscatter ultraviolet spectrometer.
bus  /  Spaceraft carrier vehicle for various payloads.  
   /  In EDP, main route for power or data. Alternatively, trunk.
bus bar  /  In EDP, main route for power or data. Alternatively, trunk.
busbar  /  In electrical system, main conductor linking all generators and/or batteries and distributing power to operative branches.
Busemann biplane  Aeroplane, so far not built, in which at supersonic speed shockwaves and flows around upper and lower wings would react favourably.
Busemann theory  First theory for two-dimensional supersonic wing to take into account second-order terms (1933).
bush  /  Open-ended drum tailored to fit inside hole, eg to reduce its diameter, act as shaft bearing or serve as electrical insulation (see grommet).
bush aircraft  Aerodynamic tailored to utility service in remote (eg Canadian Arctic) regions.
bushie  /  Bush pilot (Australia).
bush pilot  /  Operator (often also owner) of bush aircraft, usually freelance jobbing professional.
business aircraft  /  Aerodynamic tailored to needs of business management and executives of government and other organisations.
Business Class  Airline passenger category between Tourist and First; no universal definition of seat pitch or services provided.
business engineering  /  BE, a business integration strategy based on net value to the business, not functional optimisation.
business jet  /  Rapidly growing class of business aircraft, abb. bizjet, subdivided by passenger seating into: micro <5, light <7, super light <10, midsize <12, super-midsize <19, and large 20+.
bust  /  A failure to comply with instruction to fly at assigned FL.
butterfly

maximum continuous power”, normally to effect interception.

butterfly Distorted figure-8 pattern, looking like a butterfly, flown by orbiting combat aircraft on weapon-guidance, EW or, rarely, AWACS duty.

butterfly tail Comprises two oblique (dihedral in region 25°–45°) fixed stabilizer surfaces each carrying a hinged surface, the latter operating in unison as elevators or in opposition as rudders; also called V tail.

butterfly valve Fluid-flow valve in form of pivoted plate, usually having circular form to close a pipe.

butt joint Sheet joint with edge-to-edge contact without overlap, with joining strip along either or both sides.

buttock lines Profiles of intersection of longitudinal vertical planes with surface of solid bodies, esp. aircraft fuselages and marine floats. Zero ** is that on axis of symmetry. Used in lofting, these lines do not necessarily correspond with structural members.

button Extreme downwind end of usable runway (colloq.).

button contact Electrical connector in which a plunger is pressed against the surface of a convex disc [button]; this ensures clean separation, e.g. on launch of a missile.

buttonhead rivet Rivet with approximately hemispherical head; used where tensile load may be high.

butt rib Compression rib at joint between outer and inner wing, or wing and fuselage.

butts Facility for testing aircraft guns [rare, singular].

BUV Backscatter ultraviolet.

BuWeps Bureau of Weapons, combined BuAer and BuWeps.

Buys Ballot’s law Professor Buys Ballot postulated that an observer with back to wind in N hemisphere has lower pressure to left (in S hemisphere, to right). True for any isobar pattern.

buy the farm To be killed in a crash, not excluding military action (colloq.).

buzz Oscillation of skin or other structure at frequency high enough to sound as a note.

1 Oscillation of control surface at high frequency.

2 Loosely, any single-direction-of-freedom vibration at audible frequency.

Wake-interaction noise generated by turbo-machinery, esp. large fans, at 900–4000 Hz.

High-frequency, often violent, pulsation of airflow at supersonic air-breathing engine inlet.

To fly aircraft, esp. one of high performance and manoeuvrability, in a way designed to harass another aircraft or ground target. Transitive, thus “to * the control tower”.

Collective noun for micros.

buzz liner Sound-absorbent liner to fan duct or other surface bounding wake-interaction noise.

buzz number Extra-large individual aircraft number (can be unit number or aircraft serial), readable from a distance.

buzz-saw noise Buzz (3) from shock system of fan with supersonic flow over blades, composed of discrete tones at multiples of Nt.

BVA Bleed-valve actuator.

bypass turbojet

BVCU Bleed-valve control unit.

BVD Battlespace visualization display.

BVI Blade/vortex interaction (helicopter).

BVID Barely visible impact damage.

BVIS Baggage vector interface server, provides routing system for host systems of all carriers at one airport.

BVOR/BVortac Weather broadcast VOR or Vortac.

BVQI Bureau Veritas Quality International.

BVR Beyond visual range.

1 Beyond.

2 Best-value rate.

BVTRU Bleed-valve transient reset unit (controls BVs during transients).

BVU On-board computer (R).

b Wing span [alternative to b].

BW Biological warfare [or weapons].

2 Bomb (or bombardment). Wing [USAAC, USAAF, USAF].

Bandwidth; also B/W.

BWA Blast-wave accelerator.

BWAN Back-up WAN.

BWB Blended wing/body.

1 Bundesamt für Wehrtechnik und Beschaffung [MoD procurement office] (G).


BWEC British Wind Energy Association [a major programme is to evaluate impact of wind farms on radars].

BWEA British Wind Energy Association [a major programme is to evaluate impact of wind farms on radars].


BWER Bounded, or boundary of weak echo region [of thunderstorms].

BWF Ministry of research and technology (G).

BWO Backward-wave oscillator.


BWRA British Welding Research Association.

BX Base Exchange, today AAFES.

BAX Bureau of Export Administration (US).

BY Blowing spray.

BYD Beyond.

BYS Base-year dollars.

BYG Blue/yellow/green.

Bygrave Slide rule for solving vector triangles, esp. from sextant readings (obs.).

1 Capacitor connected in shunt to provide low-impedance alternative path.

2 Alternative flow path for fluid system.

bypass duct Annular space surrounding engine core through which bypass air flows; in modern turbofans usually called fan duct. May be short, or extended back to a mixer.

bypass engine Air-breathing jet engine in which air admitted at inlet may take either of two flow paths (see bypass turbojet).

bypass ratio In bypass turbojet or turbofan, numerical ratio of mass flow in bypass duct divided by that through core, ie cold jet divided by hot. Some have defined as total mass flow divided by core mass flow; this is incorrect, and would always yield numbers greater than 1. BPR is normally measured at TO power at S/L.

bypass turbojet Turbojet in which mass flow through LP compressor stages is slightly greater than that through HP stages, excess being discharged along bypass
byte

duct. Also called leaky turbojet. In principle difference between this and turbofan is purely of degree; turbofan has much higher bypass ratio (greater than 1) and probably at least two shafts. In general subsonic engines may be considered turbofans and supersonic engines bypass turbojets.

byte  1 Group of bits normally processed as unit.

2 Sequence of consecutive bits forming an EDP word, thus an 8-bit *, which gives $2^8 = 256$ possible combinations.

BZ  Benactyzine.
C

1 Degrees Celsius.
2 Coulomb(s).
3 Yawing moment of inertia.
4 Compass heading/bearing/course.
5 Capacitance, capacitor, capacity (electrical).
6 Ceiling, or bottom of cloud layer.
7 Thermal conductance.
8 Any constant.
9 Aggregate fuel consumption.
10 Carrier-wave power in watts.
11 Basic mission, cargo (USAS, USAAC, USAAF, USN since 1925, USN since 1962, UK mission prefix since 1941).
12 IETDS code: air-transportable, carrier-wave, common use.
13 Fighter category (F).
14 Prefix: ground service connection (BSI).
15 Viscous-damping coefficient.
16 Council (ICAO).
17 Customs available.
18 Clear, clears, clearance delivery (ATC).
19 Cell of storm.
20 Continental (air mass).
21 Circling landing minimum.
22 Dirigible class (USN 1914–16).
23 Sport-parachuting certificate; 50+ jumps, 20 landing ≤20m of target.
24 Heat capacity per mole.
25 Chemical concentration.
26 Site of Contrôle d’Aérodrome office [large black on yellow sign] (F).
27 Aircraft category: aeroplanes (FAI).
28 Centre (runway identification).

C

1 Chord [needs defining in each case].
2 Speed of light in vacuum, \( = \frac{2.997925 	imes 10^8}{\text{ms}^{-1}} \).
3 Collector of semiconductor device.
4 Prefix, centi (×10\(^{-2}\), non-SI).
5 Compass.
6 Prefix, circa, = approximate.
7 Subscript, convective, convection.
8 Specific heat.
9° Lower’s function.
C\(^e\) Thrust specific fuel consumption.
\(C\) Mean aerodynamic chord [US usage].
\(c\) Geometric mean chord; sometimes \(C\).
\(e\) Aerodynamic mean chord; sometimes \(C\) [UK usage].
\(\text{Chord length ratio.}
(e) Astronomical Unit, see AU.
\(C\) Characteristic exhaust velocity of a rocket.
2 Weighted linear combination of pilot’s pitch-control input to aircraft pitch-rate and normal acceleration. In 1964 refined to \(C = k_{\text{ry}} \times \text{t}^2 + k_{\text{ny}} \times \text{t}^2\) where \(t\) is time in s, g normal acceleration and \(q\) pitch rate in rad/s.
\(C_0\) to \(C_9\) See cloud types.
C\(^1\), C\(^2\) Avion de chasse [fighter] with 1 or 2 seats (F).
\(C_{1A}\) Cr/Al oxidation/oxy sulphuration coating.
C\(^2\) Also called \(C\)-squared = command and control; BMC adds battle-management communications, I adds interface or intelligence. IPS information-processing subsystem, ISR intelligence, surveillance and reconnaissance [to which \(C\) adds center], IT interoperability trial, MC mobile-capable, P processing, RAD robotics assets display, S status, SIM simulation, SS or S\(^2\) switching system, V vehicle, and W warfare.
2 Camouflage and concealment, thus C\(^2\)D (usually not C\(^3\)D) is camouflage, concealment and deception.
\(C^3\) Also called C-cubed = command, control and communications; CM adds countermeasures, I intelligence, and ISRSS intelligence, surveillance, reconnaissance and space systems.
2 Crash-crew chart(s), detailed airfield plan(s) carried on RIV.
3 Coated carbon/carbon.
\(C^D, C^3D\) Cross-cockpit collimated display.
\(C^4\) Plastic explosive based on RDX/PETN.
\(C^*\) Command, control, communications and computers; addition of I and ISR as above, C\(^4\)ISR previously being called ACN(3); IFTW adds information for the Warrior.
\(C^4\) Wing or tail surface quarter-chord line.
\(C\)-band EM frequencies 3.9–6.2 GHz, now covered by Bands S and X (see Appendix 2).

C-certificate The first [most junior] awarded to a glider pilot. In 1929 the requirement was 5+ min, landing at a place not lower than point of departure; in 1952 raised to 15+ min.

C-channel \(C = \text{circuit-mode}, \text{provides full duplex, voice 9.6 kbit/s, data 10.5, assigned in pairs uplink/downlink.}
\(C\)-check A-check plus thorough inspection of structure, removing fairings where necessary, plus test of systems. For modern airline engine, 24 months.

C-clamp Headset.

C-class Controlled airspace near busy airport, usually a radar service area.

C-code IFR flight-plan suffix: no-code transponder and approved area navigation.

C-cycle One complete flight simulated in engine development or test.

C-display Rectangular display in which horizontal axis is target bearing and vertical axis is its angle of elevation.

C-duct Half a fan duct forming part of an engine pod cowl, usually pivoted at the top for access to the core.

C-licence Permits ground engineer to inspect and rectify engines.

C-Lite Small polycarbonate fin on wingtip for guidance on crowded airfields and showing if wingtip lights are illuminated.

C-mode Transponder transmits altitude.

C-power supply Between cathode and grid, for grid bias.

C-scope C-display.

C-spar Structural member along helicopter rotor blade between D-nose and main spar or I-beam, closed at front, open at rear.

C-stars Carriage, stream, tow and recovery (AMCS3).

C-stoft Rocket propellant (fuel+coolerant), hydrazine hydrate plus methyl alcohol, often plus water, usual percentages 30/75/13 (G).
C-wing

C-wing  Blended wing/body.
CA  1 Controller Aircraft; holder of this office is also Deputy Chief of Defence Procurement (UK).
  2 Controlled airspace.
  3 Cabin attendant(s) (airline costings).
  4 Conversion angle.
  5 Circuit analog.
  6 Cruiser, gun armed [can have SAM secondary armament (USN)].
  7 Cetyl alcohol, a lubricant.
  8 Control advises.
  9 Conflict alert.
 10 Component availability.
CIA  1 Coarse acquisition (GPS).
  2 Course acquisition.
CAA  1 Civil Aviation Authority [1972–, said to mean ‘campaign against aviation’; London WC2B 6TE] (UK).
  2 Civil Aeronautics Authority [1938–40] (US).
  3 Civil Aeronautics Administration [1940–58, part of Department of Commerce, became FAA] (US).
  4 Civil Aviation Administration (Israel).
  5 Conformal-array antenna, or aerial.
  6 Chromic-acid anodizing.
  7 Cargo Airline Association (US).
  8 Component application architecture.
  9 Continued airworthiness assessment (FAA).
CAAA  1 CAA(1) Approved.
  2 Commuter Airlines Association of America, also called C3A or C-triple-A, and now the RAA.
  3 Canadian Aviation Artists Association.
CAAC  Civil Aviation Administration of China, from 1964.
CAACU  Civilian Anti-Aircraft Co-operation Unit (UK, various dates 1950–71).
CAADR  Civil Aircraft Airworthiness Data Requirements [originally Recording] Programme (UK).
CAAFI  1 Commercial aviation alternative fuels initiative (Int.).
  2 CAA(1) of the Fiji Islands.
CAAFU  CAA(1) Flying Unit, originally for navaid cali-
  2 Centre for Airborne Systems (DRDO).
CAAG  1 Combat aircraft trouble-shooting.
CAASD  Center for Advanced Aviation System Development (Mitre Corp.).
CAASP  Commonwealth Advisory Aeronautical Research Council (Int., office in London).
CAARP  Cooperative des Ateliers Aéronautiques des la Région Parisienne (formed 1965).
CAAS  1 Computer-assisted approach sequencing.
  2 Computer-aided aircraft trouble-shooting.
  3 Civil Aviation Authority of Singapore.
CAASA  1 Computer-aided aircraft trouble-shooting.
  2 Commercial aviation alternative fuels initiative (FAA).
  3 Common avionics architecture system.
  4 Common avionics architecture system (USAAF).
  5 Common avionics architecture system program (USSO).
CAB  1 Civil Aeronautics Board (US, 1940–84).
  2 Common avionics baseline.
  3 Computer-aided aerodrome training suites.
  4 Computer-aided aerodrome training systems.
CAAV  CAA of Vietnam.
CAAVTS  Compact airborne automatic video tracking system.
CAAZ  CAA of Zimbabwe.
CAAR  Centre for Airborne Research (Int., office in London).
CAATS  1 Computer-aided aircraft trouble-shooting.
  2 Combat assessment capability.
  3 Computer acceleration control.
  4 Centralised approach control.
  5 Caution advisory computer.
  6 Course acquisition code.
CACA  National certification authority (Poland).

Cacas

Cacas  Civil Aviation Council of the Arab States.
CAC 1, CACCC  Combat air command and control center.
CIA code  Coarse acquisition code (GPS).
CACP  Cabin-air, or area, control panel.
CACRC  Commercial aircraft composite repair committee [formed by US airframers and operators 1991, administered by the SAE].
CACS  Common aviation command and control system (USMC).
CACTCS  Cabin-air conditioning and temperature control system.
CACU  Coast Artillery Co-operation Unit (RAF c1926-).
CAD  Computer-assisted design [CAM adds computer-assisted manufacturing, D adds drafting].
2 Cushion-augmentation device [US = LID].
J Cartridge-actuated [or activated] device; /PAD adds propellant-actuated device.
4 Close-in air defence.
5 Computer-aided dispatch.
6 Component advanced development.
7 Civil Aviation Department (Hong Kong).
8 Chemical agent defeat.
9 Continuous [i.e., 24-hour] airborne deterrent.
Cadal  Communications automation and data-link.
CADC 1 Computerised air-data centre (Elbit).
2 Central air-data computer.
CAD-DET Pronounced ‘Cadet’, close air-defence detachment engagement trainer [22 MoD sites] (UK).
CADS  Canadian dollars.
CADE  Computer-aided design evaluation.
CADEA Confederación Argentina de Entidades Aero deportivas.
cadence braking  Rapidly repeated jabs on pedals or other input.
cadensicon  Measures fuel density and permittivity as it enters aircraft tank.
Cades, CADES  Computer-aided design and evaluation system.
Cadets  Computer-assisted documentation education tutorial system.
CADF 1 Commutated-aerial (or antenna) direction-finder, or finding.
2 China Aviation Development Foundation (Taiwan).
Cadfn  Czech aeronautical data-interchange network.
Cadiz  Canadian air-defense identification zone.
CADM  Clustered airfield defeat, or dispensed, munition(s).
Cadmat  Computer-aided, or augmented, design, manufacture and test.
cadmium  Symbol Cd, soft white metal, density 8.7, MPt 321°C; major uses electroplating, NiCd batteries, CdS IR detectors and fusible alloys.
CADO  Central Air Documents Office (USA).
CADP  Central annunciator display panel.
CADRE, Cadre 1 Communications-actuated data-retrieval equipment.
2 Center for, now College of, Aerospace Doctrine, Research and Education (Air University, Maxwell AFB).
cadre  Adjective: formed from regular and reserve personnel.
2 Initial, incomplete military unit, deploying new hardware for first time.
CAGs, CADS 1 Cushion-augmentation device[s] to increase jet lift near ground.
2 Concept and design study/studies.
3 Computer-aided debriefing system.
4 Controlled aerial delivery system [without aircraft having to land].
CADSI The Canadian Association of Defence and Security Industries.
CADWS  Close air-defence weapon system[s].
CAE 1 Computer-aided, or assisted, engineering.
2 Component-application engineer.
3 Control-area extension.
Caé  Commission d’Aérologie (WMO).
CAEA Confederación Argentina de Entidades Aero deportivas [federation of air sport, office BA] (Argentina).
CAEDM Community/airport economic-development model.
CAEE Committee on Aircraft Engine Emissions (ICAO).
CAEM Cargo-airline evaluation model.
CAeM Commission for Aeronautical Meteorology (WMO).
CAPE Committee on Aviation Environmental Protection, or Protocol (ICAO).
Caepend, CAEP Centre d’Achévement et d’Essais de Propulseurs d’Engins (F).
CAER See EARC.
Caerat, CAERAT Common American/European Reference Aeronautical Telecommunications [F adds facility, NF network facility].
Caesar, CAESAR 1 Component and engine structural assessment and research.
2 Coalition aerial surveillance and reconnaissance (NATO).
3 Captor active electronically scanned array radar.
caesium  In N America cesium, symbol Cs, gold-colour soft metal, density 1.9, MPt 28°C, used in glasses (but the hydroxide dissolves glass), highly reactive and toxic.
CAEW Compact, or conformal, airborne early warning.
CAF 1 Canadian Armed Forces.
2 Citizen Air Force (South Africa).
3 Confederate Air Force [US, from 1961, now called Commemorative AF, Midland, TX].
4 Chinese Air Force.
5 Cleared as filed.
6 Cyprus Airports Federation [Nicosia 2122].
7 Charities Aid Foundation (UK).
CAFAC CAF(1) Air Command.
Cafac  Commission Africaine de l’Aviation Civile (Int.).
CAFATC Canadian Air Transport Command.
CAFCD Collection, analysis, fusion and dissemination.
Cafda Commandement Air des Forces de Défense Aérienne (F).
CAFH Cumulative airframe flight hours.
Cafi Commander’s annual facilities inspection.
CAFMS Computer-assisted force management system.
CAFT 1 Combined advanced field team (evaluated new captured hardware in WW2).
2 Civil Airworthiness Flight Testing (ETPS).
C/Aft  CNS/ATM focus team.
CAFU Civil Aviation Flying Unit (UK).
CAG 1 Carrier air group (USN).
CAGE

2 Civil Air Guard (UK, 1937–39).
3 Circulation aérienne générale (F).
CAGE 1 Commercial and governmental entity.
2 Commercial avionics GPS engine.
3 Combined arms gateway environment.
cage 1 To orientate and lock gyro into fixed position relative to its case.
2 Housing for bearing balls/rollers/needles.
caged switch Protected against inadvertent operation by spring-loaded hinged box.
CAGR Compound average, or annual, growth rate.
CAGS Central attention-getting system.
CAH Cabin-attendant handset.
CAHC The Canadian Aviation Heritage Centre [McGill University Macdonald Campus, Montreal H9X 3V9].
CDHgTe Cadmium mercury telluride.
CAHI Central Aerodynamics and Hydrodynamics Institute (Moscow, founded 1 December 1918).
CAHS Canadian Aviation Historical Society.
CAL 1 Civil Aeromedical Institute (FAA).
2 Computer-aided instruction (see CMI).
3 Close approach indicator (STOVL carrier landing).
4 Czech Astronomical Institute.
5 Caution annunciator/indicator.
6 Component analysis and integration.
7 Composites affordability initiative (USAF).
CAIG Cost analysis improvement group (DoD).
CAIMS Central aircraft information management, or maintenance, system.
Cains Carrier aircraft (since 1982, also aligned) inertial navigation system.
CAIP Civil aircraft inspection procedure[s].
CAIR Confidential aviation incident reporting [P adds programme].
Cair System for humidifying First and Business on long-haul (CTT).
CAIRA See IAARC.
CAIS 1 Common Ada (or APSE) interface set.
2 Common airborne instrument, or instrumentation, system.
CAIV Cost as an independent variable [each decision taken on basis of cost of program].
CAK Continental Arctic air mass, very cold.
cal Calorie.
CALCM Common Ada [or APSE] interface set.
CALCS Canadian Civil Aviation Standards.
CALLM Conventional [i.e., not nuclear] air-launched cruise missile.
calculated altitude Celestial altitude calculated but not observed.
Calda Canadian Airline Dispatchers Association [Milton, ON].
Calea Canadian Airlines Employees Association [Mississauga, ON].
Cale gear Shock-absorbing system in carrier arrester wire anchors.
CALF, calf Common affordable lightweight fighter.
Calfaf Computer-aided layout and fabrication.
Calfax Patented quick-release panel fastener, latch opened or closed by 540° rotation.
Call-garters Automatic leg-restraint straps in certain ejection seats.
caliber US unit of length. = 0.3937 in.
calibrated airspeed IAS corrected for ASI system errors; ‘true indicated airspeed’, but see airspeed.

Calorizing

calibrated altitude Not normally used, but signifies pressure altitude or radar height corrected for instrument errors.
calibrated club propeller Club propeller whose drive torque has been measured and plotted against rpm; thus, can serve as dynamometer.
calibrated focal length Equivalent focal length adjusted to equalise positive and negative distortion over view field.
calibration card Graphical or tabular plot of instrument errors (other than compass); usually displayed near instrument.
calibration test Static run of bipropellant rocket engine to check propellant mixture ratio and performance.
calibrator Device for measuring instrument errors.
calibre Bore (ID) of tube, esp. diameter of largest cylinder that fits inside (thus, in rifled barrel, touches highest points of opposing lands).
caliper Instrument for measuring or checking thickness, diameter or gap; with internal or external measuring points on tips of pivoted or sliding arms.
caliph Caliper.
Calippo Cloud aerosol lidar and IR pathfinder satellite observation[s].
Callback Confidential reporting system to attempt to record civil (especially air carrier) incidents caused by human failures (FAA via NASA).
call fire Fire against specific target delivered as requested.
call for fire Request, by FAC or other observer, for fire on specific target and containing target data.
calling See next.
calling out Spoken data readout by crew member or ground observer to assist pilot or other crew member; thus, co-pilot’s speed/altitude checks on instrument approach.
call mission CAS (3) mission at short notice by pre-briefed pilot with pre-armed aircraft, target assigned after take-off.
call number 1 In EDN, number code identifying subroutine and containing data relevant to it.
2 Aircraft serial number, its identity on radio [general usage] (US).
callout notes On engineering drawing, written notification of special features (eg material, process, tolerance or equipment installation).
calls Computer-aided language learning system.
call sign, call sign Pronounceable word(s), sometimes with suffix number, serving to identify a communications station (such as an aircraft). Civil aircraft ** are ICAO phonetic letters and numbers derived from international registration; ground station ** are name of airport followed by type of station (tower, departure, clearance delivery, etc).
calm No sensible wind.
CALNS, Calns Common air-launched navigation system.
calorie Unit of quantity of heat, contrary to SI; International **, ccal = 4.1868 J by definition, 15°. ° = 4.1855 J, thermochemical ** = 4.184 J.
calorific value Quantity of heat released by burning unit mass of fuel: kJ/kg = 0.429923 Btu/lb; kJ/m³ = 0.200784 Btu/Imp. gal.
Calorizing Heating steel part surrounded by aluminium.
Calow

(liquid or granules); gives protection in high-temperature use.

Calow Contingency and limited objective warfare.

Calpa Canadian Air Line Pilots’ Association [office, Brampton, ON].

Calrod Electric heater [many types] fitting inside shafts of FCS or other mechanisms.

Cals, CALS 1 Computer-aided logistics support.

2 Computer-aided acquisition and logistic [or lifetime] support.

3 Continuous acquisition and life-cycle support.

4 Carrier aircraft-landing system.

Calpsel Proposed Selcal modification in which signal is combined with a gating tone to produce automatic receiver function.

CALT China Academy of Launch-vehicle Technology, Beijing.

Caltech California Institute of Technology, Pasadena, name since 1920, founded 1891 as Throop Polytechnic Institute.

Calthrop Patented designs of aircrew parachute, c1917.

CalVer Calibration verification.

Calvert lighting Original system of crossbar approach lighting.

CAM 1 Cockpit angle measure (flight deck vision limitations expressed as angles).

2 Catapult armed merchantman (UK ships, 1941–43).

3 Chemical-agent munition (or monitor).

4 Circulation aérienne militaire (F).

5 Computer-assisted manufacture, or computer-aided manufacturing.

6 Conventional attack missile.

7 Content-addressable memory.

8 Counter-air missile.

9 Centre of Aviation Medicine (RAF).

10 Commercial, or Contract, Air Mail routes (US, from 1926).

11 Cockpit audio monitoring.

12 Cabin assignment module (CIDS, later FAP).

13 Civil Aeronautics Manual (US).

14 Control-actuator mechanism.

15 Continued airworthiness management.

Cam Rotating or oscillating member having profiled surface to impart linear motion to second member in contact with it.

CAM Civil Aviation Medical Association (US, office Oklahoma City).

CAMAA Commercial application of military airlift aircraft (USAF).

Camber 1 Generally, curvature of surface in airflow.

2 Curvature of aerofoil section, locus of points measured along centreline or upper or lower surface at 90° to camber line itself, positive when centreline is arched in direction of lift force (see upper *, lower *, centreline *, conical *, reflex *, mean *, local*).

3 Centreline of aerofoil.

4 Inclination of landing wheels away from vertical plane.

Cambered blade Helicopter main-rotor blade incorporating camber, instead of having symmetric profile.

Cambered Krüger Krüger having flexible profile to increase camber when open.
cam ring

cam ring  Ring inside crankcase of radial piston engine geared to crankshaft and having sequence of lobes to operate inlet and exhaust valves of all cylinders in that row.

CAMS 1 Combat aviation management system (USA).
2 Control and monitoring system.

camshaft  Shaft equipped with cams aligned with valve gear of cylinders of in-line piston engine.

Camsim Canadian airspace management simulator.

CAMU Central avionics management unit (databas).

CAN 1 Committee on Aircraft Noise (ICAO).
2 Correio Aereo Nacional [national air mail] (Brazil).

can 1 Individual flame tube of can-annular combustion chamber.
2 Complete combustion chamber of multi-combustor engine.
3 Five-sided box projecting into integral wing tank to accommodate slat track.
4 Controlled-environment weapon container.

Canadian break  Max-rate 360° turn.

can-annular  See cannular.

canard 1 Tail-first aerodyne, usually with auxiliary horizontal surface at front (foreplane) but vertical surface (fin, rudder) at rear.
2 Foreplane or nose yaw control fitted to * (1).

cancel 1 To terminate complete R&D or hardware programme.
2 To countermand order.
3 To deactivate activity (eg. * reverse thrust).

C&C 1 Command and control.

C&DH Communications and data-handling.

candela  SI unit of luminous intensity 1/683 W/sr [mono-
pherical].

CANS Canadian airspace management simulator.

CANSO Civil Air-Navigation Services Organization (Int., based Netherlands).

cant angle 1 Angle between centreline of winglet and local vertical [OZ axis], seen from head-on.
2 Angle between biplane interplane strut and local vertical, seen from head-on.

Canuck P1 or P2 (Canada).

Canuck P1 or P2 (Canada).

canopy 1 Main deployable body of parachute.
2 Rarely, transparent fairing over flight crew which does not form part of airframe and slides or pivots for entry and exit.
3 Main deployable body of parachute.
4 Another name for the envelope of a balloon.

CNP 1 Collision-avoidance notification procedure.
2 Civil air [or aircraft or aviation] notification procedure, tells military of low-level [≤305m, 1,000ft] civil activity (UK).

CANS Civil air navigation school.

CANSO Civil Air-Navigation Services Organization (Int., based Netherlands).

cantilever 1 Structural member, such as beam, rigidly attached at one end only. Thus * wing is monoplane without external struts or bracing wires.
2 Semi-span divided by maximum root depth.

Cannon plug 1 Vast range of electrical connectors (trade name, ITT Industries).
2 Annular combustion chamber containing separate flame tubes, each of which may have a ring of burners.

canoe fairing Boat-shaped covering over tracks for area-

increasing flaps and other wing movables.

canoe radar Aircraft radar whose radome has canoe-like shape.

canonical time unit Time required for hypothetical satel-
lite in geocentric equatorial orbit, with centre of satellite coincident with surface of Earth, to move distance subtending 1 radian at centre: 13.447 minutes.

canopy 1 Fairing, usually transparent, over flight crew or, in lightplane, all occupants, which does not form part of airframe and slides or pivots for entry and exit.
2 Rarely, transparent fairing over flight crew which does not form part of airframe and is not used for entry/exit.
CAPA

1 Various portions of parachute system (see petal *, tear-off *, vent *).
2 Tension boom in form of flat strap attached along top or bottom edge or spar or around rib.
3 Upper limit on a proposed budget.
4 Central airframe performance analyser.
5 Coalition of Airline Pilots' Associations (US).
6 Capability insertion Improvement.
7 Computer-assisted parametric engineering.
8 Rocket-propelled explosive bird-scarer.
9 In electrical system, ratio of charge to related change in potential. Basis of fuel measurement system which gives readout of fuel mass irrespective of aircraft attitude. SI unit is farad.
10 Computer-aided requirements analysis.
11 Computer-aided programme planning, or planning project.
12 Computer-aided antenna pointing system (Satcom).
13 Computer-aided passenger pre-screening system.
14 Computer-aided passenger screening.
15 Civil-aviation purchasing service.
16 Civil, or commercial, airliner protection system, against terrorist SAM.
17 Civil-aircraft packet-switching integrated network.
18 Coverage analysis and planning tool (Eurocontrol).
19 Very loosely, any PIC.
20 More correctly, officer in charge of military, naval or commercial aircraft having flight crew numbering more than one; not normally used with two-seat combat aircraft. Usually * is PIC but in RAF in WW2 could have any aircrew trade, in today's MR [e.g. Nimrod] * is Tac Nav, and in AAC helo * is Gunner [missile operator] regardless of rank. Airline * has status of rank with four gold stripes.
21 Parallel lights under tanker fuselage to assist receiver's station-keeping (USAF).
22 Undefinable. Most airline captains are permitted to ignore some rules, such as number of hours on duty, or limitations on flight time.
23 In flying aircraft, to control trajectory to intercept given instrument reading.
24 In flying aircraft, to control trajectory to intercept and then follow external radio beam (eg ILS, radio range).
25 In ATC or air-defence system, to acquire and lock-on to target.
26 In interplanetary (eg Earth-Moon) flight, eventual dominant gravitational pull of destination body.
27 In automatic or self-governing system not always operative (eg yaw damper), limits of aircraft attitude and angular velocity within which its authority is complete.
28 Data rate in kbit/s or Mb/s.
29 Fire control radar.
30 Loosey, payload container attached to or within aerostat, esp. airship.
31 Computer-aided requirements analysis.
32 Combined-altitude radar altimeter.
33 Cargo and rescue aircraft.
34 Coherent all-radio-band sensing.
35 Karabiner.
CARAM

2 Civil aircraft research and demonstration programme (UK).

CA RAM Circuit analog radar absorbent material.
carangifoil Lignocellulose blasting abrasive (BGS); used to clean gas path of running gas turbine and made from crushed apricot stones.
carbon tetrachloride CCl₄, liquid, BPt 24.89°C, s.g. at 20°C 1.595.
carbon seal Sliding seal between moving machinery (eg turbine disc) and fixed structure; oil removes heat.
carbon dioxide CO₂ and wide range of valence bond variations.
carbon-containing fuel: principally carbon monoxide CO, carbon oxides CO₂.
carbon fibre Precursor materials (eg PAN) and exhibiting outstanding specific strength and modulus. Used as reinforcement in CFRP.
carbon microphone AFCS provides reliable protection against stall, departure or overstress.
carbon monoxide CO, primary constituent of hydrocarbons [e.g., fuels], symbol C, density [graphite] 2.3, MPt various to 3,600°C.
carbon/metal Composite material: pyrolysed carbon fibres in pyrolysed carbon matrix.
carbon seal Sliding seal between moving machinery (eg turbine disc) and fixed structure; oil removes heat.
carbon tetrachloride CCl₄, liquid, BPt 24.89°C, s.g. at 20°C 1.595.
carbon, non SI unit of mass, = 0.2g.
carbobronze Copper alloys containing 8 per cent tin (and trace of phosphorous).
carbon Possibly most important element in aerospace, primary constituent of hydrocarbons [e.g., fuels], carbon/graphite fibre and even diamond [heat sink], symbol C, density [graphite] 2.3, MPt various to 3,600°C.
carbon/carbon fibre Range of fine fibres pyrolised from various precursor materials (eg PAN) and exhibiting outstanding specific strength and modulus. Used as reinforcement in CFRP.
carbonising, carbonitriding See Nitriding.
carbon microphome Contains packed carbon granules whose resistance, and hence output signal, is modulated by variable pressure from vibration of sound diaphragm.
carbon oxides Gases produced upon combustion of carbon-containing fuel: principally carbon monoxide CO, carbon dioxide CO₂ and wide range of valence bond variations. CO₂ present in Earth atmosphere (3 parts in 10³); percentage much higher in exhaled breath.
carbon seal Sliding seal between moving machinery (eg turbine disc) and fixed structure; oil removes heat.
carbon tetrachloride CCl₄, liquid, BPt 24.89°C, s.g. at 20°C 1.595.
carboniser See carburettor.
carbonisation Mixing of liquid fuel with air to form optimum mixture for combustion.
carburettor Device for continuously supplying engine, esp. Otto-cycle piston engine, with optimum combustible mixture. Many forms exist, some with choke tube and others injecting liquid fuel direct into cylinders (in which case injection pump can assume * function). Not fitted to most steady-burning devices such as gas turbines and heaters.
carburettor air Induced, usually via ram intake, along separate duct; intake normally anti-iced. If fitted, a * control provides a choice of cold air, or air heated by various means.
carburettor icing Caused by depression in venturi of choke tube giving local reduction in temperature.
carburetting flame Oxy-acetylene flame having excess acetylene.
carburising Prolonged heating of fully machined steel part in atmosphere rich in CO or hydrocarbon gases to give hard, tough outer layer.
carburising flame Oxy-acetylene flame having excess acetylene.
carconitron Backward wave oscillator; TWT for generating microwaves in which electron beam opposes direction of travel of a wave guided by a slow-wave structure.
Carnot cycle

**Carnot cycle** Ideal reversible thermodynamic cycle: isothermal compression, adiabatic compression, isothermal expansion, adiabatic expansion.

**Carousel** Pioneer family of civil INS.

**carousel** 1 Circulatory conveyor system to which baggage is delivered in arrival terminal.

2 Large structural ring on which rotating wing of tilt-rotor aircraft is mounted.

**CARP** Computed air release point.

**carpet** 1 Graphical plot of three variables having appearance of flexible two-dimensional surface viewed obliquely.

2 Strip of Earth’s surface subjected to sonic boom.

**carpet bombing** Level bombing, using one or more aircraft, to distribute bombs uniformly over target area.

**Carquals** Carrier qualification tests (USN).

**carousel** Computer-based pilot-training aid: cockpit, keyboard interface and instructor system displays.

**carrier** 1 Aircraft carrier.

2 EM wave, usually continuous and constant amplitude and frequency, capable of being modulated to transmit intelligence.

3 Electronic charge *, either so-called hole or mobile electron.

4 Substance chosen to carry trace element or trace of radioactive material too small to handle conveniently.

5 Operator of commercial aircraft engaged in transport of passengers and/or freight for hire or reward.

**carrier air group** Two or more aircraft squadrons operating from same carrier (1) under unified command.

**carrier-on-board delivery** Air delivery of personnel, mail and supplies to carrier (1) at sea.

**carrier suppression** Communications system in which intelligence is transmitted by sidebands, carrier being almost suppressed.

**carrier task force** One or more carriers (1) and supporting ships intended to be self-sufficient in prolonged campaign.

**carrier vehicle** Parent body or bus of SBI, can be equipped with mid-course sensors independent of SBI (SDI).

**carry-on baggage** Brought on board by passenger. Some airlines [eg, Aeroflot] make passenger carry all baggage.

**carry the can** Accept, or be awarded, blame for something (RAF).

**carry through** Wing spars and other linking structure inside fuselage (esp. of mid-wing aircraft).

**carry trials** Programme intended to prove carriage and release of fired, dropped or jettisoned stores.

**CARS** 1 Coherent antistrokes Raman spectroscopy.

2 Crew-awareness rating scale.

3 Community aerodrome radio station.

4 Contingency airborne reconnaissance system [MISU adds as in Carsmisu].

5 Common automatic recovery system.

**Carsmisu** Contingency airborne reconnaissance systems [and] mission intelligence systems upgrade.

**CART** Combat aircraft repair team.

**Cartesian co-ordinates** System of three mutually perpendicular planes to describe any position in rectilinear space.

**cartridge** Portable container of solid fuel or propellant, with self-ignition system, for propulsion of projectile or supplying pressure to one-shot system.

**case-bonded**

- **cartridge starter** Main-engine starting system energised by reloadable cartridges.

- **cartwheel** Aerobatic manoeuvre involving rotation about Z (yaw) axis, at very low airspeed, with that axis approximately horizontal.

2 Crash on ground involving rotation with wings near vertical plane.

**carve-out** Removal of black or otherwise classified program from oversight by security or contract-oversight organization (DeD).

**CAS** 1 Chief of the Air Staff.

2 Collision avoidance system.

3 Close air support.

4 Calibrated, or computed, airspeed (see airspeed).

5 Corrected airspeed (obs.).

6 Control [or command] augmentation system (or sub-system).

7 Controlled airspace (CAA).

8 Commission for Atmospheric Sciences.

9 Crisis action system (US JCS).

10 Cockpit avionics system (F3S[A3]/CAS).

11 Control actuation section (missiles).

12 Contract Administration Service (or standard[s]).

13 Cost allocation schedule.

14 Combined antenna system.

15 Controlled-access service (satnav).

16 Crashworthy armoured seat.

17 Ceramic ablading seal.

18 Computer-aided software, or support.

19 Cable arresting system.

20 Control actuation system (Goodrich).

21 Crew alerting system.

22 The Croydon Airport Society [1978–] (UK).

23 Co-operative operating satellite.

**CASA, Casa Civil-Aviation Safety Authority** (Australia).

**CASB** Canadian Aviation Safety Board.

**CASC** Combined acceleration and speed control.

**Cascad** Close air support cargo dispenser.

**Cascade** 1 Combat air surveillance correlation and display equipment.

2 Contribution for assessment of common ATM(7) development in Europe (Euret).

**cascade** Array of numerous (eg six or more) sharply cambered aerofoils superimposed to handle large gas flow (eg to turn flow round corner of tunnel circuit). * theory is also relevant in the design of rotating machines with numerous radial stator and rotor blades.

**cascade reverser** Thrust reverser incorporating one or more cascades to direct efflux diagonally forwards.

**cascading failure** Mechanical failure in which each break triggers the next.

**CASCC** Close air support coordination and control.

**Case, CASE** 1 Computer-assisted, or aided, software engineering.

2 Controlled-airspace synthetic environment.

3 Close air support enhancement.

**case** 1 Outer layer of carburised, nitrided or otherwise case-hardened steel part.

2 Cartridge or shell case housing propellant.

3 Envelope containing solid rocket propellant and withstands structural and combustion loads.

**case-bonded** Solid propellant poured as a liquid into motor case (3) and cast in situ.
case chute

See case ejection.

case ejection  Method of disposing of non-consumable case (2), usually stored on board or discharged through chute under assumed positive acceleration.

case hardening  Heat treatment, usually in a controlled atmosphere, to increase hardness in and near surface of a workpiece, e.g. bearing balls.

casein  Cold-water glue manufactured from dehydrated milk curd.

caseless ammunition  Gun ammunition in which case (2) is consumed upon firing.

casevac  Casualty evacuation.

casex  Combined anti-submarine exercise.

CASF  1 Composite Air Strike Force (TAC).  
2 Contingency aeromedical staging facility.

CASIT  1 Canadian Aeronautics and Space Institute (Ottawa).  
2 Commission Aéronautique Sportive Internationale (Int.).

Casid  Committee for Aviation and Space Industry Development [1991-, office Taipei] (Int. for Taiwan).

Casifs  Close air support integrated targeting system[s].

cask  Container for transport and storage of nuclear fuel or radioactive material.

CASM  Cost per a/c, or available, seat-mile.

Casom  Conventionally armed stand-off missile.

casp  1 Canada/Atlantic storms program.  
2 Commercial airborne security patrol[s] (at KSC).

Casper  Composite-aircraft spare parts with enhanced reliability.

CASS  1 Command active sonobuoy system.  
2 Crab-angle sensing system.  
3 Consolidated automated support system (USN).  
4 Commercial air service standards.  
5 Close air support system.  
6 Continuing analysis and surveillance system (FAA).  
7 Cargo accounts settlement system (IATA).  
8 Cockpit access security system.

cassette  Standard tape container, eg for recording mission data.

CASST  Civil aviation safety strategy team.

CAST, Cast  1 Civil Aircraft Study Team.  
2 Commercial Aviation Safety Team (FAA).  
3 Chinese Academy of Space Technology (People’s Republic).

4 Complete aircraft static test.  
5 Command and staff trainer.  
6 Conformal-array seeker technology.  
7 Cyclic auto self-test.  
8 Commercial Aviation Safety Team (US).  
9 Centre for Analysis of Strategies and Technologies (Moscow, R.).  
10 Centre for Aviation Safety Technology (CAAC, China).

CAS-T  Controlled airspace (temporary) (CAA).

cast-block engine  Piston engine with each linear row of cylinders arranged in a single cast block.

castellated nut  Typically, hexagon nut with six radial slots for split-pin or other lock.

Castiglione  Fundamental structural theorems relating loads, deflections and deformation energy.

Cat& trap  Catapult launch and arrested landing.

Cataphos  Chlorinated phosphate rubber-based paint for marking taxiways, aprons, etc, yellow or white.

catapult  Device for externally accelerating aeroplane or other vehicle to safe flying speed in short distance. Those on ships, especially surface warships, were originally operated by compressed air, then hydraulic, and now by steam pressure from main ship propulsion. See LEM(3).

catastrophic instability  Irrecoverably divergent loss of stability at dynamic head sufficient to break primary structure.

Cat-bird  Co-operative avionics, or airborne, testbed aircraft.

CATC  1 College of Air Traffic Control (Hurn, UK).  
2 Commonwealth Air Transport Council (UK/Int., office London SW1P).

3 Canadian Aviation Training Centre [primary flying training for Canadian Forces, Southport, Manitoba] (Canada).

Cat-C  Carrier air-traffic control officer.

Catca  Canadian Air Traffic Control Association [office, Ottawa].

CATCC  Carrier air traffic control centre.

catcher  Small fence-like strips around leading edge of sharply swept or delta-wing naval aircraft; designed to engage barrier.

CATCS  Central Air Traffic Control School (RAF Shawbury).

CATE  Conference on Co-ordination of Air Transport in Europe.

Cat E  1 Category E for an aircraft, a write-off [now Cat 5].
categories

2 For repaired runway crater, profile allows 4.5 in (114 mm) rise in first 12 ft (3.66 m).

categories 1 For flight crew, licence authorisation to qualify on all aircraft within broad groups (eg light aircraft, glider, rotary-wing).

2 For certification of aircraft, grouping based on usage (eg transport, experimental, aerobatic).

3 In bad-weather landings, operational performance * are defined by runway visible range and decision height:
Cat 1 or I: DH 60 m [200 ft], RVR 800 m [2,600 ft].
Cat 2 or II: DH 30 m [100 ft], RVR 400 m [1,300 ft].

Cat 3a or IIIa: DH 0, RVR 200 m [700 ft but 650 ft is closer conversion].
Cat 3b or IIIb: DH 0, RVR 50 m [150 or 165 ft].
Cat 3c or IIIc: DH 0, RVR 0.

* For aircraft damage and repairability: Cat 1, undamaged; Cat 2, repairable on unit; Cat 3, repairable by 2nd echelon or MU; Cat 4, by manufacturer; Cat 5, a write-off.

5 For runway repairs, see rough field.

6 For airfield conflicts, A = near-collision demanding extreme action, B = significant potential of collision; C = ample time to avoid collision (FAA).

7 For runway/taxiway dimensions and bearing strength, coded A to F (ascending order).

Category 2 box Rightangular box or window in HUD defining permissible Cat 2 deviation of localiser and GS.

catenary Curve described by points not on same local vertical.
catering vehicle Removes and replenishes galley; conventional truck with scissor lift, elevating body usually not including cab.

caterpillar Club Private club formed by Irvin Air Chute Co and open to all who have saved their lives by using parachute of any kind.

CAT-EVS CAT(1) enhanced vision system.

CATH, Cath Compact air-transportable hospital.
cathedral Anhedral (pronounced cat-hedral).
cathode 1 Positive terminal of source of EMF (eg battery).

2 Electrode at which “positive current” leaves solid circuit.

3 Negative terminal of electroplating cell.

4 In CRT and similar tube, source of electron stream.
cathode-ray oscillograph, cathode-ray oscilloscope, CRO CRT built into device including amplifier, power pack and controls for graphic examination of waveforms and other research.

cathode-ray tube, CRT Vacuum tube along which electrons (cathode rays) are projected, deflected by pairs of plates creating electric field (deflected toward positive) and impact on screen coated with electroluminescent phosphor.
cathode tuning indicator Triode amplifier and miniature CRT giving visual indication, by closure of well-defined shadow area, of changes in carrier amplitude too small to detect aurally. Also called Magic Eye.

CATIA, Catia Computer-aided 3-D interactive analysis [anglicized from next].

Catica Conception assistée tridimensionelle interactive d’applications (F).

Catic (CATIC) China National Aero Technology Industrial Corporation.
CB

CB 1 Circuit breaker.
2 Chlorobromo-type fire extinguishants.
3 Citizens’ band radio.
4 Centre of balance (or c.b., C–B).
5 Chemical/biological.
6 Centre/barrel (major portion of fuselage).
7 Construction Battalion (USMC ‘Seabees’, USN).
8 Chaff block.

C Lift proportionality constant for circulation-controlled wing.

Cb Cumulonimbus.

CBA Capabilities-based assessment.

CBAA Canadian Business Aircraft Association [office, Mississauga, ON].

CBACS C-band airborne communications system.

CBASS Common broadband advanced sonar system (US).

CBB Carrier battle group.

BBM AMSL.

CBBL 1 Control by light [registered name].
2 Conveyor-belt loader (cargo).
3 Crowd barrier line.

CBLS Carrier, bomb, light store.

CBM 1 Chlorobromomethane.
2 Confidence-building measure[s].
3 Chronological bus monitor[ing].
4 Cloud-base recorder.

CBM, CBMAM Cumulonimbus mammatus.

CBMS Chemical and biological mass spectrometer.

CBN Cubic boron nitride.

CBO Congressional Budget Office (US).

CBOM Common bill of material.

CBP 1 Contact-burst preclusion.
2 Customs and Border Protection, merger of US Customs Service and Border Patrol as part of DHS (2003–).
3 Code of Best Practice.

CBR 1 California Bearing Ratio; system for assessing ability of soft (ie unpaved) surfaces to support aircraft operations; contains terms for aircraft weight, tyre characteristics, landing gear configuration and rutting after given numbers of sorties.
2 Chemical, biological, radiological warfare.
3 Common bomb rack.
5 Cloud-base recorder.

CBRN Chemical, biological, radiological and nuclear; E adds explosive.

CBS 1 Capacity backed spiral.
2 Central Bulletin Service (NATS AIS).

CBRF Common baggage service facilities.

CBSFTCB Common preflight cockpit check for glider: controls, ballast, straps, instruments, flaps, trim, canopy, brake [airbrakes].

CBSS Coarse-beam steering system.

CBT Carrier-based training.

CBTE Carrier, (or conventional) bomb triple ejector.

CBU Cluster bomb unit.

CBW 1 Chemical and biological (or bacteriological) warfare.
2 Combat Bombardment Wing (USAAF).

CBX Control, or copilot control, box (UAV).

C by C Correctness by instruction (ATC).

CC 1 Central or countermeasures, computer.
2 Critical crack.
3 Coastal Command (RAF).
4 Communications (UK role prefix).
5 Composite command (USAF).
6 Circulation controlled (wing or rotor).
7 Compass course.
8 Co-ordinating committee.
9 Counterclockwise.
10 C-check.
11 Cape Canaveral.
12 Component command (DoD).

C/C Carbon/carbon [also rendered as C-C].

CC 1 Equivalent centreline chord.
2 Circrosculus.

CC’ Counter-C’.

CCA 1 Cooled cooling air.
2 Current cost accounting.
3 Carrier-controlled approach.
4 Continental Control Area (US + Alaska at 14,500+ ft AMSL).
5 Close-combat attack [helos] (US).
6 Common-cause analysis.

CCAA Camara de Comercio de la Aeronautica y Afines [Montevideo, Uruguay].

CCAFS Cape Canaveral Air Force Station.

CCAM Centre of excellence for Composites and Advanced Materials (NIAR).

CC&D 1 Camouflage, concealment and deception.
2 Common command and decision.

CCAOU Central Counties Air Operations Unit (UK).

CCAQ Consultative Committee on Administrative Questions (ICAO).

CCAS Centralised crew-alerting system.

CCAT Carrier control approach trainer.

CCATE Common-core automatic test equipment.

CCB 1 Configuration-change, or -control, board (software).
2 Converter circuit-breaker, or [Boeing usage] control breaker.
3 Common-core booster.
CCC

**CCC**  
1. See C\(^2\) with suffixes.  
2. Customs Co-operation Council (ICAO).  
3. Combat Control Centre.  
4. Central command control.  

**CCCA**  

**CCCD, C\(^\text{D}\)**  
1. Cross-cockpit collimated display.  
2. Counter-C\(^\text{D}\) (Italy).  

**CCD**  
1. Camouflage, concealment and deception.  
2. Charge-coupled device, or diode.  
3. Cursor-control device.  

**CCDA**  
Cockpit-control driver actuator.  

**CCDP**  
Code of Conduct on Defence Procurement.  

**CCDT**  
Chopped carbon fibre.  

**CCF**  
1. Central control function.  
2. Combined Cadet Force (UK).  
4. Compact constant-frequency generator.  

**CCFG**  
Collaborative convective forecast product, from Aviation Weather Center, esp. concerned with severe weather (US).  

**CCG**  
1. C-code generator.  
2. Computer control and guidance.  
3. Communications control group.  
5. Close-combat helicopter.  

**CCHP**  
Commission Consultatif Internationale pour la Radiocommunications (UIT), assigns wavebands, frequencies.  

**CCIR**  
1. Comité Consultatif International des Radiocommunications (UIT), assigns wavebands, frequencies.  
2. Commission Consultatif Internationale pour la Radio.  

**CCIRM**  
Collection, co-ordination and intelligence requirements management.  

**CCIS**  
Command and control information system(s).  

**CCISR**  
Command and control intelligence, surveillance and reconnaissance.  

**CCITT**  
Comité Consultatif International pour Télégraphie et Téléphone.  

**CCL**  
Climate-change levy.  

**CCLRC**  
Council for the Central Laboratory of the Research Councils (UK, by Royal Charter 1995–).  

**CCM**  
2. Counter-countermeasures.  

**CCMA**  
Comité de Compradores de Material Aeronautico de America Latina (Int.).  

**CCMS**  
Communication control and management system (Scope Command).  
1. Content compilation management system.  

**CCN**  
Contract change notice.  

**CCO**  
1. Chief corporate officer.  
2. Chief of Combined Operations.  
3. Catapult control officer.  

**CCOA**  
Centre de Conduite des Operations Aériennes (Taverny, F).  

**CCP**  
1. Cross-crew qualification.  
2. Circulation-controlled rotor.  
3. Configuration-change report, required each time a Part or Data-base No. changes.  

**CCPR**  
Civil Communications Planning Conference (NATO).  

**CCPDS**  
Command and control processing and display system.  

**CCPS**  
Command and correlation processor.  

**CCQ**  
Cross-crew qualification.  

**CCR**  
1. See ACC. (1).  
2. Circulation-controlled rotor.  
3. Configuration-change report, required each time a Part or Data-base No. changes.  

**CCRA**  
Canadian Customs and Revenue Agency.  

**CCRI**  
Climate Change Research Initiative (NOAA).  

**CCRIP**  
Continuously computed impact point; HUD display for air-to-ground weapon delivery with steering command and auto weapon release in any attitude from laydown to OTS, system controlling entire firing sequence and triggering release or firing mechanism automatically.  

**CCS**  
1. Communications control system (aircraft R/T and i/c selection and audio routing).  
2. Conformal countermeasures system.  
5. Cargo community system, electronically links shippers, airports, forwarders and carriers.  
6. Cabin-communication system.  
7. Common carriage system [external weapons].  
8. Communications countermeasures set.  
10. See next.  

**CCS-C**  
Command and control system, consolidated.  

**CCS-L**  
Cirrocumulus, standing lenticular wave.  

**CCSS**  
Command and control switching system.  

**Cet**  
Airfield circuit.
**CCTS**

*CCTS*  Co-ordinating Committee for Telecommunications by Satellite.

- 2 Cabin cordless-telephone system.
- 3 Combat Crew Training Squadron (USAF).
- 4 Closed-circuit TV.
- 5 Colour cockpit TV; S adds sensor.
- 6 Crew/cargo transfer vehicle.

**CCTW**  Combat Crew Training Wing (USAF).

**CCTWT**  Coupled-cavity travelling-wave tube.

**CCU**  Cockpit, communications, central, cursor or common control unit; TSD adds tactical-situations display.

- 2 Control and compensation unit.
- 3 Command and control vehicle.
- 4 Chamber coolant valve.

**CCW**  Counter-clockwise.

- 2 Circulation-controlled wing.

**CCWS**  Common controller workstation (CAATS/MAATS).

- 1 Certification demonstration.
- 2 Concept demonstration.
- 3 Clearance delivery (US, not UK).
- 4 Controlled-diffusion.
- 5 Convergent/divergent.
- 6 Cycle-dependent.
- 7 Capacitor-discharge.
- 8 Cold.
- 9 Compact disk.
- 10 Circular dispersion.
- 11 Civil Defence (UK, WW2).
- 12 Chrominance difference.
- 13 Carrier detect.
- 14 Coast Defence (RAF 1926 - c40).

**Cd**  Cadmium.

- 1 Candelas(s).
- 2 Zero-lift drag coefficient.

**CD-2**  Common digitiser 2 (FAA).

**CDAA**  Centre for Defence Analyses (UK).

- 1 Controlled-diffusion aerofoil.
- 2 Concept-demonstration aircraft.
- 3 Co-ordinating design authority.
- 4 Continuous-descent, or constant descending, approach, or arrival.
- 5 Cognitive decision-aiding.
- 6 Co-ordinating or centralising authority.
- 7 Cruciform detector array.
- 8 Contrôle d’Aérodrome [international title of FSSI].

**CDA**  Climb and dive angle.

**CDAAR**  Circularly disposed aerial (antenna) array.

**CDAF**  Centre de Documentation Aéronautique Internationale.

**CDAT**  Critical-defect assessment technology.

**CBD**  Cast double-base rocket propellant, allows case-bonding, varied formulation and charge configuration, low smoke emission etc.

- 2 Central [ATC] data bank, or base.
- 3 Common database [often preceded by CE4].

**CBDP**  Command Data Buffer Program (USAF).

**CBDDB**  Cabin databus repeater.

**CDC**  Concourse Directing Committee (Comité Direction Concorde).

- 2 Concorde Directing Committee (Comité Direction Concorde).
- 3 Cour des Comptes [general accounting office] (F).

**CDP**  Cabin-display computer.

- 2 Centre[s] for Disease Control and Prevention (US).
- 4 Controller of Defence Communications Network (UK).
- 5 Crédit Directeur des Opérations de la Mise au Temps (MAATS).
- 6 Common controller workstation (CAATS/CCWS).
- 7 Control and compensation unit; TSD adds tactical-situations display.

- 1 Clearance delivery frequency.
- 2 Core-driven fan [s adds stage].
- 3 Core-distributed interactive-simulation facility.

- 1 Drag coefficient for zero lift.

- 1 Fuselage drag coefficient.

- 1 Colour-coded 5-bar approach light system.

**CDFT**  Cold front.

- 1 Fractional drag coefficient, usually close to *Cd*.

- 1 Core-driven fan stage.

**CDGEN**  Configuration database generator.

**CDH**  Constant delta height.

**CDI**  Course-deviation indicator.

- 2 Collector diffusion isolation.
- 3 Capacitor-discharge ignition.
- 4 Compass director indicator.
- 5 Collateral duty inspector (US).
- 6 Chief of Defence Intelligence (UK).
- 7 Classification, discrimination and identification.

- 1 Coefficient of induced drag.

**CDIP**  Continuously displayed impact point (HUD).

**CDIRRS**  Cockpit display of IR reconnaissance system.

**CDIS**  Central control function display.

**CDIU**  Circuit-mode data interface unit.

**CDL**  Configuration data list (JARs).

- 1 Configuration delivery frequency.

- 2 Chief of Defence Logistics (UK).
- 3 Common datalink.

- 1 Cabin-discrepancy log.

- 1 Lift-dependent drag coefficient, sub-critically equal to induced-drag coefficient.

**CDM**  Collaborative decision-making.

- 2 Clean development mechanism.
- 3 Control display and management.

**CDMA**  Code-division multiple-access.

**CDMAC**  Collaborative decision-making ATC.

**CDMC**  Cranfield Disaster-Management Centre (UK).

**CDM1**  Concept demonstration.

**CDM2**  Code-division multiple-access.

**CDM3**  Commutated-Doppler microwave landing system.

**CDM4**  Commutated-Doppler microwave landing system.

**CDM5**  Combattu’s Dairy Milk, very tasty’, one of countless mnemonics, in this case meaning course → deviation → magnetic → variation → true (RAF WW2).

**CDN**  Co-ordinating message (ICAO).

- 1 Certificat de Navigabilité (C of A, F).

**CDNU**  Control, display and navigation unit (helicopter).

**CDO**  Commando (Unit).

**CDOPS**  Coherent-Doppler scorer.

**CDP**  Central data processor.

- 2 Countermeasures dispenser pod.
- 3 Critical decision point.
- 4 Chief of Defence Procurement (UK).
- 5 Contract-definition phase.
- 6 Concept-demonstration phase, or program[me].
- 7 Cockpit-display player (F-22).
\[ C_{D_p} \]

\# Continuous-data program.
\( C_{D_p} \) Coefficient of profile drag.

CDPI Crash data position indicator.

CDR 1 Critical design review.
2 Customer departure record[s].
3 Conditional route.

CDRA Carbon dioxide removal assembly.

CDRB Canadian Defense Research Board.

CDRL Contract data requirements list.

CD-ROM Compact-disk read-only memory.

CDRS 1 Control and data retrieval system.
2 Container-design retrieval system (USAF).
3 Cockpit display and recording system.

CDS 1 Controls and displays, or control/display, subsystem.
2 Chief of Defence Staff (UK).
3 Coefficient of Defence Staff (RAF).
4 Combined electronics assembly.

CE Con-di, thrust-reverser thrust vector.

CEC 1 Carbon dioxide removal assembly.
2 Carbon dioxide removal assembly.

CECAMS Cockpit-emergency directed-action program.

CED Central European Aeronautical Societies.

CEE Central European Air-Traffic Service[s] (Vienna).

CEC 1 Combined-effects bomblet.
2 Curve of equal bearings, from NDB.
3 Commercial engine bulletin (FAA).

CEC 1 Cooperative-engagement capability.
2 Communications and Electronics Command (USA).
3 Continental entry chart.
4 Centre d’Entraînement au Combat (F).
5 Crew ejectable cabin.

CECAI Conference of European Corporate Aviation Interests (Int.).

CECC Cenelec Electronic Components Committee (Int.).

Cedcom Communications and Electronics Command (USA).

Ceconite Weatherproof fabrics for skinning light aircraft.

CED 1 Continued engineering development.
2 Competitive engineering definition.

Cedam Combined electronic display and map; derived from Comed.

Cedap Cockpit-emergency directed-action program.

CEDLE Compact efficient direct-lift engine.

Cedocar Combat electromagnetic-environment simulator.

CEE 1 Cabin emergency evacuation.
2 Commission on rules for Electrical Equipment (Int.).
3 Centro de Estudios Espaciales [Chile].

CeeSim Combat electromagnetic-environment simulator.

CEF 1 Cost-effectiveness factor (materials).
2 Contrast-enhanced filter.
3 California Engineering Foundation.

CEFA Cooperation for Environmentally Friendly Aviation (EU).

CEFH Cumulative engine flight-hours.

CEI 1 Critical engine inoperative.
2 Council of Engineering Institutions (UK).
3 Commission Electrotechnique Internationale.
4 Combat efficiency improvement.
5 Cabin equipment interface.

Celling Ceiling.

Ceiling 1 Of aircraft, greatest pressure height [density altitude] that can be reached (see absolute *, absolute aero-dynamic *, service *, zoom *).
2 Of cloud, height above nearest Earth’s surface of lowest layer of clouds or obscuring phenomena that is reported as ‘broken,’ ‘overcast’ or ‘obscuration’ and not ‘thin’ or ‘partial’ (FAA).
3 Height above nearest Earth’s surface of cloud base
ceiling balloon

below 6000 m/20,000 ft covering 50+ per cent of sky (ICAO).
# Amount above which FFP contract cannot be implemented.
ceiling balloon Small free balloon, whose rate of ascent is known, timed from release to give measure of ceiling (2).
ceiling climb Aircraft flight authorised for express purpose of measuring ceiling (1).
ceiling height indicator Device for measuring height of spot produced by ceiling projector.
ceiling light See ceiling projector.
ceiling projector Source of powerful light beam projected vertically to form bright spot on underside of cloud.
ceiling unlimited Sky clear or scattered cloud, or base above given agreed height (in US 9,750 ft, 2,970 m).
ceiling zero Fog.
ceilometer Device for measuring ceiling (2), esp. ceiling projector, in later types a lidar, whose beam oscillates about horizontal axis like metronome, linked with photo-cell with readout in tower.
CEIL 1 Centre d’Essais des Landes (F).
2 Capacitively-enhanced logic, speed enhanced by incorporation on to chip of capacitor(s).
3 Component evolution list.
Celar Centre Electronique de l’Armement (F).
celestial altitude Altitude (2) of heavenly body or point on celestial sphere.
celestial body Meaning arguable, but normally all bodies visible or supposed other than Earth and man-made objects. Diffuse bodies (eg nebulae) often called ‘structures’.
celestial equator Great circle formed by extending Earth equatorial plane to celestial sphere.
celestial fix See astro fix.
celestial guidance Guidance of unmanned vehicle by automatic star tracking.
celestial horizon Great circle formed on celestial sphere by plane passing through centre of Earth normal to straight line joining zenith and nadir.
celestial mechanics Science of motion of celestial bodies.
celestial meridian Meridian on celestial sphere.
celestial navigation See astronavigation.
celestial pole Terrestrial pole projected upon celestial sphere.
celestial sphere Imaginary hollow sphere of infinite radius centred at centre of Earth (for practical purposes, at eyes of anyone on Earth).
celestial triangle Spherical triangle on celestial sphere, esp. one used for navigation.
cell 1 Combination of electrodes and electrolyte generating EMF; basic element of battery.
2 Portion of structure having form of rigid box, not necessarily completely enclosed.
3 In blimp or other multi-wing aircraft, complete assembly of planes, struts and wires forming structural box.
4 Gasbag of aerostat, esp. in airship having multiple bags in outer envelope.
5 In EDP, elementary unit of storage.
6 Self-contained air mass of violent character (eg TRS).
7 In military operations, smallest tactical aircraft element flying together (often three); another definition is a small unit of airborne military aircraft which can if necessary operate independently.
8 Compartment forming an element of large internal bomb bay.
cellulose Early cellulose-base transparent plastics film.
cell-textured See textured visuals.
cellular logic image processing Each pixel has its own dedicated logic element to which are attached its eight adjacent pixels in parallel architecture. Thus each instruction is executed by all processing elements simultaneously.
cellule Cell (3) or assembly of two or more wings on either side of centreline.
celluloid Early transparent plastics film from nitro-cellulose treated with camphor.
cellulose Carbohydrate forming major structural constituent of plants; precursor of many aeronautical materials.
cellulose acetate Thermoplastic from cellulose and acetic acid; used in rayon, film, lacquer, etc.
cellulose dope See dope.
cellulose nitrate Thermoplastic from cellulose and nitric acid; used in explosives, dopes and structural plastics.
Celsius Scale of temperature, symbol °C. Unit is same as SI scale K, but numbers are lower by 273. Until 1948 called Centigrade.
CELT Combined emitter location (or locator) testbed.
CELV Complementary expendable launch vehicle, ie in addition to Shuttle (US).
CEM 1 Centre d’Essais de la Méditerranée (F).
2 Combined-effects munition (cluster dispenser).
3 Conventional enhancement modification.
4 Concept evaluation model.
5 Core exhaust mixer.
6 Control-, or contract, equipment manufacturer.
7 Computational electromagnetics.
8 Controlled-emissivity material.
Cementite Iron carbide; carbon form in annealed steel.
Ceminal Cost-effective manufacturing in new aluminum (aluminum) alloys (US).
CEMS Centre d’Etudes de la Météorologie Spatiale (F).
CEMT Conférence Européenne des Ministres des Transports.
CEN 1 Centre d’Etudes Nucléaires (F).
2 Comité Européen Normalisation [Int. standards].
CENA Centre d’Etudes (formerly d’Expérimentation) de la Navigation Aérienne (F).
Cenelec Comité Européen pour la standardisation de l’Electrotechnique (Int.).
Cenipa Centro de Investigação e Prevenção de Acidentes Aeronáuticos (Braz.).
cenospheres Microscopic hollow ceramic spheres.
Cenrac Centre de Réduction et de Conception de matériels (F).
Cenrap Center radar processing (terminal ATC).
Centag Centre Army Group (NATO, formerly).
centi Prefix, × 10⁻¹ (one hundredth), symbol c (non-SI).
Centigrade See Celsius.
centilitre Cl, 0.01 litre; measure of volume contrary to SI.
centimetre, centimeter 0.01 metre; measure of length contrary to SI.
centimeter Hg Used as unit of pressure = 1.33 kPa.
centimetric radar

Radar operating on wavelengths around 0.01 m, with frequencies 3–30 GHz.

centipoise See viscosity.
centistoke See viscosity.

central altitude reservation See CARF.
centralised fault display system Avionics system accessing all on-board BITE systems to extract and display data and initiate maintenance tests.
centralised servicing Establishment of one unit and site for all routine maintenance on station, breaking previous intimate relationship between crew chief and each aircraft (RAF).
central warning panel See CWP (I).
centrebody Streamlined body in centre of circular, semi-circular or quasi-circular supersonic intake (inlet) to cause inclined shock.
centre controls To move primary flight controls from deflected to neutral position.
centre engine Engine on centreline of multi-engined aircraft.
centreline Principal longitudinal axis; usually also axis of symmetry (eg of aircraft, missile, runway).

two In aeroplane section, line joining leading and trailing edges and everywhere equidistant from upper and lower surfaces, all measures being normal to line itself.
centreline aircraft See centreline engine(s).
centreline camber Ratio of maximum distance between chord and centreline (2) to chord.
centreline closure Compressor, or [more often] turbine-blade hub caused by slight radial displacement.
centreline engine(s) Any engine on longitudinal centreline of multi-engine aircraft [engines hung on side of fuselage or in wing roots are excluded]. The pilot does not need a multi-engine rating.
centreline gear Main landing gear on aircraft centreline.
centreline lighting On runway, flush lights at 50 ft (15 m) intervals terminating 75 ft (23 m) from each threshold.
centreline noise plot Plot of aircraft noise, usually EPNdB, along runway centreline extended (usually 6 st miles, 9.6 km) in each direction covering approach and climb-out.
centreline tank Centre tank 1 [not 2].
centre of area See centroid.
centre of buoyancy Point through which upthrust of displaced fluid acts; e.g. in case of aerostats and marine aircraft afloat.
centre of burst Mean point of impact.
centre of dynamic lift In aerostat, point on centreline through which lift force due to motion through atmosphere acts.
centre of gravity, c.g. Point through which resultant force of gravity acts, irrespective of orientation; in uniform gravitational field, centre of mass. For two-dimensional forms, centroid.
centre of gravity limits In nearly all aircraft, esp. aeroplanes, published fore and aft limits for safe c.g. position; in case of aeroplanes expressed as percentages of MAC. Centre of gravity margin Hg, distance along aircraft major axis from c.g. to neutral point, expressed as % SMC.
centre of gravity travel Fore and aft wander of c.g. in course of flight due to consumption of fuel, release of loads, etc.
centre of gross lift In aerostat, usually centre of buoyancy.
centre of gyration For solid rotating about axis, point at which all mass could be concentrated without changing moment of inertia about same axis.
centre of lift Resultant of all centres of pressure on a wing or other body.
centre of mass Point through which all mass of solid body could act without changing dynamics in translational motion; loosely, but not always correctly, called c.g. Alternative title, centre of inertia.
centre of pressure, c.p. On aerofuselage, point at which line of action of resultant aerodynamic force intersects chord. Almost same as aerodynamic centre, but latter need not lie on chord. In general, c.p. is resultant of all aerodynamic forces on surface of body.
centre of pressure coefficient Ratio of distance of c.p. from leading edge to chord.
centre of pressure moment Product of resultant force on wing (or section) and distance from c.p. to leading edge (or leading edge produced at aircraft centreline). Inapplicable to very slender wings.
centre of pressure moment coefficient As above but divided by dynamic pressure; not same as coefficient of moment.
centre of pressure travel Linear distance through which c.p. travels along chord over extreme negative to positive operating range of angles of attack, ignoring compressibility in subsonic flow.

two Linear distance through which c.p. travels along chord over complete aircraft operating range of Mach numbers (supersonic aircraft only).
centre of thrust Thrust axis, for one or multiple engines.
centre of twist The axis about which a solid body rotates when under an applied torque.
centre punch Hand tool for making accurate conical depressions.
centre section In most winged aircraft, centre portion of wing extending symmetrically through or across fuselage and carrying left and right wings on its tips. Certain aircraft have wing in one piece, or in left and right halves joined at centreline; such have no **, though some authorities suggest it is then wing inboard of main landing gear.
centre tank 1 Most commonly, a fuel tank inside the fuselage in a system having additional tanks in the wings.

two A tank inside the inboard part of each wing, usually structurally part of the single main inter-spar box, and separated from the main tank by a rib.
centrifugal breather Centrifuge filter for removing oil from air vented overboard from interior of engine, often after passage through porous segments.
centrifugal clearance Radial clearance between rotating mass and surrounding fixed structure at peak rotating speed.
centrifugal clutch Freewheels at low speed, but takes up drive as speed is increased. At full power slip tends towards zero. Main purpose is to prevent excessive load on gear teeth.
centrifugal compressor Rotary compressor in form of disc carrying radial vanes to accelerate working fluid radially outward to leave periphery at very high speed, this being converted to pressure energy in fixed diffuser.
centrifugal separator

centrifugal separator See centrifuge filter.

centrifugal twisting moment Moment tending to rotate propeller blades towards zero pitch (opposing coarsening of pitch).

centrifuge 1 Device for whirling human and other subjects about vertical axis, mainly in aerospace medicine research.

2 Device for imparting high unidirectional acceleration to hardware under test.

3 Device for imparting high unidirectional acceleration to mixtures of fluids with or without particulate solids to separate constituent fractions.

centrifuge filter Action, inherent in turbofans and some other machines, which in rotating fluid flow causes unwanted particulate solids to be centrifuged outwards away from core.

centring, centering Radial and, usually, also axial constraint of floated gyro to run equidistant at all points from enclosure.

centring control System which, on demand, centres a variable in another system.

centripetal Acceleration toward axis around which body is rotated; usually equal and opposite to centrifugal (see coriolis).

centrisep Centrifugal separator (centrifuge filter).

centroid In geometrical figure (one, two or three dimensional), point whose co-ordinates are mean of all co-ordinates of all points in figure. In material body of uniform composition, centre of mass.

Centrospas [also rendered Tsendro-] Ministry for defence, emergencies and natural disasters (R).

CEO 1 Chief executive officer of corporation or company.

2 Crew Earth observation.

CEOA Central Europe Operating Agency (NATO pipelines).

CEOC Colloque Européen des Organisations de Contrôle (Int.).

CEOI Common electronic operating instructions.

CEOS Committee on Earth Observation Satellites (Int.).

CEP 1 See circle of equal probabilities; also called circular error probable.

2 Concurrent evaluation phase.

3 Chromate-enriched pellet.

4 Common engine program.

CEPA Commission d’Évaluation Pratique d’Aéronautique (F).

2 Common European Priority Area.

Cepana Commission d’Examens Permanents des Matériels Nouveaux d’Aéronautique (F).

CEPME College for Enlisted Professional Military Education (USAF AU).

CEPs Centre Essais de Propulseurs (Saclay, F).

CEPS Central European pipeline system (NATO).

CEPT Confederation Européenne des Postes et Télécommunications (Int.).

2 Cockpit emergency procedures trainer.

CER 1 Cost-estimating relationship.

2 Certified emission reduction[s].

ceramal See cernet (from ceramic + alloy).

ceramal See cernet (from ceramic metal).

Cerap Combined Center Radar Approach Control.

CERCA Commonwealth and Empire conference on Radio for Civil Aviation.

Cerdec Communication-Electronics Research, Development and Engineering Center (USA).

Ceres 1 Clouds and Earth’s radiant-energy system.

2 Computer-enhanced radio emission surveillance (UK).

CERFP Chemical, biological, radiological, nuclear or high-yield explosive enhanced response force package.

ceria glass Amorphous semiconductor glass doped with cerium dioxide.

cerium Reactive metal, Ce, density 8.2, MPt 799°C.

Cerma, CERMA Centre d’Etudes et de Recherches de Médecine Aéronautique (F).

cernet 1 Composite material attempting to combine mechanical toughness of metal with hardness and refractory qualities of ceramics. Early examples cemented carbidcs, eg tungsten carbide sintered with cobalt.

2 Incorrectly, part made of ceramic bonded to metal.

CERNAI Study Commission on international air navigation (Brazil).

CERP Centre-Ecole Régional de Parachutisme.

Cerrobase US lead-bismuth alloy, MPt 125°C.

Cerrobd US bismuth-tin-lead-antimony alloy, MPt 68°C.

Cerronmat US lead-tin-antimony alloy, MPt 105°C.

CERS Centre Européen de Recherche Spatiale (see ESRO).

2 Carrier evaluation and reporting system.

CERT Centre d’Etudes et de Recherches de Toulouse (ONERA).

2 Committee on Energy Research and Technology (European Community).

Certico Committee on Certification (ISO).

Certificate of Airworthiness Issued to confirm each individual aircraft is airworthy, renewed at intervals (CAA). Also issued for basic type of aircraft, called Type certificate in US.

Certificate of Compliance Issued to confirm functioning part of aircraft has been made/overhauled/repaired correctly (CAA).

Certificate of Experience Document required by private pilot showing flying as PIC in each preceding 13-month period (CAA UK).

Certificate of Maintenance Issued upon completion of major overhaul or other routine work affecting airworthiness (CAA).


Certificate of Test Document issued on release of refurbished or overhauled item.

certification For aircraft, issue of ATC (4) for US, C of A for UK or equivalent by national certifying authority, stating type meets all authority’s requirements on grounds of safety. Other aircraft certificates include Production and Registration.

certification pilot Test pilot employed by national certification authority to evaluate all types of aircraft proposed for use by operator in that country, from whatever source.

certification test Test conducted by certification authority prior to issue of certificate.

CES 1 Catapult-end speed.

2 Civil Engineering Squadron (USAF).
Cesar

- Consumables, expendables and standard hardware.
- Combat environment simulation.

Cesar Computing environment StralCom architecture.

CESE Communications equipment support element.

cesium, caesium Extremely soft silver metal, highly reactive, used as working fluid as jet of charged ions in space thrusters.

CESR Centre d'Etude Spatiale des Rayonnements (space radiation).

CET 1 Convertible-engine system technology.
2 Centre for the Exploitation of Science and Technology (UK).
3 Central European Time.

CET 1 Convertible-engine system technology.

CETE 1 Central European Summer Time.

CETA Crew and equipment translation aid.

Ceiling rating Numerical scale for ignition quality of diesel fuels.


CETPS Cooperative engagement transmission processing set.

CETS Contractor engineering technical services.

CETU Core-engine test (date).

CEU Checklist entry unit.

CEV 1 Centre d’Etudes des Systèmes et des Technologies Avancées (F).

CF 1 Combustor exit, or engine, temperature.
2 Core-engine test.
3 Calculated estimated time [surely tautological]; A adds arrival, D departure, O overflight.
4 Central European Time.

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CFCF Central flow control facility (FAA 1).

CFD 1 Chaff/flare dispenser; C adds computer, CU control unit, IU interface unit, S system.
2 Centralized fault display (IU adds indicator or interface unit, S adds system).
3 Computational fluid dynamics.
4 Continuous fire detectors, or detection.
5 Core-failure clutch.
6 Centennial of Flight Commission (US).
7 Chlorofluorocarbon.

CFES Continuous-flow electrophoresis in space.

CFI Cost plus fixed fee, sometimes CFPP.
2 Critical flicker frequency (electronic displays).

CFII Civilian, or certificated, flight instrument instructor (US).

CFIRFMS Contaminant and fluid-integrity measuring system.

CFIT Controlled flight into terrain.

CFK, Ck CFRP (G), usually KfK.

CFM Clear air level.

CFM Common functional module.

Cf Cubic feet per minute.

CFIT, CFTS Cornell, or certificated, flight instrument instructor (US).

CFK, Ck CFRP (G), usually KfK.

CFL Central flight medical officer.

CFMT, CFM/CFS Celsius, fahrenheit, magnetic, true.

CFMU Central Flow, or Flight, Management Unit (Eurocontrol).

CFPO 1 Coherent-fibre optics.
2 Chief Financial Officer.
3 Central Forecast Office.

CFQ 1 Co-operative Fuel Research.
2 Crash fire rescue.
3 Code of Federal Regulations.
4 Contact flight rules.
5 Call for release.
6 Company-funded research.

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CFROI

CFROI Cash-flow return on investment.
CFRP Carbon-fibre reinforced plastics.
CFS 1 Central Flying School (RAF).
  2 Cabin file server.
  3 Chloroform, suppresses contrails.
  4 Customer fleet service.
CFSO Command flight safety officer.
CFSP Common foreign and security policy (EU).
CFT 1 Conformal fuel tank.
  2 Contractor flight test.
CFTC Carbon-fibre thermoplastic composite.[s]
CFTR Cold-fan thrust reverser.
CFTS Contracted Flying Training and Support (Canadian DND).
CFU 1 Colony-forming unit, measure of bacteria per cubic metre of cabin air.
  2 Cartridge-firing unit (countermeasures).
CF weight Contractor-furnished.
CFWS Central Flow Weather Service; U adds Unit.
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CH 1 Hinge, or rotor drag force, coefficient.
  2 High cloud.
  3 Critical height.
  4 Chain home.
  5 Chain General.
  6 Commanding General.
  7 Coast Guard.
  8 CHG, CHG (

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CG 1 Cargo glider, USAAF 1941–47.
  2 Lethal gas phosphene.
  3 Guided-missile cruiser (USN).
  4 Commanding General.
  5 Coast Guard.
  6 CHG, CHG (}

CG /arm Arm (2) obtained by adding all individual moments and dividing sum by aircraft total mass.
CGAS Coast Guard Air Station (US).
CGASC Cornell-Guggenheim Aviation Safety Center (US).
CGB Central gearbox.
CGC Complementary ground component [European counterpart of ATC 15].
CGCC Centre of gravity control computer.
CGF Computer-generated [usually armed hostile] forces.
CGH Guided-missile/helicopter cruiser (USN).
CH 1 Chief ground instructor.
  2 Computer-generated image, or imagery.
CHG
circle guidance light[s].
c.g. limits Forward and aft limits, usually expressed as percentage MAC, within which aircraft c.g. must fall for safe operation.
CGM Computer-generated [usually armed hostile] forces.
CGM load Combined gust and manoeuvrable load.
CGN Guided-missile cruiser, nuclear (USN).
CGP Coal-gasification plant; eg for jet fuel.
CGPM Conference Général Poids et Mésures [Int.].
CGRO Compton gamma-ray observatory.
CGS 1 Centimetre, gramme, second system of units, superseded by SI.
  2 Central Gunnery, or [later] Gliding, School (RAF).
  3 Computer-generated simulation.
  4 Common ground segment, or station.
  5 Chief of the General Staff (UK).
CGT 1 Consolidated ground terminal.

2 Command generator tracker.
CGV Computer-generated voice.
CGW Combat gross weight.
CH 1 Channel (ICAO).
  2 Compass, or course, heading.
  3 Critical height.
  4 Chain home.
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chamber

In liquid rocket engine, enclosed space where combustion takes place, between injectors and throat. In solid rocket, enlarging volume in which combustion takes place, varying in form with design of motor.

chamber pressure See burn time average, action time average, MDOP.

chamber volume In liquid rocket, total volume as defined; solid motor varies during burn.

chamfered Bevelled (edge or corner, eg of sheet).

champ Cargo-handling and management planning [s adds system].

Champs Common helicopter aviation mission planning system (USN/USMC).

Chan Channel.

Chance Complete helicopter advanced computational environment.

Chance light Formerly, mobile airfield floodlight illuminating landing area and apron.

chandelle Flight manoeuvre (see stall turn); another definition, not necessarily synonymous with stall turn, is a manoeuvre in which speed is traded for altitude whilst reversing flight direction (see also Immelman).

changeover point Ground position and time at which aircraft switches from using one ground-based navaid to another, not necessarily at midpoint of leg.

channel 1 Band of frequencies in EM spectrum, esp. at radio nav/com frequencies (thus 20* allotted to ILS in all countries, each with published frequency for loc and g/p).

2 Single end-to-end 'route' in dynamic system, esp. one exerting control authority (eg collective pitch in helicopter AFCS).

3 Structural member of channel form (eg top-hat or U).

4 In EDP; several meanings: any information or data highway, one or more parallel tracks treated as unit, portion of store accessible to given reading station.

5 In semiconductor device (eg transistor), flow bypassing base.

6 Pathways for energetic ions or atoms along crystal lattices.

7 In airport terminal, single routing for departing or arriving passengers.

8 Takeoff and alighting path at marine airport.

channel nut One forming integral part of channel (3).

channel patch Channel-shaped reinforcement to aerostat envelope to anchor rigid spar.

channel section See channel (3).

channel wing Wing curved in front elevation to fit closely round lower half of propeller disc.

Chapi, CHAPI Carrier, colour or compact helicopter approach path indicator.

char Ablative material charred and eroded during re-entry (see ablation).

characteristic Sense (up or down) in which barometric pressure changes in preceding 3 h.

characteristic curve 1 Curve of atmospheric sounding results plotted on Rossby diagram.

2 Curve of primary characteristic of aerofoil when plotted (see characteristics).

characteristic exhaust velocity, C* Measure of rocket performance, numerically gA/W, multiplied by integral of chamber pressure over action time.

characteristic length 1 In rocket, ratio of chamber volume to nozzle throat area.

2 In rocket, length of cylindrical tube of same diameter as chamber, having same volume as chamber.

3 Convenient reference length (eg chord).

characteristics 1 Of aerofoil, primary * are: coefficients of lift and drag, L/D ratio, cp position and coefficient of moment, each plotted for all operating AOAs.

2 In electronics, relationships between basic variables (eg anode current/voltage, anode current/grid voltage) for valves (tubes) and correspondingly for transistors.

characteristic velocity 1 Sum of all changes in velocity, positive and negative all treated as positive, in course of space mission.

2 Velocity required for given planetary (esp. Earth) orbit.

charge 1 Total mass of propellant in solid rocket.

2 Propellant of semi-fixed or separate-loading ammunition.

3 To fill high-pressure gas or cryogenic (eg Lox) container.

4 Quantity of electricity, measured (SI) in Coulombs.

chargeable Malfunction (eg HFSD) clearly due to fault in design, workmanship, material or technique by supplier.

charging point Standard coupling through which aircraft fluid system is replenished or pressurized.

Charles' law Perfect gas at constant pressure has volume change roughly proportional to absolute temperature change.

Charlie Preplanned landing-on time in carrier operations.

Charlière Common term for a gas balloon (pre-c1850).

charm Composite high-altitude radiation model.

Charme Concept d'helice pour avions rapides en vue d'une meilleure économie (12-blade single rotation propfan).

Charpy Destructive test of impact resistance of notched test bar.

chart Simplified map, typically showing coasts, certain contours, woods, water, and aeronautical information (symbols vary and not yet internationally agreed).

chart board Rigid board, suitably sized for chart or topographic map; often provided with protractor on parallel arms.

charted approach Visual flight to destination authorised to radar-controlled aircraft on IFR flight plan.

charted delay In Loran, published delay.

charts Compact hydrographic airborne rapid total survey.

chart table Chart board mounted in aircraft.

Chase Coronal helium abundance Spacelab experiment.

chase To accompany other aircraft, esp. one on test, to observe behaviour and warn of visible malfunction; hence * plane, * pilot.

chassis 1 Rigid base on which electronics are mounted; for airborne equipment, mates with racking.

2 Landing gear. In WW2 the accepted UK term was undercarriage, but the author recalls many cockpits where * was used because there was no room for the longer word.

Chats Counter-intelligence Humint automated tool system.

chatter 1 Multiple conversations or signatures, most being of no interest, all heard on same frequency.

2 High-frequency vibration energised by intermeshing gear teeth.
CHB

CHB, HBB: chemical munit  Non-explosive ordnance operating by chemical reaction: incendiary, smoke, irritant or lethal gas, defoliant, flare or flash, dye marker etc.

chemical propulsion  Propulsion by energy released by chemical reaction, eg fuel + oxygen, with or without air breathing.

chemical rocket  Rocket operating by chemical reaction; not ion, photon or nuclear.

chemical warfare  Use of major chemical munitions, esp. irritant or lethal gases.

chemosphere  Region of upper atmosphere (say 15–120 miles, 24–190 km) noted for photochemical reactivity.

chequered flag 1 Black/white, various meanings including race winner.

2 Red/yellow, do not move off blocks until ATC permits.

3 See Checkered Flag.

chert  Change in Earth’s rate (tangential velocity) of rotation with latitude.

Cherry rivet  Tubular rivet inserted blind and closed by internal mandrel (shank) which then breaks and is removed.

chest-type parachute  Pack stored in aircraft separate from harness, to which it is secured by quick clips on chest.


cheval vapeur  Metric horsepower, 1 cv = 0.98632 hp = 0.7335 kW; reciprocals 1.01387, 1.35962.

chevron mixer  Sawtooth nozzle.

Cheyenne Mountain  Location of USAF/Norad Space Command HQ.

CHF 1 Commando helicopter force.

2 Swiss franc(s).

CHG 1 Change, ie modifying previous message;

2 Charge.

CHI  Computer/human interface.

Chicken  See State chicken.

chicken bolts  Temporary fasteners used in metal airframe assembly.

chicks 1 Fighters, especially airborne group under unified local command (USN).

2 Fighters in group round air-refuelling tanker.

chiefy  Flight sergeant in charge of erks (RAF, colloq.).

Chili  Dry southerly wind (N. Africa).

chilldown  Pre-cooling of tanks and system hardware before loading cryogenic propellant.

chilled  Stage at which design is almost frozen [change accepted reluctantly].

chilled casting  Made in mould of metal, usually ferrous, giving rapid cooling and thus surface hardness.

chimney  Melodious warning of imminent announcement to passengers, typical output 120 W.


china-clay  Technique for distinguishing regions of laminar and turbulent boundary layer from changed appearance of thin coating of * suspension.

China Lake  California desert home of NAWS.

chine  In traditional marine aircraft hull or float, extreme side member running approximately parallel to keel in side elevation. In supersonic aircraft, sharp edge forming lateral extremity of fuselage, shedding strong vortex and...
chined tyre
merging into wing. On a landing-wheel tyre, a sharp-edge lip for shedding water.

chined ty re Tyre, esp. for nosewheels, with chines to depress trajectory of water or slush.

chin fairing On centreline on undersides of leading edge [T-tail].

chin fin Fixed destabilizing fin under nose.

Chinook Warm dry westerly wind on E side of Rocky Mountains. In Europe, called Föhn.

chin turret A gun or sensor turret mounted under the nose of a pre-1950 bomber or an attack helicopter.

chip 1 Single completed device separated from slice, wafer or other substrate of single-crystal semiconductor.

2 Metal fragment, visible to eye, broken from engine or other machinery.

chip chart Rectangles of paint showing colours available.

chip detector Device, often permanent magnet, for gathering every chip (2), usually from lube oil.

Chips Killed; from to have had one's *(RAF colloq, chips
gathering every chip (2), usually from lube oil.

chip detector Device, often permanent magnet, for gathering every chip (2), usually from lube oil.

chopped fibre Reinforcing fibre chopped into short lengths.

chopped random mat Chopped fibre made into mat (two-dimensional sheet) with random orientation.

chopper 1 Rotary-wing aircraft, esp. helicopter (colloq.).

2 Mechanical device for periodically interrupting flow, esp. light beam, or switching it alternately between two sources.

Device for modulating signal by making and breaking contacts at frequency higher than frequencies in signal.

chop rate Rate of aircraft or crew loss on operations, or wastage rate in flying training (colloq.).

chord 1 Straight line parallel to longitudinal axis joining centres of curvature of leading and trailing edges of aerofoil section.

2 Some authorities prefer the line joining the trailing edge to the stagnation point on the leading edge.

3 Loosely, breadth of wing or other aerofoil from front to rear.

4 Boundary members of structural truss.

5 In the new century this is the preferred spelling of what was previously called miniature detonating cord.

cord direction In stress analysis, usually parallel to chord at aircraft centreline (of wing, or wing produced to centreline).

chord length Length of chord (1), not measured round profile.

chord length ratio At any radius, the total chord length of all the blades of a propeller divided by the diameter.

chord line See chord (1). Ambiguously, sometimes line tangent at two points to lower surface (see geometric chord).

chord plane Plane containing chord lines of all sections forming three-dimensional aerofoil (assuming no twist).

chord position Defined by location of quarter-chord point and inclination to aircraft x-y plane, point being defined on primary centreline co-ordinates.

chord wire Wire tying vertices of airship frame.

chordwise Parallel to chord (normally also to longitudinal axis).

chosen instrument Carrier selected as national monopoly [can be private company].

CHP Controlled-humidity preservation.

CHR Cooper-Harper rating.

CHRG Charges.

Christmas tree Aircraft temporarily set aside as source of spare parts, but to be eventually returned to service.

crater Chlorine (or heavy).

Crateric anti-corrosive, antimicrobial surface treatment, esp. for water traps in airframe.
**chromatic aberration**

**chromatic aberration** Rainbow effect caused by simple lens having different focal length for each wavelength.

**chrome steels** Steels containing chromium; often also vanadium, molybdenum etc.

**chromic acid** Red crystalline solid, H₂CrO₄, used in solution as cleaner and etchant, as electrolyte (eg, Alocrome) for Cr plating and anodising, and for crack detection.

**chromic paint** Coating which changes colour (usually white-grey-blue-black) as temperature increases.

**chromium** Cr, hard silvery metal taking brilliant polish, density 7.2, M₉ 1,860°C.

**Chromoly** Alloy steels containing chromium and molybdenum.

**chromosphere** Thin (under 15,000 km) layer of gas surrounding Sun’s photosphere.

**chronograph** Device for producing hard-copy readout of variable against time, with particular events recorded, typically by pen and disc or drum chart.

**chronometer** Accurate portable clock with spring drive

**CIGAR**

1. Mnemonic reminding pilot of vital actions before takeoff: controls, instruments, gas, attitude [trim/flaps], run-up [mags., carb. heat, etc].
2. Many US mnemonics begin: Controls, instruments, gas, attitude [trim/flaps], run-up [mags., carb. heat, etc].
3. Captured in action.
4. Ceiling.

**CIGAR** Aeroplane from which wings have been removed (colloq.).

**Cigarette-burning** Solid propellant ignited at one end across entire section and burning towards other end.

**Cigars** Mnemonic reminding pilot of vital actions before takeoff: controls, instruments, gas, attitude indicator, run up, seat belt (US, WW2).
CIGFTPR

CIGFTPR Controls-instruments-gas-flaps-trim-prop-run-up (US).

CGIS Chief of the Imperial General Staff [now CGS] (UK).

CIGSS Common imagery ground/surface standards.

CIGTF Central Inertial Guidance Test Facility (USAF).

CIP Critical information infrastructure protection.

CL Close-in jamming.

CIL 1 Candidate-items list.

CIM Computer-integrated manufacturing.

CIMA 1 Chartered Institute of Management Accountants (UK).

CIME Commission Intergouvernementale des Migrations Européennes (Int., arranges mass flights, eg for refugees).

CIMEF Configuration integration management team.

Cimic C1 and munitions test improvement contract.

CIMT Chartered Institute of Marketing Travel Industry Group (office Westerham, UK).

CIN Commission Internationale de la Navigation Aérienne (Int., office Paris, 1922–).

Circ Capacity increase through controller assistance tools (Euret).

Cinch Compact inertial navigation combining HUD.

CINS Compact INS.

CIO 1 Central Imagery Office (US).

CIO 2 See AFL-CIO.

Chairman in office.

Chief information officer.

CIOD Counterspace and Information Operations Division (USAF).

CIOS Combined Intelligence Objectives Subcommittee (US/UK, WW2).

CIP 1 Cold iso-pressing (beryllium).

Component [or communications] improvement programme.

Commission Internationale de Parachutisme (FAI).

Commercially important passenger.

Command input potentiometer.

Capital investment plan (FAA).

Critical infrastructure protection.

Common integrated processor.

Common imagery, or core-integrated, processor [see next].

CIPM Common integrated processor manager.

CIPR 1 Cubic inches per revolution.

Continuous in-flight performance recorder.

CIR 1 Constant, or continuous, infra-red (heat source on target).

Cockpit image recorder.

CIRA 1 Cospar International Reference Atmosphere.

Centro Italiane Ricerche Aerospaziali (I).

CIRC Central information reference and control.

Circ, circ Circling or circulating.

Circadian rhythm Change in physiological activity on approximate 24 hour cycle.

Circe Cossor interrogation and reply cryptographic equipment, enabling all participating nations to have own secure cryptographic IFF.

Circular milfoot Circular (US); can also be an instruction to join stack.

circle marker On unpaved airfield, white circle indicating centre of landing area.

circle of confusion Image of any distant point on lens focal plane (eg on film).

circle of equal probabilities, CEP Radius of circle within which half the strikes (eg bullet impacts on single aiming point) fall or within which probability is equal that one bullet, bomb or RV will fall inside or outside. Also called circular error probable.

circle of latitude On celestial sphere through equatorial perpendicularly to ecliptic plane.

circle of longitude On celestial sphere parallel to ecliptic.

circle of origin Normally, Equator or Prime Meridian.

circle of position Circle on Earth’s surface centred on line joining centre of Earth to heavenly body, from which altitude of body is everywhere equal. Sometimes called circle of equal altitude.

circuit 1 Basic element in pilot training, short flight comprising takeoff and precisely executed * back to landing, if necessary ready for repeated *. In US often circular, but in UK and most other countries rectilinear, comprising takeoff, straight climbout [upwind leg] to [typically] 300 m/1,000 ft, turn 90° [in either direction, but usually L] on to crosswind leg, second 90° turn on to downwind leg, passing airfield parallel to active runway, third 90° turn with power off on to descending second crosswind leg [often called base leg] followed by 90° turn on to finals. Depending on circumstances, * may be followed by immediate takeoff called touch-and-go [if the aircraft is brought to rest, called stop-and-go] for second * or by taxi back to downwind end of runway for next takeoff; * can be L-hand or R-hand. US term pattern, circle or traffic circle.

2 List of airshows [usually annual] at which particular aircraft regularly appear.

3 Closed loop of electrical conductors.

circuit analog absorber Large family of RAM (2) in which outer resistive sheet is given an imaginary part to its admittance, by laying it down in form of many discrete elements such as dipoles, crosses and meshes. See frequency-selective.

circuit breaker Switch for opening circuit (3) while carrying large electrical load.

circuit length Length round closed-circuit wind tunnel traversed by streamline always equidistant from walls.

circuits and bumps Repeated circuits (1) with landing [or at least a touch-and-go] at end of each (colloq.).

circular approach Precision training manoeuvre, chiefly associated with carrier flying, where circuit (1) is circular.

circular dispersion Diameter of smallest circle within which 75 per cent of projectiles strike.

circular error probable See bombing errors (1).

circular isotropic Aerial (antenna) radiation pattern equal in all directions (normally in azimuth).

circularisation Refinement of satellite orbit to approach perfect circle, usually at given required height.

circular mil Area of circle of one mil (1/1,000 inch) diameter = 5.067 × 10⁻⁶ in² (7.85 × 10⁻⁷ in²).

circular mil foot Unit of resistivity; resistance of one foot of wire of one circular mil section, equal to ohm-mm × 6.015 × 10⁻¹⁰.
Circular milliradian
Conical beam or spread of fire having angle (not semi-angle) of one milliradian.

Circular nose
Control surface whose leading-edge section is semicircle about hinge axis.

Circular velocity
At given orbital height, velocity resulting in circular orbit, \( V_c = \frac{\sqrt{Rg}}{R} \) where \( R \) is radius from Earth centre.

Circulation
1. Rotary motion of fluid about body or point; vortex.
   2. Ideal flow around (not past) circular body, with streamlines concentric circles and velocity inversely proportional to radius (body needed to avoid infinite \( V \) at centre).

Streamline flow around body of any form, defined as integral of component of velocity along closed circuit with respect to distance travelled around it. Wing lift created by * superimposed on rectilinear flow past surface (see bound vortex, Magnus, Zhukovsky).

Gross motions of planetary (eg Earth) atmosphere.

Circulation controlled
Wing, rotor blade or other aerofoil in which external power is used to enhance lift, typically by high-velocity tangential blowing of various kinds.

Circulator
Non-reciprocal device in microwave circuit to produce phase-shift as function of direction of wave flow (see duplexer).

Circulatory flow
Rectilinear flow past lifting body inducing circulation (3) (see Zhukovsky).

Circumaural
Fitting around the ear.

Circus
Small formation of bombers with much larger Circus (RAF, WW2).

Circus
Large loose formation of fighters, usually with distinctive individual markings, flown by aces (G, WW1).

Loosely, group of itinerant aircraft entertaining public and offering rides (1919–39).

C.I.R.F.
Consolidated intermediate repair facility.

C.I.R.M.
Comité International de Radio Maritime.

C.I.R.O.
Centre Interarmée de Recherches Opérationelles (Fr).

CIRPAS
Centre for interdisciplinary remotely-piloted aircraft studies (USN).

Ciris
Cryogenic infrared radiation instrument for Shuttle.

Cirrocumulus
Ce, layer of globular cloud masses at about 6,000 m/20,000 ft. Also known as mackerel sky.

Cirrostratus
Cs, high milky-white or grey sheet cloud, 7,000 m/23,000 ft.

Cirrus
Ci, high white cloud; detached, fibrous, silky, 7,500–12,000 m/25,000–40,000 ft.

Cirstel
Combined IR suppression and tail-rotor elimination.

CITCVS, CIRTVS
Compact IR TV system.

CIS
1. Combat identification system.
   2. Computer interface system.
   3. Communications, or command, or combat, or corporate, information systems.
   5. Cluster ion spectrometer.
   6. Chemical ignition system.
   7. Control indicator set, or suite.

Commonwealth of Independent States, of former USSR; CST adds Collective Security Treaty.

Cargo-inspection system, usually PFNA or X-ray.

Civil Reserve Air Fleet

10 Cycles in service (FAA).

11 Common Industry Standards (ADIAE).

cishum
Between Moon’s orbit and Earth.

CISPR
Comité International Spécial des Peturbations Radiophoniques [radio interference].

CISS
Configurable integrated surveillance system.

CIT
1. Compressor inlet temperature (flight envelope limit).
   2. Central integrated testing.
   3. Cranfield Institute of Technology.
   4. Control in turbulence [mode].
   5. Critical-item test.
   7. Near or over a city.
   8. Combined interrogator and transponder.

CITTA
Commission Internationale de Tourisme Aérien.

CITEA
Confédération Interamericana de Transportadores Aéreos.

CITE
Computer integrated test equipment (USAF).

CITEA
Computer, central, cockpit, coupler, communications, or control interface unit.

CITS
Central integrated test system, or subsystem (eg Shuttle).

CITIS
Central integrated test experimental parameter subsystem.

CITES
Convention on International Trade in Endangered Species.

CITIS
Contractor integrated technical information system.

CITPS
Central integrated test system, or subsystem (eg Shuttle).

CIV
1. Combat information transport system.
   2. CAS (3) integrated targeting system.
   3. Combat information transport system.

City pair
Pair of cities studied from viewpoint of mutual passenger/cargo traffic.

City pair ranking
Lists of ** in order of current or projected traffic generation.

CIU
1. Computer, central, cockpit, coupler, communications, or control interface unit.
   2. Central Interpretation Unit (RAF, 1941–).
   3. Control-information unit (cartridge dispensing).

CIV
1. Crossbleed isolation, or centre interconnect, valve.
   2. Coannular inverted-velocity (nozzle).
   3. Civil.

CIVIA
Commission International de Vol Aérobatique.

Civil Aeronautics Administration
Since 1958 FAA (1).

Civil Aeronautics Board
US Government (DoC) agency responsible for civil aviation, including CARs, licensing, routes and US mail rates.

Civil aircraft
Not in government [including military] service.

Civil Air Patrol
US para-military organization using pilot and lightplane resources of general aviation for national ends.

Civil day
Day of constant 24 hours (sometimes counted as two periods of 12 hours); mean solar day.

Civil Reserve Air Fleet
US airline transport aircraft and flight crews predesignated as available at any time for reasons of national emergency.
civil time

civil twilight  See mean solar time.
civil twilight  Period at sunrise or sunset when Sun’s centre is between 0° 50’ and 6° below horizon.

CIVL  Commission International de Vol Libre (FAI hang-gliding organization).

CIVRES  Congrès International des Techniques du Vide et de la Recherche Spatiale.

Civ, Civils  CAA [1], (UK, colloq.).

CIVV  Commission International de Vol à Voile (gliding).

CIWS  Close-in weapon system.

C1  Blowing coefficient, or thrust coefficient of jet engine.

CJAA  Classic Jet Aircraft Association (US).

CJAP  Commonwealth Joint Air Training Plan (1939-45).

CJCS  Chairman of the Joint Chiefs of Staff.

CJO  Chief of Joint Operations (UK MoD).

CJS  1 Canopy jetson system.

2  Commerce, justice and science (US Senate).

CJS  Combined joint statement of requirements.

CTF  Combined [or commanders] joint task force.

CK  Cape Kennedy.

CK, Ck  Check

CKD  Component knock-down, or completely knocked down, parts imported for assembly in importing country to avoid duty.

CKEM  Compact kinetic-energy missile.

CL  1 Centreline of aircraft.

2 Checklist.

3 Chemical laser.

4 Catapult-launched.

5 Charge limit, ie limit payload (RAF).

6 Creeping landing.

7 Centre of lift.

8 Compass locator.

9 Centreline lights of runway, followed by number giving number of bars of approach lighting.

C1  1 Coefficient of lift.

2 Low cloud.

CL  1 Centrelne.

C1  Rolling-moment coefficient (BSI).

C1  Main-rotor section lift coefficient L/½ p V2

c  Centrelne.

Cg  Section lift coefficient.

Cg  Mean list coefficient of helicopter rotor.

CLA  1 Clear ice formation.

2 Centreline average (surface roughness).

3 Collective labor agreement (US).

4 Consortium of Lancashire Aerospace, Became NWAA.

5 Creeping line ahead.

CLAC  Comisión Latino Americana de Civil Aviación (Int.).

clack, clacking  Aural warning, esp. of Mach limit.

clack valve  Fluid one-way valve having freely hinged flap seated on one side.

Cladosporium  See Hormonicon.

Clads  Common large-area display set.

CLAES  Cryogenic limb etalon etalon spectrometer.

CLAEX  Air-force flight test centre (Spain).

clag  Widespread low cloud, mist and/or rain (colloq.).

Claire  Clean-air engine.

CLJAL  Catapult-launched, arrested landing.

CLC  1 Accelerator hook.

2  Operative part of arrester hook.

Claw  Complementary low-altitude weapon system (USMC).

CLB  1 Crash locator beacon.

2 Climb, helicopter autopilot mode.

Ci  Dihedral effect, the rolling moment due to sideslip; also called dihedral derivative.

Cg  Rolling moment due to sideslip rate [US usage, small].

CLBR  Closed-loop aeronautical management programme.

clamped  Of a structural member, fixed in space and also unable to rotate or pivot. Hence a beam can be * at one end and free at the other.

clamping  To hold either or both peaks of waveform or signal at desired reference potential (d.c. restoration). Increasingly used in processing sensor images; black-level * references all black levels to darkest point of image.

clamshell  1 Cockpit canopy hinged at front or rear.

2 Nose or tail of cargo aircraft hinged into lower and upper or left and right halves.

1 Reverser opening in upper and lower halves meeting on jet centreline behind nozzle [US = bucket].

clandestine aircraft  Aircraft designed to overly without detection, having minimal noise, IR and radar signatures.

clang box  Jet-engine switch-in deflector for V/STOL comprising an internal valve and side nozzle with deflecting cascade.

Clansman  Army tactical radio communication system (UK).

CLAP  Centre Liaisón d’Aviation Populaire (F).

clapper  Part-span shroud.

Clara  Carbon-dioxide-laser radar, for obstacle avoidance.

Clas, CLAS  Conformal load-bearing-antenna structure (AFRL).

CLASB  Citizens’ League Against the Supersonic Boom (US).

clash detection  See dynamic *, static *.

Class  Coherent laser airborne shear sensor.

class action  Litigation in US courts in which plaintiffs represent a class, eg airline passengers, or passengers of a particular carrier.

classic  Term merited by aircraft produced for many years, esp. to distinguish from later versions of same type.

classical aeroplane  Aeroplane having clearly defined fuselage, nacelles and aerodynamic surfaces, not necessarily with all tail surfaces at rear. Opposite of integrated aeroplane.

classical flutter  Occurring because of coupling – aero-dynamic, inertial or elastic – between two degrees of freedom.

classify  1 To protect official information from unauthorised disclosure [UK and US have numerous classification grades].

2 In ASW to sort sonar returns according to types of source.

claw  1 Accelerator hook.

2  Operative part of arrester hook.

Claw  Complementary low-altitude weapon system (USMC).

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2 Climb, helicopter autopilot mode.

Ci  Dihedral effect, the rolling moment due to sideslip; also called dihedral derivative.

Cg  Rolling moment due to sideslip rate [US usage, small].

CLBR  Calibration.

CLC  1 Command launch computer.

2 Course-line computer.
**CLD**

**CLD** 1 Cloud (ICAO).
2 Crutching light-duty (stores carrier).

**clid** Cloud.

**CLDP** Convertible laser-designation pod.

**CLDS** 1 Cockpit laser-designation system.
2 Clouds.

**CLE** Central Landing Establishment, RAF Ringway 1941, pioneer paratroop/glider school.

**Clean** Component validator for environmentally friendly aero engine (Europe).

**clear** 1 Of aircraft design: streamlined, devoid of struts and other excrecences.
2 Of aircraft condition: landing gear, high-lift systems and other extendible items retracted, and not carrying drop tanks, external ordnance or other drag-producing bodies.
3 Nuclear weapon designed for reduced, or minimal, residual radioactivity compared with normal weapon of same yield.

**cleaning** In prolonged glide with piston-engined aircraft, to open up engine briefly to high power to clear over-rich mixture and gummy or carbon deposits.

**clean room** Sealed airlock-entrance facility for manufacture [eg, of inertial gyro] or examination of space devices, with rigid rules on humans admitted.

**clean up** To retract gear and flaps, and other high-lift devices, after takeoff.

**clear** 1 To authorise hardware as fit for use.
2 To authorise person to receive classified information.
3 To rectify stoppage in automatic weapon.
4 To unload weapon and demonstrate no ammunition remains.
5 To empty core store, register or other memory device.
6 In flight operations, authorised to take off, land or make other manoeuvre under ground control.
7 En route, to pass over waypoint.
8 To destroy all hostile aircraft in given airspace.
9 Of local sky, devoid of clouds ("the *"), but may be above or between cloud layers.
10 To clean piston engine; see cleaning.
11 To fly out of a local area, eg a flying display.
12 Not secure [communications].

**clear air turbulence, CAT** Significant turbulence in sky where no clouds present, normally at high altitude in high windshear near jetstream.

**clearance** 1 Authorisation by ATC (1), for purpose of preventing collision between known aircraft, for aircraft to proceed under specified conditions within controlled airspace (see abbreviated * *, SIDS, STARS, * delivery, * items, * limits).
2 Minimum gap between portions of hardware in relative motion (eg fan blade and case).
3 Transport of troops and material from beach, port or airfield using available communications.
4 Approval for publication of written text, image or film concerning sensitive subject, after excision of offending parts.

**clearance amendment** Change in clearance (1) made by controller to avoid foreseeable conflict.

**clearance control** Precise control of the microscopic gap between the tip, or outer radius, of a rotating structure and the surrounding fixed casing. Also called tip*.

**clearance delivery** ATC service, with assigned frequency, for issuing pre-taxi, taxi and certain other pre-flight clearances.

**clearance function** Clearance delivery (UK).

**clearance limit** Fix or waypoint to which outbound flight may be cleared, there to receive clearance to destination.

**clearance void** Automatic cancellation if takeoff not made by specified time.

**clearance volume** Minimum volume remaining in piston engine cylinder at TDC.

**cleared flight level** FL to which flight is cleared, though possibly not yet reached.

**cleared through** Valid to clearance limit, including intermediate stops.

**clear ice** Glossy, clear or translucent accretion from slow freezing of large supercooled water droplets.

**clearing manoeuvre** Change of aircraft attitude, on ground or in flight, to give better view of other traffic.

**clearing procedure** Clearing manoeuvre, often combined with vocal callouts (esp. when pupil under instruction) before takeoff or any other flight operation (eg scrutiny of airspace beneath prior to spin).

**clearing turn** Turn in which pilot checks local airspace, especially below, before stall or spin.

**clear-vision panel** See DV panel.

**clearway** 1 Rectangular area at upwind end of runway or other takeoff path devoid of obstructions and prepared as suitable for initial climbout.
2 Specif., area beyond runway, extending not less than 250 ft/76 m wide on each side of centreline, no part of which (other than threshold lights away from centreline and not over 26 in/660 mm high) projects above * plane.

**clearway plane** Plane extending from upwind end of runway at slope positive and not exceeding 1.25 per cent.

**clean** 1 In airframes, a triangular brace at a junction.
2 In an aircraft equipped for towing [large military] gliders, the attachment [usually with two pivoted jaws] for the towrope.

**clevis joint** Fork and tongue joint (eg between solid motor cases) secured by large-diameter pin.

**CLF** Carbon-loaded foam, common single-layer RAM.

**CLFA** Centre de Laser Franco-Allemagne.

**CLG** 1 Ceiling (ICAO).
2 Calling.

**Clg, Cl g, C lg, C lg**, Circulation lift coefficient.

**CLGE** Cannon-launched guidance electronics.

**CLGP** Cannon-launched guided projectile.

**CLI** Common languages interactions.

**Climate Change Levy** Financial penalty imposed [in absence of precise numerical values] on users of energy from non-renewable sources (EC).

**climatic test** Static test in simulated adverse environments (rain, ice, temperature extremes, salt, sand, dust) to demonstrate compliance with requirements.

**climb** 1 Any gain in height by aircraft (verb or noun).
2 More commonly, deliberate and prolonged gain in height by appropriate trajectory and power setting (ie not zoom).

**climb corridor** Positive controlled military airspace of published dimensions extending from airfield.

**climb gradient** Vertical height gained expressed as percentage of horizontal distance travelled.

**climb indicator** See VSI.
climbing cruise, climb cruise

climbing cruise, climb cruise Compromise between speed and range, typically at 1.15 V_{ASW} planned from published tables for peak efficiency rather than attainable in constant-height cruise.

climbing shaft Access hatch and ladder leading from bottom to top of airship hull.

climb out 1 Loosely, flight from unstick to setting course (lightplane in VFR).
2 Specific, flight from screen height (35 ft/11 m) to 1,500 ft/460 m. Comprises six segments: 1, 35 ft to gear up (V_{1}); 2, gear up to FRH (V_{2}); 3, level (accelerate to FUS); 4, FRH to 5-minute power point (FUSS); 5, level (accelerate to initial ERCS); 6, to 1,500 ft/460 m (ERCS) (see NFP).

CLIN Contract line-item number.

clinker-built Marine hull or float constructed from diagonal or longitudinal planks overlapping at edges.

clinometric Holding constant lead angle.

clinometer 1 Instrument for measuring angle of elevation, used in some ceilometers.
2 Several authorities use * as synonymous with inclinometer.

clip, CLIP 1 Cellular logic image processor.
2 Pack of air-launched missiles loaded as a unit.

clipped wing Aircraft having wing modified by removal of tips or outer portions (eg for racing).

clipper Clipping (1) circuit.

clipping 1 Limiting positive and/or negative parts of waveform to chosen level.
2 Mutilation of communications by cutting off or distorting beginnings and/or ends of words or syllables.

clipper clipping Reduction of amplification below given frequency.

CLIRC, Clircm Closed-loop IRCM.

CLL Centreline lighting provided.

CLK Clock, clock time.

clops Maximum attainable lift coefficient.

Cnc, CLNC Clearance (UK), hence Cnc Del, for delivery.

CLNP Connectionless network protocol.

CLNS Connectionless network service.

CLNTS China Lake Naval Testing Station (CA, USN).

cloth 1 To knock out a ground or air target (colloq.).
2 To seal spacecraft, esp. manned; task performed by ad hoc crew who are last to leave pad area.

close air support, CAS 1 Close air support, CAS
2 Same for fly-by spacecraft.

close parallel operation Runways less than 200 m [656 ft] apart.

closest approach 1 Time, location or separating distance at which two planets are closest.
2 Same for fly-by spacecraft.

closet Above-floor bay or compartment for carry-on baggage or folded wheelchairs.

closure Relative closing velocity between two air or space vehicles.

clot Idiot (RAF colloq.).

cloud Large agglomeration of liquid droplets (water in case of Earth) or ice crystals suspended in atmosphere.

cloud absorption Absorption of EM radiation by planetary cloud depends on cloud structure, size and EM wavelength, long waves reflected from planet surface being strongly absorbed even by thin layers.

cloud amount Estimated as apparent coverage of celestial dome, as seen by observer; originally estimated in tenths, now expressed in oktas and written in symbolic form on met chart.

cloud attenuation Reduction in strength of microwave or IR radiation by cloud, usually due to scattering rather than absorption.

clothes See banner cloud.

clothesline cloud See cloud cover.

clothing See clothe.

clothes 1 Baggage or folded wheelchair.
2 Above-floor bay or compartment for carry-on baggage or folded wheelchairs.

cloud-cover satellite

closed-circuit tunnel Wind tunnel which recirculates given mass of working fluid.

closed-circuit TV Camera/microphone linked to TV receiver/speaker by wires.

closed competition Procurement competition in which prices, performances and design details are not disclosed to rival bidders.

closed cycle See closed thermodynamic cycle.

closed-jet tunnel Tunnel, not necessarily closed-circuit, in which working section is enclosed by walls.

closed-loop system Dynamic system in which controlled variables are constantly measured, compared with inputs or desired values and error signals generated to reduce difference to zero. Future aircraft will probably have * cabin-air systems, significantly reducing fuel burn.

closed thermodynamic cycle Cycle which can transfer energy but not matter across its boundary. Thus, the working fluid recirculates endlessly, a system achieved in APUs but not for aircraft propulsion.

close flight plan To report safe arrival to appropriate ATC authority and thus terminate flight plan. (Failure to close may trigger emergency.)

close hangar doors! Stop talking shop (RAF, colloq.).

close out 1 To seal spacecraft, esp. manned; task performed by ad hoc crew who are last to leave pad area.
2 To complete manufacturing programme.

closed competition Procurement competition in which prices, performances and design details are not disclosed to rival bidders.

closed operation Runways less than 200 m [656 ft] apart.

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cloud-cover satellite Satellite equipped to measure by spectral response cloud cover on Earth or planet below.
cloud deck

**cloud deck** Cloud layer, esp. visibly dense, seen from above.

**cloud droplet** Water or ice particle with diameter ≤0.2 mm.

**cloud height** Altitude of base.

**cloud 9** To be on * = feeling of elation and/or hazziness.

**cloud point** Temperature at which cooling liquid becomes cloudy.

**cloud seeding** Scattering finely divided particles into cloud to serve as nuclei for precipitation (rainmaking).

**cloud types** Each type has its own entry. They are classified by numbers giving an indication of danger: cirrus 0, cirrocumulus 1, cirrostratus 2, alto cumulus 3, altocumulus 4, nimbostratus 5, stratocumulus 6, stratus 7, cumulus 8, and cumulonimbus 9.

**clover leaf** 1 A search pattern in which the aircraft describes three or more radial leaf patterns, repeatedly overflying a central point.

2 Cross-section of a solid-propellant rocket motor grain in the form of a hollow drum with three inward-projecting radial ridges or walls.

**clovers** Common low-observables verification system (USAF).

**CLP** Club der Luftfahrtpublizisten (Austria).

**Cm** The roll-damping derivative, introduced chiefly to correct for spanwise variation in α in roll; positive except perhaps in a spin.

**CLR** 1 Clearance, or cleared to (given height).

2 Clear sky [≤10% cloud].

3 Compact, long-range (Filir).

**CLRC** Central Laboratory of the Research Councils (UK).

**CLS** Weather clear and smooth.

**CLSD, Csl** Closed.

**CLSU** Culham Lightning Studies Unit.

**CLT** 1 Centreline tracking (ILS/ILM).

2 Customised lead time.

3 Central logging system.

4 capsule launch system.

5 Lift coefficient at stall.

**CILS** Cruising/loiter speed.

**CILS, Cild** Closed.

**CMATZ** Combined military air, aerodrome, traffic zones.

**CMCA** Cruise-missile advanced guidance.

**CMAG** Cruise missile.

**CMBR** Common munitions built-in test reprogramming equipment.

**CMC** 1 Central__ maintenance application. 2 Common-mode analysis.

3 China Meteorological Administration.

4 China Meteorological Service.

5 Cruise missile.

6 Comsec module.

7 Countermeasure[s].

8 Capability Manager (MoD UK).

9 Crew module.

10 Crew module.

11 China Meteorological Service.

12 China Meteorological Service.

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46 China Meteorological Service.
C_{mbg}  

C_{mcg} Coefficient of pitching moment about c.g.  
CMCS Central maintenance computing system.  
CMDS 1 Command, ie total autopilot authority.  
2 Countermeasures dispenser, or duties.  
3 Cruise-missile defense.  
4 Colour [or common] multipurpose [or multifunction] display [S adds system, U unit].  
CMDO Convolutionary multidisciplined optimisation.  
CMER 1 Coherent monopulse Doppler radar.  
2 Card maintenance data recorder.  
CMDS Countermeasures dispensing system.  
Cmdt Commandant.  
CME 1 ECM (1) (F).  
2 Coronal mass ejection.  
3 Central Medical Establishment (RAF).  
CMEA Council for Mutual Economic Assistance.  
CMF 1 Conceptual military framework (NATO).  
2 Central maintenance function.  
3 Common message format.  
CMFS Chassis-mounted fuel system.  
CMFT Canadian Museum of Flight and Transportation, Surrey BC.  
CMG Control-moment gyro.  
CMH Center for Military History (US).  
CMI 1 Computer-managed instruction (see CAI[2]).  
2 Cruise-missile interface.  
3 Catia Metaphase Interface.  
CMIK Cruise-missile integration kit.  
CMIS 1 Command-missile information system.  
2 Conical microwave imaging/sounder.  
CMISE Combat management integration support environment.  
CMIT Components management integrated team.  
CMIV Cabin management and interactive video.  
CML Consumable materials list.  
C_m Pitch coefficient of moment about the leading edge [usually of the wing].  
CMLP Cruise-missile launch point.  
CMLS Commercial microwave landing system (A adds avionics).  
CMMS 1 Computerised modular monitoring (of health of hardware).  
2 Condition-monitored maintenance.  
3 Co-ordinate measuring machine.  
4 Common-mode monitor (AFCS).  
5 Component maintenance manual.  
6 Capability maturity model; I adds integration (ATOS).  
7 Common modular missile.  
8 Command memory management.  
CMNI See CMM(6).  
CMMCA Cruise-missile mission control aircraft.  
CMMCS Congressionally mandated monthly study (US).  
CMN Control-motion noise (MLS).  
CMO Certificate Management Office (FAA).  
C_m Pitch coefficient of moment (¼-chord) at zero lift.  
CMOS 1 Complementary metal-oxide silicon, or semiconductor.  
2 Cockpit maintenance operations simulation, or simulator.  
CMP 1 Countermeasures precursor (aircraft penetrating hostile airspace ahead of attacking force).  
CNATRA, Cnatra  
2 Counter-military potential (strategic balance).  
3 Central maintenance panel.  
4 Configuration management plan.  
CMPL, cmpl Completion, completed.  
C_m Pitch damping moment.  
CMRB Composite main-rotor blade.  
CMRS 1 Countermeasures receiver system.  
2 Crash maintenance recorder system.  
CMSS 1 Continuous monofilament, spun.  
2 Commission de Météorologie Synoptique.  
3 Cockpit, cabin or circuit [electric/electronic, not ATC] management system.  
4 Constellation, or central, maintenance system.  
5 Common modular, or combat-mission, simulator.  
6 Computer module system.  
7 Cassette memory system.  
8 Component-management support.  
9 Content, or combat, management system.  
10 Combat mission simulator.  
11 Civil maritime surveillance.  
CMSAFE Chief master sergeant of the Air Force (USAF).  
CMT 1 Cadmium mercury telluride (IR detector).  
2 Communications management terminal.  
3 Certificate management team (ATOS).  
C_m Coefficient of moment of the tailplane [horizontal stabilizer].  
CMTC Committee for Military-Technical Cooperation.  
C_m Blowing coefficient of circulation-controlled airlift.  
CMU 1 Communications, or central, management unit.  
2 Control and monitor unit (Hums).  
CMUP Conventional-mission upgrade program.  
C_m The turb derivative.  
CMW Compartmented mode workstation.  
C_m Coefficient of moment of the wing.  
CMWS Common missile warning system.  
CMx, C\_{m0} Helicopter roll moment coefficients, Mx, M_{0} divided by pAR [IR].  
C_{m0} CM zero Coefficient of pitching moment at zero lift.  
C_{m0.25} C_{m0.25} See C_m.  
C\_n 1 Crew’s Notes [in large aircraft, can be a massive tome].  
2 Fleet carrier, nuclear [previously CVN] (USN).  
3 Consigne de Navigabilité [= AD0] (F).  
C\_n Cadet Navigator (RAF rank).  
C_{n} Coefficient of normal force, N/½pU².  
C_n Directional stability, yawing moment coefficient due to sideslip, = yawing moment - q bs [dymanic pressure, span, wing area].  
C_{n} Constructor’s number.  
C\_NA 1 Computer network attack.  
2 Center for Naval Analyses.  
3 Common-nozzle assembly.  
4 Cast nickel alloy.  
C\_NA Conference of National Armaments Directors (NATO).  
C_m Slope of normal force plotted against α curve.  
CNATRA, Cnatra Chief of Naval Air Training (USN).
CNATS

**CNATS** Controller of National Air Traffic Services (UK).

**CNC** 1 Computer numerical control (NC machining).

2 Com/nav controls.

**CNCE** Communications nodal control element.

**CNCS** Central Navigation and Control School (RAF).

**CNCT** Combat Network Communications Technology [adds AEHF] (USA).

**CND** 1 Computer network, defense.

2 Campaign for nuclear disarmament (UK).

**CNDB** Customised navigation database.

**CNDRTOK** Could not duplicate, retest OK.

**CNEIA** Comité National d’Expansion pour l’Industrie Aéronautique (F).

**CNEL** Community noise equivalent level.

**CNES** Centre National d’Études Spatiales (F Paris 75039).

**CNF** Central notice-to-airmen facility.

**CNG** 1 Compressed natural gas.

2 Chief of [State] National Guard.

**CNH** Carbon Nomex honeycomb.

**CNI** 1 Communications, navigation, identification.

2 Chief navigational instructor.

3 Continuous nitrogen inerting.

**CNIÉ** Comision Nacional de Investigaciones Espaciales (Arg.).

**CNIÉW** CNI (1) electronic warfare.

**CNIÍ** Central research institute (R).

**CNIMS** CNI (1) management system.

**CNIR** Communication, navigation, identification and reconnaissance.

**CNIÍT** Central scientific institute for radiotechnical measurement; often rendered TsNITI (R).

**CNIU** CNI (2) unit.

**CNK** Cause not known.

**CNL** Cancel, cancelled.

**CNMA** Communications network for manufacturing applications, search for ISO standards complementary to MAPs and TOP (EEC).

**CNO** 1 Chief of Naval Operations (USN).

2 Computer network operations; JTF adds Joint Task Force.

**CNO** 1 Controller of National Air Traffic Services (UK).

2 Com/nav controls.

**CNP** Com./nav./pulse.

**CNPI** Communication(s), navigation and position(ing) integration.

**CNR** 1 Community noise rating.

2 Consiglio Nazionale Ricerche (I).

3 Yaw-damping derivative, contributor to Cn.

**CNRA** Certificat de Navigabilité Restreint (homebuilts, F).

**CNRE** Centre National de Recherches de l’Espaire (F).

**CNRJ** Combat net radio interface.

**CNRS** Centre National de la Recherche Scientifique (F).

1 Convective.

2 Convective mean wind.

3 Convective instability.

**CNS** 1 Continuous.

2 Communications network simulator.

3 Communications, navigation, surveillance; ATM adds air-traffic management (ICAO).

4 Common nacelle system, able to accept different types of engine.

5 Chief of Naval Staff [First Sea Lord] (UK).

**CNSA** China National Space Administration.
co-axial cable
blades on same axis rotating in opposite senses independently. Not same as contra-rotating.

co-axial cable  Comprises central conductor wire and conducting sheath separated by dielectric insulator.

COB  1 Co-located operational base.
  2 Certified operational base.

Cob  The thick inner boundary around the centre of a compressor rotator stage or disc.

cobalt  Hard, silver-white metal, density 8.9, MPt 1,495°C, important in steels and in high-temperature engine alloys, Co–60 is dangerous radioisotope theoretically producible in large amount by nuclear weapons.

cobblestone turbulence  1 High frequency * due to large mass of randomly disturbed air without significant gross air movement.
  2 Buffet experienced by jet V/STOL descending into ground effect.

COBE  Cosmo-origin background explorer.

Coh  Common business-oriented language.

cobonding  Manufacture of composite aerofoil, esp. wing, in which entire surface is assembled and cured, but with one skin (usually upper) separated by debonding agent. This skin is then attached by removable bolts.

Cobra  1 Maneuvre in which from level flight at moderate airspeed pilot applies moderate symmetric nose-up command, reaching AOA 90° up to possibly 130°, when control neutralised for flip-down recovery to nose-up command, reaching AOA 90° up to possibly 130°.
  2 Optimized booster for reusable applications.
  3 Co-located operating base.

Coca  1 Common (or combat) operations centre, for tactical control of all arms in theatre.
  2 Catalytic ozone converter.
  3 Copper on ceramic.
  4 Chamber of Commerce.
  5 Cash operating cost.

COC  Contractor’s operational control centre.

Cockade  National insignia worn by military aircraft, esp. one of concentric rings.

COD  1 Co-located operational base.
  2 Certified operational base.

CODIA, Codisia  Contractor’s operational control centre.

COE

COE 1 Certification of equivalency (USAF).
   2 Co-operative emitter.
   3 Common operating environment.
COEA Cost and operational effectiveness analysis.
coefficients Except for next four entries, see under appropriate characteristics.
Coefficient A In simple magnetic compass, deviations on cardinal and quadrantal points summed and divided by 8.
Coefficient B In simple magnetic compass, deviation E minus deviation W divided by 2.
Coefficient C In simple magnetic compass, deviation N minus deviation S divided by 2.
coefficient conversion factor Formerly, multiplier 0.00256 required to convert absolute to engineering coefficients.
COEIA Combined operational effectiveness and investment appraisal (UK 2001).
COF Centrifugal oil filter.
C of A Certificate of Airworthiness.
COFAS Centre d’Opérations des Forces Aériennes Stratégiques (Taverny, F).
CoFAS Commandement des FAS, same address.
C of C 1 Certificate of Compliance.
   2 Change of control.
COFDM Code orthogonal frequency-division multiplexing (helicopters).
C of E Certificate of Experience
C of F Construction of facilities.
coffin 1 Missile (ICBM) launcher recessed into ground but not hardened.
   2 Symbol which appears in place of a downed aircraft (ACMR).
C of G See c.g.
C of M Certificate of Maintenance.
C of P See centre of pressure.
C of R Certificate of Registration of aircraft.
COG Component Obsolescence Group [1937–, 160+ member organizations] (UK).
C of T Certificate of test.
cogbelt Flexible belt incorporating teeth to prevent slip.
cognitive model An imagination of a future hardware item, including a complex system, in the brain of a design engineer. Software engineers have imagined thousands of lines of software code before anything has been created physically.
COGT Centre-of-gravity towing.
coherent Radiation in which, over any plane perpendicular to direction of propagation, all waves are linked by unvarying phase relationships (common simplified picture is of waves ‘marching in step’ with all peaks in exact alignment).
coherent echo Radar return whose amplitude and phase vary only very slowly (from fixed or slowly moving object).
coherent pulse radar, coherent radar Incorporates circuitry for comparing phases of successive echo pulses (one species of MTI).
coherent transponder Transmitted pulses are in phase with those received.
coherer RF detector in which conductance of imperfect part of circuit (eg iron filings) is improved by received signal.
cold plug
Cohoe Computer-originated holographic optical elements.
COI Co-ordinator of Information (US, WW2).
COl Central Office of Information (UK).
COAE Colegio Oficial de Ingenieros Aeronauticos de España [office, E-28041 Madrid] (Spain).
Coil, COIL 1 Chemical oxygen iodine laser.
   2 Commercial overhaul information letter (FAA).
coin, Co-In, CO-IN Counter-insurgency; aircraft designed for guerrilla war.
CoIncat Community of Interests in Civil Air Transport (G).
coincidence circuit Gives output signal only when two or more inputs all receive signals simultaneously or within agreed time.
CIONS, Coins Computer-operated instrument system.
COIS Coastal ocean imaging spectrometer.
Cojas Coherent jammer simulator.
coke Verb, to modify aircraft with Küchemann ‘Coke bottle’ fuselage.
col In atmosphere isobar field, saddle-shaped region separating two highs on opposite sides and two lows on remaining sides.
colander In some ramjet engines, perforated shell controlling secondary airflow into combustion chamber.
   Generally equivalent to gas-turbine flame tube.
cold 1 Without using afterburner.
   2 Of a restricted area, not currently active.
cold air mass Colder than surrounding atmosphere.
cold-air unit Air-cycle machine, usually in an ECS, which greatly reduces temperature of working fluid by extracting mechanical energy in expansion through a turbine.
Coldama Co-ordination of loads data acquisition management.
cold bucket In aft fan with double-deck blades, outer blades handling cold air.
cold cathode Highly emissive coating and operating at ambient temperature.
cold cockpit alert Combat aircraft has no ground power supplies and is ‘cold’ until pilot enters and initiates start sequence for engine, gyros and systems.
cold cockpit+
front Front of advancing cold air mass moving beneath and lifting warmer air, esp. intersection of this front with Earth’s surface.
cold gas Reaction-control jet or rocket using as working fluid gas released from pressure or monopropellant decomposed without combustion.
cold launch 1 Launch of missile or other ballistic vehicle under external impulse, usually from tube (in atmosphere, in silo or on sea bed) with vehicle’s propulsion fired later.
   2 Takeoff of aircraft with INS not aligned.
cold mission Mission or test judged non-hazardous, thus not interfering with other activities.
cold plate In high-vacuum technology, refrigerated plate used to condense out last molecules of gas in chamber.
cold plug Spark plug having short insulated electrode
cold rating
keeping relatively cool (because rate of carbon deposit from oil or fuel is very low).
cold rating Cold thrust; rated output of jet engine without afterburning. Can be MIL.
cold rocket Operating on pressurized gas or mono-propellant, without combustion.
cold rolling Performed on steels to harden and increase strength, at expense of ductility.
cold round Test missile launched without active propulsion.
colds Common opto-electronic laser detection system (detects laser beams and measures angle of arrival).
cold shut Porosity due to premature surface freezing in casting, or formation of gas bubble in weld.
cold soak J Test of complete aircraft by prolonged exposure to lowest terrestrial temperature available before flying a mission. 2 Test of cryogenic propulsion system by prolonged passage of propellant.
cold stream Fan airflow; hence * reverse, one not affecting core.
cold test Determines lowest temperature at which oil or other liquid will flow freely.
cold thrust Maximum without afterburner.
cold wave Sudden major fall in surface ambient temperature in winter.
cold working Forming metal workpiece at room temperature; increases hardness and strength but reduces ductility (increases brittleness).
Coleman theory Derived by NACA's R. P. Coleman and A. M. Feingold, basic explanation of ground resonance of helicopters with articulated rotors; hence such resonance called Coleman instability.
coleopter Aircraft having annular wing with fuselage at centre; usually tail-standing VTOL.
collaborative programme Undertaken by industrial companies in two or more countries as result of legal agreements between those companies or between their national governments.
collar Impact-absorbent ring around bottom of balloon gondola (usually lightweight foam polystyrene).
collateral damage J Refers esp. to injury to friendly eyes from clumsy use of powerful lasers in warfare.
2 Damage caused to anything other than the intended target.
collation Selection in correct sequence and stacking in exact register of pre-cut piles to make part in composite material.
collective pitch Pilot control in rotary-wing aircraft directly affecting pitch of all blades of lifting rotor(s) simultaneously, irrespective of azimuth position. Main control for vertical velocity. Colloq. = 'collective'.
collective stick Collective-pitch lever (colloq.).
collector J Bell-mouth intake downstream of working section of open-jet tunnel.
2 Region of transistor between * junction and * connection carrying electrons or holes from base.
collector cell Small compartment at the inboard end of a main wing fuel tank, or elsewhere in the tank system where fuel might collect when fuel nearly consumed, which will continue to feed even under negative-g.
collector ring Circular manifold collecting exhaust from cylinders of radial piston engine.

 combating

combat load
Aggregate of warlike stores carried
collimate To adjust optical equipment to give parallel beam from point source or vice versa.
collimating mark A short line or cross at the mid-point of each edge of a reconnaissance photo.
collimating tower Carries visual and radio/radar target for establishing axes of aerials (antennas) with minimal interference from other electrical fields. Alternatively collimation tower.
collision-avoidance system Provides cockpit indication of all conflicting traffic, without latter carrying any helpful equipment or co-operating in any way, and increases intensity of warning as function of range and rate of closure.
collision beacon Powerful rotating visual light, normally flashing Xenon tube, carried by IFR-equipped aircraft (normally one dorsal, one ventral).
collision-course interception Aimed at point in space which target will occupy at a selected future time; interceptor may approach this point from any direction.
collision-warning radar See weather radar.
collision-warning system See collision-avoidance.
colloidal propellant Having colloidal structure, with particles never larger than $5 \times 10^{-3}$ mm and apparently homogeneous to unaided eye.
co-located Two ground nav aids, usually VOR and DME, at the same site.
colours of the day Particular combination, changed daily, of [usually two] Very [or similar] signal cartridges, fired to confirm aircraft as friendly to suspicious ground forces.
colour stripping Removal of all MES (6) colours except those indicating organic substances such as plastic explosives.
Colpar Confederacion Latino Americana de Paracaidismo (sport parachuting, office Argentina).
COLT CO₂ laser technology.
COM 1 Computer output on microfilm (direct recording).
2 Company operations manual.
3 Acronyms based on Command[er] or communications [over 50].
4 Cockpit operating manual.
com Communications (FAA = comm).
Comac Cockpit-management computer.
ComAO, COMAO 1 Composite air operation[s].
2 Combined air operations.
comb J Rake, usually linear, of pressure heads.
2 IFF aerial (antenna) with linear array of dipoles often sized to match spread of wavelengths.
combat aircraft Aircraft designed to use its own armament for destruction of enemy forces; thus includes ASW but not AEW or transport (definition controversial).
combat air patrol, CAP Maintained over designated area for purpose of destroying hostile aircraft before latter reach their targets.
combat camera Colour ciné camera aligned with fighter armament to film target.
combat control team Air force team tasked with establishing and operating nav aids, communications, landing aids and ATC facilities in objective area of airborne operation.
combat fuel tank Combat tank.
combat gross weight See weight.
combat load Aggregate of warlike stores carried...
combat mission

(includes guns/ammunition but excludes radars, lasers/receivers and drop tanks carried for propulsion).

**combat mission** Mission flown by balloon, airship, kite, aeroplane, helicopter or other aircraft such that it may expect to encounter enemy land, sea or air forces.

**combat persistence** Ability of fighter aircraft to engage numerous successive targets, by virtue of large number of AAMs carried.

**combust** Manual control of fighter engine permitting TET limit to rise to new higher level for period of emergency (typically 30 sec to 3 min).

**combust radius** Radius of action.

**combust spread** Variable loose formation affording best visual lookout.

**combust tank** External jet-retainable fuel tank used on combat missions; possibly smaller than ferry tank.

**combust thrust loading** Thrust loading assumed for fighter in typical combat.

**combust trail** Combat aircraft, usually interceptors, in loose trail formation, maintaining position visually or by radar.

**combust wing loading** Wing loading assumed for fighter in typical combat.

**combust zone** Geographic area, including airspace, required by combat forces for conduct of operations.

**combi**, **Combi** Transport aircraft with main deck furnished for both passenger and freight (from ‘combination’). Proportion devoted to freight usually variable.

**combination** Tug and glider, before separation.

**combination aircraft** Combi.

**combination propulsion** See mixed-power aircraft.

**combination slide** Escape slide designed for subsequent use as life raft.

**Combined** Involving armed forces of two or more allied nations. Thus *common user item, *forces, *staff etc.

**combined arms gateway environment** Complete mission planning from a single laptop.

**combined display** Presents information from two or more sources, usually radar superimposed on moving-map display.

**combined-effects munition** One having anti-armour, anti-personnel and incendiary effects.

**combined sight** Weapon-aiming device able to operate in more than one mode, eg optical and thermal imaging.

**combined stresses** Two or more simple stresses acting simultaneously on same body.

**combiner** Optical element in HUD for aligning, collimating or focusing at infinity all displayed elements on single screen.

**combining gearbox** Reduction gearbox driven by two or more engines or [e.g.] surface power units, and driving single or contra-rotating propeller or lifting rotor.

**Combre** See **CMBRE**.

**COMBS** Contractor-operated and managed base supply, ie manufacturer of major system manages and maintains government-owned GSE and spare parts and carries out heavy maintenance.

**combust** Chemical combination with oxygen (burning).

**combust chamber** 1 In piston engine, space above piston(s) at TDC, arguably extended over part of stroke depending on progress of flame front.

2 In gas turbine, entire volume in which combustion takes place, including that outside flame tube(s) occupied by dilution air.

3 In liquid rocket or ramjet, entire volume in which combustion takes place, bounded by injector face, walls of chamber and plane of nozzle throat (not nozzle exit).

4 In solid or hybrid rocket, inapplicable.

**combustion efficiency** Ratio of energy released to potential chemical energy of fuel, both usually expressed as a rate.

**combustion ratio** Ratio of fuels or propellants actually achieved; in case of fuel/air usually termed mixture ratio.

**combustion ring** Combustion chamber of annular (eg Aerospike) liquid rocket engine.

**combustion space** See combustion chamber (1).

**combustion starter** Gas-turbine engine-start energised by burning fuel, either fuel/air, monopropellant (eg Avpin) or solid cartridge. Some purists add “within a cylinder”.

**combustion test vehicle** Free-flight vehicle (RPV or missile) whose purpose is test or demonstration of propulsion performance.

**combustor** 1 See combustion chamber (2).

2 Combustion chamber (2) together with fuel manifold, injectors, flameholders and igniters.

3 Rarely, afterburner burning region, with fuel spray bars, flameholders and ignition system.

**combustor loading** Expressed as a function of mass flow, and inversely of velocity, and total inlet pressure and temperature.

**Comdac** Command, display and control (USCG).

**Comencon** Council for Mutual Economic Assistance.

**Comed** Combined map and electronic display (pronounced co-med).

**Comeds** Conus meteorological data system (DoD).

**Comest** European colour-TV satellite management consortium.

**Comfile** Expandable network connecting ATC data, voice and radar to digital recorders.

**comfort chart** Plot of dry-bulb T° against humidity (sometimes modified to include effect of air motion).

**Comint** Communications intelligence.

**comlo** Compass locator.

**comm** Communication[s] (FAA).

**command** 1 Intentional control input by flight crew or remote pilot.

2 Electrical or radio signal used to start or stop action.

3 In EDP, portion of instruction word specifying operation to be performed.

4 Authority over precise flight trajectory exercised by ATC or military authority (hence *altitude, *height, *heading, *speed etc.).

**command airspeed** A target airspeed displayed as a command parameter.

**command augmentation system** Compares pilot demand with aircraft response, FCS receiving the difference; latest CAS have full authority and often high gain.

**command bars** Principal reference index on flight director instruments, giving attitude in pitch and roll.

**command destruct** System which, at range safety officer’s discretion, can explode malfunctioning missile, RPV or other unmanned vehicle, or trigger BUs, thereby averting hazard to life or property.

**command dot** Command marker in form of bold dot or small disc.

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**command ejection**

**command ejection** Ordered [not necessarily triggered] by captain of aircraft.

**commander** Used only in military aviation, aircraft *has* authority over everyone on board even though he may not be a member of flight crew. Not synonymous with PIC or with civil term captain.

**command guidance** Steering by remote human operator.

**command lane** The principal channel in a primary flight-control system. It continuously outputs the incoming flight-control commands on the relevant A629 bus until, following a malfunction, it is over-ridden by the majority rule, or [in a more modern system] by the appropriate standby lane.

**command marker** Reference index (line, bug, arrow or other shape) indicating target value, set by pilot on tape (sometimes dial) instrument and then flown to centre reference line. See **command reference symbol**.

**command parameter** Variable subject to command (1), (2), (4) and thereafter displayed as target value on instrument or display.

**command reference symbol** HUD symbology in form of ring or other shape showing a point at which to aim ahead of aircraft, eg landing touchdown point or an aerial point for optimum AOA on overshoot (go-around).

**comma rudder** Rudder shaped like comma, with balance area ahead of hinge axis, used without a fixed fin.

**Commendation** Official praise for skilful flying, written in personal log book, usually of pilot.

**commercial** In military use, purchasable from civilian source (eg aircraft rivet).

**commercial aircraft** Aircraft flown for hire or reward.

**commercial electrics** Electrical systems serving passenger functions only (eg steward call circuits, PA system, cabin lighting).

**commercial load** Not defined, but usually means payload.

**commercial support** Assistance to operator of civil aircraft given or sold by original manufacturer or dealer.

**com./met./ops.** Communications, meteorology, operations.

**commitment** Announced decision to purchase an aircraft type, usually commercial transport.

**committal height** See **decision height**.

**commodity loading** All cargo of one kind grouped together, without regard to destination.

**commodity rate** Price charged to fly specified kind of cargo, typically per kilogramme over particular route.

**common aero vehicle** 1 Originally this was a standard design of RV [to house different payloads] for ICBMs.

2 Today, a common vehicle structure for deploying a variety of customised payloads, including weapons, into the atmosphere (MSP).

3 Capitalized, “an unpowered, manoeuvrable hypersonic glide vehicle carrying 1,000lb of munitions” launched from space to hit within 10ft (USAF).

**commonality** 1 Hardware quality of being similar to, and to some degree interchangeable with, hardware of different design.

2 Objective of using one basic design of aircraft, or other major system, to meet needs of more than one user service in more than one role (with economies in training, spares and other areas).

**common automatic recovery system** To retrieve UAVs on surface ship: electronic guidance to system of nets and cables on LPD quarterdeck.

**commutation**

**common-cause analysis** Procedure maintained through planning, design and operation of a system to identify common-mode failures of all kinds.

**common configuration** Numerous plans, mainly USAF, to bring as many aircraft of one type as possible to uniform standard, usually by upgrades.

**Common Criteria** The chief standard for certifying secure software [very like DO-178B], used by the US and 20 other countries. See EAL2.

**common display system** Standardised glass cockpit.

**common-flow afterburner** Augmented turbofan in which fan and core flows mix upstream of afterburner.

**common infrastructure** Financed by two or more allies, eg by all members of NATO.

**common mark** Marking assigned by ICAO to aircraft of international agency (eg UN) on other than national basis. Hence ** registering authority.

**common module(s)** Use of identical “black box” subsystems as building blocks for different major equipments, eg * IR components to build night-vision, recon., weapon guidance and other systems for different armed forces or civilian customers.

**common route** Portion of N American route west of coastal beacon.

**common sensor** The principal meaning is a sensor that intercepts both communications and Elint.

**common servicing** Performed by one military service for another without reimbursement.

**common-user airlift** In US, provided on same basis for all DoD agencies and, as authorised, other Federal Government agencies.

**communication deception** Interference with hostile communications (including ATC and navaids) with intent to confuse or mislead.

**communication language** Complete language structure for linking otherwise completely separate (and possibly dissimilar) EDP (1) systems.

**communications intelligence** Gained by listening, by whatever means, to hostile communications.

**communications satellite** Vehicle, normally man-made, orbiting planetary body, usually Earth, for purpose of relaying intercontinental telecommunications (telephone, telex, radio, TV, online etc.) (see active **, passive **, synchronous **).

**communications security** Made up of physical security of transmitter and receiver, emission security of transmitter, transmission security en route and cryptosecurity of message.

**community** Clearly defined group, usually of aircrew, eg all who fly particular aircraft type or particular type of mission.

**community boundary** Drawn around inhabited or urban areas surrounding airport or airfield.

**community noise level** Flyover, sideline and approach NLs measured at designated points on or beyond community boundary (see noise).

**commutated Doppler** Form of MLS in which beam is frequency-coded and/or linearly commutated instead of scanned in azimuth and elevation.

**commutation** Repeated reversal of current flow in winding of electrical machine, esp. to change output from a.c. to d.c.
commissar

1. Transfer of current between elements of polyphase rectifier to produce unidirectional output.

Commissar Typically, radially separated series of conductors forming ring round rotating generator shaft, opposite pairs of which are touched by brushes in external circuit to give d.c. output by commutation (1).

Commissar aircraft See feederliner.

Commissar airline In theory, air carrier operating between outlying regions and major hub(s). In practice, applied to anything from air-taxi operator to—indeveloped regions—national carrier (see third-level).

Com/Nav Communications and navigation aids; usually means complete avionic fit.

Commo Naval Aviation.

Common Naval Aviation.

Common Mode 5 (Eur ATC).

Common house See W/V along Tr (strictly, along flight-plan track between check points).

2 Compressor.

Compact airborne early warning AEW platform without a rotodome.

Compacta tyre Landing wheel tyee of reduced diameter and greater than normal width (Dunlop).

Companion body Hardware from launch system accompanying space vehicle or satellite on its final trajectory.

Comparative cover Reconnaissance coverage of same scene at different times.

Comparative vacuum monitoring Potentially very important method of detecting even the smallest cracking in structures by measuring any flow of air into a volume maintained as partial vacuum.

Compartment marking Stencilled subdivisions of cargo aircraft interior to assist compliance with floor loading and c.g. position limits.

Compass Computer-oriented metering, planning and advising system.

Compact multipurpose advanced stabilized system.

Compass acceleration error See acceleration errors.

Compass base Area on airfield, usually paved disc, on which aircraft can conveniently be swung.

Compass calibration pad Compass base.

Compass compensation See compensating magnets.

Compass course See heading.

Compass deviation Deviation (2).

Compass error 1. Vector sum of variation E plus variation W.

2 Sum of deviation, variation and northerly turning error.

Compass heading See heading.

Compass locator Low-power beacon used with ILS, 2-letter ident.

Compass points 32 named directions comprising cardinal points, quadrantal points and 24 intermediate points.

Compass rose Disc divided into 360°, either on simple magnetic compass or on compass base.

Compass swing See swing.

Compass testing platform See compass base.

Compass variation See variation.

Compatibility Ability of materials (solids, liquids and gases) and dynamic operating systems to interface for prolonged periods without interference under prescribed environmental conditions.

Component efficiency

Compatible 1 Colour TV transmission capable of being received as monochrome by monochrome receiver.

2 Language and software capable of being used in given computer.

Compensated gyro Incorporates correction for apparent wander.

Compensating magnets Two pairs of bar magnets carried on arms rotatable about axis of magnetic compass to correct or minimise deviation.

Compensation manoeuvres Aircraft manoeuvres required for accurate use of compensator (2), always involving four orthogonal headings, and sometimes circle or cloverleaf.

Compensator 1 Instrument for measuring phase difference between components of elliptically polarised light (Babinet * has pair of quartz wedges with optical axes perpendicular).

2 Device, manually or computer-controlled, carried in ASW aircraft to eliminate false readings caused by permanent (airframe and equipment hardware), induced and eddy-current interference signals.

Compensers Low-density composite of graphite fibres in ceramic matrix, offering strength at very high temperatures (United Technologies).

Compiler ECP (1) program more powerful than assembler for translating and expanding input instructions into correctly assembled sub-routines.

Complementary shear Induced in tension field (eg aircraft skin) at right angles to applied shear, in plane of field.

Completion business Process of taking green airframes from manufacturer and equipping and furnishing to each customer’s specification (principally in field of executive or commuter transports). Hence, a completion = one aircraft ready for customer.

Complex See launch complex.

Compliance Demonstrated fulfilment of requirements or certificating authority.

Compliance limit Time (usually GMT) by which compliance must be demonstrated.

Compliancy member Capable of substantial elastic or otherwise recoverable deflection.

Compliancy volume Trapped body of fluid, usually oil, having predetermined stiffness resulting from fluid’s bulk modulus. Often sealed by diaphragm or piston having small bleed, to even out pressures over a period (see stiffness).

Component 1 One of assemblage of structural members.

2 One of assemblage of parts used to build hardware system.

3 Major subdivision of prime mover, esp. gas turbine (eg fan, compressor, combustor, turbine, afterburner, nozzle); hence * efficiency.

4 Force, velocity or other vector quantity along reference axis, such that components along two mutually perpendicular axes sum vectorially to actual vector. Thus, crosswind * on landing.

5 Major portion of aircraft that can be separated in flight, esp. if this leaves two complete aircraft able to proceed independently.

Component efficiency Measure of performance of part of machine, normally on basis of energy output * 100 divided by energy input. Thus overall efficiency of gas turbine is product of ** of each part, considered on both mechanical and thermodynamic basis.
component life

**component life** Authorised period of usage without attention, as stipulated by manufacturer or other authority. At expiry may be discarded or overhauled. Period may be extended from time to time.

**components tree** Notional “tree” formed by interlinking of aircraft systems, highlighted in CBT by ability to strip aircraft layer by layer.

**composite aircraft** 1 Comprising two aircraft joined together at take-off [see component (5)] but separated later in flight. 2 Aircraft made principally of composite material(s).

**composite air picture** Fed from many sources to give giant hi-resolution monitor with many overlays controlled by keyboards, mice and trackballs.

**composite beam** Composed of dissimilar materials bonded together.

**composite cloud** Combination of, or intermediate between, basic forms, eg cirro-cumulus.

**composite construction** See composite material.

**composite cooling** Evaporative cooling.

**composite double-base** Solid rocket filling of combined double-base and composite types (eg AP (2) + AlP in matrix of NC + NG).

**composite flight plan** One specifying VFR for one or more portions and IFR for remainder.

**composite flying** Long-range navigation along great circle but modified (eg to avoid high mountains) by inserting sectors using other methods.

**composite launch vehicle** Single launch vehicle carrying two or more distinct payloads.

**composite material** Structural material made up of two or more contrasting components, normally fine fibres or whiskers in a bonding matrix. Unlike an alloy, usually anisotropic.

**composite power** See mixed power.

**composite propellant** Solid rocket filling comprising separate fuel and oxidiser intimately mixed.

**composite route** One where composite material is authorised.

**composite separation** Reduction [usually to half normal] of lateral and vertical minima on oceanic routes meeting criteria.

**compound aerofoil** Not defined, but has been applied to wing whose trailing edge comprises separately hinged upper and lower sub-aerofoils leaving controllable gaps.

**compound aircraft** Having wing(s) and lifting rotor(s). Compromised two aircraft joined together at take-off [see component (5)] but separated later in flight.

**compound beam** Composed of dissimilar materials bonded together.

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**compound aircraft** Having wing(s) and lifting rotor(s).

**compound balance** Compound shelf.

**compound curvature** Sheet or surface curved in more than one plane, thus not formable by simple bending.

**compound die** Performs two or more sheet-forming operations on single stroke of press.

**compound engine** Expands working fluid two or more times in two or more places, eg in HP and LP cylinders or in piston engine followed by gas turbine or blow-down exhaust turbine.

**compound helicopter** Having propulsion (usually) turbofan or turbojet) in addition to thrust component of lifting rotor.

**compound shelf** Control surface comprising two [rarely, three] spanwise sections hinged together one behind the other and moving in opposition. LE of main [front] section normally has fabric seal to fixed surface.

**compound stress** Not simple tension/compression, torque, bending or shear but combination of two or more of these.

**compound taper** Outer wing is tapered more or less sharply than inboard.

**compound wing** Wing made up of major fixed portion and upper/lower rear foils, with or without blowing between them. Also called multi-foil section. T/c up to 30% has been achieved at high Mt.

**compressed-air starter** Expands HP airflow through piston engine cylinders or ATM or turbine-blade impingement jet. In multi-engined aircraft cross-bleed can start second and subsequent engines.

**compressed-air tunnel** Closed-circuit tunnel filled with gas or air under pressure; can be smaller, and cheaper to run, than one at atmospheric pressure for given M and R.

**compressibility** In aerodynamics, phenomena manifest at speeds close to local sonic speed, when air can no longer be regarded as incompressible. Loosely, behaviour of airflow subject to pressure/density changes of 50 per cent or more of free-stream values.

**compressibility correction** From RAS to EAS (see airspeed).

**compressibility effects** Manifest as local speed, at peak suction, exceeds that of sound in surrounding flow; include abnormally rapid increase in drag, rearward shift of CP (2) on lifting wings, appearance of shockwaves, tendency to boundary-layer breakaway and, in improperly designed aircraft, control buzz and other more severe losses of stability and control.

**compressibility error** Manifest in all instrument readings derived from simple pitot/static system at high subsonic Mach numbers; typically, progressive under-reading until pressure and static orifices have penetrated bow shock.

**compressibility factor** See Glauert.

**compressibility stall** Rapid and dramatic loss of lift of traditional [e.g., thick-section] wing when Mach numbers exceed about 0.8. Also called shock stall. Not relevant to wings designed for supersonic flight.

**compression** Control of signal gain, esp. to increase it for small signal voltages and reduce it for large.

**compression ignition** Combustion of fuel/air mixture triggered by high temperature due to compression in diesel cylinder or in highly supersonic ramjet with suitable internal profile.

**compression lift** Lift gained at supersonic speed by favourable flow field by forcing flow to accelerate beneath wing (accentuated by down-turned wingtips).

**compression pressure** Gauge pressure in piston engine cylinder at TDC (in absence of combustion).

**compression ratio** Ratio of entrapped volume above piston at BDC to volume at TDC.

**compression rib** Provided inside fabric-covered wing to withstand tension of drag bracing.

**compression ring(s)** Top ring(s) on piston, of plain rectangular section, serving to seal mixture into combustion space on compression stroke.

**compression wave** See blast wave.

**compressor** Machine for compressing working fluid (see axial *, centrifugal *, skew *, Roots *, positive-displacement *). In general, term used for device handling large mass flow at moderate pressure (say, up to 40 ata, 400 kPa); small flow at high pressure = pump.

**compressor blade** 1 Loosely, rotor blade or stator vane in axial compressor.
compressor casing

2 Precisely, operative aerofoil from axial compressor rotor.

compressor casing Fixed casing closely surrounding compressor rotor.

compressor characteristic Plot of fundamental compressor performance, $P_2/P_1$ (pressure ratio) as ordinate and W/V/T (corrected mass flow) as abscissa.

compressor diffuser Passage for working fluid immediately downstream of compressor wherein pressure is increased at expense of flow velocity.

compressor efficiency Useful work done in delivering fluid at higher pressure, in assumed adiabatic operation, expressed as percentage of power expended in driving rotor.

compressor map Fundamental graphical plot of compressor performance showing variation of pressure ratio (ordinate) against mass flow (abscissa) for each rpm band.

compressor pressure ratio Ratio of total-head pressure at delivery to that at inlet (if ratio is 24:1, conveniently written as 24, for example).

compressor rotor Main moving part in compressor of rotary form (ie, not reciprocating type).

compressor stator Stationary part of axial compressor carrying fixed vanes.

compressor vane Stationary blade attached to stator (case), one row of such vanes preceding each row of rotor blades.

compromised 1 Classified information known or suspected to have been disclosed to unauthorised persons.

2 Of serial number or civil registration, one inadvertently applied to two aircraft.

Compton wavelength Defined as $h/m_c = 2.42631 \times 10^{-12}$m.

CompuScene Add-on visual system for existing simu-lators (General Electric).

computational fluid dynamics Representation of a surface by a fine grid, enabling program to determine fluid flow over it in terms of velocity, pressure, force, moment, surface temperature and possibly other variables. Impossible before powerful computers.

computed air release point Air position at which first paratrooper or cargo item is released to land on objective.

computer approach MLS approach to a runway not aligned with an MLS radial.

computer 1 Machine capable of accepting, storing and processing information and providing results in usable form; function may be direct control of one or more operating systems.

2 Simple mechanical device for solving problems (eg Dalton *).

computer acceleration control Use of airborne computer linked to AFCS to limit (close to zero) unwanted flight accelerations, esp. in vertical plane, on aeroplanes and helicopters.

computer-assisted approach sequencing Use of one, or several interlinked, computers in ATC system to solve problem of feeding arrivals automatically into optimised trajectories so that each arrives at destination runway at correct spacing and with minimal delay.

computer board Component part of a computer or similar device, each being a driver, RAM, EPROM, A/D converter, video interface or similar self-contained unit which can be assembled with others on to a bus (eg, backplane) to form a purpose-designed EDP system.

computer-programmable Capable of being controlled by digital computer without additional interfacing (typical item would be microwave signal generator for radar testing).

computing gunsight Automatically compensates for most predictable or measurable variables in weapon aiming.

COMMR Civil[ian]-owned, military registered [initially helicopters] (UK).

con See communications satellite.

Comsec Office of Communications Security (US, NSA).

COMSS Coastal/oceans monitoring satellite system.

CON, Con Consol beacon.

2 Continuous.

3 Console.

4 Control.

Conac Continental Air Command (1 December 1948, became part of ADC).

Conaero Consorzio Italiano Compagnie Lavoro Aereo (1).

Conar Continental Norad Region (US).

Concrete surface runway (ICAO).

concentrated force, load See point force, load.

concentration ring 1 In balloon, ring, usually rigid, attached to envelope or (if applicable) surrounding net, and from which basket is suspended.

2 In airship, ring to which several mooring lines may be secured (sometimes also helping support car, if this is suspended below hull).

concentric Having common centre or central axis.

concession 1 Allowable departure from drawing or other design authority in manufacture of part (eg on material spec., surface finish or manufacturing tolerance).

2 Allowable non-compliance with certification or other requirement, esp. in emergency (eg take-off permitted with one engine or one altimeter inoperative).

concrete cloche HAST (colloq., UK).

concurrence Policy adopted for reasons of national emergency in which most, or all, parts of major system programme are implemented simultaneously, even though several large portions may need to be grossly modified or updated (eg Atlas ICBM hurriedly deployed above ground, then in surface shelters and finally in silos).

concurrent engineering 1 Consideration of market, design, manufacture [and tooling], test and life support, from outset.

2 Automatic storage in every design database for all parts of new vehicle of each new technique for reducing RC2 (2).

concussion forces Acting through common point.

Cond, Conds Condition[s].

condensation Physical change from gaseous or vapour state to liquid.

condensation level Height at which rising parcel of air reaches saturation; cools at DALR and reached 100% RH at ** at intersection of DALR and DPL.

condensation nuclei Minute particles, solid or liquid, upon which nucleation begins in process of condensation; most effective ** are hygroscopic.

condensation shock Sudden condensation of super-saturated air in passage through normal or inclined shock,
condensation trail
rendering shock field visible, often showing elliptic lift distribution around transonic aircraft.

condensation trail Visible trail, usually white but sometimes darker than sky background, left by winged or propelled vehicle when flying above condensation level. May be due to reduced pressure (eg in tip vortices), but nearly all persistent ** due to condensation (and probable freezing) of water vapour formed by combustion of fuel.

condenser 1 Capacitor.
2 Device for changing flow of vapour to liquid by removing latent heat of evaporation. Essential feature of closed-cycle space power systems in which working fluid must be used repeatedly.

condenser-discharge light Gives very short flashes of great intensity caused by capacitor discharge through low-pressure gas tube (eg collision beacon).

con-di nozzle Jet-engine nozzle having cross section which converges to throat and then diverges; subsonic flow accelerates to throat, becomes supersonic and then accelerates in divergent portion.

conditionally unstable Unsataturated air above or through which temperature falls with height faster than SALR but less than DALR; thus if air becomes saturated it will be unstable.

condition monitoring Health inspection of operative hardware, eg engine, using intrascope, X-ray photography, oil sampling and BITE.

Condo Contractors on deployed operations.

Condor 1 Confidential direct occurrence reporting, system for non-attributably ensuring that nothing having a direct bearing on flight safety is kept hidden (RAF, CAB, etc).
2 Electronic ‘sniffer’ which by mass spectometry identifies traces of vapour or particles emitted by explosives and drugs (from contraband detector, British Aerospace).

Conductance 1 Real part of admittance in electric circuit; symbol A.
2 In circuit having no reactance, ratio of current to potential difference, ie reciprocal of resistance. Symbol G, unit siemens, = 1/Ω.
3 In vacuum system, throughput Q divided by difference in p between two specified cross-sections in pumping system.
4 Several meanings in electrolytes (little aerospace relevance).
5 See thermal *.

Conduction Transfer of heat from hotter to colder material or of electrons from higher to lower potential.

Conduction band Band of electron energies corresponding to free electrons able to act as carriers of negative charges.

Conductivity Measure of ability of material to transmit energy, eg heat or electricity. Thermal *, symbol k or λ, measured in J/m·K·s. Electrical *, symbol δ, measured in mh/m (per cube); reciprocal of resistivity.

Conductor Material having very low electrical resistivity, esp. such material fashioned in form useful for electric circuits.

cone 1 Drag and stabilizing member trailed on end of HF aerial wire (trailing *) or on end of air-refuelling hose.
2 Drag and stabilizing member incorporating pressure and/or static heads trailed beneath aircraft under test in supposed undisturbed air.

cone angle Semi-angle of right circular cone having same increase in surface area per unit length as diffuser; hence diffuser **.

CONNECT, Conect Combat network communications technology.

coned Caught in beams of two or more searchlights.

cone of confusion Inverted cone of airspace with vertical axis centred on VOR or other point navaid.

cone of escape Volume in exosphere with vertical axis centred on Earth centre through which atom or molecule could theoretically escape to space without collision. Opens out in angle to infinity at critical level of escape.

cone of silence Inverted cone of airspace with vertical axis centred on certain marker beacons, NDBs and other point navaids within which signal strength reduces close to zero.

cone passage Flight through cone (of confusion or of silence) above point navaid.

cone yawmeter Cone flying point-first, with pitot holes spaced at 90° intervals, to obtain yaw indication at supersonic speeds (avoids averaging effect of wing-type yawmeter).

Confidence level Used in statistical sense, eg as percentage probability that an actual MTBF will exceed estimated or published MTBF. Value of ** increases with number of samples. Sometimes called confidence limit.

Confidence manoeuvres Set pattern of ground and air tasks easily mastered by new and inexperienced pupil pilot (eg, swinging propeller, letting aircraft recover from unnatural flight attitude hands-off); devised to ease problem of apprehension and tension. Sometimes called confidence actions.

Confidential human factors incident – reporting programme Procedure whereby professional pilots and controllers may confidentially report incidents caused by human error for analysis by IAM(2).

configuration 1 Gross spatial arrangement of major elements, eg in case of aircraft disposition of wings, bodies, engines and control surfaces.
2 Aerodynamic shape of aircraft where variable by pilot command, eg position of landing gear, leading/trailing-edge devices and external stores. Thus high-lift *, clean *.
3 Standard of build or equipment for task. Thus helicopter in dunking ASW *, passenger transport converted to all-cargo *.
4 Apparent positions of heavenly bodies, esp. in solar system, as seen from Earth at particular time.
5 A new (1990– ) usage: the number of seats in a passenger airliner, thus "220*.
6 Used, incorrectly, to mean ‘application’, eg ‘Chaparral is the Sidewinder missile in ground-to-air *’. This would be correct if hardware was physically changed in *.

Configuration bias Channel or subsystem in stall protection or stick-pusher system allowing for changes in configuration (2).

Configuration deviation list Comprehensive schedule of all variable parts of a/c, such as door panels and seals.

Configuration management Combining the management and traceability of software and hardware in a single solution.

Conflict In ATC (1), two aircraft proceeding towards
conflicting traffic

conflicting traffic With respect to one aircraft, other traffic at or near same FL heading towards future conflict.

conformal airborne early warning This usually means a large planar side-looking array radar on either or both sides of the fuselage.

conformal-array aerial Electronically scanned, fits exterior surface of vehicle.

conformal-array radar Having plurality of small or light ES aerials covered by radomes fitting vehicle shape (eg wing or rotor leading and trailing edges, etc).

conformal gears Having teeth whose mating profiles conform, both sets having instantaneous centres of curvature on same side of contact. Usually applied to W-N gears.

conformal projection Having all angles and distances correct at any point, but with scale changing with distance from point.

conformal tank Removable [not necessarily jettisonable] fuel tank shaped to fit precisely against skin of aircraft.

confusion reflector Designed to reflect strong echo to confuse radar, proximity fuze, etc. Form of passive ECM.

conical camber 1 Applied to wing leading edge so that, from root or intermediate station to tip, it is progressively drooped, centreline of profile following surface of cone with vertex at root (or at start of ** if this is some distance along semi-span).

2 The term is also loosely applied to down-curved wingtips.

conical flow Theory for supersonic flow over thin flat plate having corner (apex), with flow perpendicular to rear edge: constant pressure, velocity, density and temperature along any radius (to infinity) from apex.

conical scanning Common search mode for radar, esp. AI radar, in which beam is mechanically or electronically scanned in cone extending ahead of aerial, often using beam-switching to give az/el data.

conical sleeve Cone-shaped flexible sleeve extending inwards into gas cell of airship from aperture for line, providing near gas-tightness with freedom for line to move axially through envelope.

conic apogee Apogee of satellite if all mass of primary were at its centre.

conic perigee Perigee of satellite if all mass of primary were at its centre.

conic section Perpendicular to axis = circle; parallel to axis = parabola (eccentricity 1); eccentricity less than 1 = ellipse; eccentricity greater than 1 = hyperbola. All are found in trajectories of bodies moving in space.

Conie Comision Nacional de Investigacion de Espacio (Spain).

coning 1 Tunnel test in which model is rotated whilst held at constant AOA and sideslip by rotary balance.

2 Capturing hostile aircraft in beams of several searchlights.

coning angle 1 Angle between longitudinal axis of blade of lifting rotor and tip-path plane (assuming no blade bending). Symbol $\beta$. 2 Incorrectly, sometimes given as average angle between blade and plane perpendicular to axis of rotation.

3 Upward angular displacement of blades of lifting rotor of helicopter or autogyro; caused by their lift.

conjugate Many specialised meanings in theory of groups, complex numbers and geometry of curved surfaces.

constant beam Hypothetical beam whose bending moment assists determination of deflection of real beam.

constant foci In optics, interdependent distances object/lens and lens/image.

conjunction Alignment of two heavenly bodies sharing same celestial longitude or sidereal hour angle.

connecting rod Joins reciprocating piston to rotary crank in piston engine, reciprocating pump, etc.

connector Standard mating end-fitting for fluid lines, multi-core cables, co-ax cables and similar transmission hardware, providing automatic coupling of all circuits. Term preferred for multipin electric *; with fluid systems prefer "pipe coupling".

Conops Concept[s] of operations (USN, now all-US).

conplan Contingency plan.

Conradson Standard test apparatus and procedure for determining carbon residue left after combustion of hydrocarbon oils, especially lubricating oils.

Con Rep Connective replenishment [carrier] (USN).

condor Piston-cylinder connecting rod (colloq.).

consensus Majority vote concept in logic systems, multi-channel redundant systems etc; thus, * can command landing flare against presumed failed channel.

Consequence assessment tool set Central program used by Federal and local agencies in responding to domestic emergencies, now part of ECHO (DoD).

Consol Simple long-range navaid providing PLs (within range of two * stations, a fix) over N Atlantic. LF/MF receiver is tuned to identified * station and operator counts dots and dashes in repeated 'sweep' lasting about 30 seconds; PL is then obtained by reading off * chart.

Consolant Consol-type system radiating daisy pattern at $c300\text{kHz}$, formerly based at Nantucket (US).

console 1 Control station for major device or system, normally arranged for seated operator.

2 Control and instrument installation for pupil navigator, esp. when such * repeated along fuselage (but not used for pilot station on flight deck).

3 Single bank of controls and/or instruments on flight deck, eg roof *, left side *.

4 Station for manual input/output interface with large system, eg air defence, ATC, EDP (1).

5 Tailored box for storage of maps, cameras and other items, eg 'The Cessna 210 has centre-aisle * as an option'; misleading and ambiguous.

consolidation Period between first solo and issue of PPI or other ab initio licence; hence * exercise, * flight.

consolute Of two or more liquids, miscible in any ratio.

constantan Alloy of copper with 10–55 per cent nickel; resistivity essentially unchanged over wide range of temperature.

constant-colour Philosophy for cockpit warning systems, usually, no caption illuminated = no fault, all buttons normal; blue = normal-temperature operation; white = button abnormal, either from mis-select or to rectify/suppress fault; red or amber = fault.

constant-descending approach Self-explanatory, adopted to minimise noise over urban areas. Same as continuous-descent.

constant duty cycle Device or system whose rate of operation is unvarying despite variable demand; eg DME
constant-energy line

ground transponder beacon has *** behaving as though continuously interrogated by 100 aircraft.

constant-energy line Pots taken in steep dive at terminal velocity, when increase in dive angle has no effect on V.

constant-flow oxygen Crew-breathing system in which gox is fed at steady rate, in contrast to demand-type supply.

constant-g entry RV uses aerodynamic lift in skip trajectory to impose constant total acceleration down to relatively low velocity.

constant-heading square Helicopter pilot training manoeuvre: large square described at low level with helicopter constantly facing into wind (so one leg forwards, one backwards and two sideways).

constant-incidence cruise Transport aircraft flight plan calculated on basis of constant angle of attack over major portion, angle being chosen for best L/D or other optimised point between time and fuel consumption.

constant-level balloon Designed to float at constant pressure level.

constant of gravitation See gravitational constant.

constant-pressure chart Plot of contours showing height above MSL of selected isobaric surfaces.

constant-speed drive CSID, infinitely-variable-ratio gear between two rotating systems, esp. variable speed aircraft engine and constant-frequency alternator; output maintained invariant despite variation in input speed and output torque.

constant-speed propeller, c/s propeller Propeller whose control system incorporates governor and feedback which automatically adjusts pitch to maintain selected rpm.

constant speed unit CSU, engine-driven governor controlling c/s propeller, maintaining rotational speed by varying pitch according to airspeed and engine power.

constant torque on takeoff Turboprop electronic unit which modifies DECU voltage according to pilot’s torque command.

constant-volume combustion Super-rapid burning of stoichiometric mixture [i.e. detonation] in one or more aft-facing tubes. Also called pulse detonation, Humphrey cycle.

constant wind 1 W/V assumed for navigational purposes, until updated or refined.

2 Used in contradistinction to gust (2).

constellation 1 Traditional conspicuous group of fixed stars having supposed resemblance to Earth object.

2 Arbitrary portion of celestial sphere containing a * (1) bounded by straight lines, whole sphere being thus divided for use as reference index.

constituent day Period of Earth rotation with respect to hypothetical fixed star.

constrictor 1 Obstruction in pipe or other fluid flow constraint pierced by small hole giving precisely known mass flow per unit pressure difference.

2 Annular or distributed constriction in nozzle of air-breathing jet engine, esp. ramjet or pulsejet.

consumables Materials aboard spacecraft which must undergo once-only irreversible change during mission, eg propellants, foods (in present state of art) and some other chemicals such as in SPS.

consumables update Regular housekeeping chore, reporting to Earth mission control exact quantities (usually masses) remaining.

Consula Method of making boat, later marine-aircraft, hulls from mahogany ply sewn with copper wire (S.E. Saunders, 1898–).

cont Continuous, continuously, continued or continue.

contact 1 Visual link between pilot (rarely, other aircrew) and ground or other external body. Thus, in * = seen, * flying = by reference to ground.

2 Unambiguous radar link (radar *).

3 Single positive mechanical hook-up between FR tanker and receiver aircraft (dry * if no fuel to be transferred).

4 Shouted by pilot of simple aircraft to person swinging propeller of piston engine, indicating ignition about to be switched on.

5 Unidentified target appearing on radar or other surveillance system (rarely, seen visually).

contact altimeter See contacting altimeter.

contact approach Visual approach to airfield requested by, and granted to, pilot making IFR flight.

contact-burst preclusion Nuclear-weapon fuzing system which, in the event of failure of desired air burst, prohibits unwanted surface burst.

car Lent-run, usually AFV, housing local tactical air controller and army liaison officer, plus multiservice radio (1943–).

contact flying Aircraft attitude and navigation controlled by pilot looking at Earth’s surface. (Certain authorities, questionably, include clouds as source of visual cues.)

contact height That at which runway is first glimpsed during landing approach.

contacting altimeter Makes or breaks electrical circuit (eg warning or radio transmission) at chosen reading(s).

contact ion engine Space thruster stripping electrons from caesium or other supply material infiltrated in substrate (eg tungsten). Bombardment ion engine more common.

Contact Judy AAM firing mode: target is within correct parameters.

contact lights White lights on either side of runway in use, parallel to centreline (obsolescent, see runway edge lights).

contact lost Situation in which contact (5) can no longer be seen, though target believed still present.

contactor Electric switch having remote (usually electromagnetic) control.

contact car Front-line vehicle, usually AFV, housing local tactical air controller and army liaison officer, plus multiservice radio.

contact patrol Patrol beyond front line with intention of encounter hostile a/c (WW1).

contact point In CAS (3), geographical or time point at which leader established R/T contact with FAC or ground ATC.

contact print Photograph made from negative or diapositive in contact with sensitised material: optical, radar or IR.

contact race Competitors are required to land at several intermediate points where their logbooks are signed by a marshal.

contact ratio The number of points or lines at which intermeshing gear teeth touch each other.

contagious failure One likely to transmit to an adjacent item.

container 1 Standard rigid box for baggage or cargo: maindeck *, ISO 96 in × 96 in × 10, 20, 30 or 40 ft; SAE 10, 96 in × 96 in × 25 in; SAE 20, 96 in × 96 in × 238.5 in;
container delivery

underfloor *, IATA A1 (LD3) 92 in × 60.4 in × 64 in; A2 (LD1) 79 in × 60.4 in × 64 in.

* Standard ASR package dropped to aircrew in dinghy.

container delivery Standard military airdrop supply of from one to 16 bundles of 1,000 kg (2,200 lb) each.

containment Demonstrated ability to retain every part within machine, following mechanical breakup of portion or whole of moving machinery. Applies particularly to gas-turbine engines, certification of which usually prohibits ejection of fragments even through inlet or nozzle.

containment casing Specially designed ring structure surrounding a fan or other rotating part.

contaminate Aerospace meanings include transfer of terrestrial germs and other organisms to spacecraft sterilized for mission, transfer of unwanted atoms to single-crystal (eg semi-conductor) materials, and deposit and/or absorption and/or adsorption of any NBC material on friendly surfaces.

contaminated fuel Fuel containing any unwanted material, including water or ice.

contaminated runway Surface all or partly covered with water, snow, slush, blown sand or foreign objects capable of causing damage.

Contap Consol Technical Advisory Panel.

Conticell Proprietary low-density sandwich structure.

Contap Mobile air-transportable unit

CONTAP Comet-nucleus tour (NASA).

contour Contour 1. * Contours (1, 2).

Contour capability 1 Of mapping radar, ability to display all ground above selected height above MSL or other datum.

CONTINUUM Spectral region in which absorption or emission is continuous, with no discrete lines.

CONTINUOUS-DESIGN APPROACH Especially important at night, philosophy of eliminating stacking and enabling every arrival to avoid power settings for level flight.

CONTINUOUS-ELEMENT SYSTEM Fire-detection system comprising either electrical circuit or gas-filled tube; heating any part sends signal.

CONTINUOUS IGNITION In a gas-turbine engine flying through hazardous conditions [tropical rain or severe hailstorm], continuous operation of the igniter[s].

CONTINUOUS-PATH MACHINING Shaping of workpiece by cutter traversing unbroken path, esp. this form of NC control and machine program.

CONTINUOUS STRIP Film produced by ** photography, using ** camera, in which ** film passes at constant speed, related to speed of aircraft, past slit in optical focal plane.

CONTINUOUS-WAVE, CW, C.W. EM waves repeated without breaks indefinitely, usually with constant amplitude and length (frequency); ie, not pulsed.

CONTINUOUS FLOW See free-molecule flow.

Contour Comet-nucleus tour (NASA).

Contour On topographic map or chart, line joining all points of equal surface elevation above datum (eg MSL).

CONTOUR Operative cloud echo that has black centre showing region of greatest precipitation (and assumed greatest gust severity). With colour radar each contour has distinctive hue.

CONTROVERSY Normally denotes holding constant small height AGL, ie not following contours (1) but terrain profile (see NOE).

contour interval Difference in height between adjacent contours (1, 2).

contour template Hard copy of profile of 2-D or 3-D shape, eg for tunnel throat, press tool, form block.

contractor definition phase Important process in procurement linking end of feasibility study and other conceptual phases with full hardware development, CFP involves collaboration with one or more industrial contractors and can involve detailed computer study and hardware test to establish what is to be bought and on what terms.

contracting state Sovereign country party to an international agreement.

contraction Duct of diminishing cross-section through which fluid is flowing; eg front part of venturi.

contraction ratio 1 In subsonic tunnel, ratio of maximum cross-section to that at working section.

in supersonic tunnel, ratio of maximum cross-section to that at working section.

contractor-furnished equipment, CFE

Continuous-flow system See constant-flow oxygen.

continuous half rolls Display/competition manoeuvre in which numerous half rolls are made, marking being on accuracy of intermediate wings-level positions, which are held very briefly.

continuous ignition In a gas-turbine engine flying through hazardous conditions [tropical rain or severe hailstorm], continuous operation of the igniter[s].

continuous-path machining Shaping of workpiece by cutter traversing unbroken path, esp. this form of NC control and machine program.

continuous strip Film produced by ** photography, using ** camera, in which ** film passes at constant speed, related to speed of aircraft, past slit in optical focal plane.

continuous-wave, CW, C.W. EM waves repeated without breaks indefinitely, usually with constant amplitude and length (frequency); ie, not pulsed.

continuum Spectral region in which absorption or emission is continuous, with no discrete lines.

CONTINUOUS FLOW See free-molecule flow.

Contour Comet-nucleus tour (NASA).

Contour On topographic map or chart, line joining all points of equal surface elevation above datum (eg MSL).

2 On * chart, line joining all points of equal elevation (height above or below datum, eg MSL, and above or below ground or sea surface) of selected pressure surfaces. Thus can plot * of 1,000 mb surface at -120 ft, MSL and +120 ft.

3 On weather radar, area blanked out in centre of display of storm cell, or whenever return level exceeds given threshold.

Contour capability 1 Of mapping radar, ability to display all ground above selected height above MSL or other datum.

2 Of weather radar, ability to make contour display.

Contour display Radar display in which all echoes above given strength are cancelled. Normally used in viewing storm clouds. With contour operative cloud echo has black centre showing region of greatest precipitation (and assumed greatest gust severity). With colour radar each contour has distinctive hue.

contour flying Normally denotes holding constant small height AGL, ie not following contours (1) but terrain profile (see NOE).

CONTOUR Operative cloud echo that has black centre showing region of greatest precipitation (and assumed greatest gust severity). With colour radar each contour has distinctive hue.

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Contracting State Sovereign country party to an international agreement.

contraction Duct of diminishing cross-section through which fluid is flowing; eg front part of venturi.

contraction ratio 1 In subsonic tunnel, ratio of maximum cross-section to that at working section.

2 In supersonic tunnel, ratio of cross-sectional area just ahead of contraction to that at throat (can be variable).

contractor-furnished equipment, CFE Hardware, software or, rarely, specialist knowledge or experience,
contractor-furnished weight, CF weight

supplied by contractor to support programme; esp. items
normally GFE, bought-out or supplied from other
source.

contractor-furnished weight, CF weight Total mass of
aircraft in precise state in which ownership is transferred
to customer.

contract oversight Ongoing monitoring of contracts,
with particular attention to finance and national security
(DoD). Does not mean to fail to notice an irregularity.

Contrafan Registered name for studies of advanced
direct-drive shrouded propeller engines in Mach 0.9 class
(Rolls-Royce).

contra-flow engine Loosely, any engine involving fluid
flow in opposite directions; specif., gas turbine having
compressor and turbine back-to-back, with flows
(1) axially towards each other and radially out together,
(2) radially out from compressor and radially in through
turbine, or (3) forward through compressor and back
through ducts to turbine.

contra-injection Upstream injection of fuel droplets into
airflow or of one liquid rocket propellant against another.

contra-orbit defence Supposed technique of defending
area by launching missile along predicted trajectory or
orbit of hostile weapon.

contra-rotating Two or more propellers rotating at
equal speed in opposite directions on common shaft axis,
and sharing common drive.

2 Installation of similar tandem piston engine/propeller
combinations back-to-back on opposite ends of common
nacelle. (Not to be used for propellers rotating in oppo-
site directions but not on common axis. See counter-rotating, handed.)

2 Of any rotating assembly, turning in opposite direc-
tions, possibly at different speeds.

contrast Difference in luminous intensity between
different parts of picture (photograph, radar display,
synthetic display or TV).

control 1 Exercise of civil or military authority, eg over
air traffic.

2 In hardware system, device governing system
operation.

3 In man/machine system, device through which
human command is transmitted across interface.

4 In photogrammetry, points of known position and
elevation.

5 In research experiment, unmodified test subject used
as yardstick.

control airport See tower airport.

c control and reporting centre Subordinate air-control
element of tactical air-control centre from which radar
control and warning operations are conducted within its
area of responsibility (USAF, NATO etc).

control and reporting system Organisation set up for (1)
early warning, tracking and identification of all air
and sea traffic, and (2) control of all active air defence.

control anticipation parameter In a sudden large nose-up
command, ratio of initial to steady-state normal accelera-
tion [in simple manual aircraft].

control area Controlled airspace extending upwards
from specified height (ICAO prefers 'limits') above Earth
(NATO adds 'without upper limit unless specified').

c control augmentation system See command aug-
mentation.

c control bar Main pilot's input to hang glider.

c control cable Physical connection between human
control (3) and operating system, esp. between pilot's
flying controls and control surfaces.

control car Housing pilot or coxswain of airship.

control centre See launch **.

control column Aerodyne trajectory control (flight
control input) normally exercising authority in pitch and
roll. May be stick, wheel, miniature sidestick or spectacles
(see yoke).

control-configured vehicle See CCV.

contrôle auto généralisée Voice + computer (F).

c control feel See feel.

c control-force gradient Increase in hinge moment with
indicated airspeed.

control jet See reaction control jet.

c controllable-pitch propeller Capable of having blade
pitch manually altered in flight, either to set positions or
over infinite range (but not c/s).

controlled rocket Having rate of combustion of liquid,
solid or hybrid propellants capable of being varied at will
during burn.

c controlled twist Helicopter rotor blade capable of
changing angle of incidence in predetermined manner
from root to tip in course of flight.

controlled aerodrome One at which ATC service is
supplied to aerodrome traffic (does not imply existence of
control zone).

controlled airspace Airspace of defined dimensions
within which ATC service is provided (ICAO adds 'to
controlled flights'). Can be IFR only, IFR/VFR or visual
exempted [no control provided].

controlled attack Bombing target with Master Bomber
in attendance (RAF WW2).

controlled-emissivity material Substrate or surface
coating designed to reduce IR signature.

controlled environment One in which such variables as
temperature, pressure, atmospheric composition, ionising
radiation and humidity are maintained at levels suitable
for life or hardware.

controlled flight Provided with ATC service.

controlled flight into terrain Unexpectedly encountering
terra firma (land or water, but usually hills or mountains),
the No 1 killer in commercial aviation. The flight need not
be controlled (see previous); definition means PIC has not
lost control.

controlled interception One in which interceptors are
under positive control (from ground, ship or AWACS).

controlled Leakage Environment for life or hardware in
which harmful products (eg carbon dioxide) are allowed
to leak away and be replaced by fresh oxygen or other
material.

controlled mosaic One in which distances and directions
are accurate.

controlled response Chosen from range of options as
being that giving best all-round result.

controlled torque tightening Use of special adjustable
tool to tighten bolts/nuts etc according to material, diam-
eter, plating and lubricant.

control line 1 Connection between operator and **
aircraft.
control-line aircraft

2 Connection between control car of airship and controlled item.

control-line aircraft Model aircraft whose trajectory is controlled by varying tensions or signals in two or more filaments linking it with ground operator.

control lock Physical lock preventing movement of control surface, either built into aircraft or brought to it and fastened in place.

control-motion noise Sufficient to cause small surface movement in coupled ILS, but not affecting trajectory.

control panel Self-contained group of controls, indicators, test connections and other devices serving whole or portion of aircraft system, either accessible in flight or only during ground maintenance.

control pattern In SSR/IFF, governs reply code for each mode selected.

control plane CP, in a helicopter, the plane commanded by cyclic pitch, also called the swashplate plane.

control point Fixed position, marked by geographic feature, electronic device, buoy, aircraft or other object, used as designated aid to navigation or traffic control (NATO, USAF).

control reversal In aircraft flight control system, dangerous state in which pilot demand causes response in opposite sense. Normally caused by either mechanical malfunction (eg crossed controls) or aerelastic distortion of airframe.

control rocket Usually small and intermittently fired thruster for changing spacecraft attitude and refining velocity.

controls As *the *, primary flight control input devices, esp. in aerodyne; typically stick and rudder pedals.

control sector Defined block of airspace within which one controller, or group of controllers, has authority [normally feature of civil ATC].

control stick Control column (colloq.).

control-stick steering Control of aircraft trajectory by input to AFCS by means of primary flight controls. Not same as * -wheel *.

control surface Aerofoil or part thereof hinged near extremities of airframe so that, when deflected from streamwise neutral position, imparts force tending to change aircraft attitude and thus trajectory.

control surface angle Measured between reference datum on control surface and chord of fixed surface or aircraft longitudinal axis.

control system In missile, RPV or aircraft flying on AFCS, serves to maintain attitude stability and correct deflections (NATO, USAF). Also, not included in this definition, translates guidance demands into changes in trajectory.

control tower ATC organization, normally located on tower or near airfield, providing ATC service for airfield traffic and possibly within other airspace.

control vane Refractory surface, usually small, pivoted in jet of rocket or other propulsion system to control attitude, and hence trajectory, of vehicle when deflected from neutral setting.

control warfare Information warfare.

control-wheel steering Autopilot mode giving manual control of heading while holding velocity and/or attitude.

control zone Controlled airspace extending upwards from Earth’s surface (NATO, USAF). SEATO has long and involved definition including ‘and including one or more airdromes’ (sic). ICAO adds ‘to a specified upper limit’. Conus Continental US, ie US and its territorial waters between Mexico and Canada plus Alaska, but excluding overseas states.

Conv Convergent, convergence.

convection 1 In fluid dynamics, transfer of fluid property by virtue of gross fluid motion.

2 In atmosphere, transfer of properties by vertical motion, normally thermally induced.

convection cooling Method of cooling hot hardware, esp. gas turbine rotor blades, by removing heat from within bulk of material by flow of cooler air passing through system of holes or passages (see film cooling, tran-spiration cooling).

convective cloud Cumuliform, CuF, triggered by convection; normal vertical development fair-weather cumulus; extreme form is cumulonimbus. Bottom lies at condensation level; top can be in stratosphere.

Convective Sigmet Issued for convective weather posing potential danger.

convenience bag Sick bag [despite name, not for urine, though some are marketed for both purposes].

conventional Not nuclear, ie HE.

conventional enhancement Modifies B-52H for electrical and software interfaces for future weapons, using MIL-STD-1760.

conventional stores Free-fall HE devices.

conventional take-off and landing, CTOL Aeroplanes other than STOL, VTOL and other short-field forms.

convergence 1 Condition in which, at least reckoned on surface winds, there is net inflow of air into region. 2 Of mathematical series, one having a limit. 3 Of vector field, contraction. 4 Of terrestrial meridians, angular difference between adjacent pair at particular position.

convergence factor Ratio of convergence (4) and change of latitude (zero at Equator, max. at poles).

convergent Of oscillation – eg sinusoidal motion, phugoid or structural vibration – tending to die out to zero within finite (possibly small) number of cycles.

convergent/divergent See con-di nozzle.

converging flight rule Aircraft approaching from right has right of way.

conversion angle That between great-circle and rhumb-line bearings.

Convertible Fighter-type aircraft missing canopy / canopies, for whatever reason (US colloq.).

convertible aircraft 1 Transport aircraft designed for rapid conversion from passenger to all-cargo configuration or vice versa. 2 Aircraft which can change its configuration [eg. from rotor to fixed wing] in flight.

convertible brake Able to make quick change anywhere between carbon/compo/steel.

convertible engine One capable of giving either fan thrust or shaft power.

convertible laser designation pod Any ‘convertible’ pod usually offers a choice of LIR or TV.

converticar One term for a roadable VTOL.

convertiplane Aerodyne capable of flight in at least two distinct modes, eg vertical flight supported by lifting rotor and forward translational flight supported by wing.

conveter Among many other meanings;
**Conv1**  
/ Rotary machine for changing alternating into direct current.  
2 Self-regulating boiler for drawing on Lox storage and supplying flow of Gox.

**Conv2**  
1 Convolution Conventional.  
**convo** Convolution response algorithm.  
**COO** 1 Chief operating officer of company or corporation.  
2 Cost of ownership.

**cookie**  
HIC bomb 4,000 lb or over (RAF colloq.).

**cook-off**  
Inadvertent firing of automatic weapon due to round being detonated by residual heat in breech.

**Coolant**  
Inert liquid of high heat capacity used as a thermal transport medium.

**cooldown**  
Liquid circulated through closed circuit to remove excess heat, eg from piston engine.

**cooled cooling air**  
Use of a fuel/air heat exchanger to cool [hot] compressor-bleed air used to cool the turbine and nozzle, permitting higher TGT.

**cooling drag**  
That due to need to dump excess heat to atmosphere (with skill can be made negative).

**cooling effectiveness**  
Expressed as $\frac{T_{\text{gas}} - T_{\text{metal}}}{T_{\text{gas}} - T_{\text{coolant}}}$.

**cooling gills**  
Hinged flaps forming partial or complete ring around rear edge of cowling of air-cooled piston engine to control airflow.

**co-operative aircraft**  
In ATC, one carrying transponder for SSR.

**co-operative emitter**  
Any friendly emitter, esp. those provided for surveillance and tracking of hostile targets.

**Co-operative Fuel Research**  
Permanent committee of SAE including fuel and engine representatives with special brief to measure and improve anti-knock ratings.

**co-operative independent surveillance**  
Monitoring aircraft position, beyond radar range, by satellite tracking; co-operative because aircraft emits a signal, and independent because aircraft’s navaids are not used.

**Cooper-Harper**  
Refined scale of flying qualities, broad bands being: up to 3.5 satisfactory, 3.5–6.5 adequate, improvement warranted, over 6.5 inadequate, improve further.

**core-failure clutch**  
Unauthorised R/T word meaning “received and understood”.

**co-pilot**  
Licensed pilot serving in any piloting capacity other than (1) PIC or (2) being on board solely to receive instruction.

**Copper Flag**  
Air-defence equivalent of Red Flag, held at Tyndall AFB (USA).

**COPR**  
Cruise overall performance specification.

**copy machining**  
Using machine tool having means for copying shape of template or master part.

**copy milling**  
See copy machining.

**COR, cor**  
1 Correct, corrected, correction.  
2 Certificate of Registration.

**Coral**  
British computer language very similar to Jovial.

**cord**  
US measure of volume, = 3.6246 m$^3$.

**cord, cored**  
From pioneer era rigging of flight-control surfaces was adjusted by doping on length [guessed from experience] of cord. Even today trim can be improved by cord on one side of trailing edge, and overbalance by adding cord on both sides.

**cordite**  
Gun propellant prepared mainly from nitrocellulose (gun-cotton) dissolved in nitroglycerine.

**Cords**  
1 Coherent on-receive Doppler system  
2 Centre for Orbital and Re-entry Debris Studies (US).

**Cordex**  
Blasting or cutting cord comprising high explosive in flexible filament form.

**Cordwood**  
Electronic technology (1948–55) designed to achieve maximum packing density of discrete components in pre-semiconductor era.

**CORE, Core**  
Controlled requirements expression, discipline which defines software design (BAC).

**core**  
1 Gas-generator portion of turbofan, term especially when *small in relation to fan; less relevant to bypass or ‘leaky turbojet’ engines.

2 Central part of launch vehicle boosted by lateral or wrap-round rockets.

3 Low-density stabilizing filling inside honeycomb, foam-filled or other two-component structure.

4 High-density penetrative filling in armour-piercing projectile.

5 Magnetic circuit of transformer or inductor.

6 Central portion of nuclear reactor in which reaction occurs.

7 Solid shape(s) which make casting hollow.

8 Loosely, EDP (1) memory of magnetic type, from * (5).

9 Interior of carburised or nitrided part unaffected by surface treatment.

**core booster**  
Booster 3.

**core deposits**  
Solids deposited on metal surfaces of core (1).

**core exhaust mixer**  
In engine of ejector-lift STOVL, core nozzle capable of inflight limited vectoring and, in jet-lift mode, of deflecting at least 90° while entraining fresh air from above.

**core-failure clutch**  
Upon major mechanical failure of
corel

corel (1), disconnects drive to tilting rotors (rarely, to helicopter transmission).
corel Combined omnidirectional runway/taxiway edge lighting.
coring Uneven flow of oil through oil cooler due to reduced viscosity of oil in hot central core.
coriolis acceleration Acceleration of particle moving in co-ordinate system which is itself accelerating, eg by rotating. In Earth-referenced motion, ** is experienced in all motion parallel to local surface except for that on Equator.
coriolis correction Applied to all celestially derived fixes to allow for coriolis acceleration.
coriolis effect 1 Physiological response (eg vertigo, nausea) felt by persons moving inside rotating container (eg space station with rotation-induced gravity) in any direction other than parallel to axis.

coriolis force Apparent inertial force acting on body moving with radial velocity within a rotating reference system. Such a force is necessary if Newtonian mechanics are to be applicable. On Earth, ** acts perpendicular to direction of travel, towards right in N hemisphere and towards left in S hemisphere. Also called deflecting force, compound centrifugal force, geostrophic force.
coriolis parameter Twice component of Earth’s angular velocity about local vertical, ie twice Earth rate multiplied by sin lat.
coriolis rate sensor Instrument based on beam vibrating in plane of aircraft-referenced vertical, sensing any disturbance about longitudinal axis.
corkscrew Evasive manoeuvre, esp. when subjected to stern attack by fighter; interpretation variable but * axis basically horizontal.
Cortiss valve Fluid-system throttle in form of a section of pipe rotating on diametral axis. [not to be confused with steam-engine * gear].
corenco Descriptive generic name for multi-row radial or multi-bank in-line piston engine (colloq.).
corner point Instantaneous change in slope of graph; eg kink in payload/range curve, esp. limiting range for max payload.
corner reflector Passive device for giving strong radar echo, based on three mutually perpendicular metal plates or screens which automatically send back radiation directly towards source.
corner speed Lowest airspeed at which a fighter can pull structure- or aerodynamic-limiting g.
Corogard Vinyl-modified polysulphide paint resistant to hydraulic fluid, usually silver from added aluminium powder.
Corona Radio countermeasure: issuing misleading voice commands to enemy fighters (RAF Bomber Command WW2).
corona discharge Electric discharge occurring when potential gradient around conductor is sufficient to ionise surrounding gas. Unlike point discharge, can be luminous and audible, but unlike spark discharge there are an infinity of transmission paths carrying continuous current. Also called brush discharge, St Elmo’s fire (see static wick).
corrugated strip co-rotating wheels Landing-gear wheels on live axle and thus constrained to rotate together.
Co-Route Company route.
CoRSP Common radar processor, partner to MoRE.
corpuscular cosmic rays Cosmic rays are primary particles (protons, alpha particles and heavier nuclei) which react with Earth atmosphere to yield particles and EM radiation. Term corpuscular is redundant.
CORR Corridor.
corrected advisory Resolution advisory that instructs pilot to change vertical speed [ROC], [TCAS].
corrected airspeed No defined meaning [see airspeed, SSEC].
corrected altitude No defined meaning, other than "true height above SL." (see altimeter errors).
corrected gyro Normally taken to be one corrected (by latitude nut) for apparent wander due to Earth rotation.
correction Many, such as SSEC.
corrective advisory Resolution advisory commanding changes in ROC, vertical speed.
correlation Confirmation that aircraft or other target seen visually or on radar display or plotting table is same as that on which information is being received from other source(s).
correlation criterion Statistical basis for defruiting or decoding raw IFF, typically on ** of 2/7, ie 2 valid synchronous replies detected within any 7 successive interrogations.
correlation factor In nuclear warfare, ratio of ground dose-rate reading taken at approximately same time as one at survey height over same point.
correlation protection Development by RAE with industry of method of avoiding false ILS indications caused by spurious signals reflected from large objects near runway; localizer and glide-path aerials duplicated (respectively horizontally and vertically) and emit signals which, if not received almost simultaneously at aircraft, are suppressed.
corridor 1 Geographically determinate path through atmosphere, typically curved-axis cone with apex at surface, along which space vehicle must pass after launch.
2 Path through atmosphere, geographically determinate for given entry point, along which space vehicle must pass during re-entry; has precisely defined upper and lower limits, above which vehicle will skip back into space and below which it will suffer severe deceleration and risk injuring occupants or burnup through heating.
3 Assumed safe track in LO penetration of hostile territory.
4 Path through atmosphere, usually at low level, along which defences are assumed handicapped by prior seeding with chaff and decoys.
5 Region of any shape on graph within which solution to problem is possible.
6 In Europe pre-1960, nominated tracks along which aircraft were permitted to cross a frontier...
corrosion A normally used word, but see exfoliation.
corrugated mixer Turbofan core nozzle of deep multi-lobe form to promote rapid mixing with fan airflow.
corrugated skin Stabilized against local bending by uniform rolled corrugations which, when used as external skin of aircraft, are aligned fore and aft (incorrectly assumed parallel to local airflow).
corrugated strip Interposed between welded sections of
corruption
gas-turbine flame tube, admits film of cooling air; colloq. wiggl-ly-strip.
corruption Degradation of EDP (1) memory, typically from severe EM interference or, with volatile memory, from switching off power.
CORS Continuously operating reference station (NGS).
Corsaire Co-ordination of research for the study of aircraft impact on the environment (EU).
CORS 1 Corporation for open systems, software improvement concept.
  2 Common operating system.
CoS Chief of Staff.
Cosac Computing system[s] for air cargo.
Coscap, COSCAPH A grouping being formed (from 2005) by 90+ members to oversee safety and implement international standards and procedures. By 2005 ACSA, PASO, *SA [south Asia], *SEA [south-east Asia] and *NA [north Asia] were functioning, and seven more groups had been established (ICAO).
Cosim Variometer (colloq., obs.).
Coslane Constant [lateral] separation lane.
Coslettising Anti-corrosion treatment involving a wet deposition of Zn.
cosmetic RFP Issued for sake of appearance, contract award being already decided.
cosmic speeds Those sufficiently high for interstellar exploration, similar to that of light; even allowing for relativistic time effects these are wholly unattainable at present.
cosmodrome Space launching site (USSR).
cosmology Science of the Universe.
cosmonaut Member of spacecraft crew (USSR, R).
cosmonautics See astronautics.
Cospar Committee on Space Research [office, F-75016 Paris] (Int.).
Cospas Anglicised form of space system for search for distressed vessels [e.g., downed aircraft], in conjunction with Sarsat (R).
Cosro Conical scan, receive only, i.e. only during reception.
Cossi Commercial Operations and support savings initiative.
Cost European Co-operation in the field of Scientific and Technical Research [established by EU November 1971] (Int.).
  In procurement main elements may include R&D, T&E, flyaway, spares provisioning, ground equipment, base, crew and publications. Operating adds fuel and other consumables, depreciation and various indirect *.
  costa Rib, translated in aviation not as wing rib but as fuselage frame.
costal Pertaining to frames or ribs; hence intercostal.
Costar Correcting optics space telescope axial replacement (Hubble).
cost/economical Cruise conditions for minimum trip cost.
cost-effectiveness Measure of desirability of product, esp. a weapon system, in which single quantified figure for capability (including reliability, survivability and other factors) is divided by various costs (total ownership, acquisition et cetera).
cost plus fixed fee Reward invariant with actual costs but fee may be renegotiated.
countermeasures
cost plus incentive fee Reward covers actual costs plus a fee which depends on contractor performance and possibly costs.
cost-sharing No fee, contractor merely reimbursed agreed percentage of costs.
cot Cot Compressor outlet temperature.
  2 At the coast.
  3 Centre of twist.
cotal Confederación de Organizaciones Turísticas de la America Latina (Int.).
CoTAM Commandement du Transport Aérienne Militaire (F).
Cotim Compact thermal-imaging module.
COTP Connection-oriented transport protocol.
COTS, Cots 1 Commercial off-the-shelf [item already available, esp. for military a/c].
  2 Cabin off-flake system.
  3 Commercial orbital transportation system (NASA).
cottage loaf Fuselage with smaller-section upper deck and unfaired sides [almost figure 8].
cotter pin 1 Wedge-shaped pin used in joining parts, or transmitting rotation.
  2 In US, often split pin.
  3 At the coast.
CO2 Carbon dioxide.
Cougair Co-operative unmanned ground-attack robot (USA).
  2 Counter-UAV GBAD additional module requirement.
coulomb SI unit for quantity of electricity or electric charge, = 1 As, symbol C.
coulomb damping That due to opposing force independent of distance or velocity; also called dry friction damping.
coulomb excitation Raising of energy level as a result of charged particle passing outside range of nuclear interactions.
coulomb’s law Force between two magnetic or electric charges is proportional to product of charges and inversely to square of distance apart: \[ F = \frac{Q_1 Q_2}{4\pi\varepsilon_0 r^2} . \]
countdown Oral telling-off of time, usually at first in minutes, then in seconds, remaining before launch of vehicle or other event.
counter 1 Portion of ship hull from stern overhanging water; thus applicable to undersurface of rear fuselage above and behind jet nozzles or other lower section.
  2 Electronic circuit which counts bits, impulses, waves or other repeated signals.
counter air Defensive and offensive actions against enemy air power.
counterfeit part An unapproved part knowingly installed.
counterforce Attack directed against enemy ICBMs and SLBMs or other strategic forces.
counter-illumination Challenging LO technology in which appearance of an object is changed or [in theory] eliminated by nullifying incident illumination; also called active visual camouflage.
counter-insurgent, Coin Directed against supposed primitive guerrilla forces.
countermeasures All techniques intended to confuse or mislead hostile sensors such as radar, IR, visual, TV or noise.
counter-pointer

counter-pointer Dial indication comprising rotating pointer(s) and counter readout in same instrument.
counter readout Numerical display generated by numerals on adjacent rotating drums, also called veeder.
counter-reflector Metal mesh or other radio reflector arranged in pattern under VOR or other ground station to nullify interference and give radiation as from perfect level-surface site.
counter-rotating Left and right devices rotate in opposite directions, on different axes.
countersink To form or cut conical depression in workpiece to receive rivet or bolt head flush with surface.
countersilence All active or passive measures to prevent hostile surveillance.
countertrade Trade in reverse direction generated to assist high-tech (eg defence) exports by an industrialised country; in no sense barter.
countertrade A device to receive and transmit information from and to friendly aircraft.
countertop Tellie, a visual device used by controllers in tower.
countertime Usually a time counter for aircraft to manage their flight plans.
countersurveillance All active or passive measures to prevent hostile surveillance.
countertime To prevent or stop hostile surveillance.
countertop Tellie, a visual device used by controllers in tower.
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C/P
15 Control panel.
16 Conflict probe.
C/P Cadet Pilot (RAF).
C\(_r\) Helicopter rotor power coefficient.
C\(_p\) 1 Pressure coefficient.
2 Specific heat at constant pressure.
3 Propeller power coefficient.
Cp\(_p\) 1 Centipoise.
2 Continental polar air mass.
cp Candlepower.
C\(_p\) 1 Critical-path analysis (see critical path).
2 Continuous patrol aircraft.
3 Closest point of approach.
4 Cabin public address.
5 Certified public accountant.
6 Civilian Production Administration (succeeded WPB, US).
C/PA Cost/performance analysis.
CPACS Coded-pulse anti-clutter system.
CPAM 2 Committee of Purchasers of Aviation Materials (Int.).
2 Cabin-pressure acquisition module.
CPC 1 Cabin-pressure controller; S adds system.
2 Cursor-position control.
3 Controller/pilot communication[s].
C\(_p\) 1 Helicopter climb power coefficient.
CPCI Computer program-configuration item.
CPCP Corrosion prevention and control programme.
CPCS Cabin-pressure control system.
CPD 1 Command planning and direction (GTACS).
2 Continuing, or continuous, professional development.
3 Cabin-pressure detector.
CPDA Continuing professional development in aerospace (BWEC).
CPDL Controller/pilot data link [C adds communications].
CPE 1 Central Photographic Establishment (RAF).
2 Circular position error.
CPEF 1 Complete power failure.
2 Central processing facilities.
CPFF Cost plus fixed fee.
CPG 1 Co-pilot/gunner.
CPGS Cassette-preparation ground station.
CPI 1 Cost plus incentive (F adds ‘fee’).
2 Chief pilot instructor.
3 Crash position indicator.
C\(_p\) 1 Helicopter power coefficient.
CPITF Cockpit procedures and instrument flight trainer (Pacer Systems).
CPILS Correlation-protected ILS.
CPION Core processing, or common processor, input/output module.
cP Continental polar, colder than surface.
CPL 1 Commercial pilot’s licence.
2 Current flight plan message (ICAO).
CPL/A Commercial pilot’s licence, aeroplanes.
CPL/H Commercial pilot’s licence, helicopter.
CPL/JR Commercial pilot’s licence, instrument rating.
CPL/SEL Commercial pilot’s licence, single-engine limitation.

C\(_p\) 1 Capacity passenger-miles.
2 Critical-path method.
3 Core [or control, or common, or central] processor [or processing] module.
4 Certification program manager.
5 Command-post modem; P adds processor.
6 Cabin pressure-altitude monitoring and warning system.
7 Channel-plate multiplexer.

CPMIEC China Precision Machinery Import and Export Corporation, Beijing.
CPO Close parallel operation.
CPP 1 Cost per passenger.
2 Critical parts plan (ECPP).
3 Crossfeed phasing parameter [µ is preferred].
C\(_p\) 1 Helicopter parasitic power coefficient.
CPPC Cost plus percentage of cost.
CPR 1 Coherent-pulse radar.
2 Crack-propagation rate.
3 Contract (or contractor, or cost) performance report.
4 Covert penetration radar.
CPRSR Compressor.
CPRMT Cents per revenue ton-mile.
CPS Central processing system (or site).
2 Cabin-pressure sensor.
3 Controller/pilot communication[s].
4 Characters per second (also cps).
5 Control power supply.
6 Conventionally[ly] profiled sortie.
cps Cycles per second (Hz is preferred).
CPSA Conseil Permanent de la Sécurité Aérienne [Paris F-75015] (F).
CPT 1 Cockpit procedure[s] trainer.
2 Central passenger terminal complex.
3 Civilian pilot training program (US, 1939–46).
4 Clearance, pre-taxi.
5 Combined processor/totaliser [fuel system].
CPIA Civilian Pilot Training Act (1939).
CPTP CPT Program (US 1939–42), became WTS.
CPTR Command-post terminal replacement.
CPL 1 Contractor payment unit.
2 Central [or communications] processing unit.
3 Control-panel unit; -F adds front, -S side.
cPw Continental polar, warmer than surface.
CPX Command-post exercise.
C\(_p\) 1 Helicopter profile power coefficient.
CQ 1 Carrier (ship) qualification.
2 General message to all stations.
3 Target control (remotely piloted target), USAF 1942–47.
4 Carrier (ship) qualification.
5 Contrast ratio.
6 Contour.
7 Contour.
8 Cost-reimbursable.
9 Credit (aerial victory).
10 Countermeasures receiver.
C/R

11 Close-range.
12 Component repair.
13 Common requirements (ANSP).
14 See next.
C/R 1 Counter-, or contra-, rotating, or rotation, usually refers to handed engines driving single-rotation propellers in opposite directions.
2 Command/response.
3 See CR (9).
Cr 2 Resultant-force coefficient.
Cr 3 Range constant, velocity \( \times \) wt/fuel flow.
Cr 4 Chromium.
Cr 5 Sometimes cr, wing chord at root.
Cr 6 One of the three chromium oxides.
CRA Centro Ricerche Aerospaziali, Rome.
crab 1 To fly with wings level but significant drift due to crosswind.
2 To fly with wings level but significant yaw due to asymmetric thrust.
3 To fly with wings level but significant yaw imparted by rudder to neutralise effect of crosswind.
4 Miniature trolley driven by Link trainer and certain other simulators which reproduces aircraft track on map on instructor’s desk.
crab angle 1 Drift angle.
2 In landing, angle between runway axis and aircraft heading.
3 Angle between fore/aft camera axis and track.
crab list List of snags after flight test (US, WW2).
crab-pot Fabric non-return valve in circular duct in crab-pot.
Cram 1 Counter rocket, artillery and mortar.
C-RAM 1 Counter rockets, artillery and mortars.
CRCACS Cooperative Research Centre for Advanced Composite Structures [Fishermens Bend, Vic.] (Australia).
crack 1 Microscopic rupture in stressed metal part which under repeated loads progressively grows longer, without deformation of structure, until remaining material suddenly breaks.
2 To break down hydrocarbons by cracking. Originally done continuously in giant cat-crackers in refineries, this is becoming a procedure necessary in JP-7-fuelled hypersonic ramjets.
3 Application of heat and usually pressure, sometimes in presence of catalysts, to break down complex hydrocarbons, esp. petroleums, into desired products. Hence cracked spirit.
4 Structural design feature, such as assembly of part from several components with joints perpendicular to expected crack directions, to prevent crack progressing right across.
CRAD, Crad Critical R&D.
CRADA, Crada Co-operative R&D agreement.
CRAF 1 Civil Reserve Air Fleet (US, From 1951).
2 Comet rendezvous/asteroid flyby.
3 Committee on Radio Astronomy Frequencies.
crafted Made (US usage).
Crag, CRAG From Pacer -*, compass, radar, GPS.
C-RAM Counter rockets, artillery and mortars.
Cram Conditional route-availability message.
crane helicopter Designed for local lifting and positioning of heavy or bulky items rather than normal transport; characterised by vestigial fuselage with payload attached externally or slung.
Cranfield Formerly College of Aeronautics, now Cranfield University [Bedfordshire, MK43 0AL] (UK).
crank Apart from familiar meanings, a single rotation of crank handle [human increment], thus full flap may need 12 cranks.
cranked wing Has acute anhedral inboard, dihedral outboard, usually with abrupt change at about 30 per cent semi-span.
cralking 1 Turning engine (any type) by external power.
2 Making a max-rate turn away from the target immediately upon launching an AAM, hence: a crank.
C-Rap Condensed recognized air picture.
crash Unpremeditated termination of mission at any point after start of taxi caused by violent impact with another body, with or without pilot in control, usually causing severe damage to aircraft. Term never used in official language.
crash arch Strong structure above or behind pilot(s) head(s), esp. in open cockpit or small cabin aircraft, able to bear all likely loads in overturning and sliding inverted on ground.
crash barrier See barrier.
crash deflector lever See crash switch.
crash gate Gate in airfield periphery through which crash/fire/rescue teams can most quickly reach nearby crashed aircraft.
crash locator beacon Automatic radio beacon designed to be ejected from crashing aircraft, thereafter to float and survive all predictable impacts, crashing forces or fire while broadcasting coded signal.
crash pan Secondary structure under para-dropped load, esp. vehicle or artillery, which absorbs landing shock by plastic deformation.
crashproof tank Euphemistic, denotes fuel or other tank designed not to rupture, leak or catch fire in all except most severe crash.
crash pylon Structure having same purpose as crash arch.
crash restraint barrier Quickly fitted/removed barrier across the front of a cargo deck.
crash switch Electrical switch triggered by various crash symptoms to shut off fuel, isolate electric batteries, activate fire/explosion suppression, release CLB, etc.
crashworthiness Generally unquantifiable ability of aircraft to crash without severely injuring occupants or preventing their escape. A crashworthy fuel system is designed to remain fuel-tight in a crash.
crate Aerodyne, esp. aeroplane (colloq., derogatory, archaic).
Crater Cosmic-ray telescope for the effects of radia-
tion (NASA).
CRAW Carrier replacement air wing (USN).
CRB 1 Chlorinated rubber-based; P adds paint [airfields].
2 Crash restraint barrier.
CRC 1 Control and Reporting Centre.
2 Carbon-fibre reinforced composite.
3 Communications Research Center (Canada).
4 Central [ised] radio control.
5 Cyclic redundancy check, or code.
6 Cassegrain Ritchey/Cretien.
CRCACS Cooperative Research Centre for Advanced Composite Structures [Fishermens Bend, Vic.] (Australia).
CRES, Cres Corrosion-resistant steel.
crescent wing Has progressive reduction in both t/c CRES, Cres given temperature.
to be proportional to time. normally set at or near point at which elongation ceases
the surface of a solid body.
cresting Ceremonial admission to exclusive group, such as Blue Angels (USN).
crevic corrosion Initiated by presence of crevice in structure in which foreign material may collect; eliminated by modern structural coating and assembly methods.
crew Divided into flight * to fly aircraft, mission * to carry out other duties in flight, cabin * to minister to passengers and, arguably, instructors; all assigned to these duties by appropriate authority.
crew duty time Measured from reporting for duty to completion of all post-flight duties.
crewing 7 Make-up of flight crew by trade or appointment.
  2 Make-up of flight crew by individual rostered names.
crew ratio Number of complete air crews authorised per line aircraft (civil) or per aircraft in unit complement (military).
crew resource management Ever-refined improvement in in-flight [airline] crew behaviour, esp. in flight-deck and cabin communications, esp. in crisis.
crew return vehicle Lifting-body vehicle, with final descent by inflatable wing, to bring ISS crew of six back to Earth.
crew room Room reserved for (usually military) flight crews, some on standby and others relaxing after a mission, where publications are kept and notices promulgated.
crew trainer Aircraft designed to train whole flight crew, esp. of traditional military aircraft requiring several flight-crew trades: pilot/navigator/bombardier/signaller/engineer/gunner.
crfmu Cabin radio-frequency management unit [ensures passenger phones do not cause RF interference].
crg Contingency Response Group (USAF).
crib Shop-floor container for small tools, parts or material other than scrap.
crismss Cross-track IR microwave sounder system.
criss Management of military (war or near-war) situations or of civil crises such as major accidents or natural disasters.
criss Cross-track IR sounder.
crisp CRISP 1 Contra-rotating integrated shrouded propfan.
  2 Computer-reconstructed images from space photographs.
  3 Compact reconfigurable interactive signal processor.
crista Cryogenic infrared spectrometer telescope for the atmosphere.
crit Centre de Recherches Industrielles et Techniques (F).
critical altitude 1 The highest density altitude which a supercharged piston engine can maintain its maximum continuous rated power.
  2 See decision height.
critical angle 1 Angle from local vertical at which radio signals of given frequency do not escape through ionosphere but just return to Earth.
  2 Incorrectly used to mean stalling angle of attack.
critical case That combination of failures (of propulsion, flight controls or systems) giving worst performance (see critical engine).
critical crack One of length.
Critical Design Review Almost self-explanatory, the CDR immediately follows the stage of detailed design of hardware and software, and is the last opportunity to
critical engine
introduce changes without incurring very large costs in item and money. Passing CDR permits the hardware build and software coding that will result in the prototype or other initial product.
critical engine Engine of a multi-engine aircraft, the failure of which is most disadvantageous, due to asymmetric effects, loss of system power or other adverse factors; failure of ** at V1 is basis of takeoff certification in most multi-engine aircraft.
critical frequency That corresponding to natural resonance of blade, control surface or other structure.
critical Mach number \( M_{\text{crit}}; \) Mach number at which most-accelerated flow around a body first becomes locally supersonic; for thin wing might be \( M = 0.9 \) while thick wing may have * below 0.75.
critical line Locus of critical points (when track is not known precisely).
critical mass Mass of fissile material in which chain reaction becomes self-sustaining.
critical part An item whose failure would imperil continuation of safe flight.
critical path That traced through number of tasks proceeding both consecutively and concurrently (as during turn-round of aircraft) that determines minimum total elapsed time.
critical-path technique Minimisation of total elapsed time by concentrating on those elements that form critical path.
critical point That from which two fixed bases, such as departure airfield and destination, are equidistant in time.
critical position That over large city or mountain range at which propulsion failure would be most serious.
critical pressure In fluid flow through nozzle, that final pressure below which no further reduction results in increase in flow from fixed initial pressure; usually rather more than 50% of initial pressure (fixed ratio for any given medium and temperature).
critical pressure coefficient \( C_{\text{pc}}; \) pressure coefficient at critical Mach number, approximately given by Prandtl-Glauert.
critical pressure ratio That at which particular axial compressor suddenly ceases to operate efficiently due to choking, stall or other flow breakdown.
critical speed \( \dot{\theta} \); 2 That rotational speed at which machinery (eg, engine) suffers dangerous resonance or whip of shafting.
critical static pressure That at critical Mach number; symbol \( P_c \).
critical temperature That below which gas or vapour may be liquefied by pressure alone.
critical velocity Speed at which fluid flow becomes sonic, ie locally reaches Mach number of unity; \( V_c \) or \( V_{\text{crr}} = a_n \sqrt{\frac{(Y-1) M_a^2 + 2}{Y-1}} \)
critical point (when track is not known precisely).
critical temperature \( T \), that final temperature below which no further reduction results in increase in flow from fixed initial temperature; usually rather more than 50% of initial temperature (fixed ratio for any given medium and temperature).
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2 Cambridge [Massachusetts] Research Laboratory (USAF).
CRLCN Circulation.
CRM \( \Delta \) Originally cockpit resource management, now crew resource management.
2 Collision-risk model.
\( \Delta \) Customer relationship, or resource, management.
CRN Common random number.
CRNA Centre Régional de la Navigation Aérienne (F).
CRO \( \Delta \) Civilian Repair Organization.
2 Cathode-ray oscilloscope.
\( \Delta \) Community relations officer (RAF).
\( \Delta \) Combat recovery operation(s).
Crocco Luigi Crocco (1932) derived equation:
\[
T = Tw - \left( Tw - Tf \right) \frac{a}}{Uf} + \frac{u(Uf - u)}{2Cp}
\]
where \( T \) is temperature within boundary layer, \( Tw \) temperature of adjacent solid surface, \( Tf \) free-stream temperature, \( u \) local velocity, \( Uf \) free-stream velocity, and \( Cp \) specific heat at constant pressure.
crocodile \( \text{a} \) Control surface, usually aileron, which can split apart into upper and lower halves as airbrake; see decceleron.
2 Covered ganway to protect passengers from slipstream, c 1920–40.
cropped-fan engine Turbofan whose fan has been reduced in diameter to match reduced thrust requirement and permit LP turbine and other parts to be simplified.
cropped surface Wing, tail or other surface whose tip is cut off diagonally at Mach angle appropriate to particular supersonic flight condition.
cropped tip \( \text{c} \) Cropped surface.
cross To pass over a fix under ATC at a specified altitude, or a specified maximum or minimum altitude.
cross-bar System of approach lighting using straight rows of white lights perpendicular to runway centreline. Calvert and some other systems use several bars decreasing in width to threshold while US practice is single white bar followed by red undershoot zone.
cross-beam rotor Helicopter (usually tail) rotor comprising two two-blade assemblies superimposed; usually set at 90° but in AH-64 at 55°/125°.
cross-bleed Pneumatic pipe system connecting all engines so that bleed from one can start, or drive accessories on, any other.
crossbar \( \text{b} \) Code for air attacks on flying-bomb launch sites, 1944.
cross-bracing Use of crossed diagonal wires, cables or struts/ties to achieve a rigid structure.
cross certification To certify an item on the basis of certification by another country.
cross check \( \text{c} \) Brief message from one pilot to another, or another crew member, in same aircraft giving or confirming situation, eg “Inner marker” or “crosscheck, I have the yoke”.
cross-cockpit collimated display Simulator display providing large visual scene on back-projected screen viewed in curved concave mirror, giving correct perspectives with no discontinuities.
cross-country Flight to predetermined destination, where landing may or may not be made, esp. one to gain practice in map-reading and navigation.
cross-crew qualification Training course for mixed-fleet flying.
cross-deck  Operations by two or more aircraft carriers, not necessarily of same navy, in which aircraft operate from unfamiliar decks on exchange basis; hence * ing.

cross-drive  Facility enabling an engine to drive a secondary power item on the other side of the aircraft centreline, e.g. left engine to drive right hydraulic pump.

crossed controls  Application of flight-control movements in opposite sense to those in normal turns or manoeuvres, eg right stick and left rudder; rarely required.

crossed-spring balance  Wind-tunnel balance whose pivots are made up of two or more leaf springs crossing diagonally and giving virtually frictionless flexure through defined axes.

cross-over Transverse slope of runway surface, to ensure sufficiently quick run-off of water to avoid aquaplaning except in particular adverse crosswinds.

cross-feed  Feeding items (eg, engines) on one side of aircraft from supply (eg, fuel) on opposite side; abnormal condition under pilot control.

2 Often crossfeed, use of rudder to minimise sideslip in roll or in sustained very steep turn. See next.

crossfeed phasing parameter  Not quantifiable-value $\mu$ derived from ratios of transfer-function numerators of rudder: sideslip and aileron: sideslip, with profound effect on pilot rating.

cross-flow  Having two fluids flowing past each other at 90° while separated by thin metal walls.

cross-level  Lateral clinometer, instrument formerly used to indicate direction of local vertical as aircraft manoeuvres in rolling plane.

cross-modulation  Unwanted modulation from one carrier being impressed on another in same receiver, usually resulting from inability to filter out certain side-bands.

cross-needle  Instrument display based on two pivoted needles which pilot attempts to keep crossed at 90° in centre of display.

cross-over exhaust  Gas from inboard cylinders of multi-piston engine aircraft is piped to discharge on outboard side to reduce noise in fuselage.

cross-over model  That model of compensatory operation in a powered flight-control system at which the open-loop frequency response has a gain of unity, the same as the closed-loop bandwidth $\omega_n$, i.e. at which open-loop amplitude response crosses 1.0 [zero db] line.

cross-over struts  Inclined radial gas paths in one form of coannular inverted-flow engine to convey high-V core jet to outer periphery and low-V fan flow to centre.

crossover turn  Fighter battle formation in which left aircraft move across to right.

cross-qualification  Among other meanings, qualification of pilots on a type of aircraft with characteristics and flight deck similar to that habitually flown, but (except on simulator) not actually flown; eg, A300B/A310, B737-200/B757.

cross-radial navigation  Routine not on a radial constituting a promulgated airway; ie, RNAV using VOR and/or DME to fly direct from A to B (see GNAV).

cross-range  Approximately at 90° to axis of missile or space launch range. See next.

cross-range limit  Maximum lateral distance to either side of re-entry trajectory which can be reached by a lifting body on a particular re-entry.

cross-section 1 Transverse section through object, eg fuselage or structural member.

2 Measure of radar reflectivity of object, usually expressed as area of perfect isotropic reflector perpendicular to incident radiation; depends on structural materials, incident angles, physical size of target, radar wavelength and possibly other factors.

3 In nuclear or atomic reactions, area (expressed in barn) giving measure of probability of process occurring.

cross-servicing  Between-flights routine maintenance and replenishment of aircraft at base of different armed force or different nation; * guide is manual facilitating operational turnround at locations where relevant documents are not available.

cross start  Using power from one engine [electrical, air bleed or whatever] to start another.

crosstalk  Unwanted signals generated in one set of circuits in communications or EDP (1) system by traffic in another.

cross-trail  Distance bomb or other free-fall object falls downwind measured perpendicular to track (or track at release point projected ahead).

cross-trail angle  Angle in horizontal plane measured at release point between track and line to point of bomb impact.

crosstube  Transverse tube forming main spar of wing in most microlight and similar aircraft.

cross-turn  Rapid 180° in which each half of formation turns towards remainder.

crosswind  One blowing more or less at right angles to track, to runway direction, or to other flown direction.

crosswind axis  Straight line through c.g. perpendicular to lift and drag axes.

crosswind component  Velocity of wind component at 90° to runway, track or other direction; = WV sin A where A is angle between WV and direction concerned.

crosswind force  Component along crosswind axis of resultant force due to relative wind; normally zero except in sideslip.

crosswind landing gear  One whose wheels can be castored or prealigned with runway while aircraft crabs on to ground with wings level.

crosswind leg  In landing circuit, that made at 90° to landing direction from end of downwind leg to start of approach.

crosswind testing  Testing of engine with high-velocity wind (simulated at known speed) blowing across inlet.

crowbar  Unswept wing (c 1950 colloq.).

crowd-line  Often one word, line defining front edge of airshow crowd, parallel to runway.

crown 1 Upper part of fuselage, above cabin ceiling, of passenger transport, especially large pressurized aircraft.

2 Loosely, upper part of any fuselage.

crpf  Top of canopy [envelope] of balloon.

CRP 1 Carbon-fibre reinforced plastics.

2 Control and reporting point (or post).

3 Counter-rotation propfan.

4 Compulsory reporting point.

5 Contractor’s Repair Party.

CRPA  Controlled reception-pattern antenna.

CRPAE  Cercle des Relations Publiques de l’Aéronautique et de l’Espace (F).

CRPM  Compressor rpm.

CRPMD  Combined radar and projected-map display.
CRRA  Capabilities review and risk assessment.
CRS  1 Container release system.
  2 Control and reporting squadron (or section).
  3 Component repair squadron (US).
  4 Computer reservation system.
  5 Child restraint system.
  6 Congressional Research Service (US).
  7 Cosmic-ray subsystem.
  8 Not recommended, course.
  9 Course.
  2 Cruise.
CRT  Cathode-ray tube.
CRT display CRT whose electron beam[s] create pictures and diagrams on the tube-face, a basic element in radars and, since c1960, flight instruments.
CRT scope; term not recommended.
CRT display CRT whose electron beam[s] create pictures and diagrams on the tube-face. A basic element in radars and, since c1960, flight instruments.
CRSTE  Combat rescue training exercise.
CRTS  CRT scope; term not recommended.
CRU  1 Control routing unit [MIL-1553B].
  2 Chemical-resistant urethane.
  7 Computer receiver unit.
CRUAV  Communications-relay UAV.
crucible  Hot source designed for radiating IR, for decoy or training.
cruciform  Having approximate form of a cross, in aero-space usually when viewed from front; thus * wing missile has four wings arranged radially (often at 90°) at same axial position round body.
cruise  1 In any flight from one place to another, that portion of flight from top of climb to top of descent en route to destination, usually at altitudes, engine settings and other factors selected for economy and long life.
  2 Verb, to perform (1).
  3 Tour of operations by naval air unit aboard carrier.
cruise configuration  Describes not only aerodynamic (normally fully clean) status but also systems status and possibly location and duties of flight crew, during cruise (1).
cruise missile  Long-range pilotless delivery system whose flight is wing-supported within atmosphere.
cruise motor  Propulsion, of any kind, used to sustain speed of missile from boost burnout onwards.
cruising altitude  That assigned to or selected by pilot for flight from top of climb to top of descent; varies with type of aircraft, sector distance, take-off weight, ATC rules and other traffic, winds and other factors.
cruising boost  With piston engine, that available in weak mixture for continuous operation giving best time or lowest fuel burn.
cruising ceiling  Formerly, greatest height at which 1.35 $V_{tas}$ could be maintained at max WM cruise power.
cruising speed  That selected for cruise (1).
cruising threshold  1.35 $V_{tas}$, considered (1935–50) practical lower limit to cruising speed.
crutches  Lateral arms carrying pads which are screwed down on upper sides of bomb, missile or other store to prevent movement relative to rack, pylon or other carrier.
CV  1 Centre-reading voltmeter.
  2 Crew rescue vehicle.
  3 Crew-return vehicle.
CRW  Canard rotor/wing.
CRW Circular rotating wing; spinning wing provides gyrostabilization as well as [in fast forward flight] adequate lift.

CryoGenesis  Cleaning by blast of air + solid CO$_2$ [dry ice].
cryogenic  Operating at extremely low temperatures.
cryogenic fuels  By far the most important is LNG (liquefied natural gas), consisting mainly of methane with traces of ethane and other gases; BPt is about -161°C. LH$_2$, liquid hydrogen, has the drawbacks of very low density and exceedingly low BPT (near absolute zero, at -233°C).
cryogenic materials  Limited range of highly specialized materials suitable for sustained structural or other use at below -180°C.
cryogenic propellants  Gases used in liquid state as oxidants and/or fuels in rocket engines, esp. Lox, LH$_2$, Fl and various FL compounds or mixtures.
cryoplane  Aeroplane designed to use cryogenic fuel.
cryopump  High-vacuum pump operating by cooling chamber walls so that residual gas molecules are condensed on to them, leaving vapour pressure below that required.
cryostat  Usually small lab rig for experiments at ultra-low temperatures, eg NMR, superconductivity etc.
cryotech  Range of deicer materials, used alone or in combination with sodium or potassium acetate.
crystal laser  One whose lasing medium is a perfect-lattice crystal, eg ruby.
crystal lattice  Three-dimensional orthogonal space lattice whose intersections locate the atoms of a perfect crystal (except on small scale, most crystals contain important imperfections).
crystal oscillator  One with added subcircuit containing piezo-electric crystal (eg quartz) whose extremely rigid response gives high frequency stability.
crystal transducer  Transducer containing piezo-electric crystal which translates mechanical strain into electrical voltage.
Cryogen  See refrigerant.
CryoGenesis  Cleaning by blast of air + solid CO$_2$ [dry ice].
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CS-A
- Control-stick assembly.
- Chief Scientific Advisor (UK MoD).
- Customer Service Agent.
CSAA Chinese Society of Aeronautics and Astronautics (China).
CSAF Chief of Staff (USAF).
CSAM Chief of Staff, Air Operations [F].
CSA Canada (see also Canadian Society of Aviation Medicine [office, Ottawa]).
CS&S Customer solutions and support.
CSAR Combat search and rescue.
CSAS 1 Command [one source says “control”], stability augmentation system.
CSAT Commander’s situational-awareness workstation.
CSB 1 Closely spaced basing (ICBM).
CSBA 2 Carrier and sidebands (ILS).
CSBA 1 Center for Strategy [or Strategic] and Budgetary Assessment[s] (US Congress).
CSBM Confidence and security building measures (MBFR treaty).
CSBPC Control-stick boost and pitch compensator.
CSBS Course-setting bombsite.
CSC 1 Course and speed calculator.
CSC 2 Constant symbol contrast (HUD).
CSC 3 Centreline stowage cabinet.
CSA Command and Control-stick assembly.
CSA Command and Control-stick assembly.
CSA 1 Cabin sensor indicating system.
CSB 1 Cabin sensor indicating system.
CSA 2 Canadian Security Intelligence Service.
CSA 3 Center for Strategic and International Studies (US).
CSK Countersunk.
CSLC Coherent side-lobe canceller, or cancellation.
CSM 1 Command/service module.
CSM 2 Customer support manager.
CSM 3 Crash-survivable memory [M adds module, U unit].
CSM 4 Cabin-systems management [U adds unit].
CSM 5 Computational solid mechanics.
CSMA Carrier-sense multiple access.
CSMM Crash-survivable memory module (CSMU, see above).
CSN Catalogue sequence numbers[s].
CSO 1 Command Signals Officer (RAF).
CSO 2 Communication systems operator.
CSOC Combined Space (or Satellite) Operations Center (pronounced C-sock).
CSOCR Consolidated space [or Satellite] Operations Center.
CSOSIT Communications/surveillance operational implementation team.
CSP 1 Common signal-processor.
CSP 2 Capability-sustainment programme (UK), or plus.
CSP 3 Comprehensive surveillance plan[s] (ATOS).
CSP 4 Common services programme [airlines share maintenance].
CSRA Canadian Sport Parachuting Association [office, Navan, PO].

CSA Certification Specifications for Airframes (EASA).
CSAR Combat search and rescue.
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<th>CSR</th>
<th>CTL</th>
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</thead>
<tbody>
<tr>
<td>CSR</td>
<td>1 Covert strike radar.</td>
</tr>
<tr>
<td>CSRDF</td>
<td>Crew-station research and development facility.</td>
</tr>
<tr>
<td>CSRHP</td>
<td>Common strategic rotary launcher.</td>
</tr>
<tr>
<td>CSRNP</td>
<td>Safety research program.</td>
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<tr>
<td>CSRS</td>
<td>Counter-surveillance and reconnaissance system.</td>
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<tr>
<td>CSS</td>
<td>1 Control-stick steering.</td>
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<td>CSS</td>
<td>2 Cockpit system(s) simulator.</td>
</tr>
<tr>
<td>CSS</td>
<td>3 Clean stall[ing] speed.</td>
</tr>
<tr>
<td>CSS</td>
<td>4 Communications subsystem.</td>
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<tr>
<td>CSS</td>
<td>5 Complementary satellite system.</td>
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<td>CSS</td>
<td>6 Computer support or sighting system.</td>
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<td>CSS</td>
<td>7 Central space transportation.</td>
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<td>CSS</td>
<td>9 Coastal, coastal.</td>
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<td>CSS</td>
<td>10 Categorization and status unit (ILS).</td>
</tr>
<tr>
<td>CSS</td>
<td>11 Cross-strap unit.</td>
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<tr>
<td>CSS</td>
<td>12 Combined station and tower.</td>
</tr>
<tr>
<td>CSS</td>
<td>2 Centre Spatial de Toulouse (F).</td>
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<tr>
<td>CSS</td>
<td>3 Commercial space transportation.</td>
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<tr>
<td>CSS</td>
<td>4 Central terminal building.</td>
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<tr>
<td>CSS</td>
<td>5 Coast, coastal.</td>
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<tr>
<td>CSS</td>
<td>6 Centistoke[s].</td>
</tr>
<tr>
<td>CSS</td>
<td>7 Centistoke[s].</td>
</tr>
<tr>
<td>CSTA</td>
<td>2 Central suppression unit, prevents mutual interference in complex avionics.</td>
</tr>
<tr>
<td>CsTe</td>
<td>Caesium telluride, photocathode material.</td>
</tr>
<tr>
<td>CSTF</td>
<td>Cross-scan terrain following.</td>
</tr>
<tr>
<td>CSTI</td>
<td>Control-surface tie-in.</td>
</tr>
<tr>
<td>CSTM</td>
<td>Centro Studi Trasporti Missilistici (I).</td>
</tr>
<tr>
<td>CSTMS</td>
<td>Customs</td>
</tr>
<tr>
<td>CSU</td>
<td>1 Constant-speed unit.</td>
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<td>CSU</td>
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<td>CSU</td>
<td>3 Command sensor unit.</td>
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<td>CSU</td>
<td>4 Cabin service unit.</td>
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<tr>
<td>CSU</td>
<td>5 Configuration stopping or strapping] unit.</td>
</tr>
<tr>
<td>CSU</td>
<td>6 Communications switching unit.</td>
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<td>CSU</td>
<td>7 Crew-station unit.</td>
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<td>CSU</td>
<td>8 Control-status unit.</td>
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<td>CSU</td>
<td>9 Control selection unit.</td>
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<td>CSU</td>
<td>11 Cross-strap unit.</td>
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<tr>
<td>CSV</td>
<td>1 Capacity (or catapult) safety-valve.</td>
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<tr>
<td>CSV</td>
<td>2 Common standard vehicle.</td>
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<tr>
<td>CSV</td>
<td>3 Command track counter.</td>
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<tr>
<td>CSV</td>
<td>4 Central telemetry control.</td>
</tr>
<tr>
<td>CSV</td>
<td>5 Control transmitter, or tower.</td>
</tr>
<tr>
<td>CSVR</td>
<td>Crash-survivable voice recorder.</td>
</tr>
<tr>
<td>CSVTs</td>
<td>Scientific and technical society (Czech).</td>
</tr>
<tr>
<td>CSW</td>
<td>1 Conventional standoff weapon.</td>
</tr>
<tr>
<td>CSW</td>
<td>2 Combat Support Wing.</td>
</tr>
<tr>
<td>CSWIP</td>
<td>Certification scheme for weldment inspection personnel.</td>
</tr>
<tr>
<td>CSWS</td>
<td>Corps-support weapon system.</td>
</tr>
<tr>
<td>CT</td>
<td>1 Carry trials.</td>
</tr>
</tbody>
</table>
CTLA

1. Coal to liquid.

CTLA Control area.

CTLZ Control zone.

CTM 1 Capacity ton-miles (unless otherwise stated, short tons, statute miles).

2. Centrifugal twisting moment.

3. Cost per ton-mile.

CTMO Centralized air-traffic flow management organization.

CTN 1 Caution.

2. Case, throat, nozzle.

3. Chief technical officer.


5. Crypto operator.

CTOC Common tactical operations centre (GBAD).

CTOL Conventional takeoff and landing, ie ordinary aeronautical configuration test requirements document.

CTR Dollar.

CTRDA Critical technology project[s].

CTRDAC Civil tilt-rotor development advisory committee.

CTRL Control.

CTIS 1 Central tactical system.

2. Cockpit television sensor.

3. Common termination system.

4. Clear to send.

5. Contractor transition support (USAF).

6. Communications technology satellite.

CBs, or C/ Colombian blade-loading coefficient.

CTSS Commercial training simulator, or simulation services (USAF).

CIT 1 Capital-transfer tax (UK).

2. Commander’s tactical terminal; H/R adds hybrid-receive only.

3. Controllable-torque tightening.

4. Conversion to type; T adds training.

5. Combined Test Team (Int.).


CIITO Central Tactics & Trials Organization (RAF).

CITTF, CITF Combating Terrorism Technology Task Force (DoD).

CTU 1 Control terminal unit.

CUP 1. Cabin telecommunications, or telephone, unit (satcom).

2. Crew transfer vehicle.

CTV 1 Curved trend vector.

CTVS Cockpit TV sensor [or system].

CTWADN Council of Third World Aerospace & Defence Newspapers [Karachi, Pakistan].

CTPC Command and control personal computer.

CTZ 1. Control zone [this is preferred].

2. Corps tactical zone.

CU 1. Conversion unit.

2. Cage/uncage; gyro system control.


4. Control unit (HMS).

5. Combiner unit (HUD).

6. Channel utilization.

Cu Cumulus.

CUAV Clandestine UAV.

cubage Total volume of rectilinear cargo that can be accommodated; typically 0.7 of pressurized above-floor cargo volume.

Cuban eight Manoeuvre in vertical plane normally comprising ½ loop, half-roll, ½ loop, half-roll.

cube out To run out of payload volume (either pax, cargo or both) at less than MSP (5).

cubic foot Non-SI measure of volume, 1 ft³ = 0.0283167 m³; reciprocals, 3.53 x 10⁻³, 35.3148.

cubic inch Non SI measure of volume, 1 in³ = 16.387 cm³ = 0.0164 litre; reciprocals 3.53 x 10⁻³, 35.3148.

c/unc Cage/uncage.

CUDS Common-user data services.

CUE Computer update equipment.

cue 1 Glimpse of Earth’s surface through cloud or darkness giving helpful attitude and distance information.

2. To slave homing seeker of missile to target, using information from other source.

CuF Cumuliform cloud.

cuff 1. Secondary structure added around propeller blade root, usually for aerodynamic reasons.

2. Structure added ahead of wing LE extending chord 3–5%, with sharp inboard end.

3. Heated muff round drain valve or drain mast.


CuFr Cumulus fractus.

CUG Computer Utilization Group (OECD).

CUGF Counter underground facilities [weapons against caves].

CUGR Cargo utility GPS receiver.

CUI Committee on Unlawful Interference.

cuin Cubic inch, 16.387 cm³.

culture Man-made terrestrial features.

cumulonimbus Cb, extremely large cumuliform clouds whose tops reach stratosphere and spread in form of fibrous ice-crystal anvil. Extreme vertical velocities and turbulence make them dangerous.

cumulus Cu, dense white clouds with almost horizontal base and large vertical development, domeshaped tops (cushflow) showing growth in strong upcurrents.

cumulus mammatus Cumuliform clouds having pendenous protuberances on underside.

CUP 1. Capabilities upkeep program (USN).
cup 2 Cockpit upgrade program[n].
cup Non-SI unit of volume, \( \approx 2.3659 	imes 10^{-3} \) m
cupid Common, or combat, upgrade plan integration, or integrated, details (USAF).
cupola Joint between driving and driven shaft

curring Re-rigging to increase angle of incidence.
curie point Critical temperature, different for each material, above which ferromagnetic materials lose permanent or spontaneous magnetisation.
curing Process by which most synthetic rubbers, plastics and solid-propellant binders are converted to compositions of higher molecular weight; may involve heating (condensation polymerization), chain reaction via free-radical or ionic mechanism (addition polymerisation), or use of catalysts. In solid rocket motors semi-liquid is often cured in case, solidifying and becoming case-bonded.
curl Vector resulting from action of operator del (differential operator in vector analysis) on vector; sometimes called rotation.
curling die Used with curling punch to bend sheet edges to tubular form.
curlover Possibly dangerous downdraft and turbulence downwind of trees or buildings.
currency Continuing validity of licence, esp. that for pilot.
current 1 Pilot is qualified on particular type and routinely flying it. 2 Civil aircraft is on active register and in routine operation. 3 Flight plan is that being followed.
cursive writing Rounded, flowing writing with strokes joined; hence formed in display by actual strokes rather than TV-type raster scanning.
curtain Non-gastight partition in aerostat.
curved approach Adopted by some aircraft, notably WW2 fighters, because of inadequate forward view straight ahead at low airspeeds. 2 Any of numerous possible quasi-elliptical paths followed when using MLS or other system offering such approach paths on either side of straight centreline.
curved trend Turn information imparted by three future track-lines on EHSI terminating 30 sec, 60 sec and 90 sec hence; these are straight with wings level but in banked turn show *, in extreme case linking in 360° circle (does not allow for drift).
curve of pursuit Followed by any aircraft chasing another and continuously steering towards latter’s present position; with non-manoeuvring target curve soon becomes asymptotic with target straight-line course.
curvilinear flight Accelerated flight, ie not straight and level.
cus, CUS Customs available.
cushion See ground cushion.
cushion creep Use of ground cushion for gradual helicopter takeoff.
cusrg Canada/US Regional Planning Group.
cuss Common-use self-service, for check-in desks which automatically identify and process passenger.
custodian Usually purchaser and operator are synonymous; where purchaser is government agency and operator an air force, or purchase is finance company or bank, * normally applies chiefly to operator.
customer base Total list of customers (term usually refers to civil air carriers) committed to purchasing or leasing new type.
customer bleeds See customer supplies.
customer mock-up Exact reproduction of aircraft interior, or part thereof, furnished with materials, fabrics, colours, seats and other equipment as specified by customer.
customer supplies Bleed-air or shaft power, other than that required for propulsion, needed for aircraft services.
customised lead time No supplies expedited until needed, * typically 2h–2 years.
customising 1 Finishing GA aircraft to customer’s spec., eg furnishing, avionics kit, external paint. 2 Finishing avionics or instruments for particular task with chosen language, labels, IC chips and self-test.
cumulative sum [suggest: tautology].
cut Sudden complete shutdown of power [noun and verb]; hence: the *, command given by batsman on carrier.
cutaway General term for detailed perspective drawing showing maximum detail of 3-D object.
cutback Sudden partial closure of throttles at end of first climb segment for noise-abatement reasons. 2 Reduction in existing or planned procurement. 3 Reduction in manufacturing rate.
cut-back nozzle Normally, one (not of con-di type) shortened in length and terminating obliquely to give thrust slightly inclined to pipe axis.
cut-back speed ASIR at top of first segment.
cute Common-user terminal equipment (SITA).
cutlass Combat UAV target locate and strike system.
cutlet Cutlet-shaped flattened outer arm of hub forging of rigid rotor.
cutoff 1 Termination of rocket propulsion before burnout because desired trajectory and velocity have been reached. 2 Flying shortest track to intercept an air target.
cutoff ports Circular apertures in forward face of solid motor which can swiftly be blown open to terminate combustion.
cut-out 1 Aperture in pressurized fuselage, for door, window, hatch or other purpose. 2 Absence of rear inner part of elevator, terminating in diagonal edge, to allow full rudder to be applied.
cut-out switch One isolating or inactivating circuit or subsystem.
CV 1 Fleet [aircraft] carrier. 2 Carrier vehicle (SDI).
cycle parameters

CWH Canadian Warplane Heritage Museum [Mount Hope, PO].
CW1 Continuous-wave illuminator [or interference].
CWD Coalition Warrior interoperability demonstration (NATO).
CWIN 1 Cockpit weather information system.
2 Cyber warfare integration network.
CWM Comparator warning monitor.
CWN Call when needed, short-term contract prevalent in firefighting.
CWP 1 Central warning panel.
2 Contractor’s working party.
3 Compact when packed (antennas).
4 Controller, or controlled, working position[s].
5 Central West Pacific (ICAO).
CWR Continuous-wave [or colour weather] radar.
CWS 1 Caution/warning system.
2 Central [or collision] warning system.
3 Control-wheel steering.
4 Container weapon system.
CWSG Civil Wing Study Group.
CWSU Central [or Center] Weather Service Unit (US).
wgt Hundredweight, archaic unit of mass, = 112 lb = 50.8032 kg; US short * = 100 lb = 45.3592 kg.
CWU–45P Classic USAF leather flight jacket.
CWV Crest working voltage.
CWW Cruciform-wing weapon.
CWX Clearway.
Cxx Cyan, not used.
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cyclic pitch

In most helicopters main rotor blade pitch progressively increases from minimum (a very small) angle when head-on to airstream (momentarily occupying position of wing) to maximum 180° later (when in position of wing trailing-edge-on to airstream); this makes blade fall on advancing side of rotor and rise on retreating side, effectively decreasing and increasing angle of attack to even-out lift on both sides. This is also called feathering, and results in blade flapping (see * control).

cyclic-pitch control  Primary helicopter flight control. Usually governed by stick, similar to aeroplane control column, which in central position causes basic cyclic variation as described above by tilting stationary and rotating stars on rotor hub. Pilot demand is passed through mixing unit and output tilts fixed star in desired direction to superimpose additional cyclic variation causing disc to tilt in desired direction to cause helicopter to rotate about pitch or roll axis.

cyclic rate  Rate at which automatic gun fires, expressed in shots per minute, measured after maximum rate has been attained and not necessarily attainable except for brief periods.

cyclic stick  Cyclic-pitch control stick.

cyclic testing  Repeated application of supposed operating cycle, usually of exceptionally severe nature, under arduous environmental conditions to prove endurance or life of hardware.

cycling  Cyclic testing.

cycloconverter  Elegant method of generating constant-frequency a.c., by commutating six phases of h.f. [over 1,600 Hz] to very precise 400 Hz three-phase.

cyclogenesis  Development of a cyclone.

cyclogiro  Aerodyne, never successfully achieved, lifted and propelled by pivoted blades rotating about substantially horizontal transverse axis as in paddle steamer.

cyclone  Tropical revolving storm.

cyclonite  See RDX.

cyclostrophic force  That experienced by wind following curved isobars acting in addition to geostrophic force to give resultant wind along isobar according to Buys Ballot’s law. At Equator geostrophic force vanishes, leaving pure cyclostrophic wind.

cyclostrophic wind  As explained above, wind near Equator with strong circular motion, such as a tornado.

cyclotron  Family of magnetic resonance particle accelerators, many extremely large.

cyclotron resonance  Motion of moving charged particle in magnetic field on which is superposed alternating electric field normal to magnetic field.

cycsec  Cycles per second, SI unit is Hz.

CYI  Canary Islands (AMR).

cylinder  One unit of piston engine, or, specif., surrounding cylinder enclosing combustion space and guiding piston.

cylinder block  Single unit enclosing row of liquid-cooled in-line piston engine cylinders.

cylinder head  Usually removable top of piston engine cylinder containing plugs, inlet/exhaust connections and (except with sleeve valve) valves.

cylinder liner  Hard abrasion-resistant lining inserted into cylinder of light alloy or other soft material.

cylinder of piston engine  Cyl.

cylinder of engine  Cyl.

cylinder wall  Cyl.


CZ  Control-zone (US).

cZ  Normal force coefficient, C_l cos A + C_d sin A, where A is angle of attack; rarely called C_N, which is strictly negative.

cZ  Fore/aft magnetic VSI component.

CZCS  Coastal zone colour scanner.

CZI  Compressor-zone inspection.
D 1 Total aerodynamic drag.
   2 Danger area (ICAO).
   3 Duration of phenomenon in seconds, eg $D_{sec}$.
   4 Drift.
   5 Diameter (rarely, d); for tyre [tire], at rim ledge.
   6 For airspace, see *-class.
   7 Departure chart.
   8 Pavement bending strength for dual-wheel landing gear.
   9 Drone (UK).
   10 Drone director (US modified-mission prefix).
   11 Electric flux density.
   12 Fuze delay time.
   13 PPL Group for microlights (CAA).
   14 Sport-parachuting certificate: 200 free-falls, 20
      landing ≤15m of target.
   15 Detail (maintenance check), followed by number.
   16 Aircraft category: gliders and motor gliders (FAI).
   17 Other meanings include Doppler, downward,
      distance, day, dust, delete, designated, delay, displacement,
      differential coefficient, chemical diffusion coefficient and decision.
   d 1 Distance, and spacing between structural members.
   2 Differential.
   3 Deci, prefix, multiply by $10^{-1}$ (not recommended).
   4 Clear distance between contact areas of landing
      wheels (can include axial or transverse distance between
      wheels of bogie).
   5 Thickness of RAM surface-wave absorber.
   6 Usually as subscript, design.
   7 Diameter of fuselage, jet or propeller (alternative to
      $D_f$).
   D 1 Diode.
   2 Relative density.
   10 90 per cent semi-span, usually measured outboard
      from root.
   11 Maximum depth of wing at root [assumed to be
      greatest anywhere on semi-span].
D* Also called co-ordination-perception parameter,
   time-response criterion for the lateral/directional control
   response, combining lateral acceleration and angle of
   sideslip.
D In 2-D flow, often used for section drag [per unit span,
   parallel to freestream].
$D_1$, $D_2$ Non-dimensional drag factors.
D1 Deliverable one, the first report (Sesar).
D' Data download and display.
D/S Dynamic data-display subsystem.
D8PSK Differential-8 phase-shift keying.
$D_{100}$ Drag at 100 ft/s.
D-check Major overhaul carried out every 3–5 years.
D-class Airspace up to 2,500 ft (762 m) AGL above
   airfield with operating tower; 2-way dialogue radio
   required.
D-code In flight plan, have DME.
D-factor Actual, or true, altitude divided by pressure altitude.
D-gun Detonation gun, firing suspended particles of hard surface coating by detonation of oxy-acetylene.
D-layer Region of increasing electron and ion density in
   ionosphere, existing in daytime only and merging with
   bottom of E-layer.
D-licence For inspection of engines after overhaul.
D-nose Strong leading edge of aerofoil, often forming
   principal structural basis of wing or helicopter rotor blade.
D-notice Issued regularly to advise [esp. Press, broad-
   casters] of changes in classification status of defence or
   other sensitive subjects (UK MoD).
D-nozzle Propulsive nozzle of jet engine on centreline of
   fuselage or nacelle vectoring to give lift or thrust (from
   cross-section).
D-ring Steel handle with which parachutist pulls
   ripcord.
D-spar D-nose.
D-tube Leading edge of lightplane or micro comprising
   spar and load-bearing skin, generally simpler than
   D-nose.
D-value Departure from pressure altitude.
DA 1 Drift angle.
   2 Diplomatic authorization.
   3 Double attack.
   4 Long-range (bomber) aviation, predecessor of ADD
      (USSR).
   5 Delayed-action (bomb).
   6 Dual-alloy (turbine disc).
   7 Direct action (fuze).
   8 Deck alert.
   9 Decision [or density] altitude.
   10 Danger area.
   11 Development aircraft.
   12 Design authority.
   13 Duplex aluminide.
   14 Air defence (F).
   15 Defence advisory.
   16 Drought area.
   17 Direct access (telecoms).
   18 Descent advisor, or advisory.
   19 Display Authorization.
da Deca [US, deka], prefix, multiplied by 10, non-SI.
   $d_n$ 1 Radar resolution in azimuth.
   2 See $d_\alpha$.
D/A Digital/analog.
DAA 1 Directorate of Air Armament (UK).
   2 Digital/analog adaptor.
   3 Directorate, Army Aviation [DAAvn is preferred]
      (UK).
DAACM Direct airfield-attack cluster munition.
DAAIS Danger area activity information service (CAA,
   UK).
DAAS Defense advanced automation system (ATC).
DAAT Digital angle-of-attack transmitter.
DAAvn Directorate of Army Aviation (UK).
DAB 1 Defense Acquisitions Board (US).
   2 Digital audio broadcast[ing].
DABF Digital adaptive beam-forming; N adds network
   number.
DABM Defence against ballistic missile(s).
DABRK Daybreak.
DABS, Dabs

DABS, Dabs  | Discrete-address, or addressable, beacon system; can address individual aircraft via transponder, pointing a narrow beam at it to transmit messages via data-link.
| 2 Dual aft-body strakes.
Dabsef Dabs Experimental Facility (Lincoln Laboratories, US).

DAC  | Deployable ACCS component (USAF).
| 2 Design aperture card.
| J Dual annular combustor.
| 4 Dangerous air cargo.
| 5 Defensive-aids computer.
| 6 Duplex anodine coating.
| 7 DSMC (2) analysis code.
| 8 Divide and conquer (parallel modelling).
| 9 See DAC.

dac Digital-to-analog converter.

DACCC Dangerous Air Cargo Committee (UK, RAF).

DACOS, Dacos Deputy Assistant Chief of Staff; CS (Carrier Strike).

Dacota Dacks (Canada).

DACS Deployable air-data computer.

DACU Data-acquisition control unit.

DACS Directorate of Aerospace Combat Systems (Canada).

6 Danger area crossing service (CAA, UK).

2 Danger area divert and attitude-control system.

DACT Dissimilar air-combat training, or tactics.

3 Data automated communications terminal.

DACU Data-acquisition control unit.

DACT Digital automatic, or advanced, flight-control system.

DACS Deployable air-data sensor.

2 Digital air-data system.

DADT Durability and damage – tolerance analysis.

DAC E Deutscher Aero Club eV (D-63150 Heusenstamm) [G].

Daedalians National fraternity of military pilots (US).

DAES Directorate of Avionic Equipment and Systems (UK).

DAFCS Digital automatic, or advanced, flight-control system.

DAF/D Digital autopilot/flight director.

Dafes Digital automatic flight inlet control system.

DAFIF Digital aeronautical flight-information file.

Dafusa Data-fusion airports (Euret).

DA fuze Direct-action fuze; designed to explode on impact.

DAG Deutsche Angestellten-Gewerkschaft Bundesgruppe Luft- und Raumfahrt.

2 Domestic Aviation Grade.

Dagmar Faired shape [a body, not a blister] in front of a bluff projection.

DAGR Defense advanced GPS receiver, probably to replace PLGR.

DAI Direction des Affairs Internationales (F. MoD).

2 DCMS Audio interface.

3 Directed airborne intelligence (UK).

DAIR Direct altitude and identity readout (FAA/USAF).

DAIRS Distributed-architectures, or aperture, IR system, or sensing.

DAIS Digital avionics information system.

2 Distributed airport information system.

DAISS Digital airborne intercom switching system.

Daisy Decision-aid for interpretation of air situation display (Alcatel from 1994).

Daisy chain Several helpers link arms to swing large propeller.

Daisy cutter US tactical store designed to kill maximum number of exposed infantry [1969–].

DAIW Danger area infringement warning.

DALGT Daylight.

Dallenbach layer Pioneer form of RAM(2) coating consisting of homogeneous lossy layer backed by metallic plate (eg, aircraft skin); if lossy layer has same impedance as free space there will be no surface reflection.

Dalmatian effect Increase in number of spots in map of VISTOL air bases compared with airfields.

DALO Divisional Air Liaison Officer (UK).

DALR Dry adiabatic lapse rate.

D-alt Density altitude.

Dalton computer Family of pocket-size mechanical calculators for navigation [esp triangle of velocities] problems.

Domestic Aviation Grade.

DAMS Demand-assigned, or assignment, multiple access.

damage assessment Determination of effect of attacks on targets.

damages cycle Loss of life of engine or other hardware.

damage limitation Ability to limit effects of nuclear destruction by using offensive and defensive measures to reduce weight of enemy attacks.

Damage-tolerant Structure so designed as to continue to bear normal in-flight loads after failure (through fatigue, external damage or other cause) of any member (see fail-safe).

DAM Dollars per aircraft-mile.

Dama, DAMA Demand-assigned, or assignment, multiple access.

damper

DADR Deployable high-altitude radar.

DAC Rams/DAMAs (Russia).

DACR Danger area crossing service (CAA, UK).

2 Danger area divert and attitude-control system.

DACU Data-acquisition control unit.

DAVC Victoria’s safety valve.

DACU Data-acquisition control unit.

DACE Digital aeronautical flight-information file.

Dakterics Digital automatic, or advanced, flight-control system.

Dace E Deutscher Aero Club eV [D-63150 Heusenstamm] (G).

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Dalton computer Family of pocket-size mechanical calculators for navigation [esp triangle of velocities] problems.

Domestic Aviation Grade.
damping factor

6 See yaw*. damping factor Ratio of peak amplitudes of successive oscillations.

damping moment Proportional to rate of displacement; tends to restore aircraft to normal flight attitude after upset.

DAMS Dynamic airspace management system(s).

2 Drum auxiliary memory subunit.

Dams Dictionary and message specification language.

Dan Decane Newton, unit of force = 2.248 lbf.

Danac Deca area-navigation airborne computer (1984 also appeared as digital air-navigation control).

D& C Design and clearance.

2 Diagnostic and conditioning.

D& D Distress and diversion (ATC).

2 Diesel and dye (smoke-making).

D&F Determination and findings.

D&O Description and operation.

D&P Development and Production (MoD contracts).

D&V Demonstration and validation.

danger area Airspace of defined dimensions in which activities dangerous to flight may exist at specific times.

dangle Angle between local horizontal at glider and end of tow-rope (usually air tow).

DAO Defence Attaché Office.

2 Distributed analysis optimization.

3 Defence Acquisition Organization [ACT2600] (Australia).

DAP Distortion of aligned phases (LCD).

2 Director(ate) of Aircraft (originally Aeroplane) Production (UK, WW2).

3 Distributed-array processor.

3 Directorate of Airspace Policy (CAA, UK)

5 Digital service accept product.

5 Data-access protocol [see next].

DAPS Data-access protocol system.

DAPU Data acquisition and processing unit.

DAR Design and Airworthiness Requirements (UK).

2 Drone, anti-radar.

3 Direct-access recorder.

4 Design assurance review.

5 Defense Acquisition Regulation.

6 Diffuser area ratio.

7 Digital archive recorder.


Dara, DARA Defence Aviation Repair Agency [St. Athan, CF62 4WA] (UK).

2 National space agency (G).

Darc, DARC Direct-access radar channel.

DARE Defence Avionics Research Establishment [Bangalore] (India).

Darin Display attack and ranging inertial navigation.

Darkest Switched off.

dark burst Gamma-ray burst that fades very rapidly.

dark cockpit All lights out, ie correct configuration and all systems normal.

darkfire Missile system operable at night in clear visibility.

dark-trace Display phosphor creating image through reflection/absorption of light instead of light emission from phosphor (see skiatron).
DATAS

DASS 1 Defensive-aids subsystem.
2 Dynamic-assembly scheduling system.

DAST, Dast Drone[s] for aerodynamic and structural testing (NASA).

DAT 1 Damage-to-aircraft trials.
2 Digital audio tape.

DATA Defense Air Transportation Association (US).

Data, Data A MIL-STD-1553B bus carries Data in one channel and Data in the other.

databus Highway for digital data, most common linking aircraft sensors and other air or ground systems being MIL-STD-1553B or Arinc 419 (one-way) or Arinc 619 10base T (two-way).

Datac Digital-access terminal-area control, or communication [see Datas].

DATACOM, Datacom Data compilation, large hand-book and CD which attempts to give designers complete knowledge of effect on lift and moment of changes in design (USAF).

Datas Digital autonomous terminal access communications system, became Arinc 629 (Boeing).

data fusion Integration and management of possibly billions per second of bits of information from recon sensors, C3 and battle management systems.

datalink 1 Any highway or channel along which messages are sent in digital form.
2 Communications channel or circuit used to transmit data from sensor to computer, readout device or storage.

data-logger Short-term store for digital or analog information, eg for one flight or one week, periodically read back to build up service history of system, engines or other devices.

data plate Permanently fixed to aircraft, engine or other product, giving basic data, serial numbers and dates.

Datat, DATAR 1 Detection and tactical alert of radar (helicopter RWR).
2 Délégation de l’Amenagement du Territoire et à l’Action Régionale [aeronautical subcontract organization; Paris 75007] (F).

data reconstruction Assembling correct bar-codes from brief any-angle glimpses (mainly in checking baggage).

data recorder Device, usually electronic, for recording data [previously analog, now mainly digital] for subsequent playback and analysis [see flight recorder, maintenance recorder].

Datas Data-link and transponder analysis system.

Data-3 Inmarsat system enabling aircraft to link directly to ground networks.

Datco Duty air-traffic-control officer.

DATF Deployable air task force.

DATIS, D-Atis, Datis 1 Digital air-traffic information service, or system.
2 Digital automated, or automatic, terminal information service.

DATM Dummy air-training missile.

Datmas Danish air-traffic management system (2007-).

DATS Data-acquisition and telemetry system.

Data Depot automatic test system for avionics.

DATT, DAtt Defense Attaché (US).

DATTS Data acquisition, telecommand and tracking station.

datum 1 Numerical, geometric or spatial reference or base for measurement of other quantities.
2 Vertical (rarely, horizontal or other) reference line from which all structural parts are measured and identified. Most * lines are exactly at, or close in front of or behind, nose; thus, frame 443 is a nominal 443 in or mm behind*; wing * is often aircraft centreline.

datum target A point or straight line used to establish a datum.

DAU 1 Directly Administered Unit[s] (RAF).
2 Digital amplifier unit.
3 Data-acquisition unit.

DAUG Danger-area users group (NATS).

Da Vinci Departure and arrival integrated management system for co-operative improvement of airport traffic flow (Euret).

Davis barrier Retractable crash barrier across carrier (1) deck.

Davis tables List altitude and azimuth of astro-navigation targets.

Davis wing High-aspect ratio wing designed by David R. Davis; intended to cruise at low angle of attack with low drag.

DAVSS Doppler/acoustic vortex sensing system.

DAVVL Birdstrike committee, with several sub units [G].

DAW (A) Dedicated all-weather (aircraft).

day Mean solar * is defined at 8.64 × 10^4 s; sidereal * is approximately 8.616 × 10^4 s.

Day-Glo Family of dyes and paints with property of converting to visible light wavelengths outside normal visible spectrum, thus giving unnatural bright hues.

day/night Equipment giving cheap and convenient IFR training, using tinted pilot goggles and complementary tinted cockpit transparency (eg blue goggles and amber canopy or red + green); pilot sees clear but tinted cockpit while outside world appears black.

DB 1 Development batch.
2 Direct broadcast. [S adds satellite, service or system].
3 Database.
4 Databus.
5 Double base (rocket propellant).
6 Diffusion bonding.
7 Day bombardment category (USA 1919-24).
8 Denied boarding.

dB Decibel, see noise.

DBA 1 Dominant battlespace awareness.
2 Long-range bombing aviation (USSR, R).

dBA Decibels absolute, or A-weighted, see noise.

d.b.a. Doing business as.

DBC 1 Denied boarding compensation for bumped passengers; for pax reaching their destination within 4 h of original booked time 50% of flight-coupon value in Europe, 200% in US. No compensation for aircraft under 60 seats.

2 DCMS bus coupler.
3 Data-bank, Comecon.

DBE 1 Data bank, Eurocontrol.
2 Down between engines [rotation of handed propellers in four-engined aircraft].

DBF 1 Doppler beat frequency.
2 Digital beam forming.
3 Destroyed by fire.
4 Doppler blade flash.

DBGS 1 Data-base generation system.

DBFM Defensive basic flight manoeuvres.

DBI 1 DCMS bus interface.


**dB**

2 Downlink block identifier.
3 Data-bus input.

**dB** Decibels referenced to isotropic antenna or above isotropic circular.

**dBm** Decibel-meter, unit of power referenced to 1 mW = 1 mW = 1 × 10⁻³.

**DBM/C** Data bus controller.

**DBMS** Database management system; also rendered as DBMX.

**dBm²** Measure of radar cross-section using m² as reference.

**DB/N** Data base No.

**DBNS** Doppler bombing/navigation system.

**DBO** Data-bus output.

**DBPS** Digital [electron] beam-positioning system.

**DBR** Dual-band radar.

2 Damaged beyond repair.

**DBS** 1 Doppler beam-sharpening.
2 Direct-broadcast satellite, or service.
3 Database storage.

**DBSA** Directorate for Broadening Smart Acquisition (MoD, UK).

**dBi** Decibel unit of radar beam cross-section referenced to 1 m²; dBm² more common.

**DBSA** Director of Broadening Smart Acquisition (DoD, UK).

**DBSE** Data-bus test equipment.

**DBT** Diffusion-bonded titanium.

**DBTF** Duct-burning turbofan.

**DBU** Database unit.

**DBUF** Database work-station.

**DBW** Differential ballistic wind.

**dBw** Decibels referenced to 1 Watt.

**DBWS** Database work-station.

**DC** Depth charge.

2 Departure control.
3 Direct cycle.
4 Display controller.
5 Directionally cast.
6 Drag control.
7 Dead centre.
8 Detection centre (homing).
9 Dry chemical.
10 Direct cost.
11 Digital compass.

**DC, d.c.** Direct current.

**DCA** 1 Defense Communications Agency (US).
2 Directorate of Civil Aviation.
4 Department of Civil Aviation (A, Braz.).
5 Dual-capable aircraft.
6 Document content architecture (IBM).
7 Defensive counter-air.
8 Design Chain Accelerator.
9 Drift correction angle.
10 Defense Certification Authority.
11 Defense Codification Agency (UK).


**DCACMRM** Defense and control airspace configuration/manufacturing resource management.

**DCAOOC** Deployable combined air & space operations centre (NATO).

**DCAPES** Deliberate & Crisis Action Planning & Execution Segments [part of GCSS] (USAF).

**D-carts** Decoy cartridges.

**DCAS** 1 Deputy Chief of the Air Staff (UK).
2 Digital core avionics system.
3 Defense Contract Administration Service (DoD).
4 Digitally controlled audio system.

**DCAV** STOVL (F).

**DCC** 1 Drone Control Center.
2 Direct computer control.
3 Digital computer complex.
4 Data collector correlator.

**DCCA** Direction Centrale du Commissariat de l’Air (F).

**DCCR** Display-channel complex rehost.

**BCD** 1 Data collector and diagnoster.
2 Data-collection device (helicopter).
3 Double-channel duplex.
4 Damage control deck [carrier].

**DCDI** Digital course deviation indicator.

**DCDS** Deputy Chief of the Defence Staff (UK).

**DCDU** Digital control and display unit (Fans).

2 Digital, or data, communications and display unit.

**DCE** 1 Data communications equipment.
2 Data-circuit terminating equipment.

**DCEE** Distributed continuous experimentation environment.

**DCFS** Digitally controlled frequency service.

**DCG** Direct-current generator.

**DCGA** Deck closed, go-around.

**DCGF** Data-conversion gateway function.

**DCGS** 1 Distributed common ground system [UAV].
2 Distributed common group, or ground, station.

**DCH** Destination change (input button).

2 Defence-capabilities initiative (NATO), or interface.
3 Director of Central Intelligence (DoD).

**DCIC** Defence Capability Investment Committee (Australia).

**DCIU** Digital control and interface unit.

**DCKM** Docking.

**DCLO** Defence Contractors List (UK).

**DCM** 1 Defense Contract Management; A adds Agency, C Command or Committee (US).
2 Data-conversion management; F adds function.
3 Diagnostic and condition monitoring.

**DCMAA** Direction Centrale du Matériel de l’Armée de l’Air (F).

**DCMF** Data communication management function.

**DCMS** 1 Digital, or data, communications management system.
2 Door control and monitoring system.

**DCMNO** Decommissioned.

**DCMT** Defence College of Management and Technology [Shrivenham, Wilts.] (MoD, UK).

**DCMU** Digitally coloured map unit.

**DCN** 1 Drawing, or design, or document, change notice.
2 The Defence Contractors’ Network [office, Bristol BS9 5ME] (UK).
3 Diplomatic clearance number.

**DCNO** Deputy Chief of Naval Operations.
DDC

DCO

Duty carried out.

DCOM  Distributed-component object model.

DCoS  Deputy Chief of Staff.

DCP  Distributed communications processor.

DCPS  Data collection and processing system.

DCPU  Display control power unit (IFF).

DCR  Digitally-coded radar.

DCRJ  Previously DCRJ, dual-combustion ramjet.

DD  Data display.

DDA  Designation of a nacelle; -dD is a forward thrust, such as negative drag of a winglet.

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DDBS  Distributed database system.

DDC  Digital display.

DDCPS  Digital display and control panel.

DDCVR  Digital crystal video receiver.

DDT  Direct digital synthesizer.

DTR  Difficulty.

DDU  Data delivery.

DDU  Data delivery.

DDUE  Digital display and control unit.

DDUM  Data display unit.

DDUW  Data display unit.

DDV  Data display indicator (Awacs).

DDV  Data display indicator (Awacs).

DDVR  Data display processing system.

DDW  Data display, or display.

DDX  Data display, or display.

DDY  Data display, or display.

DDZ  Data display, or display.

DD1  Data display, or display.

DDC  Digital data collection and processing system.

DDCVR  Digital crystal video receiver.

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DDT&E

DDT&E Design, development, test and evaluation.

DDU Diagnostic display unit.

DDV Direct-drive valve (hydraulics/brakes).

DDVR Displayed-data video recorder.

DE Directed energy.

D.2 Direct-entry (RAF).

DEA Drug Enforcement Agency (OAO adds Office of Air Operations).

DEAD Destruction of enemy air defence[s].

dead centre In piston engine, with conrod aligned with cylinder axis [in normal designs], piston at end of stroke.

dead engine One that cannot be operated after IFSD.

dead-eye Circular block pulled by surrounding cable or rope to exert tension on other cables passing through transverse holes.

deadface To cut off all system power by circuit interrupters at interface between modules, stages or spacecraft, prior to separation.

dead foot Failed engine of twin- [rarely more] engined aircraft.

deadhead To fly to maintenance base off-route.

dead men Masses [not necessarily anthropomorphic] simulating passengers.

dead reckoning Plotting aircraft position by calculations of speed, course, time, effect of wind, and previous known position.

dead-rise Difference in height from keel to chine of float or flying-boat hull.

dead-rise angle That between line joining keel and chine and transverse horizontal through keel.

dead side Side away from aircraft formation, eg left seat when in echelon to right.

dead spot In a system, region centred about neutral position where small inputs produce no response.

dead-stick landing Landing of powered aircraft with all engines inoperative.

dead vortex Remnants of vortex after breakup and decay.

dead zone Surface area within maximum range of weapon, radar or observer which cannot be covered by fire or observation because of obstacles, nature of ground, or trajectory characteristics or pointing limitations of weapon.

DDM Distance between elements of an array antenna.

DDT&E Decay time

dead reckoning simulating passengers.

Masses [not necessarily anthropomorphic] dead men deadhead prior to separation.

rupters at interface between modules, stages or spacecraft, deadface transverse holes.

Circular block pulled by surrounding cable or deadeye dead engine cylinder axis [in normal designs], piston at end of stroke.

dead centre 1

1 Diameter of single jet or nozzle with area equal to total of system of multiple nozzles.

2 Distance between elements of an array antenna.

dead engine One that cannot be operated after IFSD.

deadeye Circular block pulled by surrounding cable or rope to exert tension on other cables passing through transverse holes.

deadhead 1 To fly to maintenance base off-route.

2 Of aircrew, to ride as passenger(s) while on duty.

dead men Masses [not necessarily anthropomorphic] simulating passengers.

dead reckoning Plotting aircraft position by calculations of speed, course, time, effect of wind, and previous known position.

dead-rise Difference in height from keel to chine of float or flying-boat hull.

dead-rise angle That between line joining keel and chine and transverse horizontal through keel.

dead side 1 Side away from aircraft formation, eg left seat when in echelon to right.

2 Side of airfield or active runway away from that of circuit [pattern] in use. It is usually the side from which arrivals join circuit.

dead spot In a system, region centred about neutral position where small inputs produce no response.

dead-stick landing Landing of powered aircraft with all engines inoperative.

dead vortex Remnants of vortex after breakup and decay.

dead zone 1 Surface area within maximum range of weapon, radar or observer which cannot be covered by fire or observation because of obstacles, nature of ground, or trajectory characteristics or pointing limitations of weapon.

2 Zone within range of radio transmitter in which signal is not received.

3 Region above gun or missile into which weapon cannot fire because of mechanical or electronic limitations.

4 Area(s) next to surfaces of aircraft plate for integrally machined parts which cannot be ultrasonically inspected and for which ultrasonic-inspection thickness allowances can be removed.

dead aerator Static or centrifugal screen for removing air from circulating lubricating oil. Also called rotating separator, centrifugal breather.

deal Bad error by ATC controller.

dealer plate No Issued temporarily to a/c for export, often to several in succession, to avoid need for proper US registration (FAA).

deatc Directed-energy applications in tactical airborne [or air] combat.

DEB Digital European backbone (major NATO programme).

dehoist Retrograde or braking manoeuvre which lowers either perigee or apogee of orbiting spacecraft.

debrief To interrogate aircrew or astronauts after mission to obtain maximum useful information.

debriefs 1 Remains from catastrophic accident.

2 In particular, fragments from exploded engine.

3 Loosely, BFO(3).

debug To isolate, correct or remove faults or malfunctions, especially from computer program.

DEC Data-Exchange Committee.

2 Digital engine [or electronic] control [S adds system, U unit].

3 Decrease.

4 Declination.

5 Decommissioned.

6 Digital electronic clock.

7 Defence; or Directorate of, equipment capability (UK).

decea Prefix, multiplied by 10, symbol =a (non-SI).

Decade DFS(4) Eurocontrol ATM(7) development.

decl Decisive or other mark applied by transfer, usually to a model.

decalage Difference in angles of incidence of wings of biplane or multiplane; angle between chord of upper plane and that of lower plane in section parallel to plane of symmetry. Negative when angle of lower plane is greater.

decalence point Temperature, characterised by sudden evolution of heat, at which definite crystalline transformation takes place when heating steel.

decal Decisive or other mark applied by transfer, usually to a model.

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Decca chain

Decca chain  Single system of master and three slave Decca Navigator stations giving guidance over one geographic region.

Decca Flight Log  Pictorial presentation of Decca Navigator inputs on roller-map display.

Decca lane  In original Navigator, any hyperbolic region between two adjacent position lines.

Decca Navigator  Pioneer hyperbolic navaid using CW.

Decca Omnitrac  Airborne digital computer which eliminates Flight Log chart distortion, sets pen accurately after chart change and enables system to be coupled to autopilot.

DECD  Digital expandable color display.

deceleration limit  That sustained value allowed for fully equipped astronauts or aircrew, normally –10 g.

declaw  Aileron which splits into upper/lower halves to serve as speed brake (originally Northrop patent).

decentralised control  In air defence, normal mode whereby higher echelon merely monitors unit actions, making direct target assignments only when necessary.

deciphering  Measure designed to mislead enemy by manipulation, distortion or falsification of evidence, eg by DECM (1).

deci  Prefix, one-tenth, symbol d (non-SI).

DECIDE  Defence equipment capability indirect battlefield effect (UK).

decibel  Fundamental unit of sound pressure (see noise).

decimetre  $10^{-1}$ m = 3·937 in (contrary to SI).

decimetric  Having wavelengths in the order of $10^{-1}$ m (not recommended).

decimillimetric  Having wavelengths in the order of $10^{-3}$ mm (not recommended).

declearing  Specified height AGL at which missed approach must be initiated if the required visual reference to continue approach to land has not then been established; normally but not exclusively ILS, PAR or MLS approach.

decision height  Angular distance to body on celestial equator along hour circle of body. Comparable to latitude on terrestrial sphere.

decision height above  For test purposes, landing from points deliberately offset laterally or longitudinally at decision speed.

decision speed  Usually, $V_1$.

decorder  Digital enhanced cordless telecommunications.

decoupler  Large-amplitude elastic connection separating two systems of masses which, if rigidly linked, would be prone to dangerous flutter; hence * pylon for separating vibration of wing and heavy stores hung below it.

decoy  Device or technique used to simulate attacking aircraft and their defensive systems. Usually operates at radar or IR wavelengths.

decrease  Quantified decrease in value of variable.

decreasing  Decrease.

decrater  To yaw crabbing aircraft landing in crosswind to align wheels with track.

decrease  Quantified decrease in value of variable.

DECS  Defence Economic-Commerce Service (UK).

DECT  Digital enhanced cordless telecommunications.

Dectrac  Decca Navigator display for GA aircraft.

DECU  Digital engine (or electronic) control unit.

ded  Dedicated.

DED  Data entry display.

DED  Directed-Energy Directorate (AFRL).

DED  Directorate of Engineering Development (UK).
dedicated

dedicated Available only for one declared application; thus a * dock is tailored to one type of aircraft.

dedicated runway That permanently assigned as main instrument runway.

2 Department of Education and Employment (UK).

DEEC Digital electronic control.

DEEP Digital electronic flight-control system.

Defcon, DEFCON (Euret).

airport movements guidance control and management

Defamm Development of demonstration facilities for airport movements guidance control and management (Euret).

Defcon, DEFCON Defence contracting (UK, MoD.).

DEFCS Digital electronic flight-control system.

Defdars Digital expandable flight-data acquisition and recording system.

Defence/vehicle-mounted, for draining fuel and condensate from aircraft.

DEG, Deg Degree[s].

degaging

degraded performance Usually means failure of surface power unit.

Degraded performance Performance reduced by internal shortcomings, eg airframe tiredness, engine gas-path deposits, etc. Not normally used for external influences, eg hot-and-high conditions.

Degraded flight control Usually means failure of surface power unit.

Def Stan, DEF Stan Defence Standard (UK).

DEFT Defence Elementary Flying Training School (replaced JETS 2003).

DEFTS Defence Elementary Flying Training School (UK, until 2003).

Degree Non-SI unit of plane angle, = 1.745329 \times 10^{-2} rad.

Degree of freedom Mode of motion, angular or linear, with respect to co-ordinate system; free body has six possible ***, three linear and three angular.

Degree of freedom In unconstrained dynamic system, number of independent variables required to specify state at given moment. If system has constraints, each reduces *** by one.

defl Deflection.

deflection angle In supersonic flight, that between longitudinal axis and outer surface of bow [nose] of body.

2 That between longitudinal axis and surface [esp. trailing edge of airfoil] determining angle of top and bottom shocks.

deflection crash switch One triggered by impact significantly changing shape of structure.

deflection error Lateral artillery error, as distinct from range error, usually problem with land rather than air targets.

deflectometer Instrument for measuring deflection under load of airfield surface. There are several species.

Defra Dept. of the Environment, Food and Rural Affairs, with many air-transport responsibilities [UK].

defruiting 

Elimination of fruiting by rejecting all non-synchronous replies; PRFs varying by 2.5μs can be eliminated.

Def Stan, DEF Stan Defence Standard (UK).

Def Stan, DEF Stan Defence Standard (UK).

DEFTS Defence Elementary Flying Training School (UK, until 2003).

DEFTS Defence Elementary Flying Training School (replaced JETS 2003).

defueller Unit, usually vehicle-mounted, for draining fuel and condensate from aircraft.

DEG Dressed engine gearbox.

DEG, Deg Degree[s].

degarbling Elimination of garbling by trying to extract interleaved replies, differentiating between the exact leading and trailing edges of the pulses.

degassed Degassed or previously gassed.

degassing Removal of grease, oil or related residue by solvent, either liquid such as naphtha or vapour such as trichlorethylene.

degree of freedom Mode of motion, angular or linear, with respect to co-ordinate system; free body has six possible ***, three linear and three angular.

2 Spec. of gyro, number of orthogonal axes about which spin axis is free to rotate.
DEI

DEI demonstrator programme
delphinopter Class of micro air vehicles weighing c4·5g combining tail-flapping propulsion with a forward wing which twists for trajectory control. Most alternate between flapping and gliding.
DELSC Defence Electrical and Electronic Standardization Committee.

delta (δ) 1 Surface deflection angle, thus \( \delta = \) elevator deflection angle.
2 Difference; thus * 1700–1745 is 45 min.
3 Delta wing, or delta-wing aircraft.
Delta Gold Top FAI rating for glider pilot, requiring flight of 300 km or closed circuit (landing back at start) of 200 km.
delta h, \( \delta h \) Quantified change in altitude or height above ground.
delta hinge Helicopter main-rotor flapping hinge, giving blade freedom to flap up/down vertically. Thus, * is perpendicular to both blade axis and axis of rotation.
Delta Silver FAI qualification for glider pilot requiring distance flight 50+ km and [can be same flight] 5+ h duration.
Delta-3 Helicopter tail rotor with two pairs of blades not crossing at 90°.
delta-V, \( \Delta V \) Quantified change in velocity, usually uaspeed.
\( \Delta V_{\text{wind}} \) Change in whirl velocity, usually across a single stage of compression or expansion.
delta wing Wing of basically triangular plan-form with one apex at front and transverse trailing edge, usually with sharp leading-edge sweep giving low aspect ratio.
deluge pond Facility at site for testing or launching large vertically mounted rockets into which cooling water is flushed; also called skimmer basin.
DEM 1 Digital elevation model.
2 Data-exchange model.
3 Detector electronics module.
demand breathing See demand mask.
demand mask Mask through which oxygen or other therapeutic gas flows only on inspiration of wearer.
demand mode Acars mode initiated by either aircraft or ground processor.
demand oxygen See demand mask.
demijohn Fluid container of cylindrical form (F).
Demiz Distant early-warning military identification zone.
demodulation Detection of received signal by extracting modulating signal from carrier.
Demon Demodulation of noise.
demonstrate 1 To display new hardware according to detailed test schedule before certificating authority or sponsoring military customer.
2 More specifically, to show compliance with numerical performance values, reliability or maintainability.
demonstration flight Made for potential customer [on board], normally not forming part of an airshow programme.
demonstration lifejackets Demo jackets are kept in a special locker, and are not normally considered part of actual emergency equipment.
demonstrator programme 1 Showing of new civil aircraft in visits to potential customers.
2 Agreed schedule of tests of new hardware, including complete aircraft, before military customer in advance of
demounting

any decision on procurement and often to establish what is possible.

demounting One meaning is to remove tyre from wheel; the wheel may include a demountable flange.

demoval, Demval Demonstration and validation.

dempi [pronounced dimpy]. Designated mean point of impact.

densimeter 1 Instrument for measurement of optical density, generally of photographic image.

  2 Instrument for measuring fuel density, usually part of fuel measurement system.

density 1 Mass per unit volume; SI unit kg/m³ = 0.062428 lb/ft³ = 0.01002 lb/Imp gal; 1g/cm³ = 27.6799 g/cm³ = 27,679.9 kg m⁻³;

  1 lb/ft³ = 16.0185 kg/m³ [reciprocal, 0.0624278]. Often needs qualifying for temperature and pressure (see absolute*, relative*).

  2 Of aircraft, MTOW divided by total aircraft volume calculated from external envelope, or divided by both wing area and mean chord.

density altitude Pressure altitude corrected for non-ISA temperature.

density error Correction to EAS to give TAS (see airspeed).

desorbit Deliberately to depart from spacecraft orbit, usually to enter descent phase or change course.

dEOS Digital engine operating system.

dEP 1 Department of Employment and Productivity (UK).

  2 ICAO code for depart, departure, departure message.

  3 Departure airfield.

  4 Design eye position (usually of pilot).

  5 Direct-entry pilot.

  6 Data-entry panel.

departure 1 Any aircraft taking off from airport (as distinct from other airfields) under departure control.

  2 In air navigation, distance made good in E/W direction, usually expressed in nm.

  3 General term for uncontrolled flight beyond the stall; see divergence (1) or disturbance (2).

departure alternate Alternate airfield specified in flight plan filed before takeoff.

departure control Function of approach control providing service for departing IFR aircraft and, on occasion, VFR aircraft in such matters as runway clearances, vectors away from congested areas and radar separations, all at nominated time.

departure pattern That flown in 3-D by departure (1).

departure point Navigational check point, such as VOR or visual fix, used as a marker for setting course.

departure procedures ATC procedures (usually SID) flown by departing aircraft during climb-out to minimum en route altitude.

departure profile Flight profile flown by departure (1) to suit needs of vertical and horizontal separation, noise abatement, obstacle clearance, etc.

departure runway That from which departures (1) are cleared.

departure stall On attempted takeoff from small field, pilot avoids obstacle ahead by steep bank and sharp turn, then applying top rudder, stalling upper wing.

departure strip Flight progress strip recording callsign, ETD and route of departure.

departure tax Imposed by most states at flat rate per passenger.

departure track That followed by departure (1).

departure traffic Total number of departures, scheduled and non-scheduled, from one airport, usually expressed in movements per hour or per day.

depos Departure control.

depos Departure co-ordination system (Airsys); see Depos.

depigram Plot of variation of dewpoint with pressure for given sounding on tephigram.

deploy plane Normally transitive verb, to ask all occupants to leave aircraft, especially because of fault or potential danger.

deployable simulator Installed at front-line airbase or aboard carrier.

deployment 1 Strategic relocation of forces to desired area of operation.

  2 Extension or widening of front of military unit.

  3 Change from cruising approach, or contact disposition, to formation for battle.

  4 Process from pulling ripcord to fully opened parachute.

  5 Extension of solar panels from spacecraft.

  6 Basic meaning of word: to use a military or naval aircraft operationally.

deploy range Range of combat aircraft on transfer from one theatre to another, if necessary with internal or external auxiliary fuel.

dEPM Data evaluation program manager[s] (ATOS).

depos Departure co-ordination system (ATC).

depot-level maintenance Performed at a specialized overhaul facility, remote from user unit.

depreservation run Test run of machinery after storage, to validate performance.

depressed-datum reheat Engine control mode for jet STOVL giving reheat operation at low (dry) thrust levels, giving smooth auto control to max. thrust.

depressed-sightline attack Shallow dive.

depressed trajectory Flight profile of ballistic missile, esp. SLBM, fired over relatively short range with altitude kept low to reduce exposure to defending radars.

depression 1 Region of relatively low barometric pressure, also known as cyclonic area or low; secondary* is small low accompanying primary.

  2 Negative altitude, angular distance below horizon.


depth Aerospace meanings include * of depression, * of
Dept[s] modulation and distance down runway; * of wing profile is thickness.

Dept[s] Department[s].

DER 1 Designated engineering representative.

2 Departure end of runway.


derated engine One whose maximum power is governed at a lower than normal value. Hence derating.

Derd, DERD 1 Display of extracted radar data.

2 Incorrectly used to mean DEnGRD.

deregulation Removal of rules regarding admission to air-transport industry of new carriers, routes and equipment.

derisking Self-explanatory procedure of basing a new design on known technology.

derivative Not precisely defined, but taken by certifying authority to mean that new aircraft or engine is so similar to the original version that no new certification programme is needed.

derivatives, resistance 1 Lateral ** give variation of forces and moments caused by small changes in lateral, rolling and yawing velocities.

2 Longitudinal ** give variation of forces and moments caused by small changes in longitudinal, normal and pitching velocities.

derivatives, stability Quantities expressing variation of forces and moments on aircraft due to any disturbance to steady motion.

derotation To put nose gear on runway after landing.

DES 1 Design environmental simulator (USAF).

2 Design engineering support.

3 Data encryption standard.

4 Descend, descent.

DESC 1 Defense Electronic Support Center (US).

2 Defense Energy Supply Center [concerned with fuels].

DesCat Data-exchange system for control and targeting.

descending node Longitude or time at which satellite crosses Equator from N to S.

descent fuel Fuel burned from TOD until either hold or approach.

descent idle Engine setting to optimise parameters in near-glide.

descent indicator See VSI.

descent orbit insertion Start of lunar or planetary landing procedure from orbit, with retrograde thrust into descent transfer orbit.

descent propulsion That providing trajectory control for soft lunar or planetary landing.

descent stage Lower part of two-way lunar or planetary lander which, when mission is completed, acts as launch pad for ascent stage.

descent transfer orbit Highly elliptical around Moon, can be circular around planet, in which soft lander is placed before descent to surface.

Desc. Description.

deselect 1 To switch off.

2 Eliminate contender from competition.

desensitization Reduction in TCAS threat volume.

design Entire process of translating hardware requirement or specification into final production drawings and NC tapes.

designate To point out a target by aiming a laser.

designated flying course Prior to carrier landing, 15 seconds before turning downwind.

designated target One at which friendly designator (2) is pointed.

designation marking Use of laser or other designator.

designator 1 Letter/number code identifying each flight by a scheduled carrier.

2 Number/letter code identifying each runway, thus 26L = 26° left runway of pair.

3 Laser or other device pointed at target to make latter emit signals on which missile can home.

Design Chain Accelerator One of the first commercially offered clusters (1) for simulating complex systems (Intel/MSC/HP).

design envelope See gust envelope.

design gross weight Anticipated MTOW used in design calculations; design takeoff weight.

design landing weight Anticipated MLW used in design calculations.

design leader 1 Individual leading design team.

2 Nation in collaborative project said to have political dominance.

design load Specified load below which structural member or part is designed not to fail, usually expressed as probable maximum limit load, unfactored.

design load factor Maximum repeated vertical acceleration which an aircraft structure is designed to withstand without accretion of damage. Typical values for a jet transport are +2·5/-1g (with flaps extended reduced to +2), and for a fighter +12/-6.

design maximum weight Assumed weight used in stressing structure for flight loads.

design office That in which design takes place, and authority vested therein.

design points Specific combinations of variables upon which design process is based; together these cover every combination of air density, airspeed, Mach, dynamic pressure, structural loads (including free or accelerated take-off and normal or arrested landing) and system demands aircraft can encounter.

design verification First item built to new design to prove compliance with drawings and demonstrate correct functioning (see DVA).

design weight No standard meaning, but with most design/certification authorities is less than MTOW.

design wing area Area enclosed by wing outline (including flaps in retracted position and ailerons, but excluding fillets or fairings) on surface containing wing chords, extended through nacelles and fuselage to plane of symmetry.

Desir Direct English statement information retrieval (EDP).

desmodromic Mechanical drive giving perfect SHM to/fro action, esp. of cam drive to piston-engine valve.

Deso, DESO Defence Export Services Organization [former agency of the MoD, disbanded July 2007, replaced by UKTI].

de-spin To rotate part or whole of satellite or other spacecraft to neutralise spin previously imparted (see next).

despun antenna One mounted on satellite spun for reasons of stability which, because it must point continuously towards an Earth station, must rotate relative to satellite.
decssyn

dessyn Synchro (trade name).
dest Destination airport.
destage To redesign an engine by removing one stage of blading from an axial compressor (usually the last stage).
destretch To produce new version of transport aircraft with fuselage of reduced length.
destruct To destroy vehicle after launch because of guidance or other failure making it dangerous.
destructive test One which destroys specimen.
destruct line Map boundaries which vehicle must not cross; any which does is immediately destructed.
destructor 1 Device, explosive or incendiary, for intentionally destroying all or part of vehicle such as wayward missile or aircraft down in enemy territory.
2 NW for undersea use.
DESU Digital electronic sequence unit (APU).
deswirl Deliberate reduction in swirl velocity, for whatever reason. Hence *tubes, *vanes.
DET 1 Direct energy transfer.
2 Double-element thermocouple.
3 Or Det, detachment.
DETA Di-ethylene triamine.
detachable Capable of being removed from aircraft with normal hand tools.
detachable pack Parachute held to the harness by quick-release clips.
detached shockwave One proceeding ahead of body causing it.
detail 1 To design small part such as attachment bracket.
2 Drawing (can be inset on main design drawing) giving graphical representation of features.
3 Small military detachment for particular task.
4 To assign to special task or duty.
detail part One not normally broken down during service or storage.
Datasheet Plastic explosive based on RDX/PETN.
detectable crack Nominal length 100 mm, 4 in.
detector Sensitive receiver for observing and measuring IR.
dent A spring-loaded catch permitting linear movement in one direction only.
deterrence Prevention of aggression through fear of consequences.
DETF 1 Data-exchange test facility.
2 Delayed explosive tyre [tire] failure.
detolering The principal meaning is to open out (relax) dimensional limits on airframe structure.
detonating cord Flexible explosive [usually shaped-charge] pipe for emergency severing of doors, canopies, etc. More recently spelt chord.
detonation 1 Violent and irregular combustion in piston engine cylinder resulting from excessive compression ratio or supercharging, or using inferior fuel; also known as knocking or pinking.
2 Correct triggering of explosive.
detonator Explosive device usually sensitive to mechanical or electrical action and employed to set off larger charge of explosive.
detonizing counter Indicates total remaining of substance being measured, such as rounds for a gun or kg of fuel.

Detresfa Distress phase of a search/rescue operation.
DEU 1 Display electronic unit.
2 Decoder/encoder unit (CIDS).
dence Two fighter or attack aircraft, usually in loose echelon formation.
deutron Nucleus of deuterium.
deuterium Isotope of hydrogen (heavy hydrogen) whose nucleus contains a neutron as well as a proton; used as projectile in nuclear processes. Forms heavy water (D₂O) with oxygen.
deuteride Compound of deuterium. Lithium-6 deuteride is a standard fusion material in NW.
DEV Deviation.
Devco Development Committee (ISO).
development 1 Process of converting first flight article into mature product ready for delivery.
2 Ongoing process of improving production aircraft to carry heavier load, fly farther, accomplish new tasks, etc.
3 Determining by mathematical calculation, computer graphics or drafting methods, size, shape and other pertinent characteristics of non-flat parts.
4 Opening of parachute canopy.
5 Generally not precisely quantifiable, process in which aircraft becomes locked-in to stall, superstall or spin.
development stage Begins as soon as hardware to new design is available; main phase complete at service (production) release or certification, but continues throughout active life of aircraft.
deviation 1 Distance by which impact misses target.
2 Angular difference between magnetic and compass headings caused by magnetic fields other than that of Earth.
3 In statistics, difference between two numbers (also known as departure), difference of variable from its mean (esp. standard *), or difference of observed value from theoretical.
4 In meteorology, angle between wind and pressure gradient.
5 In radio, apparent variation of frequency above and below unmodulated centre frequency.
6 In flying, sudden excursion from normal flightpath.
7 Any significant variation from plan.
development card Records compass courses corresponding to desired magnetic headings.
devil Dust devil.
development light[s] Warn pilot or ground controller of excessive departure from ILS beam.
DEW 1 Distant early warning.
2 Directed-energy weapon.
3 Dressed engine weight.
dew Atmospheric moisture condensed upon cold objects, esp. at night.
dewar Thermally insulated container, eg for cryogenics.
DEWD Dedicated electronic-warfare display.
DEWIZ Distant early-warning identification zone, extends from surface north of DEW line and around Alaska.
dewpoint Temperature at which, under ordinary conditions, condensation begins in cooling mass of air.
Dews

Dews Digital electronic-warfare simulator.

DF, DF 1 Direction-finding (or finder).
  2 Digital filter.
  3 Directed-flow (reverser).
  4 Dichromated gelatin.
  5 Data fusion.
  6 Deutsche Flugsicherung (ATC) (G), also DFS.
  7 Dong Feng = east wind, family designations of
     strategic ballistic missiles (China).
  8 Double-fuselage.
  9 Diesel fuel.
 10 Defensive [or direct].
 11 Downlink format.
 12 Direct to fix.
  D.F. Helicopter rotor damping factor.
Dy Zero-lift drag, usually of whole aircraft.

DF-1, DF-2, DF-A GA specifications for diesel fuel.

DF-A 1 Deutsche Flug-Ambulanz Gemeinnützige
     GmbH (G).
  2 Delayed-flap approach.
  3 Direction-finding antenna.
  4 Design for assembly.

DFAC Data-fusion analysis convergence.

DFAD Digital-feature analysis data.

DFAR Defense Federal Acquisition Regulations (US).

DFAS Defense Finance and Accounting Service (US).

DFBW Digital fly-by-wire.

DFC 1 Distinguished Flying Cross.
  2 Direct force control, eg on F-16.
  3 Digital flight control [adds system].
  4 Duty-free confederation.

DFCC Digital flight-control computer.

DFCL Director (ate) of flight-crew licensing.

DFCS Digital flight – [or fuel] – control system.

DFCT Director (ate) of Foreign and Commonwealth
     Training (UK, multiservice).

DFD 1 Digital frequency discriminator.
  2 Data flow diagram (real time).
  3 Digital flight data.

DFDA 1 Defence Force Discipline Act (UK).

DFDFAF Digital flight-data acquisition function.

DFDAMU DFD(3) acquisition management unit.

DFDAU Digital [or distributed] flight-data acquisition
     unit.

DFDR Digital flight-data recorder; S adds system.

DFDS Digital fire-detection system.

DFDUF DFD(3) unit.

DFES Dept. for Education and Skills (England).

DFF Display failure flag.

DFG 1 Digital flight guidance [C adds computer, S
     system, U unit].
  2 Defence Fuels Group.

DG 1 Digital function unit.
  2 Deployable floatation unit.
  3 Exhortation, Don’t f*** up!

DFV Deutsche Flugdienstleiterer Vereinigung (G).

DFVLR Deutsche Forschungs- und Versuchsanstalt
     für Luft- und Raumfahrt, now DLR (G).

DFW Dedicated field work (USN).

DFWD Discrete flight warning display.

DFWF Direct-fire weapons effects; S adds simulator or
     simulation.

DG 1 Directional gyro, = DI (2).
  2 Dichromated gelatin.

Dg Maximum growth of tyre [tire] outside diameter.

DGA 1 Dispersed ground alert.
  2 Délégation Générale pour l’Armement (F).
  3 Director-General Aircraft, (N) adds Navy (UK).
  4 Displacement gyro assembly.

DGAA Director-General for Aeronautical Armaments
     (I, for NATO).

DGAC 1 Direction Générale de l’Aviation Civile (F).
  2 Directorate-General of Air Communications
     (Indonesia).
  3 Direzione Generale dell’Aviazione Civile (I).
  4 Direccao-General da Aviacao Civil (Portugal).
DGES
5 Dirección General de Aviación Civil (Spain etc).
DGES Director-General Equipment Support; can have suffix (Air) (UK).
DG1 Directional gyro instrument or indicator.
DGIA Dirección General de Infraestructura Aeronáutica (Uruguay).
DGIA Defence Geographic and Imagery Intelligence Agency (UK).
DGLR Deutsche Gesellschaft für Luft- und Raumfahrt [office, Bonn] (G).
DGLRM Deutsche Gesellschaft Für Luft- und Raumfahrtmedizin (G).
DGM 1 Distance-gone meter (Doppler).
2 Digital-group multiplexer.
DGNM Director-General of Medical Services (RAF).
DGNSS Differential global navigation system.
DGNSS Differential global nav-sat system; U adds unit.
DGS Deutsche Gesellschaft Für Ortung und Navigation (G).
DGPS 1 Digital-generation subsystem (ECM).
2 Digital-generation subsystem (ECM).
DGSI Docking guidance system.
DGSI Deployable ground system [various suffixes] (USAF).
DGSI Drift and groundspeed indicator (Doppler).
DGTM Digital GPS translator.
DGTA Dirección General de Transporte Aéreo (Peru, etc).
DGTE Director-General Test & Evaluation (UK).
DGU Display generator unit.
DGUS Doppler ground velocity system.
DGW Design gross weight.
DGZ Desired ground zero; point on Earth’s surface nearest to centre of planned nuclear detonation (see actual ground zero, ground zero).
DH 1 Decision height.
2 Datalink Header.
DHA Display head assembly.
DHB Dynamic hot bench.
DHDA Digicon header diode array.
DHF Defence Helicopter Flying School, (RAF Shawbury, UK).
DHKAH Aeronautic Association (S. Korea).
DHMI Airports authority (Turkey).
DHO Damped harmonic oscillator.
DHS 1 Data-handling system.
DHSN Defence Helicopter Support Authority (UK).
DHUD Diffraction, or diffractive-optics, HUD.
DHN 1 Deutscher Hubschrauber Verband, [helicopter association; office, D-56581 Melsbach] (G).
2 Deutscher Hängegleiterverband, [hang gliding and sport parachuting; office, D-83703 Gmund] (G).
DI 1 Daily inspection.
2 Direction indicator.
3 Director of Intelligence.
4 Duty instructor.
5 Direct-injection.
6 Data interrupt.
7 Dynamic inversion [control of linear system].
D4 Induced drag.
DIA 1 Documentation Internationale des Accidents (DocIntAcc).
2 Defense Intelligence Agency (US).
3 Document interchange architecture (IBM).
4 Data-interaction architecture; DEM adds demonstrator.
5 Digital interface adaptor card.
diabetic process Process in thermodynamic system with transfer of heat across boundaries.
diabolo Landing gear with two wheels side-by-side on centreline of aircraft [esp. MLG].
diagonal-flow compressor One in which air flows diagonally to plane of rotation, centrifugal with axial component.
Dial Differential-absorption lidar.
dial-a-STOL Notional method of operating CTOLs from bomb-damaged runways in which weapon/fuel load is selected according to length of undamaged runway available.
Dialmet Automated Metar and TAF service.
Dials Digital integrated automatic landing system.
dial your weight Small computer on whose keyboard is manually inserted all fuel, crew, payload and other on-board items, displaying MTOW and c.g. position (colloq.).
diamagnetic Reacting negatively to magnetic field, developing magnetic moment opposed to it, with permeability less than 1; includes aluminium, non-ferrous alloys and corrosion and heat-resistant steels.
diameter 1 That of any circular arcs making up fuselage external cross-section.
2 In optics, unit of linear measurement of magnifying power.
3 Of parachute canopy, that while fully spread out on flat surface.
diametral clearance The total free movement in the radial direction between the inner and outer races of a ball or roller bearing.
diametral pitch Ratio of number of teeth on gearwheel divided by pitch diameter.
Diamond C Highest proficiency award for which sailplane pilots can qualify.
diamond landing gear Tandem centreline mainwheels, and outriggers.
diamond roll Precision machine tool for dressing grinding wheels.
diamonds See shock diamonds.
diamond-wing aircraft Has swept-back front wing merged at tips into forward-swept rear wing; also called twin-wing.
Diane 1 Digital integrated attack navigation equipment.
DIAP

2 Détection identification analyse des nouveaux emetteurs [helo threat warning] (F).
DIAP Defense Information Assurance Program (DoD).
diaphragm Fabric partition within aerostat; may be gastight (ballonet *) or non-gastight (stabilizer *).
diathermy Generation of heat by HF power, usually at 0.5/1.5 MHz.
Diatsm DISN interim asynchronous transfer services.
DIB 1 De-icer boot.
  2 Digital, or DCCS1, integration backbone.
  3 Dry-ice blasting.
dibber Weapon intended to penetrate concrete runway before exploding.
DIC 1 Defence Industries Council (UK member of EDIG).
  2 Dynamic-inversion controller.
Dicars Digital cassette recorder for passive sonar.
Dicass Directional command-activated sonobuoy system.
dice 1 Semiconductor chips or IC after scribing and separation.
  2 To fly, esp. in exciting manner or on operations (collog. RAF, WW2). Hence, dicing: ‘op’ is on, not scrubbed.
dichroic mirror One coated with molecular-thickness layer of reflector, usually metal, so as to transmit some EM wavelengths (esp. visible colours) and reflect others.
DICU Display interface control unit.
DID 1 Data-item description [S adds sheet(s)].
  2 Digital-image design.
  3 Data-insertion device.
didler CRT auxiliary electrostatic plates which can collapse elongated blips to sharp spots.
DIE Defense [defence] information environment.
die 1 Press tool, often in mating male/female halves, which cuts sheet or imparts three-dimensional shape to workpiece.
  2 Shaped tools used in *-casting.
  3 Shaped tools used in *-forging.
  4 Shaped female mould used in explosive or magnetic forming.
  5 Shaped male tool used in ultrasonic, ECM and related mechanical, chemical or electrochemical shaping.
  6 Tool with shaped aperture used in extrusion.
dielectric Substance capable of supporting electric stress, sustaining electric field and undergoing electric polarization; includes all insulators and vacuum.
dielectric constant Ratio of capacitance of material to same condenser using air or vacuum, or of ratio of flux densities in the two media. Also called permittivity. Symbol εr, but Δε, χ and other symbols can be found.
dielectric heating Generated in dielectric subjected to HF field, resulting from molecular friction due to successive reversals of polarization; power dissipated is dielectric loss.
dielectric strength Measure of resistance of dielectric to electrical breakdown under intense electric field; SI unit is Vm–1; also known as breakdown potential.
dielectric tape camera TV recording camera (Vidicon) giving output on tape in form of varying electric field.
DIELI Direction des Industries Electroniques et de l’Informatique (F).
diffuser
microminiature grids, or light apertures, to create a volume hologram which makes possible a wide-angle HUD suitable for all-weather low-level navigation and weapon-aiming.

diffuser
Expanding profiled duct or chamber, sometimes with internal guide vanes, that decreases subsonic velocity of fluid, such as air, and thus increases its pressure, downstream of compressor or supercharger, upstream of afterburner, and in some wind tunnels. In contrast, supersonic flow through a pipe is reduced in pressure and increased in velocity, hence con/di nozzle.
diffuser area ratio
7 Ratio of outlet to inlet cross-section area of diffuser, esp. of ramjet.
diffuser efficiency
Ratio of total energy at exit to entry or achieved/theoretical pressure rise.
diffuser tunnel
Wind tunnel containing section in which velocity is converted into pressure.
diffuser vanes
Guide vanes inside diffuser that assist in converting velocity into pressure.
diffusion
1 In atmosphere or gaseous system, exchange of molecules across border between two or more concentrations so that adjacent layers tend towards uniformity of composition.
2 Of stress, variation along length of structure of transverse distribution of stress due to axial loads.
3 In materials, movement of atoms of one material into crystal lattice of adjoining material.
4 In ion engines, migration of neutral atoms through porous structure prior to ionisation at emitting surface.
5 Of light, scattering of rays, either when reflected from rough surface or during transmission through translucent medium.
6 In electronic circuitry, method of making p-n junction in which n- or p-type semiconductor is placed in gaseous atmosphere containing donor or acceptor impurity.
7 Of uranium, repeated gaseous-phase concentration of fissile U-235.
diffusion bonding
Use of diffusion (3) to join solids with high surface finish in uncontaminated intimate contact.
diffusion coefficient
Absolute value of ratio of molecular flux per unit area to concentration gradient of gas diffusing through gaseous or porous medium, evaluated flux per unit area to concentration gradient of gas.
diffusion coefficient
Average of the diffusion coefficients of the two species.
diffusion coefficient
Molar diffusion coefficient.
diffusion coefficient
Product of the diffusion coefficient and concentration.
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DINS

DINS Direct noise amplification.

DINAS, Dinas Digital inertial nav/attack system.

DINFIA Direction Nacional de Fabricaciones e Investigaciones Aeronauticas (Arg.).

dinghy Small boat, usually of inflatable rubberised fabric, for use by crew and passengers after aircraft has ditched. Correct term is liferaft.

dinghy drill Procedure for unpacking, inflating and entering dinghy.

dining-in night Formal dinner, usually once per month, attended by all members of mess and invited guests (RAF).

dinking Use of thin blade-like shaped die(s) to cut soft sheet materials such as leather, cloth, rubber or felt, and to cut lightening holes in thin sheet-metal; inexpensive die is used, and cutting action is by steady pressure or hand hammer.

DINS Digital inertial navigation system.

DIO 1 Defence Industry Office [Sydney, NSW 2000] (Australia).

2 Distributed Information Operation (USN).

diode Two-electrode thermionic valve containing cathode and anode, or semiconductor device having unidirectional conductivity.

diode lamp Semiconductor diode which, when subject to applied voltage, emits visible light. Smaller than most switchable light sources. Also known as light-emitting diode (LED).

DIOT & E Dedicated initial operational test and evaluation, requires four primary aircraft plus backup, all close to production configuration.

DIP 1 Digital image processing.

2 Defense industrial plant (US); EC adds ‘equipment center’.

3 Defense industrial participation.

4 Defence Industrial Policy (UK, October 2002).

5 Debtor in possession.

6 Dual inline package [ICs].

7 Data-interrupt program.

8 Diplexer.

dip 1 Angle between magnetic compass needle perfectly poised or on horizontal axis and local horizontal plane. Also known as magnetic inclination.

2 Vertical angle at eye of observer between astronomic horizon and apparent line of sight to visible horizon.

3 Angle between local horizontal and lines of force of terrestrial magnetic field (indicated by [1]).

4 Salutation by briefly rolling aircraft towards observer, to * wing in salute.

DIPA Defence Industrial Program Authorization.

diplexer Device permitting antenna (aerial) system to be used simultaneously or separately by two transmitters.

DIP/LNA Diplexer and low-noise amplifier.

diplomatic authorization Authority for over-flight or landing obtained at government level.

diplomatic clearance The number and callsign allocated to a military aircraft to permit it to overfly foreign territory.

diplomatic locker Secure compartment used solely for documents and other items being carried on behalf of the government to which the aircraft is registered.

dipole 1 System composed of two separated and equal electric or magnetic charges of opposite sign.

2 Antenna (aerial) composed of two conductors in line, fed at mid-point. Total length equal to one half wavelength.

DIPP Defense/industry partnership program (Canada).

dipper See fuel dipper.

dipping sonobuoy One designed to be suspended but not released from helicopter and immersed in selected places in sea.

DIPR Directorate of Intellectual Property Rights (UK).

DIPS Dipole inches per second (chaff dispenser).

dipstick Graduated quasi-vertical gauge of fluid level in container, usually disconnected for reading.

dipsydoodle Official term for rollercoaster manoeuvre performed by SR-71 and some other supercruise aircraft following inflight refuelling, comprising dive to supersonic speed followed by accelerating climb back to operating height.

DIQAP Defence Industries Quality-Assurance Panel (UK).

DIR 1 Diagnostic imaging radar.

2 Distributed IR.

3 Direct, direction, director.

4 Digital instant recall.

5 Dwell illumination region.

Dircen Direction des Centres d’Experimentations Nucléaires (F).

Direc Directional, or directed, IR countermeasures (said as a word, USAF).

direct-action fuze See DA fuze.

direct approach Unflared landing.

direct broadcast Satellite powerful enough to transmit TV direct to terrestrial recipient or subscriber.

direct coupling Association of two circuits by having an inductor, condenser or resistor common to both.

direct-cranking starter Hand crank or starter geared to crankshaft to start engine.

direct current Electric current constant in direction and magnitude.

Direct Digital imaging reconnaissance demonstrator.

direct damage assessment Examination of actual strike area by air or ground observation or air photography.

directed-energy weapon One whose effect is produced by a high-power beam, normally of EM radiation, having essentially instantaneous effect at a distance. Most important are lasers and HPM.

directed-flow reverser Reverser whose discharge in the reverse mode is confined within limited angular limits to avoid the airframe or FOD/reingestion problems.

directed mode DME mode allowing FMCS to select one to five DMEs for interrogation.

directed slipstream Means of achieving STOL in which slipstream created by propellers or fans is blown over entire wing. Also known as deflected slipstream.

direct flight 1 Portions of flight not flown on radials or courses of established airways.

2 Point-to-point space flight, without rendezvous, docking or other manoeuvre.

direct force control Control of aeroplane trajectory by application of force normal to flightpath without prior
direct frontal

need to rotate to different attitude; eg lateral force by combined rudder and chin fin, vertical by tailerons/stripes or vectored thrust.

direct frontal Air-combat tactic for double attack in which one interceptor closes head-on on each side of enemy force.

direct injection Precise metered doses of fuel sprayed directly into cylinder combustion space, not into eye of supercharger.

direction See azimuth, bearing, course, heading, track.

directional aerial, antenna Aerial which radiates or receives more efficiently in one direction than in others.

directional beacon Transmitter emitting coded signals automatically to enable aircraft to determine their bearing from the beacon with a communications receiver.

directional gyro Free-gyro instrument for indicating azimuth direction. Usually free from turning errors but prone to precess/wander.

directional instability Tendency to depart from straight flight by a combination of sideslipping and yawing.

directional marker Ground marker indicating true north and direction and names of nearest towns.

directional network waveform A high-speed net linking mobile stations throughout a theater of operations.

directional solidification Casting metal alloys in such a way that all transverse grain boundaries are eliminated, leaving long columnar crystals aligned with direction of principal stress.

directional stability Tendency of an aircraft to return at once to its original direction of flight from a yawing or sideslipping condition; also known as weathervane stability.

direction-finder Automatic or manually operated airborne receiver designed to indicate bearing of continuous-wave ground radio beacon (see ADF).

directivity Antenna radiant energy per unit solid angle in a given direction [usually main axis] divided by that averaged over all directions.

direct lift control Use of aerodynamic surfaces, esp. symmetric spoilers, to provide instantaneous control of rate of descent without need to rotate aircraft in pitch.

direct operating cost Costs of operating transport aircraft, usually expressed in pence or cents per seat-mile, per US ton-mile or per mile, and including crew costs, fuel and oil, insurance, maintenance and depreciation. Excluding indirect expenses, such as station costs or advertising; usually taken as 100 per cent of direct costs.

director 1 Aircraft equipped to control RPV or missile.

2 In air traffic control, a radar controller.

3 Fire-control tower in warships.

director horizon One name for a panel instrument combining an artificial horizon with radio inputs, especially ILS and VOR.

direct shadow photo Simplest and oldest shadow photography: bright point source of light (in former days, spark) throws shadow of body and shockwaves on to photographic plate.

direct side-force control DFC (2) flight-control system in which aircraft (heavier than air) can be translated sideways without yaw or change of heading by application of direct lateral force.

direct transit Special rules under which aircraft may pause [eg, to refuel] in a Contracting state.

disc loading

direct-view storage tube CRT storage tube needing no visor in bright sunshine.

direct-vision optics See next.

direct-vision panel Flight-deck window or part of window that can be opened.

direct voice input Control of function [eg, panel display, weapon selection, radio channel] by spoken command.

dirigible Capable of being guided or steered; thus an airship but not a balloon.

dir/fac Direct intercept.

DIRP 1 Defense industrial reserve plant (US).

2 Defense Industrial Research Program (Canada).

DIRS 1 Damage information reporting system.

2 Distributed IR system.

dirty 1 Aircraft configuration in which aerodynamic cleanliness is spoilt by extension of drag-producing parts, eg landing gear, flaps, spoilers, airbrakes.

2 NW whose detonation releases large quantity of toxic radiological material or emissions.

dirty bird Stealth aircraft coated [especially freshly] with ferrite paint.

dirty duty On intercept-ready status (USAF aircrew).

DIS 1 Distributed-intelligence system (MMI).

2 Defense Investigative Service (US DoD).

3 Defence Intelligence Service (UK MoD).

4 Distributed interactive simulation.

5 Data-intensive system(s).

6 Drawing-introduction schedule.

7 Defence Industrial Strategy [December 2005–] (UK).

DISA Defense Information Systems Agency (US).

disabled aircraft Damaged, or otherwise unairworthy, aircraft which could interfere with an airfield’s operation.

DISC Defence Intelligence and Security Centre (Chicksands, UK).

disc 1 Disconnect.

2 Direct [defense injection, reception and emergency action message command and control terminal] improvement and sustainment contract (NMCC).

disc 1 Ring on which one stage of compressor blades is carried. There is no defined boundary between this and a ring.

2 Hub carrying blades of fan or turbine.

3 Circular area swept by propeller or lifting rotor.

disc area Of propeller or helicopter rotor, area of circle described by tips of blades.

disch Discharge.

dischargeable weight 1 All masses which may be jettisoned overboard in emergency.

2 Of airship, total weight that can be consumed or jettisoned and still leave ship in safe condition with specified reserves of fuel, oil, ballast and provisions.

discharge coefficient The ratio of actual to theoretical mass flows, symbol $C_d$.

discharge correction factor Of rocket nozzle, ratio of mass flow to that of ideal nozzle which expands identical working fluid from the same initial conditions to same exit pressure.

discharge valve Manually operated and opened sparingly to release hot air from balloon envelope. Generally = dump valve (3).

discing Operation of propeller in ground fine pitch to cause aerodynamic drag.

disc loading Helicopter weight, or rotor thrust, divided by main-rotor disc area, T/A.
Disco

Disco Directional composite whose resin-impregnated fibres can slip past each other, giving highly deformable product which retains directional strength properties.

Discon Defence integrated secure communications network (Australia).

disconnect Inadvertent or deliberate severance of flow during boom-type air refuelling.

disconnect bolt Manually removed link in nose landing gear to permit sharper turns when under tow on ground.

discontinuity A sudden break in the continuity of mathematical variable.

2 In meteorology, zone within which there is rapid change, as between two air masses.

discontinuous fibre Chopped roving as distinct from yarn or tow.

discount carrier Despite next entry, one that [often in partnership with another] legally offers permanent low-cost travel, principally for tourists.

discounting Illegal selling of airline tickets, for affinity group and other promotional fares, at below agreed tariffs.

discourager A form of gas sealing insert closely related to honeycombs and labyrinths.

disc Discrepancy.

discrete code Any of the 4096 xpd codes available to ATCRBS except those ending with a zero.

discretion Flight time outside normal crew duty limits but legally permitted with concurrence of captain or PIC.

discrimination Of radar, minimum angular separation at which two targets can be seen separately.

2 Precision with which satellite antenna can focus in particular direction.

discriminator Stage of FM receiver which converts frequency deviations of input voltage into amplitude variations.

discus Of variable-geometry wing, part-circular portion of upper surface of fixed glove on which swinging portion can slide.

disembark To step down from COD aircraft.

dish Reflector for centimetric radar waves whose surface forms part of paraboloid or sphere.

dishing Pressing regular depressions in thin sheet to increase stability and resistance to bends.

2 In formation aerobatics, unwanted distortion of planar formation into dish shape [e.g. in formation roll].

disk Disc, except for compact *

dismounted flight training Hands-off training on ground using hand-held model aircraft, particularly for air-combat tactics.

DISN Defense Information System Network (DoD).

Disney bomb Armour-piercing free-fall bomb weighing 4,500 lb (2041 kg) finally accelerated to 2,400 ft/s (1089 ms⁻¹) by rocket (UK WW2).

DISOSS, Disoss Distributed office support systems (SNA).

DISP Displaced.

dispatcher One who is responsible for despatching an airplane flight See air *

dispatch delay Any notifiable delay, measured variously from either 5 or 15 min, in departure of scheduled flight.

dispatch deviation Any reportable irregularity other than deficiency which does not prohibit on-time departure.

At any notifiable delay, measured variously from either 5 or 15 min, in departure of scheduled flight.

discharger Any of the 4096 xpdr codes available to ATCRBS except those ending with a zero.

dispersion 1 Essentially self-explanatory, the quantified record of an aircraft in repeatedly fulfilling its design mission. It can be plotted graphically with probability of dispatch as the ordinate [the axis typically extending from 0.95 to 1] and the number of days without maintenance action as the abscissa. Thus, for each failure the aircraft shall be able to operate for a specified number of days with the stipulated likelihood of a second failure not occurring.

2 Percentage of all scheduled flights by particular aircraft or all aircraft of that type, often over specified period or for particular operator, that departed on time (measured as within 5 or 15 min).

dispensing Agreement to waive a rule without affecting safety.

dispenser 1 Container from which objects [e.g., ECM chaff cartridges, flares and active emitters] can be ejected in predetermined sequence.

2 Externally carried container for bomblets or other small multiple munitions.

dispersing 1 Release of ECM payloads in controlled manner.

2 Supply of fuel to aircraft via hydrant.

dispensing sequence Graphical or tabular plan for ECM to meet expected threats.

dispersal 1 Geographical spreading out of aircraft, material, establishments or other activities to reduce vulnerability to enemy action.

2 Dispersal area.

3 Parking area, usually paved, accessible from perimeter track, on which one aircraft could be parked. Some WW2 airfields had over 100.

dispersal airfield Potential operating platform for strategic aircraft, especially bomber with NW, which could within hours become an operating base following political crisis or actual attack [1957–90].

dispersal area Area usually on remote parts of airfield to which aircraft and support equipment can be dispersed in wartime.

dispersant oil Lubricating oil with additives which slow or even prevent formation of sludge and other solid deposits.

dispersion 1 Average distance from aim point of bombs dropped under identical conditions or by projectiles fired from same weapon or group of weapons with same firing data.

2 In AAA, scattering of shots about target.

3 In chemical operations, dissemination of agents in liquid or aerosol form from bombs and spray tanks.

4 In rocketry and AAM testing, deviation from prescribed flight path; circular dispersion.

5 Measure of scatter of data points around mean value or around regression curve, usually expressed as standard-deviation estimate or standard error.

6 Process in which EM radiation is separated into its components.
dispersion error

7 Measure of resolving power of spectroscope or spectrophotograph, usually expressed in A/mm.
8 Tendency over long period of commercial traffic to move from primary to secondary airports.
9 Scatter of actual touchdown points on runway over a period.

dispersion error Distance from aim point to mean point of impacts.

dispersion hardening Scattering of fine particles of different phase within metallic material, resulting in overall strengthening.

dispersion pattern Distribution of series of rounds fired from one weapon or group of weapons on fixed aim under conditions as nearly identical as possible.

dispersion warhead Discharging bomblets, FAE or other multiple or dispersed payloads.

displaced threshold Threshold not at downwind end of full-strength runway pavement. It is usually beyond it, and is available for takeoff or for end of landing roll, but not for touchdown.

displacement 1 In air interception, separation between target and interceptor tracks to provide interceptor acquisition space.
2 Distance from standard point (usually origin) measured in given direction.
3 Of IC engine, total volume swept by pistons during crankshaft rotation from BDC to TDC. Also known as swept volume.
4 Of airship or balloon, mass of air displaced by gas, expressed as weight or volume.
5 Lateral, vertical or angular * of any point of zero DDM from localizer or glidepath.

displacement thickness Dimension characteristic of all boundary layers and equal to thickness of completely stagnant fluid having same overall effect. Equal to distance through which each streamline is displaced from position it would have assumed had fluid been inviscid.

\[ \delta^* = \frac{2}{L} \left( 1 - \frac{u}{V} \right) \frac{dy}{\sqrt{\frac{L}{V}}} \]

where \( u \) is local boundary layer velocity, \( V \) free-stream velocity, \( y \) distance from solid surface, \( v \) kinematic viscosity and \( \delta^* \) characteristic length; actual boundary-layer thickness is nearly three times \( \delta^* \).

display Graphic presentation of data for human study.

Display Authorisation Document required from national aviation authority before pilot can take part in airshow.

display datum Also called display centre, the mid-point of the crowd-line.

disposable lift Gross lift less fixed weight of an aerostat.

disposable load Maximum ramp weight minus OEW.

DISR 1 Descent imager [and] spectral radiometer.
2 Department of Industry, Science and Resources (Australia).

disruptor-type stabiliser Maximises local turbulence.

disruptive threat Pentagonese for a totally unpredicted disruptive threat that 'comes out of left field' to tilt the balance of power (DoD).

dissimilar air-combat training Mock air combat with friendly fighters of different type(s) acting part of enemy aircraft, chosen for performance similar to that of enemy types and usually painted to resemble them.

dissimilar redundancy Use of different teams of engineers and programmers to design and code the software in different channels or control lanes in an attempt to avoid sudden multiple failure.


Dist Distance or district (ICAO).

distance Standard airline unit is nm (contrary to SI); up to 1,200 nm airline * calculated as \( D \) (great-circle distance) + \( (7 + 0.015D) \); above 1,200 nm measure is \( D + 0.02D \).

distance bar Rigid bar linking tow vehicle with aircraft.

distance marker 1 Numbers painted on runway side to indicate thousands of feet to upwind end.
2 Reference marker on radar display; usually one of series of concentric circles. Also known as range marker.

distance-measuring equipment Airborne secondary radar sending out paired pulses (interrogation) received at ground transponder; time for round trip is translated into distance. DME offers 252 frequencies from 962 to 1,213 MHz at 1 MHz spacing, providing 126 channels each comprising two frequencies 63 MHz apart.

Distant Marshal At gliding championship, official charged with arranging tugs and gliders in correct start sequence.

distillate 1 Any petroleum product.
2 Fuel oil, eg for diesels.

distortion 1 Undesired change in shape.
2 Undesired change in waveform.
3 In radio or sound reproduction, failure exactly to transmit or reproduce received waveform.
4 Variation of flow velocity or temperature across transverse plane through gas turbine.

distraction ECM mode in which hostile missile locks-on to decoy before it can see real target.

Distress & Diversion ATC cells [or in UK RAF units] which maintain 24-h monitor on v.h.f./u.h.f. emergency frequencies to offer assistance.

distress frequency Internationally 121.5 kHz.

distress signal Signal transmitted by vehicle in imminent danger.

distributed-aperture system EO sensors providing a protective sphere around aircraft for missile warning, navigation support and night operations.

distributed data-processing Distribution of EDP (1) capability among a number of positions in a geographically large system.

distributed jet system Any arrangement in which a power source is arranged to augment lift along the length of an aerofoil, examples being the jet flap, augmentor wing, EBF, IBF, CCW and USB.

distributed load One which has no single point of application but is distributed over a line or area, such as air load on a surface.

distributed mass-balance One distributed along span of control surface.

distributed mission training Creating realistic battle-space for aircrew by using networked simulators.

distributor 1 Rotary switch feeding HT in sequence to spark plugs.
2 Circumferential gallery connecting engine fuel manifold(s) to burner nozzles, probably incorporating a *
disturbance

valve, to compensated for gravity head and ensure all burners receive same supply.

1 See spreader 2.

disturbance 1 Upset to normal flight involving uncommanded change in AOA (α), normally quantified as change in $C_\alpha = \Delta \alpha$.

2 Situation involving unpremeditated loss of control, eg pitch-up or stall/spin.

3 Local departure from normal wind conditions; often used to mean cyclone or depression.

disturbance motion Uncommanded movement of cockpit caused by turbulence, vibration or other input beyond pilot’s capacity to counter.

disturbed-state concept Advanced yet simplified modeling of the mechanics of materials and interfaces.

disturbing moment Moment which tends to rotate aircraft about an axis.

Ditacs Digital tactical system.

DITC Department of Industry, Trade and Commerce (Canada).

Ditco Defense Information Contracting Organization; E adds Europe (Int.).

ditching Emergency alighting of aircraft, especially landplane, on water; thus verb to ditch.

ditching characteristic Way in which aircraft behaves on being ditched, dynamically and structurally.

ditching device Causes RPV to land or crash land when control has been lost.

ditching drill Emergency procedures for aircraft crew and passengers, performed before and after ditching.

DITCO Defense Information Technology Contracting Organisation.

dither Signal applied to keep servo motor or valve constantly quivering and unable to stick in null position.

DITS Data information transfer system [or set]; centralised control of military aircraft communications.

dits Digital information transport standard.

ditty bag Container for AC(2)’s personal items and mission documents carried aboard combat aircraft.

DITU De-icer timer unit.

DIU Data interface unit.

diurnal Adjective generally meaning daily, or in 24h cycles.

DIV Divert, diverting, division.

DIVC Digital imagery and video compression.

DIVADS Division air-defense system (USA).

dive Steep descent with or without power.

dive bomber Aircraft designed to release bombs at end of steep dive towards objective.

dive brake Extensible and retractable surface designed to enable aircraft to dive steeply at moderate airspeed.

dive-recovery flap Simple plate flap hinged at leading edge on underside of wing at about 30% chord and opened to assist recovery from dive by changing pitching moment, removing local compressibility effects and increasing drag. Common c1942–50.

divergence 1 Disturbance which increases without oscillation.

2 Expansion or spreading out of vector field; considered to include convergence, or negative divergence.

3 Aerelastic instability which results when rate of change of aerodynamic forces or couples exceeds rate of change of elastic restoring forces or couples.

divergence, lateral Divergence in roll, yaw or sideslip; tends to a spin or spiral descent with increasing rate of turn.

divergence, longitudinal Non-periodic divergence in plane of symmetry; leads to nose dive or stall.

divergence Mach No Value higher than $M_{\text{cr}}$ beyond which there is rapid drag rise.

divergence speed Lowest EAS at which aeroelastic divergence occurs.

divergent oscillation One whose amplitude increases at accelerating rate.

diversion 1 Change in prescribed route or destination made because of weather or other operational reasons.

2 Traffic diverted or claimed to be diverted from one airline by another, or to non-scheduled, charter or supplemental operators on same route. Frequently called material *.

diversity receiver See spaced diversity.

divided landing gear Traditional fixed main gear but with no axle or horizontal member linking wheels.

divided shielding Nuclear radiation shield in two or more separated layers.

divider 1 Logic circuit which performs arithmetical division.

2 Bulkhead or non-structural panel separating flight deck from passenger cabin.

dividing streamline That which eventually separates a flow into two parts, such as that which impacts the dividing line along the leading edge of a wing.

division, air 1 Air combat organization normally consisting of two or more wings of similar type units (US).

2 Tactical unit of naval aircraft squadron, consisting of two or more sections.

DIWS Digital-imagery workstation.

Dixie cup Simple continuous-supply drop-down oxygen mask for passengers.

DJ Detector-jammer.

DJE Deception-jamming equipment.

DJF Deployable Joint Task Force (NRF).

DK Docked.

DKATMS Danish air-traffic management system.

DL 1 Delay line.

2 Deck landing.

3 Downlink, or datalink.

DLA 1 Delay message.

2 Defense Logistics Agency (US).

3 Dedicated lease agreement.

4 Helicopter rotor disc loading.

DLAD Delayed.

DLAIND Delay indefinite (DLI more usual).

DLAND Development of Landing Areas for National Defense (US, 583 airfields 1941–44)

DLAP Downlink application processor.

DLARS Data-link automated response system (USAF).

DLB Datalink buffer.

DLC 1 Direct-lift control.

2 Datalink communication (sonobuoy).

3 Datalink control; DU adds display unit, I identifier.

4 Diamond-like carbon.

5 Domestic labor cost (usually per ASM2) (US).

DLCO Deck-landing control officer.

DLCRJ Detect, locate, classify, record and jam.

DLE Datalink entry.
DLF  Design load factor.
DFA  Deutsche Luftundraumfahrt ForschungsAnstalt (G).
DGF  Data-load gateway function.
DLS  Datalink ground station, for reconnaissance pods (RAF).
DLI  1 Deck-launched intercept.
    2 Delay indefinite.
    3 Datalink interface, or interpreter.
DLIR  Downlink jammer, or jamming.
DLK  Datalink (AECC).
DLL  1 Design limit load.
    2 Datalink library.
DLR  Deutsche Liga für Luft- und Raumfahrt (G Munich).
DLM  1 Declarative language machine.
    2 Depot-level maintenance (US, NATO).
DME  1 Direct lift and manoeuvre enhancement.
    2 Datalink and message engineering.
DMS  Digital land-mass simulation, common though superseded by MIL-STD protocols.
DMSU  Data-loader mass storage unit.
DMLU  Datalink management unit.
DLSA  Diplexer/low-noise amplifier.
DLO  Defence Logistics Organization (UK); ES(A) adds Equipment Support (Air).
DLLC  Design load factor.
DLY  1 Daily.
    2 Disconnect mode.
    3 Docking module.
    4 Double Master (Loran station).
DLYE  Digital linear tape.
DMD  1 Digital multi-broadcasting.
    2 Digital metal compaction, by EM pulses.
    3 Disaster-monitoring constellation.
    4 Display(s) and mission computer.
    5 Display management computer.
    6 Digital-map computer.
DMDL  Deployment manning document(s) (USAF).
DME  1 Digital message, or micromirror, device.
    3 Digital map display; G adds generator.
DMDR  Digital mission-data receiver.
DME  1 Distance-measuring equipment; suffixes N, J, T and /W signify normal, precision, Tacan or time, and wide-spectrum.
    2 Designated maintenance examiner.
DMEA  1 Defect-mode and effect[s] analysis.
    2 Defense Micro-Electronics Activity (DoD).
DMEAN  Dynamic management of the European airspace network (Eurocontrol).
DMD  1 Digital-message entry device.
DME  1 Distance.
DMEC  1 Decision and modeling/modelling language.
DMEES  Deployable mobility execution system.
DMEF  1 Distance determined by DME.
    2 Data memory, or management, module.
    3 Digital-map computer.
DMM  1 Department of Manufacturing Industry (Australia).
    2 Meteorological Institute [and service] (Denmark).
DMMsuite  Digital-message entry device.
DMMAD  Design for manufacturing and assembly.
DMMAC  Defense Mapping Agency Aerospace Center (US).
DMMAB  Defended modular-array basing.
DMMAC  Defence Mapping Agency Topographic Centre.
DMMAW  Deployable Multinational Air Wing (NATO).
DMMB  Digital multi-broadcasting.
DMMC  1 Direct manufacturing, or maintenance, cost[s].
DMM  1 Digital-message entry device.
    2 Digital metal compaction, by EM pulses.
    3 Disaster-monitoring constellation.
    4 Display(s) and mission computer.
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    2 Data memory, or management, module.
    3 Digital-map computer.
DMMF  Developmental manufacturing and modification facility.
DMMH/FH Direct maintenance man-hours per flight hour.
DMN Data multiplexing network.
DMO 1 Dependent meteorological office.
  2 Development Manufacturing Organization (modifies aircraft as system development vehicles).
  3 Defense Materiel Organization (US).
  4 Defence Material [now increasingly spelt materiel] Organization (Australia).
  5 Defence Management Office (central procurement body, Australia).
  6 Distributed mission operations [C adds Center, at Kirtland AFB] (USAF).
DMOR Digest of mandatory occurrence reports.
DMOS 1 Double-diffused MOS.
  2 Diffusive mixing of organic solutions (spaceflight).
DMPP 1 Display management panel.
  2 Direct-manning personnel.
DMPI Desired mean point of impact.
DMPP Display and multi-purpose processor.
DMR 1 Delayed multipath replica.
  2 Dual-mode radar.
DMRJ Digital modular radio.
DMRMS 1 Development material release.
DMS 1 Defensive management system, or subsystem.
  2 Defense Mapping School.
  3 Data, or database; management system. [DMSS, subsystem].
  4 Data multiplexer subunit.
  5 Domestic military sales.
  6 Display mode selector.
  7 Diminishing manufacturing sources [or service, or support], obsolete spare parts.
  8 Diminishing materiel shortage[s].
  9 Debris monitoring sensor, or system.
 10 Dual-mode seeker.
 11 Digital-map system.
 12 Defense Message Service (US).
 13 Docket management system.
DMSH Diminishing.
DMSK Differential-minimum shift keying.
DMSMS Diminishing manufacturing resources and material shortages.
DMSO Defense Modeling and Simulation Office.
DMSPI Defense Meteorological Satellite Program (DoD).
DMSM 1 Deployable mission support system [can go overseas on detachment].
  2 See DMS3[3].
DMD 1 Direct-operating cost[s].
  2 Delayed-opening chaff.
  3 Dominant obstacle allowance.
  4 Department of Aviation (several countries, e.g. Thailand).
  5 Design organization approval [-JA adds joint airworthiness].
  6 DoC Document [ation].
  7 Document [ation].
  8 Document [ation].
  9 Document [ation].
 10 Document [ation].
 11 Document [ation].
 12 Document [ation].
DOCCT/S Sama ordnance channel controller trainer/simulator.
Dock 1 Mechanical linking of two spacecraft or payloads.
  2 Forward movement of airliner to nose-in stand at terminal.
Docking 
  1 Structure surrounding whole or portion of aircraft undergoing maintenance, to provide easy access for ground crew to reach all parts.
  2 Large volume in factory, usually extending well below floor level, for installation of giant tools (jigs) and master tools.
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 34 Large volume in factory, usually extending well below floor level, for installation of giant tools (jigs) and master tools.
 35 Large volume in
Dolly with payload carried on two roller-dolly roll pallet transporter or trailer, container trailer or carrier or transporting it on ground. Engine, skid-equipped helicopter, radar or other item, and hammering out dents in sheet.

to mean blinker.

increasingly used Detection of laser emitters.

Dispersed operating location.

Department of Industry (UK, now DTI).

dOI Display.

diffraction-, or diffraction-, optics head-up display.

DOHC Double overhead camshaft.

Dohud Designated overhaul facility.

2 Date of flight (ICAO).

dOF, DOF Degree[s] of freedom.

DoA Department of Aviation (Australia).

2 Aircraft type all examples of which exhibit bad flying qualities (both meanings colloq.).

dogbone Bone-shaped tie, eg linking rigid-rotor blade to hub, or reacting engine thrust on testbed.

Dogfight Air-to-air combat at close visual range.

doghouse 1 Fairing for instrumentation, esp. on rocket (colloq.).

2 Balloon landing which results in basket being overturned.

dogleg 1 Track over several waypoints away from direct route.

2 Directional turn in space launch trajectory to improve orbit inclination.

dogship Repeatedly modified developmental prototype a/c [no reflection on handling qualities].

dogtooth Discontinuity at inboard end of leading-edge chordwise extension, generating strong vortex.

DOHC Double overhead camshaft.

Dohun Diffractive-, or diffraction-, optics head-up display.

DOI Descent (or docking) orbit insertion.

DOL Department of Industry (UK, now DTI).

DOL Dispersed operating location.

DOLE Detection of laser emitters.

doll's eye Cockpit magnetic indicator which when triggered clicks to a white warning aspect. Increasingly used to mean blinker.

dolly 1 Airborne data-link equipment.

2 Metal back-up block used in hand riveting or hammering out dents in sheet.

3 Pneumatic-tyred truck tailored to elevate and grasp engine, skid-equipped helicopter, radar or other item, and transport it on ground.

4 Vehicle or trolley equipped with ballmats, rollers [can be powered] or other interfaces for ULDs. Other names: pallet transporter or trailer, container trailer or carrier or even cargo trailer.

5 Each truck in airport baggage train.

dolly roll Dolly with payload carried on two roller-supported rings for rotation to any desired angle to facilitate inspection and maintenance.

Dolram, DOLRM Detection of laser, radar and millimetre (millimetric) waves.

DOM 1 Domestic, within US.

2 Director of maintenance.

dome 1 Flight simulator [esp. for combat a/c] with replica cockpit at centre of hemisphere on which images projected.

2 Convex pressure bulkhead.

3 Astro*.

dome compartment Space allocated within convex pressure bulkhead for cargo or other removables.

dome rivet Rivet with deep head, curved top and almost parallel sides.

domestic Involving one’s own country only.

domestic brief Before combat or training mission, portion of briefing which allocates aircraft (and explains where they are parked) and call-signs.

domestic reserves Fuel reserves for scheduled domestic flight.

domestic service Airline service within one country.

domicile Country in which air carrier is registered.

Domsat Domestic (usually communications) satellite.

donk Aircraft engine[s] or power (colloq. noun or transitive verb).

DO-178B Design and certification procedure for airborne equipment’ (RTCA).

DO-178 ‘Software considerations in airborne systems and equipment certification’ (RTCA).

DO-178B Design and certification procedure for software [civil aviation]. Level A is most comprehensive, Level E cheapest. See DO-254. (RTCA).

door bundle Para-dropped load immediately preceding stick of parachutists.

door-hinge rotor Articulated blades on flapping hinges visually similar to door hinge.

Doors Dynamic-object oriented requirements system.

DOP 1 Dioctyl phthalate [air-filter measures].

2 Defence and overseas policy (UK).

3 Detailed operation[al] procedure.

4 Dilution of precision.

5 Digital on-board processor.

DoPAA Description of proposed actions and alternatives.

dope 1 Liquid applied to fabric to tauten it by shrinking, strengthen it and render it airtight by acting as filler. Usually compounded from nitrocellulose or cellulose acetate base, and soluble in thinners.

2 Ingredient added to fuel in small quantities to prevent premature detonation (colloq.).

doping 1 Treatment of fabric with dope.

2 Addition of impurities to semiconductor to achieve desired electronic characteristics.

3 To prime piston engine with spray of neat fuel prior to starting from cold. Hence* pump, usually operated manually.

doploc Doppler phase lock; active tracking system which determines satellite orbit by measuring Doppler shift in radio signals transmitted by satellite.

Doppler Doppler effect.

Doppler beam sharpening As aircraft radar aerial points anywhere other than dead-ahead, computer breaks each reading into small pieces and reassembles them as high-
Doppler groundspeed of target radial velocities due to atmospheric refraction.

Doppler blade flash Transient bright spots on radar display caused by returns from rotating helicopter rotor.

Doppler correction Numerical correction to observed frequency or wavelength to eliminate effect of relative velocity of source and observer (eg removal of sea wave velocity from Doppler groundspeed).

Doppler effect Increase or decrease in frequency of wave motion, such as EM radiation or sound, sensed by observer or receiver having relative speed with respect to source. Thus, police-car siren seems to drop in pitch as it passes stationary observer at high speed. Approximate figures for X (I/J)-band: 34.3 Hz per kt, 30 per mph, 19 per km/h, 20 per ft/s. Also known as Doppler shift.

Doppler error In Doppler radar, error in measurement of target radial velocities due to atmospheric refraction.

Doppler groundspeed Groundspeed output from Doppler.

Doppler hover VTOL, esp. helicopter, hover controlled over desired geographical spot by Doppler coupler to AFCS.

Doppler navigation Dead reckoning by airborne navaid which gives continuous indication of position by integrating along-track and across-track velocities derived from measurement of Doppler effect of radar signals sent out (usually in four diagonal directions) and reflected from ground.

Doppler radar Radar which measures Doppler shift to distinguish between fixed and moving targets, or serve as airborne navaid by out-putting groundspeed and track.

Doppler ranging (Doran) CW trajectory-measuring system which uses Doppler effect to measure velocities between transmitter, vehicle transponder and several receiving stations; obviates necessity of continuous recording by making simultaneous measurements with four different frequencies.

Doppler shift 1 See Doppler effect.

2 Magnitude of Doppler effect measured in Hz or (astronomical) in terms of visible-light spectrum.

Doppler spectrum Output of Doppler radar with finite beam width.

Doppler velocity and position (Dovap) CW trajectory-measuring using Doppler effect; ground transmitter interrogates a frequency-doubling transponder and outputs is received at three or more sites for comparison with interrogation frequency, intersection of ellipsoids formed by transmitter and each receiver providing spatial position.

Doppler VOR Point-source navaid suffering all the faults of VOR but using wide-angle ground aerial which reduces errors due to local terrain. It uses an AM reference signal.

DOR 1 Directorate of Research (previously of Operational Research), under Chief Scientist (CAA, UK).

2 Dynamic observation report (ATOS).

DORA Directorate of Research and Analysis (UK).

Dora New technology for aerospace digital computers (R).

Dorca Directive on occurrence-reporting in civil aviation (CAA, UK).

dorsal 1 Pertaining to the back, interpreted as upper surface of vehicle body.

dorsal fin Shallow vertical surface on upper centreline sloping upwards to blend with main fin.

dorsal spine Ridge running along top of fuselage from cockpit to fin for aerodynamic or system-access purposes.

dorsal turret Powered gun turret on top of fuselage, normally able to cover upper hemisphere.

DOS 1 Disk operating system.

2 Denial of service (cyber attack).

DoS 1 Department of Supply (Australia).

2 Department of Space (India).

DOSAAF Voluntary society for support of Army, Air Force and Navy (USSR).

DOSAV Voluntary society for assisting Air Force (USSR, 1948–51).

DOSC Direct oil-spray cooled.

dose rate Incident rate of ionising radiation, measured in röntgens or mrem per hour.

dose rate contour line Line joining all points at which dose rates at given times are equal.

dosimeter 1 Instrument for measuring ultra-violet in solar and sky radiation.

2 Device worn by persons which indicates dose to which they have been exposed (each Apollo astronaut wore four passive * and carried a fifth personal-radiation * in sleeve pocket).

DoT 1 Department of Transportation (US, 1967), Canada and UK.

2 Designating optical tracker.

3 Day of training.

4 Details of task [unofficially “Dream of today”] (RAF).

dot Electronic dot displayed on CRT for cursive writing, providing steering guidance or other information.

DOTE Director, operational test and evaluation.

DoTI Department of Trade and Industry (UK, DTI is preferred).

Dotram Domain-tip random-access memory.

DOTS Dynamic ocean[ic] track system [flexible routing response to PDWC].


double attack Co-ordinated air/air operation by two partners making repeated synchronized yoyos (lo and hi-speed) and BR2A2s as an effective ACM system.

double-base propellant Solid rocket propellant using two unstable compounds, such as nitrocellulose and nitroglycerine, which do not require a separate oxidiser.

double blank Parachute with two gores removed.

double-bubble Fuselage cross-section consisting of two intersecting arcs [almost complete circles] with floor forming common chord.

double-channel simplex Two RF channels, one being disabled while the other is used to transmit.

double curvature Curvature in more than one plane; also known as compound curvature.

double delta Delta wing with sharply swept leading edge inboard changing at about mid-span to less sharply swept outer section.

double designation Nomination by a national government of two of that country’s airlines as national flag-carriers operating scheduled service on same international route.
**double drift**

- **double drift** Method of determining wind velocity by observing drift on three true headings flown in specific pattern.
- **double-end feed** Cooling air fed under pressure to both inner and outer radii of a turbine nozzle guide vane, to emerge through [possibly hundreds of] surface holes.
- **double engine** Power unit containing two engines driving co-axial propellers; usually one half can be shut down for cruising flight.
- **double-entry compressor** Centrifugal or radial-flow compressor that takes in fluid on both sides of impeller.
- **double farval** Rotating blade or vane with root fitting at each end to enable it to be fitted into disc either way.
- **double flow** Passive-suction system in upper surface of twin-row turbofan.
- **double horn** Dangerous ice accretion on LE forming two LEs, with channel between them.
- **double lift** Two crews per aircraft.
- **double modulation** Carrier wave of one frequency is first modulated by signal wave and then made to modulate second carrier wave of another frequency.
- **double notch** Flight-control system giving reduced surface movement for given input.
- **double propulsion** Use of two independent sources of thrust, one for lift and the other for propulsion, in an aerodyne. Historical examples include Rotodyne and Mirage III-V.
- **double protection honeycomb** Honeycomb structure protected by chemical surface conversion process and then varnish dip.
- **double root blade** Rotating blade or vane with root fitting at each end to enable it to be fitted into disc either way.
- **double row aircraft** Cargo airlifter able to carry unit loads (military vehicles, pallets, etc) side-by-side.
- **double sideband** AM signal with carrier removed (still needs some bandwidth).
- **double slot** Passive-suction system in upper surface of wing of high-subsonic aircraft in which air is continuously extracted immediately downstream of shockwave (to stabilize and weaken it) and discharged immediately upstream of it. Improves C₁ and buffet boundary.
- **double-slotted flap** Flap with vane and thus two slots, one between wing and vane, and the second between vane and flap.
- **double T** Tail comprising a vertical surface above each of two booms joined at top by a horizontal.
- **downdraft** Bulk downward movement of air such as commonly found on lee side of mountain or caused by descending body of cool air.
- **downdraft carburettor** One in which air is taken in at top and travels downwards; reduced fire hazard, and less risk of foreign-object ingestion.
- **downdraft carburettor** Aircraft that has made forced landing or ditching, esp. because of battle damage.
- **Dover control** Patented linkage permitting all engines of multi-engine aircraft to vary power in unison or with any desired differences [obs.].
- **DOW** Dry operating weight.
- **down** Faulty and unusable.
- **downburst** Local but potentially dangerous high-velocity downward movement of air mass, eg when arrested by sea-breeze front; chief cause of windshear.
- **down-channel** To lower EM frequency-band.
- **downcutting** Milling so that teeth enter upper surface of workpiece.
- **down Draught** Bulk downward movement of air such as commonly found on lee side of mountain or caused by descending body of cool air.
- **downgrade** To reduce security classification of a document or item of classified material.
- **downlink** Radio transmission from air- or spacecraft to Earth.
- **downlink data** Transmissions to Earth from spacecraft giving such information as astronaut respiration or cabin temperature; computers alert flight controllers to any deviation (7).
download

1 Any load acting downwards, eg on wing at negative angle of attack.
2 To remove unexpended ordnance or camera magazines from aircraft after operational sortie or aborted mission.

download DPMAA

1 Digital pressure altimeter.
2 Digital pre-assembly.
3 Defense Production Act (USAF).
DPAC Direction des Programmes Aéronautiques Civils (F).
DPAO Defence Public-Affairs Organization [Canberra, ACT2600] (Australia).
DPB 1 Dual-purpose bomblet, for soft- or hard-skinned targets.
2 Defence Procurement Board (India).
DPBAC Defence Press and Broadcasting Advisory Committee (UK).
DPBV Disabled-passenger boarding vehicle.
DPC 1 Defence Planning Committee (NATO).
2 Defence Production Committee (J).
3 Departure control.
4 Digital phase coding.
DPCM Differential, or digital, pulse-code modulation.
DPD Data-processing device.
DPDS Distributed, or digital, processing and display system (maritime sensors).
DPDT Double-pole, double-throw.
DPDU Data protocol data, or display, unit.
DPE 1 Designated pilot examiner.
2 Department of Public Enterprise [runs Irish civil aviation].
3 Duration of present emergency, the notional period of service for members of the armed services conscripted or volunteered in WW2 (UK).
DPEEE Directorate of Proof and Experimental Establishments (UK, MoD formerly).
DPELS Dual-pack Evolved Sea Sparrow launch system.
DPEM Direct-purchased equipment maintenance.
DPEO Dispersant piston-engine oil.
DPEWS, D-pews Design-to-price electronic-warfare suite.
DPF Data-processing facility.
DPFG Data-processing functional group.
DPG 1 See Sledyne.
2 Data-processor, or processing, group.
DPH 1 Defense Planning Guidance, policy directive underlying the budget process (DoD).
DPJ 1 Designated pilot examiner.
DPE Direct petrol-injection.
dpi Dots per inch.
DPICM Dual-purpose improved conventional munition.
DPKO Department of PeaceKeeping Operations (UN).
DPL 1 Disabled-passenger lift.
2 Departure procedure.
3 Denied Parties List [with whom no US industrial supplier is permitted to trade] (US).
4 Diode-pumped laser.
DPLA RPV or UAV (R).
DPLL Digital phase-lock loop.
DPM 1 Digital pulse-modulation.
2 Digital processing module.
3 Digital plotter map.
4 Development program manual.
DPMA Data Processing Management Association (US).
DPMAA Direction du Personnel Militaire de l’Armée de l’Air (F).
DPMC

DPMC Digital-plotter map computer.
DP/MC Display processor and mission computer.
DPMO Department of Defense POW/missing personnel office (US).
DPRG Deepening.
DPOC Deep and persistent offensive capability (UK).
DPOI Desired point of impact, or interest.
DPP 1 Deferred-payment plan.
2 Development and production phase.
DPPDB Digital point-positioning database (NIMA DoD).
DPR 1 Dual-port RAM(1).
2 Aeronautical Association (N. Korea).
DPRAM See preceding.
DPRR Central aeronautical association [N Korea].
DPS 1 Differential phase-shift.
2 Dynamic pressure sensor (brake pedals).
3 Descent propulsion system (LM or planetary lander).
4 Deorbit propulsion stage.
5 Data-processing system, or set.
DPSK Digital, or differential, or differentially coherent, phase-shift keying.
DPT 1 Durability proof test.
2 Depth.
DPTAC Disabled Persons Transport Advisory Committee (DTLR).
DPTCA Director, project technical cost-analysis.
DPU 1 Display processor unit.
2 Digital, or data, processing unit.
DQ Design qualification, demo of required reliability.
DQA Directorate of Quality Assurance; TS adds Technical Support.
DQAB Defence Quality Assurance Board; E adds Executive (UK).
DQ&R Durability, quality and reliability.
DQAR Digital quick-access recorder.
DQI Digital-quality inertial.
DQTS Data-quality tool set.
DR 1 Dead reckoning.
2 Dispense rate (mass/time) of chaff or aerosol (ECM).
3 Dispatch reliability.
4 Deck run.
5 Direct.
6 Data record[ing], or receptacle.
7 Design Review [followed by number].
Dr Drift.
Dr Receiver antenna directivity.
d Increment of radius, e.g. helicopter rotor blade.
2 Radar resolution in range.
3 Maximum depth of a rib.
DRA 1 Defence Research Agency (part of QinetiQ/ DSTL, previously DERA).
2 Direct radar access.
3 Dual-rail adapter.
4 Dual-row aerialdrop.
5 Direct radiating array.
dracone Large inflatable fluid (eg fuel, water) container, towable through sea and usable on soft land (strictly, Dracone).
Drads, DRADS Degradation of radar defence systems (active jamming by MIRVs).
Dr.afT Digital radio-frequency tag (USAF).
drag Retarding force acting upon body in relative motion through fluid, parallel to direction of motion. Sum of all retarding forces acting on body, such as induced *, profile *. Basic equation is \( D = C_D \frac{1}{2} \rho V^2 S \) where \( C_D \) is drag coefficient, \( \rho \) fluid density, \( V \) relative speed (e.g., TAS) and \( S \) total area, or total wing area.
drag area Area of hypothetical surface having absolute drag coefficient of 1.0.
drag axis Straight line through centre of gravity parallel to direction of relative fluid flow.
drag braking Internal braking commonly used in fabric-covered wings to resist drag forces; may consist of adjustable wires, rod or tubes between front and rear spars or between compression ribs.
drag chute Parachute streamed from aircraft to reduce landing run, or steepen diving angle. Also called brake or braking parachute, deceleration parachute drogue parachute or parachute.
drag-chute limit Maximum EAS at which drag chute may be deployed.
drag coefficient 1 Non-dimensional coefficient equal to total drag divided by \( \frac{1}{2} \rho V^2 S \) where \( \rho \) is fluid density, \( V \) relative speed and \( S \) a representative area of the body, all units being compatible.
2 Coefficient representing drag on given body expressed in pounds on one square foot of area travelling at speed of one mile per hour (arch.).
drag creep The [undefinable] point at which drag starts to rise prematurely before \( M_{DD} \) is reached. The usual cause is formation of small shocks round a blunt leading edge, cured by root extension.
drag curve Plot of lift coefficient against drag coefficient, also known as drag polar.
drag-divergence Mach number Loosely, that at which shock formation becomes significant from viewpoints of drag, buffet and control. A common precise definition is \( M \) at which \( dD/dM = 0.05 \); NASA Langley chooses 0.1, while another definition is simply \( M = 1.2 \). Also called drag-rise, \( M_{DD} \) and \( M_{DH} \).
drag hinge Approximately vertical hinge at root of helicopter main-rotor blade, allowing limited freedom to pivot to rear in plane of rotation.
drag index Usually means profile drag at 100 ft/s divided by total wetted area.
drag link Structural tie bracing a body, such as landing gear, against drag forces.
drag manoeuvre Air-combat manoeuvre in which one of a pair draws hostile aircraft into a firing position for his partner; can be used as verb.
drag member Structural component whose purpose is to react drag forces.
Dragn Dead-reckoning augmented GPS navigator.
Dragon Deployable ram-air glider with on-board navigation (UAV).
drag parachute 1 See drag chute.
2 See drogue (3).
drag polar Plot of \( C_D \) against \( C_L \).
drag rib See Compression rib.
drag rise Sudden increase in wing drag on formation of shockwaves.
drag rope Thrown overboard from balloon to act as brake or variable ballast when landing; also called trail rope or guide rope.
drag rudder Wing-tip surface capable of imparting drag
drag strut

[2 Wires led forward from car or other nacelle of airship to hull or envelope to react drag.]
[Draper (F).]
drag struts Strut reacting drag forces, esp. one incorporated in a wing.
drag-weight ratio Ratio of total drag at burnout to total weight of missile or rocket.
drag wires 1 Wires inside or outside wing(s) to react drag.
2 Wires led forward from car or other nacelle of airship to hull or envelope to react drag.
drain mast Pipe, usually telescopic through which liquid [fuel, water from cabin environmental system, grey water] can be extracted. No relevance to toilet servicing.
drains tank May be provided to collect fuel that escapes from any part of the [gas-turbine] engine, often continuously emptied by suction into the combustion chamber. Fuel is drained here after shutdown, and an ejector pump may transfer it back on engine start.
DRAM, Dram Dynamic random-access memory.
draping code Virtual processing tool [simulation] for composite structure in which dry preform[s] are wrapped around smooth tool.
Drapo Dessin et réalisation d’avions par ordinateur (F).
drawing introduction schedule Checks details for compliance with authorities.
DRB Defense Resources Board (US).
DRC 1 Defense Review Committee (NATO).
2 Data-recording cartridge.
DRD 1 Dry-runway distance.
2 Digital radar display.
DRDB Dual-redundant data bus.
DRDC Defense Research and Development Canada (Valcartier, Quebec).
DRDF VHF/UHF radio D/F (UK).
DRDL Defence R & D Laboratory (Hyderabad) or Laboratories (India).
DREO/DRO Defense R & D Organization (US, India).
DRDPS Digital radar data-processing system.
DREA Defence Research Establishment Atlantic (Canada).
DRED Ducted-rocket engine development.
Dreem Drone radar electronic enhancement mechanism.
Drem lighting Visual landing approach aid with red, amber and green lights in accurately inclined tubes pointing up glidepath (from RAF Drem, Scotland, 1937).
DREO/PS Defense Research Establishments: Ottawa/ Pacific/Suffield (Canada).
DRER Designated Radio Engineering Representative (FAA).
Dress Distributed and redundant electrical nose-gear steering system.
dressed Equipped with all externally attached accessories, piping and control systems, esp. of an aircraft engine or accessory gearbox.
DRET Direction des Recherches, Etudes et Techniques (F).
DREV Defense Research Establishment, Valcartier [Quebec G6R 1X5] (Canada).
DRF 1 Dual-role fighter.
2 Deutsche Rettungsflugwacht eV, air rescue service (G).
3 Data-recording facility.
drift

(DRFM Digital RF memory; S adds system[s], TG techniques generator.)
DRFT Drift
DRG During.
DRIC Defence Research Information Centre (UK, Glasgow).
DRI/DRO Dolly roll-in to dolly roll-out; engine-change elapsed time.
Drier, DRIER Dial-up rate IP [internet protocol] over existing radios (USAF).
Drift 1 Lateral component of vehicle motion due to crosswind or to gyroscopic action of spinning projectile.
2 Slow unidirectional movement of instrument pointer or other marker.
3 Slow unidirectional change in frequency of radio transmitter.
4 Angular deviation of spin axis of gyro away from fixed reference in space.
5 In semiconductors, movement of carriers in electric field.
6 Drag (until 1915).
7 Outward flow of boundary layer over swept wing, drawn towards tips by peak suction.
drift angle Angle between heading (course) and track made good.
drift climb Gentle climb after takeoff through noise-sensitive area at power just sufficient for ROC to be positive.
drift correction Angular correction to track made good to obtain correct track (for navigation, bombing, survey etc).
drift-down Gradual en route descent from top of flight profile (now rare).
drift error Change in output of instrument over period of time, caused by random wander.
drift indicator See drift meter.
drift meter Instrument indicating drift angle; in simple optical form a hair line is rotated until objects on ground travel parallel with it.
drift sight See drift meter.
drift 7 Correct procedure to be followed meticulously, eg in particular phase of flight such as takeoff.
2 Training flight by a formation, including formation changes.
drift card Checklist for correct procedures to be followed in particular phase of flight.
drift round Dolly roll-in to dolly roll-out; engine-change elapsed time.
D-ring 1 Ring in shape of capital D to which suspension ropes from balloon or other lighter-than-air craft are attached.
2 Handle for pulling parachute ripcord.
drink [the] Open sea or ocean (RAF colloq., equivalent to agin).
drip flap Strip of fabric secured by one edge to envelope or outer cover of balloon or other lighter-than-air craft to deflect rain from surface below it and prevent it from dripping into basket or car; also helps to keep suspension ropes dry and non-conducting. Sometimes called drip band or drip strip.
drip loop Inserted in wiring loom to allow for future extra length, and to direct condensation to drip in harmless place.
dripshield Any tray for collecting fluid under machinery.
drip strip

drip strip  See drip flap.
dRIR  Direct-readout infra-red.
DRIRU  Dry-rotor inertial reference unit.
DRISS  Digital read-in sub-system.
Dripline  Long essentially two-dimensional transmission of rotation, power or position, e.g. rotational flap-drive torque shaft along rear part of wing from a central actuator.
driver, airframe  Pilot, especially in tanker/transport community (RAF colloq.).
drive surface  In NC machining or GPP, real or imaginary surface that defines direction of cutter travel.
driving band  Band of soft metal around projectile fired from rifled gun which deforms into barrel rifling to impart spin.
DRivematic riveter  Patented power-driven riveter which closes aircraft rivets at high speed; can drill, countersink, insert rivet, close and mill head in sequence.
DRIRU  Direct-readout infra-red.
DRK Flugdienst  Red Cross flying service (G).
DRL  Data-reduction laboratory.  DRLMS  Digital radar land-mass simulation (for TFR, GM, Nav-weaps, EW).
DRM  1 Ducted rocket motor (USAf).  2 Digital recording module.
DRME  Direction des Recherches et Moyens d’Essais (F).
DRN  Document release notice.
DRO  1 Daily routine orders.  2 Drone Recovery Officer.
drogue  1 Conical funnel at end of in-flight refuelling hose used to draw hose out and stabilize it, and guide probe of receiver.  2 Fabric cone used as windsock, or towed behind aircraft as target for firing practice, or as sea anchor by seaplanes.  3 Conical parachute attached to aircraft, weapon or other body to slow it in flight, to extract larger parachute or cargo from aircraft hold, or for stabilizing the towing mass such as a re-entry body or ejection seat.  4 Part of connector on a spacecraft (eg Apollo lunar module) into which a docking probe fits.  drogue parachute  Drogue (3), tautological.  drogue recovery  Recovery system for spacecraft in which one or more small drogues are deployed to reduce aerodynamic heating and stabilize vehicle so that large recovery parachutes can be safely deployed.  drone  1 Pre-programmed pilotless aircraft, usually employed as airborne target; either pilotless version of obsolete combat aircraft or smaller aircraft designed as a target. Totally different species from RPVs.  2 Loosely and unfortunately used as synonym for RPV or UAV.  droneway  Runway dedicated to UAV operations.  droop  1 Downward curvature of leading edge of aerofoil to provide increased camber.  2 See droop leading edge.  3 Limited downward movement under gravity of door or access panel on underside, sufficient to have measurable effect on total aircraft drag.  droop bulk  Mechanical interlock prohibiting (a) selection of all engines at takeoff power with droops (2) up, or (b) selection of droops up in flight at above a specified angle of attack.  drooping ailerons  Ailerons arranged to droop about 15° when flaps are lowered to increase lift while preserving lateral control.  droop leading edge  Wing leading edge hinged and rotated down to negative angle relative to wing for high-lift low-speed flight (esp. takeoff and landing); colloquially called droops.

droop nose  Nose designed to hinge down for low-speed flight and landing of slender delta aircraft and to provide crew forward vision at high angles of attack. Also called droop snoot.
drops  Droop leading-edge sections.
droop snoot  1 Droop nose (colloq.).  2 Aircraft (esp. modification of familiar type) having extended down-sloping nose.
drop  1 Dropping of airborne troops, equipment or supplies on specified * zone.  2 Correction used by airborne artillery observer or spotter to indicate desired decrease in range along spotting line.  drop altitude  1 Altitude above MSL at which air drop is executed (DoD, NATO, CENTO).  2 Altitude of aircraft above ground at time of drop (see drop height).

drop forging  Forcing of metal or other materials in hot and plastic state to flow under pressure of blow(s) from drop hammer into mould or die to form parts of accurate shape.

drop height  Vertical distance between drop zone and aircraft (in SEATO, drop altitude).
drop interval  Time interval between drops (1).

drop line  Rope by which ground crew can walk balloon or other aerostat to new location.

dropmaster  1 Person qualified to prepare, perform acceptance inspection, load, lash and eject items of cargo for air drop. Also called air despatcher.  2 Air crew member who, during drop, will relay required information between pilot and jumpmaster (USAf).
drop message  Written message dropped from aircraft to ground or surface unit (probably arch.).
drop model  Aerodynamically and dynamically correct model of fixed-wing a/c, originally balsa, dropped in still air or vertical tunnel.
drop-out  1 Discrete variation in signal level during reproduction of recorded data which results in data-reduction error.  2 Of systems, automatic off-line disconnection following fault condition.  3 Disconnection of non-faulty autopilot in severe turbulence.

drop  1 Oxygen mask which drops out automatically for passengers and crew following sudden loss of cabin pressure.
dropping angle  In level bombing, the angle between the line of sight to the target at the moment of release and the local vertical.
drops  Drop tanks [more than one, carried by one a/c].
dropsonde

**dropsonde** Radiosonde dropped by parachute from high-flying aircraft to transmit atmospheric and weather measures at all heights as it descends. Used over water or other areas devoid of ground stations.

drop tank Auxiliary fuel tank carried externally and designed to be jettisoned in flight when empty.

drop test 1 Test of landing gear by dropping it from a height under various loads, with wheels at landing rpm. 2 Of models of future aircraft, free drop from balloon, helicopter or in spinning tunnel to check spinning or other characteristics.

... is close to rate at which ascending dry air body of unsaturated air (clean air) cools due to adiabatic expansion.

dry bay Structural compartment which, for a specific reason, is not used as an integral tank [it is normally surrounded by integral tankage].

dry-bulb thermometer Ordinary thermometer to determine air temperatures, as distinct from wet-bulb type; has glass capillary of uniform bore and bulb partially filled with a fluid (usually mercury) and sealed with vacuum above.

dry contact ARR hook-up between tanker and receiver without transfer of fuel.

Dryden See *DFRC*.

dry cranking Rotating main shaft[s] of gas turbine by external power, fuel system inoperative.

dry emplacement Rocket or missile launch emplacement without provision for water cooling during launch.

dry film Traditional film for optical camera, not digital smart card or video [originally to distinguish from wet film].

dry filter One on which filtration is effected by a dry matrix, without oil.

dry fog Haze due to dust or smoke.

dry fuel See solid propellant.

dry gyro Rotor has mechanical bearings and is not floated in fluid.

dry hub Rotor hub with elastomeric bearings needing no lubrication.

dry hydrogen bomb One without heavy water or other deuterium compounds.

dry ice Solid CO\(_2\), MPt –78.5C.

dry lease Transport-aircraft lease by one airline to (usually) another, without flight or cabin crew or supporting services. Sometimes called barehull charter.

dry plug Dry contact.

dry power See dry rating.

dry rating Of engine fitted with afterburner or augmentor, maximum thrust without these being ignited; usually same as MIL, maximum cold thrust.

dry run Pre-firing operation and actuation of engine (esp. liquid-propellant rocket motor) control circuits and mechanical systems without causing propellants to flow or combustion to take place. This enables instrumentation and control circuits to be checked.

dry side Especially in a long banana-shaped accessory gearbox, the position mounting starter, alternator, generator and other non-fluid items.

dry squeeze Simulated operation of a system or device (from ** of gun trigger to operate combat camera only).

dry stores Food and non-alcoholic beverages.

dry sump Engine lubrication system in which oil does not remain in crankcase but is pumped out as fast as it collects and passed to outside tank or reservoir.

dry thrust Dry rating.

dry weight 1 Weight of engine exclusive of fuel, oil and liquid coolant, and including only those accessories essential to its running. [There are many more complex definitions]. 2 Weight of liquid rocket vehicle without fuel, sometimes including payload.

Drezewicki theory Treatment of propeller blade as infinite number of chordwise elements; idealised, assumes each blade has no losses and meets undisturbed air.
DS

DS 1 Data sheet.
2 Directionally solidified alloy.
3 Documented sample.
4 Dynamic simulator.
5 Dust storm (ICAO).
7 Decision support.
8 Discarding sabot.
9 Double Slave[Loran station].
Ds  Maximum shoulder diameter (aircraft tyre/tire).
Dsa 1 Distributed system architecture.
2 Defense Supply Agency (US).
3 Disposals Sales Agency (US DoD and UK MoD).
DSAC  Defence Scientific Advisory Council (UK).
DSACT  Deputy Supreme Allied Commander Transformation (NATO).
DSAD  Digital service access device.
DSAG  Direction du Service Aérien Gouvernemental [Québec G2E 5W1] (Canada).
DSASO  Deputy senior air staff officer (RAF).
DSB  Defense Science Board (US).
DSB, d.s.b.  Double sideband.
DSC 1 Defect-survival capability.
2 Distinguished Service Cross (UK).
3 Digital selective calling.
4 Digital scan converter.
5 Disturbed-state concept.
6 Defence Study Centre [B-1020 Brussels] (Int.).
DSCE  Display select control equipment.
DSCS  Defense Satellite Communications System (US).
DSD 1 Defence Support Division (NATO).
2 Data signal display [U adds unit].
3 Data signal display [US adds unit].
DSDC  Digital signal data converter.
DSEAD  Distributed suppression of enemy air defence.
DSEDM  Departure sequenced engineering development model (FAA).
DSDDU  Data signal display unit.
DSES  Defense Systems Evaluation Squadron (simulates hostile bombers attempting to penetrate Norad/ADC).
DSF 1 Domestic supply flight (RAF).
2 Display systems function.
DSFC  Direct side-force control.
DSG  Design service goal [flight hours].
DSIF  Deep Space Instrumentation Facility, stations at Cape Kennedy, in California (2) at Goldstone, in S Africa (2) and Woomera (NASA/JPL).
DSIR  Department of Scientific and Industrial Research (NZ. UK).
DSIS  Digital software integration station (fighter radar).
DSL 1 Digital simulation language.
2 Depressed sightline.
3 Deutsche Schützstelle für Luftfahrtzeuge eV (G).
4 Digital subscriber line.
DSL C  Dynamic-scattering liquid crystal.
DSM 1 Dynamo situation modelling.
DSM 2 Departure-slot monitor.
3 Digital scene-matching.
4 Director of Support Management (RAF).
DSMAC  Digital scene-matching area-correlation, or correlator.
DSMC 1 Direct seat-mile cost.
2 Direct simulation Monte Carlo.
DSM/YOF  Distinguished Staffel Member/Ye Olde Fokker (US).
DSNA  Département de Satellite Navigation Aérienne, member of ESSP (F).
DSMS  Digital stores-management system.
DSN 1 Deep-Space Network, comprising DSIF and SFOF.
2 Defense switched network.
DSNS  Division of Space Nuclear Systems (AEC).
DSNT  Distant, = 30+ miles.
DSO 1 Defence Sales Organization (UK).
2 Defense- or defensive-, systems operator, or officer (US).
3 Distinguished Service Order (UK).
4 Device software optimization.
5 Design search and optimization.
DSP 1 Defense support program; O adds office (DoD).
2 Digital signal processor, or processing.
3 Departure spacing, or sequencing, program.
4 Display select panel.
5 Day surveillance payload.
6 Domain specific part.
7 Defense system[s] partnership[s] (UK).
DSPDRV  Display driver.
Dpled  Displaced.
DSPS  Defense support program satellite[s].
DSR 1 Director of Scientific Research.
2 Display-system replacement (FAA).
3 Directed-stick radiator (acoustics).
4 Dynamic super resolution.
5 Disk Selskab for Raumfartsforskning [aeronautical society; office, DK-2860 Søborg] (Denmark).
DSRTK  Actual track between two waypoints.
DSST 1 Department of Space Science (Estec).
2 Dipping sonar system.
3 Dynamic-signage system.
4 Decision support system.
5 Data-storage set.
6 Digital sequence/sequencer switch.
DSSP  Deep-Submergence System Program.
DSSS  Direct-sequence spread-spectrum.
DS’L, DSSSL  Document-style semantics and specification language.
DST 1 Daylight-saving time.
2 Dry specific thrust.
3 Defense and space talks, or treaty (drafted 1988).
4 Direction de la Surveillance du Territoire (F border security).
DS-T  Discarding sabot, tracer.
Dstl, DSTL  Defence Science and Technology Laboratory [created 2001 when US refused to share classified information; Porton Down, Wilts. SP4 0JQ] (UK).
DSTN  Double super-twist nematic.
DSTS  Data storage and transfer set.
DSTU  Digital-signal transfer unit.
DS200
A directionally solidified HPT material.

DSU  Direct Support Unit (USAF).
    2 Dynamic-sensor unit; gas-bearing yaw gyro and normal and lateral accelerometers.
    3 Digital switching unit.
    4 Data-storage unit; R adds receptacle.
    5 Defense-systems upgrade; P adds Program (USAF).
    6 Domain service unit.
    7 Data, or digital, signalling unit.

DSVT  Digital secure, or subscriber, voice terminal.

DSWA  Defense Special Weapons Agency.

DT  Displaced threshold.
    2 Dual-tandem landing gear.
    3 Development test.
    4 Day TV (TADS).
    5 Damage-tolerant, or tolerance.
    6, 7 Data, or digital, signalling unit.

DSU1  Direct Support Unit (USAF).

DS200 DTSP  A directionally solidified HPT material.

DS200 DTSP  A directionally solidified HPT material.

DTIC  Defense Technology Information Center (US).

DTM  Data-transfer module.
    2 Digital terrain-management; -D adds and display.
    3 Digital terrain modelling.
    4 Demonstration test milestone.

DTMC  Direct ton[ne]-mile cost.

DTM/M  Decision-to-miss point.

DTMM, DTM³  Data-transfer module/mass-memory.

DTN  Data-transfer network.

DTO  Desired test objective.
    2 Defense-technology objective.

DTOA  Difference in, or differential, or delta, time of arrival.

DTGT  Development test[ing]/operational test[ing].

DTIP  Design to price.

DTIPC  Defense Technical Procedures Committee.

DTM  Data-transfer module.
    2 Digital terrain-management; -D adds and display.
    3 Digital terrain modelling.

DTN  Data-transfer network.

DTO  Desired test objective.

DTH  Direct to home.

D-T, D-T  Deuterium/tritium (NW fusion material).

DTA  Direction des Transports Aériens, now Service des Transports Aériens (F).
    2 Dynamic, or drop, test article.
    3 Design and Technology Association (UK).
    4 Directorate of Technical Airworthiness (Canada).
    5 Deep-target attack.

DTAD  Demonstrated technology availability date.

DTAM  Descend to and maintain.

DT&E  Development, test and evaluation.

DTASS  Digital terrain-aided survival system.

DTAT  Direction Technique des Armements Terrestres (F).

DTCA  Direction Technique de Constructions Aéronautiques (F).

DTCL  Data-transfer cartridge.

DTCN  Direction Technique de Constructions Navales (F).

DTCF  Desired test objective.

DTCN  Direction Technique de Constructions Navales (F).

DDCS  Data-transfer system, or set.

DDUB  Data-transfer unit (USAF).

DDUC  Data, or digital, signalling unit.

DDUC  Data, or digital, signalling unit.

DDUT  Data, or digital, signalling unit.

DDUC  Data, or digital, signalling unit.

DDE  Data-transfer device.

DDE  Data-transfer device.

DDE  Data-transfer device.

DDE  Data-transfer device.

DDUC  Data, or digital, signalling unit.

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DDE  Data-transfer device.

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DDE  Data-transfer device.
Able to operate at either IR or RF main engine.

dual-mode EPU
dual-mode DME
duplicate harness and plugs.

dual designation
interconnected] flight-control inceptors, usually for frequencies.

Can carry both conventional and nuclear bombs.

Right of two or more airlines of same nation to compete with each other on international routes.

dual persistence CRT coated with phosphors giving bright display and dim previous indications.

dual-plane separation Space vehicle staging in which interstage(s) falls away separately.

dual propellant Ambiguous, can mean liquid bipropellant, double-base solid, or different propellants in two stages.

dual-purpose Designed or intended to achieve two purposes, eg gun or missile (esp. on surface warship) intended to destroy surface or aerial targets.

dual-roller adapter Interface enabling two AAMs to be carried on one pylon.

dual-rotation Two-spool engine in which LP and HP shafts rotate in opposite directions.

dual-row airdrop Use of slight (usually 4°) aircraft tilt to despatch pallets side-by-side.

dual-thrust motor Solid rocket motor giving two levels of thrust by use of two propellant grains. In single-chamber unit boost grain may be bonded to sustainer grain, with thrust regulated by mechanically changing nozzle throat area or by using different compositions or configurations of grain. In dual-chamber unit, chambers may be in tandem or disposed concentrically.

dual-use technology Military but can have civil applications [increasingly, perhaps, the other way round].

Can process /N or /P signals.

Can be on surface or at height up to 16,000 ft (5 km); thickness seldom greater than 330 ft (100 m).

Department of the Environment (UK).
Dufaylite
Dufaylite Airframe sandwich material with core of light plastics honeycomb.

duff gen Unreliable or incorrect information (RAF, WW2, colloq.).
dull switch Cockpit push-switch with dull appearance because never used.
DUM Dominant unstable mode, degree of freedom of aeroelastic or aeracoustic instability.
Dumas Dual-mode active IR and imaging IR seeker.
dumb Of munition, unguided or "iron"; not smart or brilliant.
dumbbell 1 Maneuvre in vertical plane resembling *, usually by helicopter, in making repeated low-level passes over same point.
2 Sign [usually white] in signals area denoting 'use paved areas only'. When ends have black bars = no restriction on taxiing but use runway for landing or TO.
dumb bogie Unimpressive opponent in air combat.
dummy deck Facsimile of aircraft carrier deck marked out on land.
dummy round Projectile, usually air-to-air or air-to-ground missile, fitted with dummy warhead for test or practice firing.
dummy run 1 Simulated firing practice, esp. air-to-ground gunnery or dive-bombing approach without release of a bomb. Also called dry run.
2 Trial approach to land, to release or pick up a load, as practice before actually performing operation.
dump 1 Emergency deactivation of whole system.
2 Of computer operation, to destroy, accidentally or intentionally, stored information, or to transfer all or part of contents of one section into another.
3 To jettison part of aircraft’s load for safety or operational reasons, eg * fuel.
4 Of spacecraft, overboard release of waste water, astronaut waste products, etc.
5 Temporary storage area for bombs, ammunition, equipment or supplies.
6 To open * valve of balloon.
dump and burn Awesome airshow entertainment in which a fighter makes a flypast in full afterburner and jetissoned fuel ignites in the hot jet[s].
dumper Lift dumper.
dump door Quick-acting hatch under hopper or tank for emergency release of chemicals, or under water tank for firefighting.
dump valve 1 Automatic valve which rapidly drains fuel manifold when fuel pressure falls below predetermined value.
2 Large-capacity valve fitted to any fluid system to empty it quickly for emergency or operational reasons.
3 Pilot-controlled valve which releases hot air or gas from balloon in controlled manner.
dunk To lower [e.g. sonobuoy] into water on tether or communication cable.
dunker training How to escape from helicopter underwater.
duo Co-ordinated aerobatics by two aircraft.
duo-tone 1 Colour of camouflage scheme with two main hues.
2 Two notes emitted by variometer.
dupe Duplicate (Message).
duple burner Basically simple gas-turbine injector which covers wide flow range by having two fuel chambers and two nozzles. See duplex burner.
duplex 1 Circuit or channel which permits fuel or electrical communication in both directions simultaneously.
2 The opposite: a radio system requiring separate T/R channels.
duplex burner 1 Gas-turbine fuel injector with alternative fuel entries and single exit orifice.
2 Small primary nozzle, used continuously, plus larger [often annular, surrounding primary] used only at T-O or other high-power regime.
duplexer Device which permits single antenna to be used for both transmitting and receiving, with minimal loss.
(See duplexer).
düppel Chaff (G, WW2).
DUR Duration, during [C adds climb, D descent, also expressed as DURGC, DURGD].
Durabond Metallic-composite adhesives for joining aluminium or stainless steel.
duralumin Wrought alloy containing 3–4.5 per cent copper, 0.4–1.0 per cent magnesium, up to 0.7 per cent manganese and the rest aluminium. Originally trade name.
Duramold Low-density structural material of thermosetting plastic-bonded wood (Clark, Fairchild, 1936).
duration 1 Maximum time aircraft can remain in air.
2 Time in seconds of operation of rocket engine.
duration model Traditional rubber-powered model aeroplane designed for flight endurance.
Durestos Composite structural material comprising asbestos fibres bonded with adhesive, usually formed by moulding under pressure (Aero Research/Ciba).
dustbin 1 Gun turret lowered through aircraft floor to provide ventral defence (colloq., arch.).
2 Similar retractable container for sensor, esp. radar.
dustbin 2 Small local whirlwind, dangerous to light aircraft.
dusting Controlled spreading of powder insecticide, fertiliser or other chemical by agricultural aircraft.
dustoff Dedicated, unhesitating service to our fighting forces (US).
DUT Delft University of Technology.
dutch door Upper portion hinges up, lower portion hinges down.
dutch roll Lateral oscillation with both rolling and yawing components; fault of early swept-wing aircraft. Especially dangerous at high altitude, when damping is insignificant. Can be stable [self-decaying], neutral, or dangerously divergent [unstable].
DUTE Digital universal test equipment (computer-guided probes check circuit boards).
duty crew Crew detailed to fly specific mission.
duty cycle Ratio of pulse duration time to pulse repetition time.
duty factor 1 In EDP (1), ratio of active time to total time.
2 In carrier composed of pulses that recur at regular intervals, product of pulse duration and PRF.
3 Several meanings in electronic jamming, usually fractions of unit time set is emitting or receiving.
duty ratio In radar, ratio of average to peak pulse power.
duty runway Runway designated for use by aircraft landing or taking off.
DUV Data under voice.
Distributed weapons co-ordination (CC&D).

DVRS

1

DVR

this is now also being translated as "direct VOR".

DVOF

warnings.

correct acceptance of DVI, and sometimes giving spoken

option).

DVO

1

DVMS

Direct-voice management system.

DVMC

Digital video map computer.

Digital voltmeter.

DVM

Digital voice-logging system.

DVO

1

DVS

1

DWC

Distributed weapons co-ordination (CC&D).

dynamic head

DWD

Deutscher Wetterdienst [meteorological service; D-63004 Offenbach/M] (G).

DWDF

Delta-wing dual-fuselage.

DWDM

Dense wavelength division multiplexing, or

multiplexed).

DWE

Doppler wind experiment.

dwell

1

Brief rest period at end(s) of sinusoidal or other oscillatory motion, eg spot scanning CRT tube, bottom of
drop-forging stroke, TDC and BDC in piston engine.

2

Period when scanning [eg, radar] beam remains

looking at a particular target, to enhance resolution.

dwell illumination region

Operator-selectable region of sky on which a surveillance radar can concentrate,

ignoring remaining coverage.

dwell mark

Caused by skin-mill, routing or similar tool

remaining too long over one spot.

dwell time

Among other meanings, the time spent in US

overseas tours (US armed forces).

DG

Digital word generator.

DVI

Installation for generating giant magnetic pulses
to explode mines (from cover name Directional Wireless Installation).

DWN

Downdraughts.

DWPS

Doppler velocity sensor.

DWS

Dispenser weapon system.

DWT

Deutsche Gesellschaft für Wehrtechnik eV (G).

DV

1

See duplex.

2

Distance.

dyadics

Sets of generalised vectors of aircraft motion

with not the usual three but nine components.

Dycoms

Dynamic coherent measuring system.

DYN

Dynamic pressure (EDP code).

dyn

see dyne.

Dynafoam

Polurethane elastomer becoming almost

standard as seat filling.

dynamic

Frequently refreshed [computer memory].

dynamic amplifier

Audio amplifier whose gain is

proportional to average intensity of audio signal.

dynamic aquaplaning

Landplane tyres running at high speed over shallow standing water and riding up out of contact with runway.

dynamic balance

Rotating body in which all rotating

masses are balanced within themselves so that no vibration is produced.

dynamic clash detection

Vital part of design process in

which 3-D computer imaging is used to confirm that all parts of an assembly can be removed and replaced as in future maintenance.

dynamic component

See dynamics.

dynamic damper

Device intended to damp out vibration

by setting up forces opposing every motion.

dynamic directional stability

Cnßdyn, refinement of divergence treatment of a/c, esp. supersonic fighters, by MouI/Paulson 1958.

dynamic factor

Ratio of load carried by structural part

in accelerated flight to corresponding basic load (see load factor).

dynamic flight simulator

Normally, flight simulator whose cabin is mounted on a centrifuge.

dynamic head

See dynamic pressure; also called kinetic head.
**dynamic heating**

*dynamic heating* Heating of the surface of an aircraft by virtue of its motion through the air. Heat is generated because the air at the surface is brought to rest relative to the aircraft, either by direct impact in the stagnation region or by the action of viscosity elsewhere. For practical purposes, synonymous with *aerodynamic heating* and kinetic heating.

*dynamic hot bench* Test facility enabling items such as avionics or auxiliary power systems to be connected as if they were in the aircraft.

*dynamic lift* Aerodynamic lift due to the movement of the air relative to a lighter-than-air aircraft.

*dynamic load* A load imposed by dynamic action, as distinct from a static load. Specifically, with respect to aircraft, rockets or spacecraft, a load due to acceleration as imposed by manoeuvring, landing, gusts, firing guns, etc.

*dynamic meteorology* The branch of meteorology that treats of the motions of the atmosphere and their relations to other meteorological phenomena.

*dynamic model* A model of an aircraft (or other object) in which linear dimensions, mass and inertia are so represented as to make the motion of the model correspond to that of the full-scale aircraft.

*dynamic particle filter* One which separates particulate solids from moving fluid by making them move relative to fluid; most common are centrifugal filter and momentum separation.

*dynamic pressure* 1 Pressure of a fluid resulting from its motion when brought to rest on a surface, given by \( \frac{1}{2} \rho V^2 \), where \( \rho \) is density and \( V \) free-stream velocity; in incompressible flow, difference between total pressure and static pressure.

2 Pressure exerted on stagnation point(s) on a body by virtue of its motion through a fluid.

*dynamic RAM* Constructed of periodically refreshed capacitor elements.

*dynamics* Main rotating parts of helicopter airframe.

*dynamic sampling* Concentration by flight recorder on one particular aspect of aircraft behaviour, esp. a malfunctioning channel.

*dynamic scale* Scale of flow about a model relative to a flow about full-scale body; if two flows have same Reynolds number, both are at same **.

*dynamic sidelobe level* That exceeded for 3 per cent of time on each main-beam scan.

*dynamic similarity* 1 Relationship between model and full-scale body when, by virtue of similarity between dimensions, mass distributions, or elastic characteristics, aeroelastic motions are similar.

2 Similarity between fluid flows about a model and full-scale body when both have same Reynolds number.

*dynamic-situation modelling* Program which seeks to create a framework for producing a real-time representation of the battlespace.

*dynamic soaring* Soaring by making use of kinetic energy of air movements.

*dynamic stability* Characteristic of a body that causes it, when disturbed from steady motion, to damp oscillations set up and gradually return to original state; used esp. of helicopters.

*dynas-tall* Transient or fluctuating separation of flow over an aerofoil, especially a helicopter rotor blade, subjected to rapidly varying angle of attack which periodically takes it beyond the normal stall angle.

*dynamic storage* In EDP (1), storage in which information is continuously changing position, as in delay line or magnetic drum.

*dynamic system* See dynamics.

*dynamic thrust* Work done by fan or propeller in imparting forward motion, equal to mass of air handled per second multiplied by \( (V_s - V) \), where \( V_s \) is slipstream velocity and \( V \) aircraft speed.

*dynakraft* Abb. dyn, unit of force sufficient to accelerate 1 g at 1 cm \( s^{-2} \); = 10^{-5} N or 2.248 dyne.

*dyne* Abb. d.yne, dy, unit of force equal to mass \( m \) unit \( m \) unit \( s^{-2} \) or \( kg \) unit \( m \) unit \( s^{-2} \).

*Dynarohr* Sound-suppressing multicell lining of engine fan cases and ducts (Rohr).

*dyne* Abb. dyn, unit of force sufficient to accelerate 1 g at 1 cm \( s^{-2} \); = 10^{-5} N or 2.248 \times 10^{-10} lb.

*dyne* Abb. dyn, unit of force equal to mass \( m \) unit \( m \) unit \( s^{-2} \) or \( kg \) unit \( m \) unit \( s^{-2} \).

*dynode* Electrode of electron multiplier which emits secondary electrons when bombarded by electrons.

*dysbarism* Decompression sickness, usually caused by release of nitrogen bubbles into blood at very low pressure.

*DZ* Drop (or dropping) zone.

2 light drizzle.

*DZA* Drop-zone assembly aid.

*Dzus fastener* Countersunk screw with slotted shank anchored in removable or hinged panel, which hooks with half-turn into wire anchor on airframe.

*Dzus rail* Mounting rail for LRUs.
Energy (but work often W).
2 Electric field strength.
3 Electromotive force; unit, volt.
4 Prefix exa = 10^18.
5 Young’s modulus of elasticity.
6 US DoD role prefix, Special Electronic (from 1962).
7 UK role prefix, ECM training.
8 Illumination.
9 Endurance (usually safe endurance).
10 Estimated.
11 Sleet.
13 East, or eastern.
14 Excellence (US defense contractors, WW2).
15 Emergency.
16 End (of reported weather).
17 Execution [NW mission] (RAF).
18 Effective (machine performance).
19 Aircraft category: rotorcraft (FAI).
20 Expected value of a function.
E 1 Strain rate.
2 Induced drag.
3 Base of natural logarithms, e2.71828.
4 Emitter.
5 Electron charge, [strictly, preceded by minus sign] = 1.6021 × 10^-19 C.
6 Eigen vector; suffix pm phugoid mode, sp short-period.
7 Elevator or slab tailplane.
8 Offset from hub of helicopter flapping hinge.
9 Subscript, exit.
10 Eccentricity of rotating item or shaft bearing, orbit or ellipse.
e, E Expansion ratio of rotating item r shaft bearing, rocket nozzle.
(E) 121.5 and 243.0 available, but may not be monitored.
É Electrostatic field, Vm^-1.
E1 See E-layer.
E2COTS See E2I COTS.
E2 PROM Electronically-erasable programmable read-only memory.
E3 Rules governing import of used aircraft into the UK, and relevant design approvals (CAA).
E3 Energy-efficient engine (NASA).
2 End-to-end encryption (networks).
3 Electromagnetic environmental effects.
E-6B Analog dead-reckoning navigation computer (US, 1982).
E36 LRD Potassium acetate liquid runway dispenser.
e-bomb Renders electronic threat dumb, blind and incapable of retaliation.
E-cats See ECATS.
e-check Electronic passenger-recognition system, usually biometric facial scan or iris scan.
e-display Radar display with az/el target on rectangular x/y axes.
E-freight Electronic replacement of paperwork (IATA).
E-glass Ultra-high-strength, used as reinforcement in advanced structures (not in commercial GRP).
E-hitch Standard connector between tug and baggage trolley, with vertical pin.
E-hour Precise time for launch of mission with NW [E from execution] (RAF, previously).
E-layer Ionised layer of ionosphere typically 100–120 km, most pronounced in daytime; also called Heaviside or Kennelly-Heaviside or E1 layer; some evidence of higher layer called E2.
E-Pinpoint Electronic pilot report[s].
E-plane Plane of antenna containing electric field; principal * is direction of maximum radiation.
E-scan Electronic scanning.
e-tag Electronic data tag.
e-ticket Book online, check-in with passport and hand luggage (IATA).
EA 1 Enemy aircraft.
3 Engine-attributable.
4 Epoxy asphalt.
5 Engineering authority.
6 Environmentally acceptable.
7 l’Espace Affaires business class (F).
8 Evolutionary algorithm[s].
9 The Institution of Engineers, Australia.
10 Engine anti-ice, followed by number.
EAA 1 Experimental Aircraft Association (US, from 1953, office Oshkosh, Wisconsin).
2 East Anglian Aircraft Preservation Society (UK).
3 Export Administration Act (US).
4 European Aluminium Association [office, Brussels B-1150] (Int.).
5 Eastern Aerospace Alliance [trade association, Stevenage SG1 2PX].
6 European Association of Aerospace Industries.
EA&SD Evolutionary acquisition and spiral development (EW).
EAAP European Association for Aviation Psychology (office in Zurich).
EAAPS European Association of Airline Pilots’ Schools.
EAAS Empire Air Armament School (RAF Manby, November 1944 to June 1949).
EAC 1 Expected approach clearance time.
2 Experimental-apparatus container.
3 Equipment Approvals Committee (UK MoD).
4 European Airlift Centre (Int.).
5 Enlisted aircrew (USN).
6 European Astronaut Center [Oberpfaffenhofen, near Cologne].
EACC European Airlift Control Cell (Eindhoven).
EACS Electronic automatic chart system.
EACSO East Africa Common Services Organization.
EAD European AIS database (Eurocontrol).
EADB Elevator-angle deviation bar.
EADE Extended air defense (US).
EADI Electronic attitude director, or display, indicator.
EADRCCEuro-Atlantic Disaster Response Co-ordination Centre.
EADSExtended air-defense simulation.
EAAEM European Airlines Electronics Meetings.
EAFEarned award fee.
EAFS Expeditionary Aerospace Force (10 AEFs) (USAF).
EAFAS European Academy for Aviation Safety, non-profit organization providing permanent training (Int.).
EAGEuropean Air Group, air forces which share facilities (Belgium, France, Germany, Italy, Netherlands, Spain, UK).
EAGA European Advisory Group on Aerospace (EU).
EAGLEuropean Association for Grey Literature.
EAGLEREuropean Association for Grey Literature.
EAGSA European Group of Air Safety.
EAGUI European Advisory Group on Urban Informatics.
EAGS Europe/Africa/Middle East theatre (December 1941 to November 1945).
EAMEuropean Airlines Medical Directors Society.
EALES European Airlines Electronics Meetings.
EAML Elevated approach light.
EARCF Breed the Fitchett.
EARDA European Air Group, air forces which share facilities (Belgium, France, Germany, Italy, Netherlands, Spain, UK).
EARDCCEuro-Atlantic Disaster Response Co-ordination Centre.
EARDDEuropean Air Group, air forces which share facilities (Belgium, France, Germany, Italy, Netherlands, Spain, UK).
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EARDAEuropean Air Group, air forces which share facilities (Belgium, France, Germany, Italy, Netherlands, Spain, UK).
EATC

- Engine analyser unit.
- Expeditionary Air Wing (RAF).
- Essential bus.
- Electric brake actuator.
- European Business Aviation Association (office, Tervuren, B-3080 Belgium) (Int.).
- Electric braking actuator controller.
- European Business Aviation Conference, or Convention, and Exhibition (Int.).
- Electric plus hydrazine.
- Electronically bombarded active-pixel sensor.
- Extended Buhr design method.
- Electric back-up hydraulic actuator.
- Electron-bombardment-induced conductivity.
- Eyeballs in.
- Electronic checklist.
- Embedded combat-aircraft training system.
- Electric combat.
- ECA/ ECA plus hydrazine.
- EBAPS, Ebaps
- Executive Board (JAA).
- EBA/ EBA plus hydrazine.
- EBA/H
- Electric brake actuator.
- EBA
- Engine bleed air.
- EBC
- Electric brake controller.
- EB
- Essential bus.
- EB
- Engine bleed air.
- EBR
- Engine bleed rate.
- EB
- Enhanced bit rate.
- EB
- Environmental control (system).
- EB
- Electronic checklist.
- EB
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- Electric cockpit-control device.
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- EB
eccentricity

eccentricity  1 Deviation from common centre or central point of application of load.
2 Of any conic, ratio of length of radius vector through point on conic to distance of point from directrix.
3 Of ellipse, ratio of distance between centre and focus to semimajor axis. Also called numerical *.
4 Also of ellipse, distance between centre and focus. Also called linear *.
5 Distance measured chordwise between a wing’s aerodynamic centre and its elastic [torsional] axis.

Ecocosorb  Important family of commercially available SFAs (RAM).

ECCP  European Climate Change Programme (Int.).

ECID 1 Execusable contract delay (no penalty).
2 Equipment Capability Directorate[s] (MoD).

ECM 1 Electronic counter-countermeasures.
2 Electrochemical machining.
3 Engine-, or equipment-, condition monitoring.
4 Electronic control module.

ECMJ  Escadrille de chasse multiplace de jour (multi-seat day fighter squadron) (F).

ECMO  ECM officer (aircrew).

ECMS 1 Electronic component management system.

ECMT 1 European Conference of Ministers of Transport = CEMT [Paris F-75775] (Int.).
2 Emerging counter-Manpads technologies.

ECN  Escadrille de chasse de nuit [night fighter squadron] (F).

ECNI  Enhanced CNI.

ECNP  Export control and non-proliferation (UK).

ECO 1 Electron-coupled oscillator.
2 Engineering change order.
3 Engine cut-off.

ECOA  Engine certificate of Airworthiness.

ECOC  Enhanced Combat Operations Center.


ECOG  Electrochemical hydrogen separator [fuel cell].

ECOP  Electronic copilot [colloq.].

ECS 1 Environmental control and life-support system [or subsystems].
2 Electronic countermeasures.
3 Engine-, or equipment-, condition monitoring.

ECLSS  Environmental control and life-support system [or subsystems].

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EDCS, EDCS, ECSR

10 Enhanced communications system[s].
11 Economical cruising speed.

EDCS, ECSM, ECSR Respectively ECS(1) plus left card, miscellaneous, right card.

ECR East Coast Spaceflight Range (USAF).
ECST Electronic-combat systems-tester (USAF).
ECSVR Engine-caused shop-visit rate.
ECT Enterprise caching technology.
ECTM Engine-condition trend-monitoring.
ECU 1 European Currency Unit (pronounced Ekyu, commonly called Euro).
2 Engine-change unit (complete bolt-on piston engine powerplant with cowl).
3 Environmental, or engine, or electronic, or Eicas, control unit.
4 Exercise Control Unit (a military formation).
5 External-compensation unit.
ECR Engineering Council (UK).
ECVS Emergency communications voice system, or switch.
ECW 1 Electronic Combat Wing.
2 Enhanced compressed wavelet.
ECWL Effective combat wing loading.
ED 1 Emergency distance (or distress signal).
2 Engineering development (part of progress schedule).
3 End of descent (Lockheed uses ‘EoD’).
4 Explosive device.
5 Environmental damage.
6 Eicas display.
7 Followed by a two-digit number, design assurance levels for avionics systems, equivalent to DO-178B and DO-254. (Eurocae).
ED End of descent.
EDA 1 Effective disc area (helicopter).
2 Electronic design automation.
3 Excess defense article, available for sale (US DoD).
EdA Ejercito del Aire [Air Force, Spain].
EDAC See EDC(4).
EDAIU Engine, or extended, data-acquisition unit.
EDB Extruded double-base.
EDC 1 European Defence Community.
2 Early display configuration.
3 Eros data centre.
4 Error detection and correction [often EDAC].
Edcars Engineering data computer-assisted retrieval system.
Edcass Equipment designers’ cost analysis system.
EDCT Expected departure clearance time, issued to a flight as part of traffic-management program (FAA).
EDD Electronic data display (ATC flight data, tabular callsigns, heights, tracks and position information).
EDDS 1 Explosive-device detection system.
2 Electronic document distribution service.
3 Eddy current Generated in conductor by varying magnetic field; to reduce ** cores are built up of insulated laminations, iron dust or magnetic ferrite.
4 In meteorology, developed vortex constituting local irregularity in wind producing gusts and lulls.
5 In meteorology, developed vortex constituting local irregularity in wind producing gusts and lulls.
eddy damping Automatic damping by eddy currents generated by moving conductor.
eddy Mach wave radiation One of three major sources of jet-engine noise, associated with supersonically convecting disturbances.
EDEM European defence equipment market.
EDG 1 Electrical-discharge grading.
2 Engine-driven generator.
edge alignment Distance, parallel to chord of propeller section, from centreline of blade to leading edge at any station.
edge diffraction Near-radial reflections caused by impedance mismatch around a radar antenna perimeter.
edge effect Distortion of eddy-current pattern when testing for cracks near edge of material.
edge enhancement Increasing the contrast at the periphery of an image, to render it easier to distinguish [important in recon. and baggage screening].
edge flare Rim of abnormal brightness around edge of video picture.
edge keys Buttons around electronic display.
edge management Strict discipline of maintaining optimum LE of wing, tail [and pylons, if present] for aerodynamics and radar signature.
edge elevator Deck-edge elevator (carrier).
EDI 1 Electronic-data interchange, or interface, between single computers or groups; F adds function.
2 Electronic design information; L adds library.
3 Electron-drift instrument.
4 Engine-data interface; F adds function, U unit.
Edifact Electronic-data interchange for administration, commerce and transport.
EDIG European Defence Industries Group [in April 2004 merged into ASD5, office same address at B-1200 Brussels] (Int.).
E-Direm Escort directional IR countermeasures (USAF).
EDIU Engine-data interface unit.
EDL 1 Engage/disengage logic.
2 Electrical-discharge laser.
3 Entry, descent and landing.
4 Erprobungsstelle der Luftwaffe (G).
Edlar European data-link for aerial reconnaissance (Int.).
EDM 1 Electrical-discharge machining.
2 Engineering development model.
3 Evasive defence manoeuvres.
4 Engine-data multiplexer.
EDMS Electronic data-management system[s].
Edna Enhanced diagnostic aid.
EDO Extended-duration orbital.
EDP 1 Electronic data-processor, or processing.
2 Engine-driven pump.
3 Experimental data-processor (Eurocontrol).
4 Engineering-development pallet.
5 Engine development plan.
EDR Engineering design requirements.
EDS 1 Explosive[s], or electronic, detection system.
2 European Distribution System; A adds aircraft (USAF).
EDSF Electronic-data standard exchange.
EDSS Explosives-detection security system.
EDT 1 Eastern Daylight Time (US).
2 Expanded data-transfer; M adds module, S system.
EDU

Educator Duct-fed ejector(s) for powered VTOL lift.

Edward California (Mojave desert) AFB, site of AFRTC and NASA DFRC, previously called Muroc.

EEJ Emergency equipment, or egress.

EEP Enhanced EPGS, typically ½-ATR boxes and EEPGS Experimental electronics package.

EEOS (USAF).

EEPS European Environment Producers Support Group (Int.).

EEPSG European Equipment Producers Support Group (Int.).

EEP Enhanced electromagnetic pulse.

EEP+P Improving engine performance.

EEProm, EEPROM, E²Prom Electronically-erasable programmable read-only memory.

EEU Elms [electrical load-management system] electronic unit.

EEVIP Early extended-range twin operations validation and integration.

EEW Equipped empty weight.

EEZ Exclusive [coastal] economic zone; IG adds industry group.

EF 1) Engine failure.

EF A End-fire array (radar).

EFAB Extended forward avionics bay.

Efams External fuel, armament and management system.

EFAS, Efas 1) En-route flight advisory service.

EECS Electrical/electronics cooling system.

Eff Expandable flight-data acquisition system.

Effective Effective.

ECU Electronic fuel-, or flight-, control unit.

EEG European Flight Engineers Organization (Int., merged into IFEO).

EEF Electronic flight display.

EEGFAE Enhanced fire-control computer; C adds configuration.

EECS Electrical [FBW], or electronic, flight-control system.

EEFAS, Efas 1) Engine failure at [or soon after] takeoff.

EEFLEX, Eflex Electronic flight-data system.

EEFLIT Electronic flight instrument[s].

EEFT Electronic flight display.

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effective helix angle

- **Effective helix angle**: Angle of helix described by point on propeller blade in flight through still air measured relative to Earth.
- **Effective horsepower**: Power delivered to propeller.
- **Effective pitch**: Distance aircraft advances along flight-path for one revolution of propeller.
- **Effective pitch ratio**: Basic propeller characteristic \( V/nd \), where \( V \) is airspeed, \( n \) propeller rpm and \( d \) diameter, units being compatible.
- **Effective profile drag**: Difference between total wing drag and induced drag of wing with same aspect ratio but elliptically loaded.
- **Effective propeller thrust**: Net propulsive force; propeller thrust minus increase in drag due to slipstream.
- **Effective range**: Maximum distance at which weapon may be expected to strike target.
- **Effective sortie**: One which crosses the enemy frontier [see sortie].
- **Effective span**: Span minus correction for tip losses; usually defined as horizontal distance between tip chords.
- **Effective terrestrial radiation**: Amount by which IR radiation from Earth exceeds counter-radiation from atmosphere. Also called effective radiation or nocturnal radiation.
- **Effective velocity ratio**: Based on dynamic pressures

\[ \sqrt{\frac{q_j}{q}} \]

where \( q_j \) is jet impingement stagnation pressure (jet-lift ground effect).
- **Effective wavelength**: That corresponding to effective propagation velocity.
- **Effector**: In any system, an output device.
- **Effects-based operations**: Selection of a series of targets in a particular order, to achieve a specific final result.
- **Efficiency**: Ratio of output to input, usually expressed in percentage form. See overall, propulsive, thermal*.
- **Efficiency of catch**: Proportion of total water droplets in path of aircraft which actually strike it.
- **Efflux**: Total composition of gas or other fluid flowing out from a device, except that in an engine with a propulsive jet * excludes flows from auxiliary devices such as turbogenerators, heat exchangers and breathers.
- **Effusion**: Flow of gas through holes sufficiently large for velocity to be approximately proportional to square root of pressure difference.
- **EFH**: 1 Earth far horizon.
  2 Engine flight hours.
- **EFI**: 1 Electronic flight instruments, or instrumentation; \( S \) adds system; \( 8 \times 8 \) colour CRTs.
- **EFIC**: Electronic flight-instrument controller.
- **EFIDS**: European flight-information display system.
- **EFIP**: Electronic flight-instrument processor; \( C \) adds control panel.
- **EFIS**: See EFL; \( C \) adds control panel.
- **EFIT**: Engineer, furnish, install and test.
- **EFL**: 1 Emitter function logic.
  2 External-finance limits.
- **EFM**: 1 Enhanced fighter manoeuvrability, e.g. with TVC and RCFAM.
  2 Engine fleet management.

**EGT**

- **EFMCS**: Enhanced flight-management computer system.
- **EFMS**: Experimental flight-management system (Phare).
- **EFOGS**: Enhanced fibre-optic-gyro missile.
- **EFP**: 1 Explosively formed penetrator, or projectile.
  2 Engine fuel pump; \( MS \) adds and metering system.
- **EFPS**: Electronic flight-progress strip; \( D \) adds data.
- **EFRS**: Engine-failure recognition speed.
- **EFS**: External fuel system (battlefield helicopter).
- **EFT**: 1 Elementary flying, or flight, training; \( E \) adds exercise, \( P \) programme, \( S \) school.
  2 Electronic funds transfer; \( S \) adds system.
- **EFU**: Emergency functions unit [air refuelling].
- **EFVS**: Enhanced flight vision system[s]. Allows aircraft below MDA and DH when not on Cat. II or III straight-in approach (FAA).
- **EFW**: Electric field and wave.
- **EFX**: Expeditionary forces experiment (USAF).
- **EGA**: 1 Exhaust-gas analyser.
  2 Excess ground attenuation.
- **EGAC**: Enhanced general avionics computer.
- **EGAD**: Export Group for Aerospace and Defence (UK).
- **Eds**: Electronic ground automatic destruct sequencer button.
- **EGAS**: European guaranteed access to space (five-year 2003–07 plan requiring E1 billion).
- **EGASF**: European General Aviation Safety Foundation.
- **EGATS**: European Guild of Air Traffic Services.
- **EGB**: End-grain balsa.
- **EGBU**: Enhanced glide-bomb unit.
- **EGCU**: Electrical-generator control unit.
- **EGDN**: Ethylene-glycol dinitrate (a powerful explosive).
  2 Excess ground attenuation.
- **Eglin**: Florida, largest AF, home of many facilities including former APGC (USAF).
- **EGME**: Ethylene-glycol monomethyl ether.
- **EGNOS**: European geostationary new, or navigation, overlay service, or system. European equivalent of WAAS. (EC, ESA, Eurocontrol).
- **EGP**: 1 Exterior-gateway protocol.
- **EGPS**: Ground-proximity warning system prefix \( E \) originally embedded, now enhanced; now called TAWS.
- **EGR**: 1 Engine ground run[ning].
  2 Embedded GPS receiver.
- **Egress**: 1 Procedure for getting out of spacecraft in orbit or after planetary or lunar landing, whether for working in space or any other reason. Begins with putting on spacesuits, and includes depressurizing and opening hatch.
  2 Departure of combat aircraft from target area.
- **Egress handle**: Handle which fires ejection seat.
- **EGS**: 1 Elementary gliding school.
  2 Exfoliation galvanic stress.
- **EGSE**: Electrical ground support [or station] equipment.
- **EGT**: Exhaust-gas temperature, measured immediately downstream of turbine[s] or exhaust valve.
eigen values

tunnel in which whole working section is open.

Cuban

eight principal values.
solution, with associated boundary conditions, exists only
Eiffel-type tunnel

system.

EIDS

EGW

Ehr

EIPI

EHOC

EHCC

EHAC

EHDD

EHIM

EICMS

EIP

EIPI

EFSF

EIOTEC

EIPI

EIT

EIAC

EIPI

EI

EI

Electro-impulse deicing.

En-route high-altitude chart.

Extended high-accuracy network orbital-determination system (USAF).

Electro-thermal hydrazine thruster.

Electronic horizontal-situation indicator.

Enhanced high-band subsystem.

Extended high-altitude chart.

ETR

Etude de Restrictions Temporelles

Ehr

EFTU

EETD

EETU

EGW

EGW

EGW

EHDD

EHIM

EICMS

EIP

EIOTEC

EIPI

EIT

EIAC

EIAC

EIAC

EICMS

EID

EIDS

Eiffel-type tunnel

Open-jet, non-return-flow wind tunnel

which whole working section is open.

Discrete values of undetermined parameter involved in coefficient of differential equation, such that solution, with associated boundary conditions, exists only for these values; also called characteristic values or principal values.

Flight manoeuvre in which aircraft flying horizontally follows track like large figure eight (see Cuban*, lazy *).

ejector exhaust

eight-ball

Artificial horizon or attitude indicator (colloq., US).

One of four Ostiv/FAI classes for competitive gliding, including span not greater than 18m.

Roll executed in eight stages, with aircraft held momentarily after each roll increment of 45°.

Manoeuvre used in air racing in which aircraft is flown around pylons so that wingtip appears to pivot on pylon.

Leading wireless cabin system [in 2002] for use by individual passengers.

Engine Industry Management Group [12 companies] (Europe).

European innovation monitoring system.

Engineering, integration, operational test and evaluation contract.

2 Environmental-industry participation.

2 Environmental-impact parameter.

1 Ecole d’Initiation Pilotage (F).

Extended initial protocol identifier.

Engine ice protection system.

Engine Integration Qualification (USA).

[Effective [or equivalent] isotropically radiated power.

2 Earth incident radiated power.

2 Entry into service.

2 Environmental impact statement.

3 Ejection initiation subsystem.

4 Electronic instrument(ation) system.

5 Engine indication, or information, or instrument, system.

6 Engine in service (Pratt & Whitney).

Extended industry-standard architecture.

Engine initial spares factor.

Enhanced information sensor system, or suite.

Equivalent isolated single-wheel load (LCN).

Exoatmospheric interceptor technology.

Engineering-Industry Training Board.

Interface unit prefixed by equipment, engine, electronic[s], Efis, Eicas or emergency.

European Joint Aviation Authorities [pre-2003 predecessor of EASA] (Int.).

Able to be ejected from aircraft, esp. capsule, crew seat, sonobuoy, dropsonde or flight recorder.

Escape from aircraft by ejection seat.

Able to be ejected from aircraft, esp. capsule, crew seat, sonobuoy, dropsonde or flight recorder.

Escape from aircraft by ejection seat.

Angle at which ejection seat leaves, measured relative to aircraft.

Detachable compartment serving as cockpit or cabin, which may be ejected as unit and parachuted to ground.

Box containing recording instruments or data ejected and recovered by parachute or other device.

Parachute(s) used to decelerate ejection seat or capsule; often ballute or drogue.

Seat capable of being ejected in emergency to carry occupant clear of aircraft.

Device comprising nozzle, mixing tube and diffuser, utilising kinetic energy of fluid stream to pump another fluid from low-pressure region.

Ejector lift

Ejector pipe(s) disposed or shaped to produce forward thrust, not necessarily incorporating an ejector.
ejector lift

Method of powered lift in which high-energy flow of hot gas (rarely, HP bleed air) from jet engine is expelled downwards through arrays of nozzles in large profiled vertical duct to entrain much greater flow of free air.

ejector nozzle

Propulsive nozzle for engine of supersonic aircraft whose jet can entrain a large surrounding airflow.

ejector ramjet

See ram-rocket.

ejector seat

See ejection seat.

EJS

Enhanced JTIDS.

Ek

Equatorial air mass.

EKG

Electrocardiograph.

Ekman layer

Transition between surface boundary layer and free atmosphere.

EKP

Exatmospheric kill vehicle.

ekW

Equivalent shaft power of turboprop, measured in kW. See equivalent power.

EL

Electroluminescent.

- 2 Ejector (augmented) lift.
- 3 Emitter locator (or location).
- 4 Elevation [or el].
- 5 Electronic logbook; also see ELB.
- 6 Expeditionary logistic[ia] (E[AF]).

E₉

Reduced elastic modulus in local buckling.

Elac

Elevator and aileron computer.

Elass, E-LASS

Enhanced low-altitude surveillance system.

Elastance

Inability to hold electrostatic charge.

elastic axis

Spanwise line along cantilever wing along which load will produce bending but not torsion.

elastic centre

1 Point within wing section at which application of concentrated load will cause wing to deflect without rotation.

2 Point within wing section about which rotation will occur when wing is subjected to twist.

elastic collision

Collision between two particles in which no change occurs in their internal energy or in sum of their kinetic energies.

elastic instability

Condition in which compression member will fail in bending before failing compressive strength of material is reached.

elasticity

Property of material which enables a body deformed by stress to regain original dimensions when stress is removed.

elasticiser

Elastic substance or fuel used in solid rocket propellant to prevent cracking of grain and bind it to case.

elastic stop nut

Nut in which self-locking is ensured by friction.

elasticity

Specific elastance.

elastomeric bearing

Bearing in which angular (and some linear) relative motion is permitted by distortion of flexible blocks bonded to the two parts. Needs no maintenance.

elastomers

Rubber-like compounds used as pliable components in tyres, seals, gaskets etc.

elasto-optical effect

Variation in length and refractive index of fibre optics when subjected to tensile stress.

elastoplasticity

Theory of finite deformations.

e-l-az

Elevation/azimuth.

ELB

1 Emergency locator beacon [A adds aircraft].

2 Extended [or extension of] littoral battlespace.

3 Electronic logbook; FCG adds fault-correction guide, ISE in-service evaluation.

ELBA

Emergency locator beacon, aircraft.

elbow

1 Angled section of piping used where change of direction is necessary.

2 Hellow fixture used for joining two lengths of electric conduit at an angle.

ELC

Engine-life computer.

ELCH

Elastically laminate checker.

ELCU

1 Electrical control unit (CAA).

2 Electronic load-control unit.

ELD

1 Electroluminescent display.

2 Earth leakage detector.

ELDO, Eldo

European Launcher Development Organization (1960, now defunct).

elec

Usually electrical, not electronic.

ElectRelease

Patented epoxy adhesive, rapidly disbonds by application of low voltage.

electric-discharge machining

Shaping hard metals by making the workpiece the anode in an electric circuit and eroding it by a shaped cathode tool, all submerged in ionic electrolyte.

electrical engine

Rocket in which propellant is accelerated by electrical device; also called electric rocket (see electric propulsion).

electrical interference

Undesirable and unintended effects on equipment due to electrical phenomena associated with other apparatus, cables, materials or meteorological conditions.

electrical load management

Supervises links between generators/alternators on main engines and APU, batteries and ground power supply and on-board loads.

electric altimeter

Indicates height by variation of electrical capacitance. Also called electrostatic or capacity altimeter.

electric bonding

Interconnection of metallic parts for safe distribution of electrical charges.

electric braking

Use of powerful [rare-earth] electromagnets to squeeze the landing-gear brake rings.

electric energy

Product of current and time, 1MJ = 0.277 kWh, 1J = 1Ws.

electric field strength

Electric potential per unit distance across field, symbol E, units volts per metre.

electric flux density

Also called dielectric flux density, D = 4π × displacement current, units coulomb/metre².

electric gyro

One whose rotor is driven electrically.

electric propeller

One whose pitch-change mechanism is actuated by an electric motor and gearbox.

electric propulsion

General term describing all types of propulsion in which propellant consists of charged electric particles accelerated by electric or magnetic fields or both; eg electrostatic, electromagnetic or electrothermal.


**electric RAT**

*electric RAT*  Ram-air turbine driving electric alternator or d.c. generator.

**electric** Generalised term for all electric power generation, control and services.

**electric starter** Electric motor used to crank engine for starting.

**electric steel** Steel made in electric furnace (induction or arc-type) which possesses uniform quality and higher strength than open-hearth steel of same carbon content.

**electric tachometer** See tachogenerator.

**electric trim** Trim tab[s] moved by electric motor [and usually irreversible screwjack].

**electric welding** Welding by electric arc or passing large current through material.

**electric wind** Emission of negative charge from sharp corner or point of conductor carrying high potential current. Also known as electric breeze.

**electrochemical machining** Range of processes in which large direct current is passed through workpiece via shaped electrode in conductive electrolyte.

**electrochemical treatment** Process involving application of electrical energy to produce some change in surface of material to be treated, such as anodization of aluminium alloys.

**electrochromatic** Optically dimmable [transparency] by applied voltage.

**electrode** 1 Terminal at which electricity passes from one medium into another; positive is called anode and negative cathode.

2 Semiconductor element that performs one or more of the functions of emitting or collecting electrons or ions, or of controlling their movements by electric field.

3 In electron tube, conducting element that performs one or more of the functions of emitting, collecting or controlling, by electro-magnetic field, movement of electrons or ions.

**electro-dynamics** Science dealing with forces and energy transformation of electric currents, and associated magnetic fields.

**electrodynamic tether** EDT, long (<100-km, 62-mile) flexible filament[s] linking in tension two bodies in orbit round Earth or other primary, providing modest artificial gravity as well as ability to change orbit and efficiently generate electrical power. See tether system.

**electro-expulsive de-icing** Use of intermittent giant pulses of EM energy which impart skin shocks which, though small amplitude, throw ice off.

**electromagnetic focusing** Control and concentration of electrons in narrow beam by magnetic fields.

**electromagnetic frequency bands** For administrative purposes various EM bands allotted letters (see Appendix 2).

**electromagnetic induction** Establishment of current in conductor cutting flux of electromagnet; principle of rotary electrical machines and transformers.

**electromagnetic intrusion** Intentional insertion of EM energy into transmission paths with object of causing confusion.

**electromagnetic radiation** Radiation made up of oscillating electric and magnetic fields and propagated in a vacuum at 299,720,456 m [983,571,007 ft]/s; includes gamma radiation, X-rays, ultra-violet, visible light, infrared radiation, radio and radar waves.

**electromagnetic riveting** Closing rivets by violent EM pulse.

**electromagnetic rocket** See electrical engine, plasma rocket.

**electromagnetic spectrum** EM radiation extending from gamma rays down through broadcast band and long radio waves.

**electromagnetic units** Several related systems of units [e.g. featuring abampere, abcoulomb, maxwell] now superseded by SI.

**electromagnetic waves** Waves associated with EM field, with electric and magnetic fields perpendicular to each other. Also known as electric waves, radio waves, light, X-rays, and by other names.

**electromechanical** Using electricity as sole source of power and of command/control functions. Such systems are expected to displace hydraulics and other secondary power services, partly because of rare-earth magnets.

**electroform** Building up a metal part of complex but thin form as an electroplated layer on a substrate, e.g. nickel on expanded polystyrene.

**electro-hydraulic** Synonymous with electro-hydrostatic; both are abbreviated EHA.

**electro-hydrostatic** Using hydraulic power to provide output force in localised system with all command and power provided by multi-redundant electric channels, which are much lighter than hydraulic piping.

**electroimpulse deicing** Mechanical method involving repeated [small] surface deformations caused by electric shocks.

**electrojet** Current sheet or stream moving in ionised layer in upper atmosphere: * move around Equator following sub-solar point and around polar regions, where they give rise to auroral phenomena.

**electrokinetics** Science dealing with electricity in motion, as distinguished from electrostatics. Electrokinetic potential symbol is $\zeta$.

**electroluminescence** Emission of light caused by electric fields; gas light is emitted when kinetic energy of electrons or ions accelerated in field is transferred to atoms or molecules of gas.

**electrolysis** Chemical decomposition or change in chemical state produced by electric current.

**electrolyte** Liquid or paste conductor in electrolytic cell or battery; when acid, base or salt is dissolved in water dissolved material ionises, so that solution has electric potential and, when current is passed, will have different potential from metal immersed in it; solution used for anodizing aluminium and alloys, sulphuric or chromic acids being most common.

**electrolytic corrosion** Corrosion resulting from electrochemical action of dissimilar metals in presence of electrolyte.

**electromagnet** Magnet whose flux is produced by current in coil which encircles ferromagnetic core; temporarily magnetised while current flows.

**electromagnetic** Pertaining to magnetic field created by current; combined magnetic and electric fields accompanying movements of electrons through conductor. Abb. EM.

**electromagnetic compatibility** All aircraft systems can work simultaneously with no mutual interference.

**electromagnetic expulsive deicing** Sends intermittent giant pulses of EM energy which impart skin shocks which, though small amplitude, throw ice off.

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electrometallurgy

Control of engine fuel system by electrical signals.

electrometallurgy Use of electricity for smelting, refining, welding, annealing and other processes, and for electrolytic separation of metals and deposition from solutions.

electromotive force External electrical pressure (measured at source) which tends to produce flow of electrons in conducting medium; volt is ** required to maintain current of one ampere through resistance of one ohm.

electron Subatomic particle that possesses smallest negative charge, and which is so-called “fundamental particle” assumed to be building block of the Universe; mass at rest \( m_e = 9.1093897 \times 10^{-28} \text{ g} \), negative charge \( 1.60217733 \times 10^{-19} \text{ coulombs} \), charge/mass ratio \( e/m_e = 1.7588 \times 10^9 \text{ C kg}^{-1} \).

electron beam Stream of electrons focused by magnetic or electrostatic field and used for neutralisation of positively charged ion beam and to melt or weld materials with high melting points. Also called cathode ray.

electron-beam lithography Range of integrated circuit (microchip) by means of an integrated circuit (microchip) by means of a focused beam of electrons.

electron-beam welding Use of powerful focused beam of electrons to make precision weld on workpiece in vacuum.

electron charge Unit, symbol \( e \), \( 1.602 \times 10^{-19} \text{ C} \).

electron gun Electrode structure which produces and emits electrons to make precision weld on workpiece in vacuum.

electronic ADI Attitude director indicator incorporating a CRT display forming part of an EFIS.

electronic charge Electron charge.

electronic cloth Rapidly growing range of microelectronics based on low-cost flexible substrates.

electronic combat See electronic warfare.

electronic counter-countermeasures Subdivision of EW; actions to ensure effective use of electromagnetic radiation despite enemy use of countermeasures.

electronic countermeasures Subdivision of EW; actions to reduce or exploit effectiveness of enemy electromagnetic radiation.

electronic data-processing System using electronic computer(s) and other devices in gathering, transmission, processing and presentation of information.

electronic deception Deliberate radiation, refraction, alteration, absorption or reflection of electromagnetic radiation, to mislead enemy in interpretation of data or present false indications; manipulative ** is alteration or simulation of friendly electromagnetic radiations to accomplish deception; imitative ** is introduction into enemy channels of radiation which imitates his own emissions.

electronic defence evaluation Mutual evaluation of radar(s) and aircraft by means of aircraft trying to penetrate radar through ECM.

electronic drop tube A multistation flight-strip manager.

electronic flight bag Software and data-services solution to digitize logbooks, charts and other flight documents to achieve paperless cockpit. Class 1, usually COTS, including laptops; Class 2, the same, but connected to aircraft systems when in use, so requires approval; Class 3, installed equipment (AC-120-76A) (FAA).

electronic flight-control unit Computer controlling surfaces used as spoilers and airbrakes, with or without roll-control function.

electronic flight instrument system[ation] system Replaces traditional flight instruments by full-colour CRT displays (typically three \( 200 \times 200 \text{ nm} \), \( 8 \times 8 \text{ in} \); for each pilot) each reprogrammable to operate in different modes and giving high redundancy.

electronic interference Disturbance that causes undesirable response in electronic equipment.

electronic intelligence Detection, recording, analysis and cataloguing (where possible, linking with particular emitters) of all unfriendly EM emissions.

electronic jamming Deliberate radiation, refraction or reflection of electromagnetic signals with object of impairing use of electronic devices by enemy.

electronic line of sight Path traversed by electromagnetic waves not subject to reflection or refraction by atmosphere.

electronic protective measures Generally synonymous with electronic countermeasures.

electronics Branch of physics concerned with emission, transmission, behaviour and effects of electrons.

electronic scanning Scanning by cathode-ray tube, or sequenced emission from larger planar antenna array, instead of by mechanical means.

electronic technical log Manages civil airline fleet data including trip reports and maintenance requirements.

electronic warfare (also electronic combat) Use of electromagnetic emissions as a weapon or a source of intelligence.

electron multiplier Electron tube which delivers more electrons at output than it receives at input, because of secondary emission.

electron tube Gas-filled tube having anode, cathode and sometimes other electrodes for controlling flow of electrons.

electron-volt See eV.

electro-optical guidance EO guidance makes use of visible (optical) contrast patterns of target or surrounding area to effect seeker lock-on and terminal homing. Three such systems are contrast edge tracker (Mk 84 EOGB and Walleye); contrast centroid tracker (Maverick); and optical area correlator, which scans contrast patterns in large area surrounding target.

electro-optic converter Device which converts electricity into laser pulses for fibre-optic sensors.

electro-optics Electronics involving visible or near-visible light, eg TV.

electroplating Coating metal with deposit removed from electrode and carried by electrolyte in which object to be coated is immersed.

Electroplating Patented assisted-takeoff device, in effect a d.c. motor “unrolled” (US c1940).

electrostatic capacity Measure of ability to hold electric charge, unit Farad, symbol F.

electrostatic deflection Bending of electron beam during passage through electric field between two parallel flat electrodes; beam is deflected towards positive electrode.

electrostatic focusing Use of electric field to focus stream of electrons to small beam.

electrostatic precipitation Use of high voltages (large potential gradients) to remove particulate matter from gas flow, smoke or other volumes.

electrostatic rocket See ion rocket, ion engine.

electrostatics Study of electricity (charges) at rest.
electrostatic storage

Storage of information as electrostatic charges.

**electrostatic unit, ESU** Unit of electric charge, amount of charge which repels similar charge in vacuum with force of one dyne; a statocoulomb.

**Elektron** Magnesium alloys with 3–12% aluminium, 0.2–0.4% manganese and often 0.3–3.5% zinc.

**element** The constituent part that contributes to electrical operation.

- In circuit, such as inductor, resistor, capacitor, generator, line, electrode or electron tube.
- In semiconductor device, integral part that contributes to its operation.
- Parameters defining orbit of body attracted by central, inverse-square force: longitude of ascending node, inclination of orbit plane, argument of perigee, eccentricity, semimajor axis, mean anomaly and epoch.
- Component parts of aircraft sufficiently distinctive and specific in type, shape or purpose as to be of major importance in design.

**elementary charge** Electron charge.

**elementary trainer** Ab initio, also known as primary trainer.

**element leader** Lead aircraft or pilot of element or flight.

**elephant ear** Thick plate on rocket or missile used to reinforce hatch or aperture.

- In air intercept, code meaning ‘take altitude indicated’.
- In air intercept, code meaning ‘take altitude indicated’.

**Elev, elev** Elevation.

**elevation** The vertical distance of point or level, measured from mean sea level.

- In air intercept, code meaning ‘take altitude indicated’.
- In air intercept, code meaning ‘take altitude indicated’.

**Elev.** Elevator.

**Elev.** Elevator.

**Elevational** Angle in vertical plane between local horizontal and line of sight to object.

**eleven** Wing control surfaces combining functions of ailerons and elevators, esp. on delta-wing or ‘tailless’ aircraft.

**elec** Electronics (colloq.).

**e.l.f., ELF** Extremely low frequency, see Appendix 2.

- In air intercept, code meaning ‘take altitude indicated’.
- In air intercept, code meaning ‘take altitude indicated’.

**EL** Emergency landing ground.

- In aircraft design, code meaning ‘electronic landing ground’.
- In aircraft design, code meaning ‘electronic landing ground’.

**ELGB** Emergency Loan Guarantee Board.

**Em** 

- Energy manoeuvrability.
- Electron microscope.
- Element manager.
- Emission.

- Electron magnet.
- Electron charge/mass ratio.

**EIA** 

- Electromechanical actuator, or actuation.
- Electron microprobe analysis.

**EM** 

- Electromagnetic.
- Electronic landing system.
- Emergency landing strip.

**EM** 

- Electromagnetic.
- Electronic landing system.

**EMADS** Euromux management and data sheets.

**EMAGR, E-MAGR** Enhanced miniaturized airborne GPS receiver.
emergency ceiling

Emergency ceiling Provides combustion products to energize hydraulic or pneumatic circuit in event of failure of normal power supply.

emergency control

emissions control

aircraft at which best rate of climb is 50 ft per minute with throttle of one engine closed; also known as usable ceiling.

electromagnetic aircraft launch system

Electromagnetic aircraft launch system (catapult).

electromagnetic aircraft recovery system (carrier).

EMARSSH, E-marsh Europe Middle East route [structure] south of the Himalayas.

EMAS Electromechanical actuation system.

1 Environmentally modified airfield surface.

2 Engineered-material(s) arresting system (ESCO).

EMAT Electromagnetic acoustic transducer.

EMBD Extended MAD boom.

emitted 1 Computer or other processor forming integral part of device or subsystem and thus unable to communicate directly with bus or highway or to be used for any other purpose.

2 Mixed clouds, usually Cu embedded in other types.

embedded optical database Plastic fibre-optic conductors printed on airframe structure, replacing looms of cables.

embedded training Simulated threat data are fed to the avionics of a real airborne aircraft; can include audio and ground control.

embodiment loan Loan of government property to private industry, research organization or individual, usually to enable recipient to fulfill government contract.

Embratel Empresa Brasileira de Telecomunicacoes SA.

EMC 1 Electromagnetic compatibility, or capability.

2 Entertainment multiplexer controller.

Emcat Electromagnetic catapult.

EMCD Electromagnetic chip detector.

EMCDB Elastomer-modified cast double-base propellant.

Emcon Emissions, or emission-monitor, control.

EMCS Energy monitoring and control system.

EMD 1 Emergency distance.

2 Eidgenossische Militärdepartment (Switz.).

3 Energy-management display.

4 Engine or engineering, model derivative.

5 Engineering and manufacturing development, or engineering, manufacturing and development.

EMDa Emergency distance available.

EMDM Enhanced multiplex-demultiplex unit.

EMDP Engine model derivative program (US).

EMDr Emergency distance required.

EMDU Enhanced main display unit (AEW aircraft).

EME Electromagnetic effects.

EMEA Europe, Middle East, Africa [or, Qinetiq, Australasia].

EMEC Enhanced master events controller.

EMED Electromagnetic-expulsion, or explosive, de-icing [sometimes Emed].

emer, Emerg Emergency.

Emerald Emerging Research and Technology Department activities of relevance to ATM(7) concept definition (Euret).

emergency air Compressed air for energizing hydraulic or pneumatic circuit in event of failure of normal power supply.

emergency cartridge Provides combustion products to energize hydraulic or pneumatic circuit in event of failure of normal power supply.

emergency ceiling Highest altitude for multi-engined emissions control

aircraft at which best rate of climb is 50 ft per minute with throttle of one engine closed; also known as usable ceiling.

emergency combat capability Condition exclusive of primary alert status whereby elements essential to combat-launch an ICBM are present and can effect launch under conditions of strategic warning (USAF).

electromagnetic interference reduction system

Emergency controlling authority Temporary air-traffic rules in vicinity of an incident if required to preserve life or property (CAA).

emergency descent Premature descent from operating altitude because of in-flight emergency.

emergency distance Distance sufficient for all takeoff or landing emergencies, such as critical-engine failure at Vf, met by runway plus stopway and possibly clearway.

electromagnetic interference reduction system

emergency exit Door or window designed to be opened after emergency landing or aborted takeoff for passenger and crew evacuation.

emergency flotation gear Inflatables fitted to aircraft in emergency to provide water buoyancy.

electromagnetic interference reduction system

emergency landing Landing made as result of in-flight emergency.

emergency locator/transmitter Radio beacon triggered by impact or water immersion giving position of crashed aircraft; fixed ***, portable ***, and survival *** (armoured and can float). Suggest synonymous with Adel.

electromagnetic parachute Second stand-by parachute.

emergency power unit On-board source of electrical and/or hydraulic power sufficient to continue controlled gliding flight following loss of main engines; commonly self-contained package using hydrazine monofuel (hence MPEU).

emergency rating 1 Special rating of remaining helicopter engine[s] following failure of one; time-limited, typically to 30s; also called super-contingency.

2 Piston engine rating for emergency sprint periods, with aid of high boost, water/methanol injection, etc.

emergency scramble Aircraft carrier CAP launch of all available fighter aircraft; if smaller number required, numerals and/or type may be added (DoD).

emergent properties Features of a new design which were not, and could not reasonably be, predicted at the original project stage, for whatever reason.

emery Hard abrasives based on corundum Al2O3.

EMF Embarked military force.

EMF Engine model derivative force (US).

EMG Electromagnetic gun.

EMGFA Armed forces general staff (Portugal).

EMH Electromagnetic health.

EMI 1 Electromagnetic induction, or inductor, or interference, or impulse(s).

2 Environmental message interchange.

EMIH EMI (1, 2) hardening, or hazard.

EMI/HIRF EMI (1) high intensity radio frequency.

EMIO Egyptian Military Industrialization Organization.

EMIRS Electromagnetic interference reduction system.

emission 1 Process by which body emits EM radiation as consequence of temperature only.

2 Sending out of charged particles from surface for electrical propulsion.

3 Loosely, any release from solid surface of electrical signal.

emissions control Combat environment in which all detectable emissions are, as far as possible, prohibited.
emissivity

Thus, shipboard aircraft must use autonomous landing aids. In the days of nuclear deterrence it was central to attack by manned bombers.

emissivity Ratio of radiation emitted by body (if necessary in specified band of EM wavelengths) to that of perfect black body under same conditions; only luminous can exceed 1, value for black body.

emittance wash repair In-flight repair of spacecraft TPS tile[s], vulcanizing Si/SiC powder.

emitter Device releasing radiation, usually in usable optical, IR or RF wavelengths.

EMI 1 Emergency medical link.

2 Electromagnetic launcher.

EMLU European mid-life update.

Emma, EMMA Engineering mock-up and manufacturing assembly.

cMMP Electronic maintenance-management planning.

EMMU Engine monitor multiplexer unit.

EMP 1 Electromagnetic pulse (nuclear).

2 Electric motor pump.

3 Engine monitor[ing] panel.

5 Motor engine pump [on ground, flight controls].

Extended maintenance plan.

Empar, EMPAR European multifunction phased-array radar.

EMPASS Electromagnetic performance of air and ship system (USN).

empannage Complete tail unit.

empirical Based on observation and experiment rather than on theory; used esp. of mathematical formulae.

employment Tactical usage of aircraft in desired area of operation; in airlift, movement of forces into a combat zone, usually in assault phase (USAF).

empty tunnel No model in test section.

empty weight Measured weight of individual aircraft less non-mandatory removable equipment and disposable load. OEW is preferred.

EMR 1 Electromagnetic radiation.

2 Electromagnetic resonance.

3 Electromagnetic riveting.

4 Extraordinary magnetoresistance.

EMRP Effective monopole radiated power.

EMRS Electromagnetic remote sensing.

EMRU Electromechanical (or electromagnetic) release unit.

EMS 1 Emergency medical service (usually helicopter).

2 Emergency monitor system.

3 Equipment Maintenance Squadron (USAF).

4 Equipment, management, or monitoring; system, see EMSC.

5 Environmental management system (AEW radar).

6 Electromagnetic-pulse shielding (hardening).

EMSC Engine-monitoring system computer.

EMSG European maintenance system guide.

EMSP Enhanced modular signal processor.

EMT Equivalent megatons.

2 Error-management training.

3 Electronic maintenance trainer.

4 Enhanced moving target; I adds indicator.

5 Expert missile tracker.

6 Emergency maneuver training.

EMTA Engineering & Marine Training Authority (UK, office Watford).

Emtas Eco-management and audit scheme.

EMTE Electromagnetic test environment.

EMU 1 Extravehicular mobility unit; suit for exploring lunar surface.

2 Engine maintenance, or monitoring, unit.

3 Electronic mockup.

4 Environment monitoring unit.

emu, e.m.u. Electromagnetic unit[s].

EMUT Enhanced manpack UHF terminal.

EMUX, Emux Electrical multiplexing.

EMWR Eddy Mach-wave radiation.

ENA 1 Escuela Nacional de Aeronautica (Arg.).

2 Extended network addressing.

3 Exhaust nozzle area.

4 Exercise notification area.

ENAC 1 École Nationale de l’Aviation Civile (F).

2 Ente Nazionale per l’Aviazione Civile [civil aviation] (Italy).

ENAV (Italy).

ENB Enhanced neutron bomb.

ENC Electronic noise-cancelling.

encasement Formal laying up and dedication of a disestablished unit’s flags and ensigns (US).

encastré Structural beam whose ends are not pinned but fixed.

enclosed cockpit Provided with an overhead structure, either integral with the fuselage or a separate hinged or sliding canopy.

encoder Analog-to-digital converter, eg converting linear or angular displacement, temperature or other variable to digital signals.

encoding altimeter Presents usual display but in addition incorporates digitized output to transponder for transmission of pressure height to ATC.

encounter Time-continuous action between airborne friendly and hostile aircraft.

end-bend blading Gas-turbine compressor blading whose ends (root and tip) are progressively given 3-D curvature to compensate for relatively sluggish flow over the inner and outer walls of the duct.

end-burning grain Solid-propellant charge which burns only on transverse surface at one end, usually facing nozzle.

end effects Aerodynamic effects due to fact wing span is finite.

end-fire Linear aerial array whose direction of maximum radiation is along axis.

end game, endgame In failed interception by AAM, time when missile runs out of V and energy.

end instrument Converts data into electrical output for telemetry. Also called end organ or pickup.

end item End-product ready for use.

endo-atmospheric Within an atmosphere.

endothermic Absorbing heat.

Endox Q-576 Alkaline soak added to water to form ultrasonic-cleaning fluid (Enthone).

endplate[s] 1 Small auxiliary fins at or near tips of tailplane.

2 * effect, aerodynamic effect of T-tail on fin, or of tanks, pods, missiles or fairings on wingtips.

end play Unwanted axial movement of shaft.

end speed Speed of aircraft relative to carrier at release from catapult.

end thrust Thrust along axis of shaft.
endurance

endurance  Maximum time aircraft can continue flying under given conditions without refuelling.

endurance limit  Highest structural stress that permits indefinite repetition or reversal of loading; always less than yield stress (see fatigue limit).

endurance on station  Maximum time maritime aircraft can patrol in designated areas.

ENEC  Extensible nozzle exit cone.


energy  Capacity to do work. SI unit = joule, or [more usefully] MJ = 0.3725 hp-h, 0.277 kW-h; 1 kWh = 3.6000 MJ; 1 hp-h = 2.68452 MJ; 1 therm = 105.306 MJ; 1 BTU = 1.05506 kj. At any time * of a flying vehicle is given by $E_b = W (h + V^2/2g)$ where $h$ is height above MSL and $W$ is instantaneous mass.

energy absorption test  See drop test.

energy conversion efficiency  Ratio of kinetic energy of jet leaving nozzle to that of hypothetical ideal jet leaving ideal nozzle using same fuel under same conditions.

energy density  Sound energy per unit volume (usual unit is non-SI: ergs/cc).

energy footprint  Total area of damage caused by aircraft crashing, especially at airshow.

energy height  A measure of kinetic and potential energy of an air vehicle, $h = h + V^2/2g$ where $h$ is altitude above MSL and $V$ is TAS expressed as a velocity.

energy level  Any specific value of energy which a particle may adopt; during transitions from one level to another, quanta or radiant energy are emitted or absorbed, frequencies depending on difference between levels.

energy management  Monitoring to minimise fuel expenditure for trajectory control, navigation, environmental control, etc.

energy manoeuvrability  Flight manoeuvres in which full use is made of kinetic energy of aircraft, normally in trading speed for altitude.

energy state  Total kinetic plus potential energy possessed by aircraft, particularly a fighter; normally expressed as altitude from SL reached (without propulsion) if all such energy were converted to potential (height) energy.

energy weapons  See directed-energy.

ENG  Electronic news-gathering.

Eng  Engine.

Engage  Armed position of some arrester hooks, extended or hinged down prior to landing.

engaged  In air interception, order to attack designated contact (DoD usage).

2 To contact arrester wire or barrier.

engage and trim indicator  Panel instrument showing proper engagement of ailerons/elevators/rudder to autopilot system.

engagement  Encounter which involves hostile action by at least one participant.

engagement control  Exercised over functions of air-defence unit related to detection, identification, engagement and destruction of hostile targets.

engaging speed  Speed of aircraft relative to arrester wire at engagement.

engine  Missile (F).

engine altitude  Indicates altitude corresponding to manifold pressure of supercharged engine.

engine-attributable  Caused by fault in an engine.

engine car  Airship car wholly or mainly devoted to propulsive machinery.

engine change unit  Aircraft piston engine removable as single unit with all accessories, cooling and oil systems.

engine cowling  Hinged or removable covering around aircraft engine shaped to keep drag to minimum and optimise flow of cooling air.

engine critical part[s]  Part[s] whose failure is likely to cause a Hazardous Engine Effect.

engineered material  Cellular concrete for overrun areas.

engineering  2 Department responsible for detail design and development.

engineering mock-up  Full-scale replica of new aircraft or major part thereof, made [usually in metal] with high precision, partly in hard tooling, to check three-dimensional geometry of structure, systems, and equipment.

engineering time  Number of man-hours required to complete engineering task.

engineering units  Pre-SI (suggested obsolete) system of units for expressing lift and drag of wing or component part in lb/sq ft at 1 mph at specified angle of attack.

engine failure recognition speed  Usually written $V_{fr}$.

engine flight cycle  The flight profile upon which the Approved Life is based.

engine icing  A problem with all engines, but especially with piston engine with a choke-tube carburettor, where temperature is sharply reduced.

engine indication and crew alerting  Eicas monitors several [typically 12] measures of engine and system performance, and can indicate impending failure.

engine mounting  Structure by which engine is attached to airframe.

engine-out  Condition in which one engine of multi-engined aircraft gives no propulsive thrust.

engine-plus-fuel weight  A criterion of propulsive efficiency, heavy engines generally burning less fuel.

engine pod  See pod.

engine positioner  Dolly or trailer designed to carry engine, especially large turbofan, on cradle provided with hydraulic, or electrohydraulic, lateral, vertical, fore/aft, roll and pitch movement.

engine pressure ratio  Pressure ratio across complete compression system [possibly fan, booster and LP, IP and HP compressors]. In 1950 an axial spool of 15 stages achieved * of about 6; today this number of stages can exceed 50.

engine rating  Power permitted by regulations for specified use; maximum takeoff, combat, maximum continuous, weak mixture etc.

engine-section stator  The ring of inlet guide vanes immediately downstream of a fan at the inlet to the core.

engine speed  Revolutions per minute of main or other specified rotor assembly.

engine swapping  Replacing engines due for overhaul with stored engines that have serviceable life remaining.

English bias  Missile aiming error at launch, and temporary guidance commands to overcome it.

EngO  Pronounced N-jo, Engineer Officer (RAF).

ENH  Earth near horizon.

enhanced GPWS  Uses aircraft flight data to calculate envelope along projected flight path and compare this with internal terrain data base. Potential conflict gives
enhanced vision system

Enhanced vision system uses dual-band IR camera to project conformal image of scene ahead on to HUD, allowing approach to continue from 200 to 100 ft (30 m) decision height.

Another provides HUD-system to input Flir and/or MWR.

ENAAP  Euro-NATO Joint Jet Pilot Training.

ENM  Endo-atmospheric non-nuclear kill.

ENNA  Enterprise Nationale de la Navigation Aérienne (Algeria).

ENOC  Engineering network operation center.

enplanement  Boarding by one passenger (US).

Enq Enquire.

ENR  En-route, also ENRT.

ENR  Electronic Navigation Research Institute (Sendai, Japan).

enrichment  Adjustment by piston engine mixture control to produce richer mixture.

en route  Between point of departure and destination.

en-route airway  For flight on airways or desired track, excluding initial departure and approach phases.

en-route automated radar tracking system  A step beyond ARTS IIIA with improved digital-display radars and failsafe features (FAA).

en route base  Air base between origin and destination of air force mission which has capability of supporting aircraft operating route.

en route clearance  Valid to destination, either to joining stack or coming under approach control.

en route climb  Climb to designated FL or cruising altitude on desired track.

en route height  See cruise altitude.

en route support team  Selected personnel, skills, equipment and supplies necessary to service and perform limited special maintenance on tactical aircraft at en route base (USAF).

en route time  Time en route (1), normally measured from initial cruise altitude to TOD.

en route traffic control service  Provided generally by ATC centers, to aircraft on IFR flight plan operating between departure and destination terminal areas.

ENN  En route.

ENSA  Euler/Navier-Stokes.

ENSA  Ecole Nationale Supérieure de l’Aéronautique (F).

ENSAE  New designation of ENSA, with addition of “et de l’Espace”. Now more commonly called Supaéro.

ENSC, or Easce  Enemy situation correlation element (US, intelligence).

Ensiet  Ecole Nationale Supérieure des Études et Techniques d’Armement [F-29806 Brest] (F).

ENSIPI, EnsiP  Engine structural integrity program (USAF).

ENSMA  Ecole Nationale Supérieure de Mécanique et d’Aéronautique (F).

ENSO  El Niño southern oscillation.

Ensolite  Very wide range of closed-cell foams made chiefly from VN (vinyl/nitrile PVC NBR rubber) or Neoprene; many applications (Uniroyal).

Entel  Empresa Nacional de Telecomunicaciones (Argentina, Chile, etc).

Enterprise caching technology  Combines VDA, APC(10) and selective caching in order to prevent superfluous data from being sent over electronic communications.

ENTG  Euro/NATO Training Group.

enthalpy  Total energy (heat content) of system or substance undergoing change from one state to another under constant pressure, expressed as H = E + PV, where E is internal energy, P pressure and V volume; another expression is Q = V + PV. See specific.

entity  Radar-detected aircraft seen on screen.

tenomopter  Flying machine based on insect aerodynamics.

ENTR  Entire.

entrainment  Sucking-in of induced fluid flow by high-velocity jet through duct.

entrance cone  Portion of Eiffel-type tunnel upstream of working section.

entrant  Start-up airline, new to the market [opposite of incumbent].

entropy  In physics and thermodynamics, measure of unavailability of energy; symbol S, a measure of energy per unit temperature J/K. Specific S, symbol s, is * per unit mass kJ/kgK = 0.238846 Btu/lb°R; the reciprocal is 4.186798. Thus, in irreversible process, such as occurs in any real engine, * always increases. Any system or process having constant * is said to be isentropic.

2 In communications theory, measure of information disorder.

entry  Penetration of planetary atmosphere by spacecraft or other body travelling from outer space.

entry flight  Portion of flight on airways or desired track, excluding initial departure and approach phases.

entry point  Ground position at which aircraft entering control zone crosses boundary.

2 Where supersonic track crosses coast inbound.

ENU  East/north/up co-ordinate system.

envelope  Variable, curve which bounds values but does not consider possible simultaneous occurrences or correlations between different values.

2 Curve drawn through peaks of family of curves or through all limiting values.

Glass or metal casing of electronic tube.

Hot air or gas container of non-rigid aerostat.

Outer cover of airship.

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envelope diameter

6 Volume of airspace bounded by limits of effective use of weapon.

envelope diameter 1 Diameter of circle encompassing engine or other irregular object.

2 Diameter of airship envelope.

envelope jiggling Precision assembly of stressed-skin structure in reverse order, starting with skin in female jig and then adding internals (Fairey).

ENVG Enhanced night-vision goggle[s] combining thermal imager with image intensifier.

environmental chamber Chamber in which humidity, temperature, pressure, solar radiation, noise and other variables may be controlled to simulate different environments.

environmental control system, ECS Produces environment in which human beings and equipment can work satisfactorily.

environmental lapse rate Measured rate of decrease of temperature with height; determined by vertical distribution of temperature at given time and place, and distinguished from process lapse rate of individual parcel of air.

environmental mock-up Mock-up cabin intended to assist design of ECS.

environmental stress screening Test procedure similar to burn-through for promoting reliability with growth.

environmental system Environmental control system.

EO Electro-optical, or optics; used thus in subsequent definitions.

2 Engineering [or Executive] order.

3 Earth observation.

EOA 1 Early Operational Assessment.

2 Engine-out allowance.

EO Engine out.

EOAR European Office of Aerospace Research (USAF).

EOB Electronic order of battle.

EORB Estimated off-block[s] time.

EOC 1 Electro-optic convertor.

2 Enhanced, or early, operational capability.

EOCCM, EOCM EO counter-countermeasures.

EOCM EO countermeasures.

EOD Explosive-ordnance disposal, or demolition; S adds system, T rearming.

2 Enhanced operating database.

3 Embedded optical database.

6 Erasable optical disc.

End Effects of defects.

EODAS, EOdas Electro-optical distributed-aperture system.

EODAP, Eodap Earth and ocean dynamic applications program.

EODC Earth-Observation Data Centre (UK).

EOE Electro-optical effect.

EOEM Electronic original equipment manufacturer.

EOFC EO fire control.

EOFT Enhanced operational flight trainer.

EOGB Electro-optically guided bomb.

EO guidance Electro-optical guidance.

EOI Expression of interest, requested by potential customer from supplier; if answered, could lead to ITT (2).
**EPCA**

- Equipment Policy Committee (UK MoD).
- Elementary Pilot Certificate.
- Electronic power conditioner.
- EANPG Co-ordination meeting(s) (ICAO).
- Exhaust-plume dilution.
- Electric product definition.
- Electric-power distribution; A adds assembly, S system.
- EPDS See above.
- Ep-era Extractor-parachute emergency-release assembly.
- EPFA The European Property Flying Association [registered Monmouth, Wales, promotes aircraft in the construction industry].
- EPG European participating governments (or groups).
- EPGs Electric(al) power generation, or generating, system.
- Ephemeris Periodical publication tabulating future positions of satellites or daily positions of celestial bodies and other astronomical data (plural = ephemerides).
- Ephemeris time Uniform time defined by laws of dynamics, determined in principle by observed orbital motions of Earth and other planets (see *universal time*).
- EPI 1 Engine performance indicator.
- 2 Engineering process improvement.
- 3 Electronic-protection initiatives (AFRL).
- 4 Elevator position indicator.
- EPIA European Photovoltaic Industry Association (Int.).
- EPIC, Epic 1 Epitaxial passivated integrated circuit.
- 2 Engineering and product information control (management team).
- 3 Emergency procedures information centre (BAA).
- 4 Electronic Privacy Information Center (DC-based watchdog).
- 5 Electronic and photonic integrated circuit (Darpa).
- Epios Global e-business platform for aerospace and defence industries (Int.).
- EPIRB, Epirb Emergency position-indicating radio beacon, operating on 121.5 and 406 MHz in link with Sarsat.
- EPL Engine power lever, ie throttle.
- EPLD Electrically programmable logic device.
- EPLRS Enhanced position-location reporting system.
- EPM Electronic protection, or protective, measures.
- EPMaRV Earth-penetrating manoeuvring re-entry vehicle; does not penetrate planet, only its atmosphere (USAF).
- EMPS 1 Engine performance monitoring system.
- 2 Electrical power management system.
- EPN European participating nations.
- EPNACB Equivalent Perceived Noise Decibel; unit of EPNL (see noise).
- Epnac École du Personnel Navigant Centre d'Essais et de Réception (F).
- EPNL Equivalent perceived noise level; measure of effect of noise on average human beings which takes into account sound pressure level (intensity), frequency, tonal value and duration.
- EPNNR Electrically powered noise reduction.
- EPO Earth parking orbit.
- Epoch Time when a satellite is established in orbit.
- Epox resin Complex organic adhesive and electrical insulating material; addition of hardeners, plasticiers and fillers tailors its properties.
- EPP 1 Emergency power package.
- 2 Enhanced parallel port.
- EPPIC, Epic Enhanced precise positioning integrated capability (satellite).
- Eppler Family of wing sections for competition sailplanes; tailored to small R, high IAS for penetration.
- EPR 1 Engine pressure ratio.
- 2 External power receptacle.
- 3 Ethylene/propylene/rubber.
- EPRIL Engine pressure ratio limit.
- Eprom Erasable, or electrically, programmable read-only message, or memory.
- EPRIT Engine pressure-ratio transmitter.
- EPS 1 Emergency, or [confusing] electrical, power system, or supply or source.
- 2 Enhanced propulsion, or polar, system.
- 3 Earnings per share.
- EPSA Emirates Parachute Sport Association [office, Dubai] (UAE).
- EPSG Equipment supply group.
- Epulam Copper-coated flexible substrate of ceramic-filled Teflon.
- EPSU European Public Service Union (Int.).
- EPT Egress procedures trainer, initially for the F-22 but with wide future possibilities.
- EPTA European Pultrusion Trade Association.
- EPU 1 Emergency power unit.
- 2 Electronic processing unit.
- EPUU EPLRS user unit [MLS can be suffix].
- EPV 1 Estimated programme value.
- 2 École du Personnel Volant (F).
- EPW Earth-penetrating warhead.
- EOX Environmental processor, military extension.
- EQAR Extended-storage [or expanded] quick-access recorder.
- EQD Electrical Quality-assurance Directorate (UK MoD).
- EQPT Equipment.
- Equal deflections Principle used in analysis of statically indeterminate structure; two members rigidly attached must deflect an equal amount at point(s) of attachment under load.
- Equaliser 1 Filter network which compensates over-specified frequency band for distortion introduced by variation of attenuation with frequency.
- 2 Connection between generators in parallel to equalise current and voltage.
- Equalising pulses Signals sent before and after vertical synchronizing pulses to obtain correct start of lines in iconoscope, vidicon and display tubes.
- Equal taper The same on LE and TE.
- Equation of time Before 1965, difference between mean time and apparent time, usually labelled + or – to obtain apparent time. After 1965, correction applied to 12 hours + local mean time (LMT) to obtain local hour angle (LHA) of Sun.
- Equations of motion Give information regarding motion of a body or point as a function of time when initial position and velocity are known.
equator

Primary great circle of sphere or sphaeriod, such as Earth, perpendicular to polar axis.

equatorial bulge

Excess of Earth’s equatorial diameter over polar diameter.

equatorial satellite

One whose orbit plane coincides, or almost coincides, with Earth’s equatorial plane.

equi-axed

Descriptive of traditional crystalline cast metal items.

equiax blade

Turbine rotor blade cast in traditional way with random arrangement of crystal axes [often capital E].

equilibrium flow

Fluid flow in which energy is constant along streamlines, and composition at any point is not time-dependent.

equilibrium glide

Supersonic gliding flight in which sum of vertical components of aerodynamic lift and centrifugal force is equal to weight at that height.

equilibrium height

At which, under given conditions, equilibrium is established between lift and weight of free aerostat without power.

equilibrium vapour

Vapour pressure of system in which two or more phases coexist in equilibrium; in meteorology reference is to water unless otherwise specified.

equinox

1 Instant that Sun occupies one equinoctial point.

2 One of two points of intersection of ecliptic and celestial equator, occupied by Sun when declination is 0°; also called equinoctial point.

equi-period transfer orbit

Orbit differing from first but having same period, eg that of lunar module following separation from command module.

equipment

Type or class of aircraft used or to be used on particular air-transport route(s).

equipment configuration report

Real-time all CMC, P/N S/N and DB/N.

equipment interchange

Agreement allowing aircraft to fly long routes over sectors of two or more carriers, crew being changed so that each carrier flies its own sectors.

equipment operationally ready

Weapon system is capable of safe use and all subsystems necessary for primary mission are ready (USAF).

equipment weight

Designed weight of individual aircraft including removable and other equipment but less disposable load.

equi-signal zone

Zone within which aircraft receives equal signals from left and right intersecting lobes, giving continuous on-track signal.

equivalence ratio

Ratio of stoichiometric to experimental air-fuel ratios.

equivalent air speed

See airspeed.

equivalent brake horsepower

See equivalent horsepower.

equivalent circuit

Theoretical circuit diagram electrically equivalent to practical circuit or device.

equivalent drag area

See equivalent flat-plate area.

equivalent flat-plate area

Area of square flat plate, normal to free-stream relative airflow, which experiences same drag as the body or bodies under consideration; usually written \( f = D/\rho V^2 \).

equivalent flight hours

The equivalent actual flight time simulated in an accelerated fatigue test.

2 A yardstick [C-130 EFH] established by the European Airlift Centre to enable members to trade flight time without the need to exchange funds (Int., 2004-).

equivalent full-throttle power

The theoretical brake horsepower which a supercharged piston engine would develop at sea level if it were run at full throttle and maximum r.p.m.

equivalent horsepower

In turboprop, sum of horsepower, usually measured as brake hp, available at propeller shaft plus equivalent power derived from jet thrust by applying numerical factor to measure of thrust (abbreviated ehp). See equivalent power.

equivalent isotropically radiated power

Product of power to antenna multiplied by antenna gain in a particular direction relative to that from isotropic antenna.

equivalent kilowatt(s)

SI measure of power of turboprop, abbrev. ekW, see equivalent power.

equivalent monoplane

Monoplane wing having same lift and drag properties as combination of two or more wings under consideration.

equivalent monoplane aspect ratio

Wings and tip vortices of biplane mutually interfere; Prandtl showed increase in induced drag of each wing is \( \Delta D_i = \frac{\pi L_i L_2}{b_1 b_2} \), where \( \sigma \) is Prandtl interference factor, \( L \) wing lift, \( b \) spans, and \( \frac{1}{2} \rho V^2 \) dynamic head. Total added induced drag is twice that of single wing, so \( \Delta D = \frac{b_1}{S} \left( \frac{\mu}{\sigma} \right) \left( \frac{1}{2} \right) \left( \frac{1}{2} + \frac{1}{r} \right) \) where \( b_1 \) is longer span, \( S \) total area, \( \mu \) ratio of shorter span to longer span.

equivalent pendulum

Freely gimballed platform usually incorporating gyros and accelerometers, which has same period of oscillation as simple pendulum of particular length.

equivalent perceived noise level

\( LPNO = L_A - 10 \log \frac{T}{T_s} \), where \( L_A \) is aircraft exposure level, \( T \) is total period of noise and \( T_s \) is (usually) 1s (see noise).

equivalent potential temperature

Temperature given sample of air would have if brought adiabatically to top of atmosphere (ie to zero pressure) so that all water vapour is condensed and precipitated, remaining dry air then being compressed adiabatically to 1,000 millibars. *** is therefore determined by absolute temperature, pressure and humidity.

equivalent power

See equivalent horsepower; in SI units power is measured in W or multiples thereof; to a first-order approximation \( ekW = kW + 68F_n \) where \( F_n \) is residual jet thrust in kN. In Imperial units jet thrust (lb force) is typically multiplied by 0.3846 [reciprocal 2.6] before being added to shaft power.

equivalent shaft horsepower

See equivalent horsepower.

equivalent single-wheel load

Mass which, supported by single wheel of size just large enough not to sink significantly into surface, causes same peak bending moment in airfield pavement as particular truck, bogie or other multi-wheel gear of actual aircraft.

equivalent still-air distance

The distance over the ground the aircraft would have covered in the absence of wind.

equivalent temperature

Temperature particle of air would have if brought adiabatically to top of atmosphere (ie to zero pressure) so that all water vapour is condensed and precipitated, remaining dry air then being compressed adiabatically to original pressure.

equivalent wing

In stress analysis, same span as actual wing, but with chord at each section reduced in propor-
ER

tion to ratio of average beam load at that section to average beam load at section taken as standard.

ER 1 Extended-range.
   2 Enhanced radiation.
   3 Echo reply.
   4 Essential requirements.
   5 Expanded Response [SLAM].

E/R Extend/extract.
Er Erbium.

ERA 1 European Regional Airlines Association [offices at Geneva and Fairwoks Airport GU24 SHX, UK] (Int.).
   2 Elastic recoil analysis, for hydrogen content.
   3 En-route [radar] array.
   4 Explosive reactive armour.
   5 Employment relations act (UK 1999).
   6 European Research Area (Int.).
   7 European Robotic Arm [ISS].
   8 Electrical Research Association (UK).

ER-AAAM Extended-range air-to-air missile.

ERAS Extended-range autonomous attack system (UAV).

eradiation See Earth radiation.

ERAM 1 Extended-range anti-tank mine (or anti-armour munition).
   2 En-route automation modernization (FAA).

ERAO European Regional Airline Organization (Int.).

ERAP 1 Earth-resources aircraft organization program (US).
   2 Enhanced range applications program (USAF).

ERAPDS Enhanced recognised air picture dissemination system.

ERAPS, Eraps Expendable reliable-acoustic-path sonobuoy.
erase In EDP (1) to expunge stored information, usually without affecting storage medium.

ERASL Enhanced recognition and sensing lidar.

Erasmus En route-air-traffic management ultimate system (Honeywell, EU).

Erast Environmental research aircraft and sensor technology (Nigeria).

E-Rast Expendable Rast.

Erat En-route absorption of (expected) terminal delay.

ERATS, Erats En route advanced, or automated, tracking system.

ERAU Embry-Riddle Aeronautical University [Daytona Beach, FL32114-3900; Prescott, AZ 86301-3720] (US).

ERB 1 Executive, and also Engineering, Review Board.
   2 Executive responsibility budget.
   3 Earth radiation budget.

erk Bright silver metal, Er, density 9.1, Mpt 1,529°C, important in optics [especially optical fibres] and in eye-safe Er-glass lasers on 2.9 μ.

erbium silicide One of the favoured materials currently used for fabricating nanowires.

ERBM Electronic rangefinding marker.

ERBS Earth radiation budget system, later satellite.

ERC 1 Electronics Research Center, NASA, Cambridge, Massachusetts.
   2 Extended runway centreline.
   3 Engine-related causes.
   4 En route chart.

ERCA Etablissements Régional du Commissariat de l’Air (F).

ERCC 1 En-route control centre.

2 Engine Requirements Co-ordinating Committee (CAA).

ERCS 1 Emergency rocket communications system.
   2 Enhanced radar cross-section (UAV decoy).

ERCE Escadrille de Réception et de Convoyage Equipe [crew ferry flight unit] (F).

ERD End-routing domain.

ERDA 1 Energy Research and Development Administration (US).
   2 European Regional Development Agency.
   3 En Route Descent Adviser (NASA).

ERDE Explosives Research and Development Establishment (formerly at Waltham Abbey, UK).

ERDI ERD infrastructure.

ERDL Extended-range, data link.

ERE External roll extrusion.

EREA European research establishments in aeronautics, or for aerospace, launched 2001 with seven members.

eerect 1 Not inverted, vertical acceleration +1g.
   2 To restore a horizon or standby horizon to give correct indication after upset.

eerection 1 Assembly and rigging of aircraft from component parts or from dismantled state; eg after crated shipment.
   2 Of gyro, acceleration from rest to operating speed with axis in desired alignment. (Thus re-* to restore proper axis alignment after being toppled.)

erector transporter Vehicle used to convey ballistic rocket, elevate it for firing and act as launcher; also known as transporter erector.

E-region Region of ionosphere in which E-layers and Sporadic E-layer tend to form.

EREI Elevated runway-edge light.

ERFA Conference on Economics of Route Air Navigation Facilities and Airports.

ERFC Extended-range fuel containment system (= tank).

ErG Erbium-glass.

erg Unit of energy in CGS (not SI) system; work done by force of one dyne acting through distance of 1 cm = 10^{-7}J.

ERGM Extended-range guided munition (USA, USN).

ergometer exerciser Device for exercising astronauts on long missions and measuring muscular work.

ERGP Extended-range guided projectile.

ERHA En-route high-altitude; C adds chart.

Erint Extended range-interceptor.

ERIS, Eris Exoatmospheric re-entry vehicle interceptor system.

ERJ External-combustion ramjet; one in which airflow and combustion are outside vehicle with profiled exterior surface.

erk RAF slang (WW2) for airman ground crew possessing minimal skills and lowest rank (AC2 or ACH).

ERL 1 Environmental Research Laboratories (NOAA).
   2 Electronics Research Laboratory (Australia).

ERL En-route low-altitude; C adds chart.

ERMA, Erma Extended-red multi-alkali (Gen II image intensifiers).

ERMP Extended-range, multipurpose.

ERMIR Economic Regulation and Multilateral Relations (European Commission).

E_{rms} Root mean square voltage.

ERO Engine repair and overhaul.
  2 Earth-resources orbiting satellite.
  3 Earth remote observing system.

erosion gauge  Instrument for measuring erosion by dust and micrometeorites on materials exposed to space environment.

ERP  1 Effective radiated power.
  2 Eye reference point.
  3 Excitation [or exciter] receiver processor.
  4 Enterprise resource planning, or process.

ER-PDU  Echo reply protocol data unit.

ER-PGM  Extended-range precision guided bomb.

ESD&DF  Electronic safety arming and fuzing.

ESM  1 Escape slide.
  4 Electrostatic.
  5 Electronic support.
  6 End system.
  7 Extended squitter.
  8 Evolution strategy [algorithm].

EOL  1 Specific energy, \( h + v^2/2g \).
  2 Secant modulus.

ES1, ES2  Radar antenna with electronic scanning about 1 or 2 axes, respectively.

ESA  1 European Space Agency [17 members; office, F-75738 Paris Cedex 15] (Int.).
  2 Enhanced signal average.
  3 Electronic signature authentication.
  4 Engineering source approval.
  5 Electronically scanned, or steered, array.
  6 Enhanced [or electronic] situation[al] awareness [S adds system].
  7 Embedded/special application, also E/SA.

ESA (6)  1 Equivalent still-air distance.
  2 Electronic safe/arm device.

ESAA  Electronic-scanning array antenna.

ESAF  Electronic safety arming and fuzing.

ES&DF  Electronic support and direction finding.

ESAR  Enhanced synthetic-aperture radar.

ESARR  Eurocontrol safety regulatory requirements.

ESAS  1 Electronically steerable antenna system.
  2 See ESA (6).
  3 Exploration systems architecture study (NASA).

ESASC  EEA/SBAC Avionics Systems Committee.

ESB  Elevating sliding bridge, simpler than apron-drive type of airbridge.

ESC  1 European Space Conference.
  2 Executive steering committee.
  3 Engine supervisory control.
  4 Energy storage [and] control.

Escadre  Wing (military unit, F).

Escadrille  Flight (military unit, F).

ESR  1 Earth-resources satellite.
  2 Error-recovery service message (networks).
  3 En-route supplement.
  4 Emergency radio switching [system].
  5 Electronic resource system.
  6 Earth remote surveillance.

ERS  Essential requirements (EASA).

ersatz  Substitute material (G).

ERSDS  En-route software development and support (FAA).

ERSU  Environmental remote-sensing unit.

ERT  1 Elevator rigging tool.
  2 Extended-range tank.
  3 Earth-receive time [signal from planet].

ERTS  Earth-resources technology satellite.

ERU  1 Ejector release unit for external stores.
  2 Emergency reaction unit (USAFSS).
  3 Engine relay unit.

ERV  Expendable rocket vehicle.

Ervis  Exoatmospheric re-entry vehicle interception (or interceptor) system (SDI).

ERW  Enhanced-radiation (neutron) weapon.

ER-WCMD  Extended-range wind-corrected munitions dispenser.

ERWE  Enhanced radar-warning equipment.

ES  1 Escape slide.
  2 Expert systems [artificial intelligence].
  3 Electronically scanned.
escape spoiler

extended (usually from doors) from transport aircraft to enable passengers and crew to evacuate quickly in emergency. (Possible confusion with escape chute.)

escape spoiler Aerodynamic baffle extended upstream of crew escape door or chute.

escape tower Connects escape rocket(s) to vehicle; separated if ascent is normal.

escape velocity Speed body must attain to escape from gravitational field. Earth 25,022 mph, 11.186 kms\(^1\), 36,700 ft/s, Moon 7,800 ft/s, Mars 16,700 ft/s and Jupiter 197,000 ft/s.

ESCC European space components co-ordination (Estec).

Eses European Satellite-Communication Earth Station (India).

ESCS 1 Emergency satcom system.

2 Electrical-system controller subsystem.

ESD 1 Electronic Systems Division (USAF Systems Command).

2 European Security [or Strategy] and Defence [A adds Agency, I adds identity, P policy]; proposed EU task force.

3 Electrostatic discharge.

4 See ESSD.

Esdac European Space Data Centre (now DIH).

ESDP European Space and Defence Policy.

Esdac European Space Data Centre (now DIH).

Esdac, Esdacs European Space Data Centres (now DIH).

ESS 1 Emergency satcom system.

2 Emergency system controller subsystem.

ESS 1 European Science Foundation (Int., office Strasbourg 67080).

2 Expanded support, or supporting, foam.

3 Explosion suppressant foam.

ESFC Emergency surgery flying centre (helicopter).

ESG 1 Electrostatically suspended gyro.

2 Extended-service goal.

3 Electronic Security Group (USAF).

ESGM 1 Electronic Security Group (USAF).

ESG 1 Electronic Security Group (USAF).

ESH End system hello.

ESHÉ École de Spécialisation sur Hélicoptères Émaraux (F).

ESHP Equivalent shaft horsepower, ehp.

ESI Engineering staff instruction.

2 Engine and system indication [D adds display, S system].

3 Earth-surface imager.

ESIC Environmental Science Information Center (NOAA).

ESID 1 Electrical-storm identification device.

2 Engine and system indication display.

ESIID Embedded-system ionosphere interoperability demonstration.

ESIL Eye-safe IR laser.

ESIP Engine structural integrity program (US).

ESIS 1 Electronic standby instrument system.

2 See ESI(2).

ESJ Equivalent single jet.

ESKE Enhanced station-keeping equipment.

ESL 1 Earth-Sciences Laboratories (NOAA).

2 Eye-safe laser [R adds range].

ESLÉ Electronic survivor-location equipment.

ESLRR Electronically scanned laser radar.

ESM 1 Electronic support measures (UK).

2 Electronic surveillance measures, or measurement (US).

essential bus

3 Electronic surveillance, or signal, monitoring.

4 Enhanced space multiprocessor.

ESMB Electrically-steered multi-beam.

ESMC Eastern Space and Missile Center (USAF Patrick AFB).

ESMD Exploration Systems Mission Directorate (NASA).

ESMO, Esmo ESM operator.

ESMR Electronically scanned microwave radiometer.

ESO 1 Engineering standards order (FAA).

2 Evolutionary structural optimization.

Esoc, ESOC European Space Operations Centre, Darmstadt (Int.).

ESP 1 External starting power.

2 Extended-service programme.

3 Elastically suspended pendulum.

4 Electrical standard practice[s].

5 En-route spacing program.

6 Expandable signal [or system] processor.

7 Expandable system programmes.

8 Engine surge protection.

9 European Safety Programme for ATM7 [2006-].

10 External stowage platform [Shuttle].

ESPA Electronically scanned phased-array.

ESPI European Space Policy Institute.

Esprit 1 European strategic programme for research into information technology.

2 Eye-slaved projected raster inset (Singer Link-Miles).

ESQAR Extended-storage quick-access recorder.

ESR 1 Electro-slag refined (or remelt).

2 European staff requirement (NATO).

3 Energy storage.

4 Emergency Sun reacquisition.

Esrange Former European (now Swedish) space launch range, Kiruna.

ESRO European Space Research Organization, now part of ESA.

ESRC Engineering and Sciences Research Council (UK).

ESRDA European Safety, Reliability and Data Association.

ESRL Electronic and Surveillance Research Laboratory [Salisbury, SA5108.

ESRP European supersonic research programme [also called PERS (F)].

ESRRD E-scope radar repeater display.

ESS 1 Environmental stress screening.

2 Experiment support system (spacecraft).

3 ESM subsystem.

4 Electronic switching system.

5 Exercise support system.

6 Electronic Security Squadron (USAF).

7 Engineering Support System (RAF), or services.

8 Engine section stator.

9 Engine support structure.

10 Essential.

ESSA Environmental Science Services Administration (now NOAA).


ESSD Electrostatic sensitive device[s].

essential bus Electrical bus (bus-bar) on which are grouped nothing but essential electrical loads.
essential items

essential items Shaft-driven accessories whose failure would bring about termination of the flight, examples being fuel and oil pumps. Drive-shafts to these items do not incorporate deliberate weak lines.

ESSI  Enhanced special structural inspection.

ESSL  Emergency speed select lever.

ESPP 1 European Satellite Services Provider [F, DSNA; G, DFS; I, ENAV; Portugal, NAV; Spain, AENA; Switzerland, Skyguide; UK, NATS]. (Int. 2005-).

2 Efficient small-scale propulsion.

ESSS, ES 7 External stores support system.

ESSh  Electronic sensors and systems sector.

Esswacs  Electronic solid-state wide-angle camera system.

1 EST 1 Eastern Standard Time (US).

2 En-route support team (USAF).

3 See E&ST.

4 Elevation, slope, temperature.

5 Estimate[d].

ESTA  Electronically scanned tacan antenna.

establish  To achieve a steady state. In particular see next.

established  Aircraft confirmed as being stable at a prescribed flight condition, notably at a given FL or on a particular glidepath.

ESTAe  Ecole Spéciale de Travaux Aéronautiques (F).

ESTC  European Space Tribology Centre.

Esteem  Elaboration of a strategy for the transition from Eatchip Phase III to EATMS (Euret).

Ester  EO sensor technology and evaluation research.

ester  Compound which reacts with water, acid or alkali to give an alcohol plus acid; important in many aerospace lubricants and other materials.

ESTL  European Space Tribology Laboratory (ESRO).

ESTOL, Estol  Extremely STOL.

ETL  Emergency supply unit.

ETM  Electro-thermal chemical.

ETN  Erroneous track change (FDR).

ETR  European Travel Commission [office, B-1000] [Int.].

ETT  Equipment trust certificate, for financing new equipment.

ETCAS  Enhanced transportation automated data system.

ETCS  Expeditionary tactical communications system (MCWL).

ETD  Estimated time of departure.

1 Explosive[s] trace detection, or detector.

2 Expendable towed decoy.

2 Estimated time en route.

2 Environmental test and evaluation.

ETEB  Engineering Test and Evaluation Board (US).

ETEC  Expendable turbine engine concept.

ETES  Exotic threat-emitter system.

ETF  Electronic time fuse.

2 Enhanced tactical fighter.

2 Engine test facility.

2 Engineering test force.

ETG 1 European Tripartite Group.

9 Enhanced target generator.

Ethernet  Ether-net, yet uses coaxial cable or twisted pair of wires to link IEEE-802 radar images or data at <10 Mbps.

ethyl alcohol  Alcohol prepared from organic compound such as grain, starch or sugar; withstands high compression ratios but compared with conventional fuel costs more, has lower heat value and vapour pressure, and affinity for water, basically C₃H₈O₆H.

ethylene glycol  Principal additive in cooling systems of liquid-cooled engines, composed of saturated solution of ethylene oxide and water (C₃H₈O), Bpt 197°C.

ethylene oxide  Petroleum-derived gas used in FAE devices.

ETI 1 Elapsed-time indicator.

2 Engine-technology improvement (US).

3 Extraterritorial income.

ETICS, Etics  Embedded tactical internet control system.

ETIENS  Enhanced technical-intelligence exploitation of SBIRS sensor data.

ETOPS  Enhanced tactical-intelligence exploitation of SBIRS sensor data.

Etip  Electronic technical log.
ETM

ETM 1 Elapsed-time measure[ment].
2 Environmental technical manual.
3 Electronic training manual [i.e., paperless].
ETMP Enhanced terrain-masked penetration.
ETMS Enhanced traffic-management system (FAA).
ETNAS Electro-level theodolite naval alignment system.
ETO 1 Estimated time over, or overhead.
2 European theatre of operations (WW2).
ETOA European Tour Operators’ Association [2005– ] (Int.).
ETPs Extended-range twin (engine) operations. Said to translate as: engines turning or passengers swimming.
ETOS Effective time on station.
ETOT Estimated takeoff time.
ETOW Engine time on wing.
ETP 1 Equal time point.
2 Estimated time of penetration.
ETPS Empire Test Pilots’ School (originally Farnborough, now Boscombe Down, UK).
ETPU Engine transient-pressure unit.
ETR Eastern Test Range (US).
ETRAC Enhanced tactical radar correlator.
ETRAS Electrical thrust-reverser actuation system [see next].
E-TRAS Electromechanical thrust-reverser actuation system.
ETRC Expected taxi ramp clearance.
ETS 1 Experimental test site.
2 External tank system.
3 Electronic systems test [S adds site].
4 Engineering test station.
5 Emitter targeting system.
7 Embedded training simulator.
ETSC European Transport Safety Council (Int.).
ETSI European Telecommunications Standards Institute.
ETSS Enterprise targeting and strike system.
ETU 1 External transmitter unit (IRCM).
2 Engineering Test Unit.
ETV 1 Elevating [cargo] transfer vehicle.
2 [missile] Eject test vehicle.
ETVS Enhanced terminal voice switch.
ETW European transonic windtunnel [D-51127 Köln] (Int.).
E’PROM See EEPROM.
ETX End of transmission.
EU European Union.
2 Ejector unit (stores carrier).
3 Electronic(s) unit [many applications].
Eu Europium.
EUUA European Union emissions allowance.
EUACA European Union Airport Co-ordinators Association (Int.).
EUAFS enhanced upper-air forecast system.
Encare European confidential aviation reporting network (Int.).
Euclid European co-operation for the long term in defence (Int.).
EUEA European Union emissions allowance.
Eug K iron garnet.
Euler formula Maximum load W of strut or long column,

\[ W = \frac{kEI}{r^2} \]

where E is modulus of elasticity, I moment of inertia of strut section, k constant, and r² square of length between supports.
Euler angles Systems of three angles which uniquely define with reference to one co-ordinate system (Earth axes) orientation of a second (body axes); orientation of second system is obtainable from first by rotation through each angle of turn, sequence being important. A singularity at 90° became significant with the latest [Russian] fighters.

**Euclidean co-ordinators** System in which properties of fluid are assigned to points in space at each time, without attempting to identify individual parcels from one time to next.

EuNetsat European meteorological satellite organization [office, D-64295 Darmstadt] (Int.).
EUAMS Engine usage monitoring system; EUULMS adds ‘life’.
EUUPS External uninterruptible power supply.
EUR European (ICAO).
Eur Eureka.
Eurac 1 European aircraft-cost formula (includes landing, navigation and interest charges).
2 European Air Chiefs conference.
Euraca European Air Carrier Assembly [charter air carriers, office, Zaventem B-1930] (Int.).
Euram European research on advanced materials (EC7).
EURANP European air-navigation plan (ICAO).
EURATN European ATN(1).
Euroca European retrievable carrier.
Eureka Ground beacon responding to Rebecca radar homing and distance-measuring system.
Eureka piece Fragments of wreckage showing cause of catastrophe.
Euresco European research conference[s].
Euret European Research Programme in Transport.
EURFCB European frequency-coordinating body (ICAO).
Euricas European Research Institute for Civil Aviation Safety.
EUROAVIA The European Association of Aerospace Students (Int.).
Eurocard Standard single-sided PCB, 160 × 100 mm.
Eurocores ESF collaborative research programmes.
Eurogrid, Euro Grid Digital map with terrain overlay from pilot-selected graphics (initially for military helicopters).
Eurogroup Informal group of European defence ministers (NATO).
Eurohorcs European Heads of Research Councils (1992– ), (Int.).
Euromep European mission equipment package (helicopter night vision etc, F/G).
Eurora European undertakings for research organization, programmes and activities, an umbrella MoU (Int.).
European Air Chiefs

European Air Chiefs Free-ranging conference held twice per year since 1993 to promote air-power co-operation.

Europlote European organization of airline pilots’ associations.

europium Symbol Eu, soft silvery metal, a lanthanide; density 5.243, Mpt 822°C, many uses in phosphors, screen coatings, semiconducting alloys and lasers.

Europol Intra-European air-transport policy (ECAC).

Europeus Popular name for AESI (merged 27 April 2004 into ASDS).

EUMETSAT European Traffic-Forecast Group (Eurocontrol).

eutectic point Lowest temperature at which mixture can be maintained in liquid phase; lowest melting or freezing point of alloy.

Eutelsat European Telecommunications Satellite Organization (Int.).


EUROPEUROPEP Eutelsat.

europium Symbol Eu, soft silvery metal, a lanthanide; density 5.243, Mpt 822°C, many uses in phosphors, screen coatings, semiconducting alloys and lasers.

Everel propeller One of the few single-bladed propellers to have achieved any commercial success, the blade being counterbalanced by a lead cylinder (US c1930–40).

Evering number \[ \text{No} = \frac{n}{C_0} = \frac{V_c^3}{96,000 \sqrt[4]{\sigma}} \cdot \frac{W_P}{W_S} \]

where \( n \) is propulsion efficiency, \( C_0 \) total drag coefficient, \( V_c \) max level KEAS, \( \sigma \) relative density, \( W_P \) power loading and \( W_S \) wing loading.

Everet’s Field Airfield serving WRE (Australia).

EVF Enter visual fix.

EVG Electrostatically supported vacuum gyro.

EVIR Enhanced-vision IR.

EVM 1 Engine-vibration monitor.

Error-vector magnitude.

E+E Earth-viewing module.

EVO Hellénique avionique (Hellenic arms industry).

EVP Executive vice-president.

EVR Electronic video recording.

EVSS 1 Electro-optical viewing system.

2 Enhanced vision sensor, or system.

Electronic voice-switching [S adds system].

EVT 1 Extravehicular transfer.

2 Educational and vocational training (for return to civilian life).

EW 1 Electronic(s) warfare.

2 Early warning.

3 Equatorial [warmer] air.

4 Elliptical waveguide.

5 Examining Wing.

6 Expeditionary warfare.

EWA European Wind-tunnel Association (Int.).

EWAAS End-state-wide-area augmentation system.

EWAC 1 Electronic-Warfare Aircraft Commander (USN).

2 Electronic-warfare analysis centre.

EW/Aco Electronic warfare and/or acoustic (RAF aircrew trade).

EWACS, Ewacs 1 Electronic wide-angle camera system.

2 Early warning and control system.

EWADS Expeditionary warfare air-defense systems.

EWAIF Electronic warfare avionics integrated support facility.

EWAM Extended-window addressable memory.

EW&C Early warning and control.

EWAP Electronic-warfare AGE [access on ground equipment] panel.

EWSA Electronic-warfare analysis system.

EWAU Electronic-warfare advanced technology.

EWSH Electronic-warfare avionics unit (RAF).

EWSB Electronic-warfare battle management.

EWSF Electronic-Warfare Combat Co-ordinator.

2 Electronic-warfare co-ordination cell (NATO).

EWCS Electronic-warfare coordination system, or command station.

EWCU Electronic-warfare computer unit.

EWDS Electronic-warfare evaluation display system.

EWEP Electronic-warfare evaluation program (USAF).

EWES Electronic-warfare evaluation system.
EWG
EWG/ECI Early warning and ground-controlled intercept.
EWIRDB Electronic-warfare integrated reprogramming database (USALF).
EW line The early-warning line 240 n.m. in advance of the frontier of the supposed hostile state [USSR] at which an NW attacking force would have descended to low level (RAF, 1957–90).
EWM Electronic-warfare management [S adds system, U unit].
EWMC Electronic-Warfare Mission Commander.
EWMS Electronic warfare management system.
EWO 1 Electronic-Warfare Officer.
  2 Emergency war order.
EWOP Electronic-Warfare Operator (USN).
EWOSE Electronic Warfare Operational Support Establishment (UK).
EWPA European Women Pilots’ Association.
EWP Electronic-warfare prime indicator.
EWR 1 Early-warning radar.
  2 Emittance wash repair.
EWS External weapon station.
EWSM Electronic-warfare (or early-warning) support measures (or surveillance measures).
EWSP Electronic-warfare self-protection.
EWTA Electronic-warfare sensor technology modeling simulator and analysis research (USAF).
EWTS Electronic-warfare training system.

Ex Expect[ed].
Ex, ex Except.
e Longitudinal distance between lift-jet centrelines.
Exa Prefix, multiply by 10^18 [million million million], symbol E.

Exactor Mechanical remote-control system giving precise position.

Exact point symbology That showing a point rather than a locus; e.g. in HUD, point where one projectile would have hit, rather than tracer line.
Excap Expanded capability (= better).
exceedence Single event, recordable on all HUM systems, in which engine or other device suffers an excursion in operating regime beyond allowable limits.
excess power 1 Difference between horsepower available and horsepower required; determines rate of climb. When horsepower available and required are equal, rate of climb falls to zero and absolute ceiling has been reached (see SEP).
  2 A totally different meaning is extra power required for level turn at same airspeed.
exchange rates Conversion factors used in calculating influence of variables in aircraft performance, most being guesses or assumptions; thus there are ** linking engine s.f.c., engine weight, parts cost, engine price and similar factors; ** will vary with stage length, operating conditions, costing formulae etc.
excliner 1 Source of small current, such as battery or d.c. rotary generator, which supplies current for field windings of large electrical machine.
  2 Oscillator which supplies carrier voltage to drive subsequent frequency-multiplying and amplifying and amplifying circuits of transmitter.
  3 Source of light used to stimulate photo-emissive cell.
exciton Bound state of electron and hole in nanoscale material.
exclusion zone Airspace prohibited to aircraft, e.g. over National Monuments (US).
EXCP Exempt[able].
exclusion Undesired short-term variation of variable, such as instrument reading or flight path, away from correct value.
exclusion fare Promotional fare offered by airlines to stimulate traffic; usually applicable only to round trips, with limits on season, days available and/or trip duration.
exclusion level 1 In glidepath, maximum vertical or angular variation of centreline voltage/signal.
  2 In glidepath, lowest safe angle of centreline voltage/signal.

EXD Expand display [in cockpit].
exducer Outlet from diffuser of centrifugal compressor.
Exec Executive.
execute missed approach A mandatory ATC instruction.
exercise There are no specific aerospace meanings.
exercise option To convert option(s) into firm order(s).
exfoliation corrosion Surface sheds thin flakes or layers.
exhaust branch Short pipe from cylinder to exhaust manifold.
exhaust collector ring Circular duct into which exhaust from radial engine is discharged.
exhaust cone Assembly of outer pipe and inner cone which leads gas from turbine to jetpipe.
exhaust-driven supercharger Turbocharger.
exhaust duct 1 Tunnel through which gas is expelled from underground missile launcher.
  2 Fan duct of aft-fan engine.
exhaust flame-damper Expanding and shrouded pipes designed to prevent exhaust gas or stacks being seen at night.
exhaust gas analyser Electrical instrument for indicating proportion of carbon monoxide and so indicating efficiency of combustion and correctness of fuel/air mixture.
exhaust manifold Duct into which gas is led from number of cylinders. In a radial engine called collector ring.
exhaust plug Streamlined body in exhaust nozzle for adjusting backpressure and giving propulsive thrust.
exhaust re heater See afterburner.
exhaust stack Exhaust pipe.
exhaust stator blades Whole or partial ring of blades behind turbine to remove residual whirl from gas.
exhaust stroke Fourth stroke in four-stroke cylinder, in which piston moves up to expel burnt gases.
exhaust stub Short pipe linking cylinder direct with atmosphere.
exhaust tailpipe Final pipe leading exhaust away from a collector ring or manifold.
exhaust turbocharger See turbocharger.
exhaust velocity Mean velocity of jet from rocket measured in plane of nozzle exit, v_e.
eximbank Export-Import Bank (US).
exit Departure from battlefield [helio or fixed-wing].
exit cone

Thus *criteria, required capabilities in flight performance and avionics to achieve this.

exit cone  Portion of wind tunnel into which air flows from working section.

exit fix  Reporting point at which aircraft leaves control area or FIR.

exit ramp  Safe path through mountainous region following pressurization failure.

exo-atmospheric  Beyond the atmosphere.

exogenous inputs  Disturbing inputs to dynamic [especially flight control] systems which, though neither actual controls nor reference signals, are crucial; Stevens/Lewis have noted that, without such an input, a glideslope coupler would command a horizontal trajectory.

exosphere  Outermost layer of atmosphere where collisions between molecular particles are so rare that only gravity will return escaping molecules; lower boundary is critical level of escape (region of escape) at 500–1,000 km.

exotic fuel  Any unusual fuel for air-breathing engine intended to produce greater thrust.

exotic material  Structural material seldom used in conventional applications; esp. one with melting point above 1,800°C.

expandable structure  One packaged in space vehicle and erected to full size and shape outside atmosphere.

expanded foam  Low-density material, usually rigid but of low mechanical strength, produced by chemical reaction in liquid state; often formed inside hollow metal airframe part.

expanding balloon  Kite balloon encircled by rubber cords or other devices to control shape when not full of gas; also known as dilatable balloon.

expanding brake  One whose segments are forced radially against drum by flexible sac.

expanding reamer  One with slotted flutes expanded by tapered pin.

expansion-deflection nozzle  Rocket nozzle in which jet enters top of bell-type nozzle moving radially outwards through an annular throat.

expansion joint  Pipe joint so constructed as to allow limited axial movement between sections held together.

expansion ratio  Ratio of cross-sectional area of rocket nozzle exit to area of nozzle throat.

expansion stroke  See power stroke.

expansion wave  Simple wave or progressive disturbance in compressible fluid, such that pressure and density decrease on crossing wave in direction of its motion; also known as rarefaction wave.

expansive corner  On supersonic body, convex corner [makes flow expand and accelerate].

expected approach clearance, EAC  Time at which arriving aircraft should be cleared to begin approach for landing; also known as expected approach time (EAT).

expected further clearance, EFC  Time at which it is expected additional clearance will be issued to aircraft.

expedite  ATC request: hurry up.

extendable construction  Rocket propellant tanks divided into sections jettisoned in sequence.

extendable nozzle  Rocket exit cone retracted or extended to alter area ratio; also called extendable exit cone.

extended air defence  Defence against aircraft, UAVs and TBMs.

extended centreline  Centreline of runway extended in either direction indefinitely.

extended overwater operation  As defined by US FAR (Pt 1), an operation over water at horizontal distance more than 50 nm from nearest shore.

extended-range Dovap, Extradop  Baseline extension of Dovap to provide coherent reference to ground transmitter and all Dovap receivers located beyond line of sight.

extended-range operations  Modern engines are so reliable that twin-engined aircraft [large jets] can be certificated for Etops routes taking them 60, 90, 180, or 240 minutes away from nearest suitable airport at engine-out cruise speed. In 2006 the FAA was considering an extension to 5½ hours.

extended-root blade  Gas-turbine rotor blade in which aerofoil is carried on long platform in disc of reduced diameter.

experimental aircraft  Aircraft whose objectives are fundamental research, or development of hardware having general application to many types of aircraft.

experimental mean pitch  Distance through which propeller advances along its axis during one revolution when slip is zero, i.e., when giving no thrust.

explosive decompression  Rapid reduction of pressure caused by catastrophic leak in pressure cabin (eg loss of window).

explosive forming  High-energy-rate forming of sheet metal by using controlled explosive energy to blow workpiece against die.

explosive rivet  Blind rivet with partially hollow shank charged with black gunpowder which, when detonated, causes shank to bulge.

explosive welding  Effecting near-perfect bond between dissimilar metals by using explosion to drive them together under such pressure that joint melts and sweeps away previous surface impurities.

exposed wing area  Net area minus projected area of nacelles and similar bodies, often written $S_{\text{ext}}$.

expansion level  $L_{\text{ex}} = k \log_{10} \frac{\Sigma L_{\text{EPN}} + 10}{10}$; can be amplified using $L_{\text{EPN}}/k$ where $L_{\text{EPN}}$ is $i$’th event and $k$ is usually 10, with additions of $10 T_0/\tau_s$ where $\tau_s$ usually 1s and $T_0$ may be 10s (see noise).

express  Property transported under air express tariffs filed with CAB; conducted on basis of agreement between Railways Express Agency and airlines.

Ext  Extension of runway.

ext  External.

EXTD, Ext  Extended.

extendable nozzle  Rocket exit cone retracted or extended to alter area ratio; also called extendable exit cone.

extended range  Distance through which aircraft may be 10s (see noise).

extended-root blade  Gas-turbine rotor blade in which aerofoil is carried on long platform in disc of reduced diameter.
extension contract  

2 Propeller blade with root extended in chord.  

extension contract  Industrial contract formed as extension of previous contract in either scope or timing.  

extension flap  See area-increasing flap.  

tensionometer  Instrument for measuring small amounts of deformation.  

external aileron  Aileron mounted clear of wing surfaces but deflected conventionally.  

external augmentor  Generalised description for arrangements which use high-energy primary flow to entrain ambient airflow remote from source of power, as in ejector lift.  

external check  See externals 1.  

external energiser  Portable motor used to supply motive power to engine inertia starters.  

external gearbox  That attached outside the casing of a gas-turbine engine, providing drives for accessories, usually from HP shaft, and connector for hand-turning. More often called the accessory gearbox.  

external input  System input from source outside system.  

external lighting  Some aircraft have none. Usually serves two functions: to render the aircraft visible from other aircraft at the same level from the greatest possible distance [see navigation *] and to illuminate the ground ahead when taxiing or under tow. Other species include ice-warning, airline-logo and air-refuelling guidance.  

externally blown flap  Flap in wake of main engine[s] when deflected, thus having greatly enhanced effect esp. in increasing lift.  

externals 1  External inspection of aircraft carried out by pilot [if necessary with other crew members] before boarding.  

2 Complete gas-turbine engine apart from the core, i.e. fuel and lubrication systems, accessories, starting system, etc.  

external storage  EDP (1) storage media separate from machine but capable of retaining information in form acceptable to it.  

external supercharger  Impeller (manifold-pressure booster) located upstream of carburettor.  

extinction  /  Attenuation of light through absorption and scattering.  

2 Cessation of combustion (see flameout).  

extinction coefficient  In meteorology, space rate of diminution of transmitted light: attenuation coefficient applied to visible radiation.  

extraction  1 To recover friendly troops from hostile location.  

2 To take shaft power from engine for performance-measuring purposes.  

extraction parachute  Extracts cargo from aircraft and deploys main parachutes.  

extraction zone  Specified ground area upon which supplies are delivered by extraction technique from low-flying aircraft.  

extractor  1 Part of firearm which engages rim or base of cartridge to pull it from chamber.  

2 Computer-controlled device for automatic initiation and maintenance of all desirable radar contacts in ATC or air-defence system.  

extraordinary magnetoresistance  Fantastic increase in resistance of superplastics in extremely powerful magnetic fields.  

extra section  Extra flight by airline to take overflow of fully booked flight.  

extravehicular activity  See EVA.  

extremely high frequency  30–300 GHz.  

Extrm  Extreme.  

extrusion  Hot or cold forming of metals, rubbers and plastics by forcing through die of appropriate cross-sectional shape.  

Exv  Extensive.  

ExW  Explosive welding.  

E, Ex  Elastic modulus of composite panel in direction of fibres.  

ey  Lateral distance between jet centrelines.  

Eye  European Young Engineers (Int.).  

eye  In centrifugal compressor, that portion through which fluid enters.  

eyeball  1 Passenger-controlled spherical valve outlet for fresh air, usually overhead.  

2 To search visually, or keep eyes on a target (colloq.).  

eyeball design  Design by eye, without calculation.  

eyeballs down  Jargon for severe positive acceleration.  

eyeball/shooter  Manoeuvre in which lead fighter flies across to identify target visually, while wingman (shooter) remains able to fire BVR.  

eyeballs in  Acceleration from behind when subject is seated upright, or below when prone [best].  

eyeballs out  Deceleration when subject is seated upright, or above when prone [worst].  

eyeballs up  Negative-g, downward acceleration.  

eyebrow panel  Panel of instruments or controls in flight deck roof, above and behind windscreen.  

eyebrow window  In roof of flight deck, also called VIT window.  

eyelids  Jet-engine reverser or afterburner nozzle halves similar to eyelid in appearance and action.  

eye patch  Worn over one eye by all members of crew of aircraft about to drop live NW or launch missile with NW warhead.  

eye reference point  Actual or notional position in three dimensions of an eye, or mean of both eyes, of pilot looking ahead, especially during landing.  

eye relief  Distance from eyeball to NVG eyepiece or image of HMD.  

Eyrie  Italian [noun and adjective, colloq.] (WW2).
F

1 Fahrenheit (contrary to SI).
2 Fighter aircraft category (USN since 1922, USAF since June 1948), UK prefix since 1942.
3 Flap angle.
4 Force, especially net propulsive force, thrust.
5 Farad.
6 Sonobuoy size, 0.3 m (1 ft) long.
7 Photographic category (USAS, USAAC, USAAF, 1924–47).
8 First class (seating).
9 Fuel mass.
10 Fuel, with suffix 12 to 44, thus F18 = 100 LL and F22 = 115 Grade (NATO).
11 Flashing [sequenced] light.
12 Fog.
13 Area forecast.
14 Magnetomotive force [usually Φ].
15 Luminous flux [usually Φ].
16 General term for a factor.
17 General term for a flight-control forcing function, suffix η for lateral, ζ for longitudinal.
18 New top airport taxiway category, able to handle A380.
19 Aircraft category: model, aeromodelling (FAI).
20 Prandtl’s tip-loss function [helicopter rotor blade].
F  Faraday constant.
F1  Frequency.
F2  Fractional force.
F3  Acceleration, esp. linear.
F4  Equivalent parasitic area of aircraft or flat-plate equivalent of helicopter fuselage.
F5  Symbol meaning a function of [rarely, F].
F6  Subscript, usually fuel, flap or fountain.
F7  Normal stress.
F8  Prefix femto, = \times 10^{-15}.
F9  FE A  Find, fix, track, target, engage and assess (AFRL).
F10  Form/fit/function, called F-cubed.
2  Full flight-envelope flight, control law and display system.
F3  Free-form fabrication.
F4  Airfield subgrade, standard asphalt.
F5  Restricted or advisory airspace (ICAO).
F6  In flight plan, aircraft has 4096-code F-code (Restricted or advisory airspace (ICAO)).
F7  Target centred in rectangle, blip gives az/el aiming errors.
F8  Dimensionless number interpreting vertical/horizontal strengths of windshear in terms of quantified reduction in climb performance.
F9  Firing point of AAM which maximises aircraft/target separation at missile impact.
F10  Avionics limit which keeps fighter nose pointing within limits of radar gimbal boundary.
FA  Frequency agility, or frequency-agile.
2  Frontal (tactical) aviation (USSR, R).
F1  Flight attendant, or assistant.
F2  Free-air (tunnel).
F3  Final approach.
F4  Fix to an altitude.
F5  Flying accident (RAF).
F6  Fix/attack (display).
F7  Flap (rarely, flap angle).
F8  Any resultant aerodynamic force.
F9  Flight Anti-Air Warfare (display).
F10  Flaperon [rarely, flap] angle.
F11  Family of advanced beyond-LOS terminals (USAFA).
F12  F/G/attack (display).
F14  Free-air (tunnel).
F15  Functional analysis and allocation.
F16  Flasher and audio (alarm).
F17  Flight Attendants Association of Australia (office, Sydney).
F18  Forward-area air defense; C/l can be added, S adds system.
F19  Flight Attendants Association of Australia (office, Sydney).
F20  Force Anti-Air-Warfare Commander.
F21  General-purpose HE bomb (USSR, R).
F23  Força Aerea Brasileira.
F24  Functional Airspace Block.
F25  Family of beyond LOS.
F26  Fabric.
F27  Family of beyond LOS.
F28  Fabric.
L  Flush.
F29  Flaperon [rarely, flap]
F30  Fabric.
F31  Flight Anti-Air Warfare Commander.
F32  Family of beyond LOS.
F33  Fabric.
F34  Flight-authorization book.
F35  Family of beyond LOS.
F36  Fabric.
F37  Flight Anti-Air Warfare Commander.
F38  Family of beyond LOS.
F39  Fabric.
F41  Family of beyond LOS.
F42  Fabric.
F43  Flight Anti-Air Warfare Commander.
F44  Family of beyond LOS.
F45  Fabric.
F47  Family of beyond LOS.
F48  Fabric.
F49  Flight Anti-Air Warfare Commander.
F50  Family of beyond LOS.
F51  Fabric.
F53  Family of beyond LOS.
F54  Fabric.
F55  Flight Anti-Air Warfare Commander.
F56  Family of beyond LOS.
F57  Fabric.
F59  Family of beyond LOS.
F60  Fabric.
F61  Flight Anti-Air Warfare Commander.
F62  Family of beyond LOS.
F63  Fabric.
F64  Flight-authorization book.
F65  Family of beyond LOS.
F66  Fabric.
F67  Flight Anti-Air Warfare Commander.
F68  Family of beyond LOS.
F69  Fabric.
F70  Flight-authorization book.
F71  Family of beyond LOS.
F72  Fabric.
F73  Flight Anti-Air Warfare Commander.
F74  Family of beyond LOS.
F75  Fabric.
F77  Family of beyond LOS.
F78  Fabric.
F79  Flight Anti-Air Warfare Commander.
F80  Family of beyond LOS.
F81  Fabric.
F82  Flight-authorization book.
F83  Family of beyond LOS.
F84  Fabric.
F85  Flight Anti-Air Warfare Commander.
F86  Family of beyond LOS.
F87  Fabric.
F89  Family of beyond LOS.
F90  Fabric.
F91  Flight Anti-Air Warfare Commander.
F92  Family of beyond LOS.
F93  Fabric.
F95  Family of beyond LOS.
F96  Fabric.
F97  Flight Anti-Air Warfare Commander.
F98  Family of beyond LOS.
F99  Fabric.
F100  Flight-authorization book.
F101  Family of beyond LOS.
F102  Fabric.
F103  Flight Anti-Air Warfare Commander.
F104  Family of beyond LOS.
F105  Fabric.
F107  Family of beyond LOS.
F108  Fabric.
F109  Flight Anti-Air Warfare Commander.
F110  Family of beyond LOS.
F111  Fabric.
F113  Family of beyond LOS.
F114  Fabric.
F115  Flight Anti-Air Warfare Commander.
F116  Family of beyond LOS.
F117  Fabric.
F119  Family of beyond LOS.
F120  Fabric.
F121  Flight Anti-Air Warfare Commander.
F122  Family of beyond LOS.
F123  Fabric.
F125  Family of beyond LOS.
F126  Fabric.
F127  Flight Anti-Air Warfare Commander.
F128  Family of beyond LOS.
F129  Fabric.
F130  Flight-authorization book.
F131  Family of beyond LOS.
F132  Fabric.
F133  Flight Anti-Air Warfare Commander.
F134  Family of beyond LOS.
F135  Fabric.
F137  Family of beyond LOS.
F138  Fabric.
F139  Flight Anti-Air Warfare Commander.
F140  Family of beyond LOS.
F141  Fabric.
F143  Family of beyond LOS.
F144  Fabric.
F145  Flight Anti-Air Warfare Commander.
F146  Family of beyond LOS.
F147  Fabric.
F149  Family of beyond LOS.
F150  Fabric.
F151  Flight Anti-Air Warfare Commander.
F152  Family of beyond LOS.
F153  Fabric.
F155  Family of beyond LOS.
Fac

2 Forward Air Controll[er], now called JTAC.
3 Flight-augmentation computer.
4 Federal Airports Corporation (Australia).
6 Farnborough Aerospace Consortium [550+ companies, office GU14 ORL] (UK).
7 Fast attack craft (maritime).
8 Federación Aerea de Chile [general aviation, office Santiago] (Chile).
Fac Facility, facilities.
FAC (A), FAC-A = FAC (2) airborne, the airborne controller in a tactical situation
FACCE See FACCE.
FACE Future airline core environment [IT system] (flat.).
face 1 Any exposed quasi-flat surface, such as main area of turbine disk.
2 Any surface for mating with another.
3 Open end of duct to be joined to another, including front of gas-turbine-engine inlet.
4 Either surface of propeller or helicopter-rotor.
face alignment Distance perpendicular to chord from propeller or rotor blade chord centreline to flat face of blade at any station.
faceblind firing Method of firing sjection seat in which occupant pulls roller blind at top of seat down over his face, thus shielding latter from airstream on leaving aircraft.
faceplate 1 Disc mounted on nose of lathe spindle for rotating work between centres or for gripping asymmetric item of short length.
2 Accessory mounting pad.
3 Transparent front of pressurized helmet.
FaCET Falcon combined-cycle engine technology (Darpa).
Facet Fault-assisted circuits for electronic training.
facet Panel forming part of external visuals of simulator. The F-22 FMT has nine.
faceted aircraft One whose external surface is made up of flat 2-D panels. Such an aircraft is theoretically invisible to hostile radars except for brief instants when one face is precisely normal to the incident signal. Such aircraft have severe flight-control limitations, and increased computer power now enables LO aircraft to have better aerodynamics.
Facets Future anti-air concepts experimental technology (also terminal) seeker.
facilitation Portmanteau word meaning making air travel easier for passengers.
facility 1 Physical plant, buildings and equipment (previously US usage).
2 Any part of adjunct of a physical plant or installation which is an operating entity.
3 An activity or installation which provides specific operating assistance to military or civil air operations.
facility availability Actual/specied operating times, usually as percentage.
facility performance category See categories (3).
Faco, FACO Final assembly and check-out.
FACP Forward air control post.
FACRI Flight Automatic Control Research Institute (China).
FACS Fully automatic compensation system.
facesimile Telecommunications process in which picture of image is scanned and signals used locally or remotely, sent by telephone or TV, to reproduce * or likeness of subject image.
Fact, FACT French air force ATM co-ordination tool.
Factor Follow-up action on accident reports.
Factor Development of functional concepts from EATMS operational requirements (Euret).
factored field lengths Any distance relative to CTOL operations (TOR, EMD, T0D etc) multiplied by factor to take account of engine failure at V1, slippery surface or any other hazard.
factoring Process of selecting and applying appropriate factors (of safety) in such areas as design and stress calculations, performance estimates etc.
factor of safety 1 Factor by which limit load is multiplied to produce load used in design of aircraft or part; intended to provide margin of strength against loads greater than limit load, and against uncertainties in materials, construction, load estimation and stress analysis.
2 Ratio of ultimate strength to actual working stress or maximum permissible stress in use of material component.
factory loaded Propellant charge or explosive filling added in plant before delivery.
factory remanufactured Product, usually an engine, indistinguishable from new.
Facts 1 FLIR-augmented Cobra Tow sight.
2 Fighter-aircraft-control training system.
FACCE Fighter air command and control enhancement.
FAC/A 1 Fleet air defense (US).
2 Fast-action device.
3 Fighter aerodynamics development.
4 Feature analysis data.
5 Flexible-aircraft dynamics.
6 Funding authorization document.
7 Fuel advisory departure.
8 Forsvars & Aerospaceindustrien i Danmark.
FADA Federación Argentina de Aeroclubes.
FADD Fatigue and damage data.
fade Decrease in received signal strength without change of receiver controls.
Fadec Full-authority, or fully authoritative, digital engine (or electronic) control.
faded Radio word meaning ‘air-intercept contact has disappeared from reporting station’s scope, and further information is estimated’ (DoD).
fade-out Fading in which received signal strength is reduced below noise level of receiver. Also known as radio fade-out, Dellinger effect, Mogel-Dellinger effect (see blackout).
fading Variation of radio field strength caused by change in transmission medium.
FADOLC Full-authority direct organic lift control.
FADR Fixed-site air-defence radar.
FADS, Fads Flush, or flexible air-data system.
FAE 1 Fuel/air explosive; large class of ordnance devices.
2 Federación de Aeronáutica Española (Spain).
Faeshed FAE store, helicopter delivery.
FAEI Federation of Aerospace Enterprises in Ireland.
FAF 1 Final/approach fix.
2 Full and free [flight controls].
3 Confusingly, French Air Force.
FAFC

FAFC  Full-authority fuel controller.
FAFL  Forces Aériennes Françaises Libres (1940–45).
FAFT  Fore/aft fuselage tankage (LH2).
FAGC  Fast automatic gain control.
FAGr  Fernauflklärungsgruppe, long-reconnaissance wing (G).
Fagsa, FAGSA  Federation of Airline General Sales Agents (UK, office, Birmingham).
FAI  Fédération Aéronautique Internationale, the supreme body ratifying aeronautical records, (office Lausanne, Switzerland, established 14 October 1905).
FAIP  First-assignment instructor pilot.
FAFC  false-nosing

Falcon  1 Frequency-agile low coverage netted.
2 Force application and launch from the Continental US (USAF/Darpa).
fallaway section  Part of rocket vehicle that separates; one that falls back to Earth.
fallback  1 Immediate return of malfunctioning ballistic vehicle after vertical launch.
2 Material carried into air by nuclear explosion that ultimately drops back to Earth.
fallback area  Area to which personnel retire once missile (large, surface-launched) is ready for firing.
fallback programme  Second project undertaken as insurance against failure of first.
falling leaf  Aerobatic manoeuvre in which aircraft is stalled and then forced into spin; as soon as spin develops, controls are reversed; process is repeated, resulting in oscillations from side to side with little apparent change in heading.
fall off on a wing  See stall turn.
fallback area  Area to which personnel retire once missile (large, surface-launched) is ready for firing.
fallout  1 Rain of radioactive particulate matter from nuclear explosion. Local * settles on surface within 24 hr; tropospheric * is deposited in narrow bands around Earth at about latitude of injection; stratospheric * falls slowly over much of Earth’s surface.
2 See spin-off.
fallback contours  Lines joining points of equal radiation intensity.
fallback mission  Alternative or secondary combat mission, primary being impossible of accomplishment.
fallback pattern  Distribution as portrayed by fallback contours.
fallback prediction  Estimate before and immediately after nuclear detonation of location and intensity of militarily significant fallout.
fallback safe height  Altitude of detonation above which no militarily significant fallout will be produced.
fallback wind plot  Wind vector diagram from surface to highest altitude affecting fallout pattern.
fake  Deliberately to close throttle of an engine in order to provide asymmetric practice.
failsafe  Quality of a dynamic functional system of remaining correctly operational after any single failure.
fail-safe  Failure inactivates system, thus preventing dangerous spurious signal or hardover output.
fail link  Deliberate weak link to prevent overload damage to costly structure.
fail-link  1 Describes part or component, notable primary structure or other unduplicated load path, fracture of which would be catastrophic.
2 Describes system component whose failure renders system immediately misleading, incorrect or dangerous.
failing load  That which, when applied, will just cause structural member to fail.
fail-over  To reduce drag of excescence by fitting fairing over or around it.
faker  Strike aircraft engaged in air-defence exercise (DoD).
Falac  Forward-area liaison and control.
false ogive

- Rounded fairing added to nose of vehicle to improve streamlining. Also known as ballistic cap.

false ribs

- Auxiliary nose ribs between main ribs forward of front spar to support fabric covering and improve contour.

false spar

- Secondary spar not attached to fuselage, used as mounting for movable surfaces.

false start

- Gas-turbine starting cycle which fails to achieve stable light-up; ability to survive is certification requirement.

FALW

- Family of air-launched weapons.

FA M  

- Fighter attack manoeuvring.
  - 2 Federal Air Marshal [P adds program].
  - 3 Final-approach mode.

Fame

- Full-sky astrometric mapping explorer.

Famest

- Fuerzas Aeromoviles del Ejercito de Tierra [army aviation] (Spain).

FAMG

- Field artillery missile group (USA).

familiarisation

- Training to acquaint technical personnel with specific system.

Famis

- Full-aircraft management and inertial system.

famished

- Air-intercept code; 'Have you any instructions for me?' (DoD).

Famos

- Floating-gate avalanche-injection MOS.

FAMS

- 2 Family of air missile systems.

  - 2 Federal Air Marshal Service (US 2002-).

FAN

- 1 Forward air navigator.
  - 2 False-alarm normalisation [normally holds CFAR to 10].

fan

- Vaned rotary device for producing airflow.
  - 2 Multi-bladed rotor, usually with single stage, serving as first stage of blading in turbofan [last stage in aft-engine] and handling much greater airflow than core.
  - 3 Propeller, when function is moving air rather than providing thrust.
  - 4 Assembly of three or more reconnaissance or mapping cameras at such angles to each other as to provide wide lateral coverage with overlapping images.

fan blade off

- Most severe turbofan certification requirement, ability to contain and survive severance of one entire fan rotor blade at redline speed without danger to aircraft.

F&E

- Facilities and equipment.

F&R

- Function and reliability.

F&U

- Fire and update.

fan duct

- Annular duct [in B-52H twin C-ducts] through which air compressed by fan of turbofan engine is delivered. Can be short, ending in annular propulsive nozzle surrounding core casing, or extend to rear where there may be a mixer. Almost always incorporates a reverser.

fan engine

- 1 See turbofan.
  - 2 Three-cylinder engine with one cylinder vertical and others at about 45° to it.

fan exit case

- Casing surrounding fan (2) carrying reverser and often accessory gearbox.

fan-failure clutch

- When necessary, disconnects engine fan from transmission of tilt-rotor.

Fang


fanjet, fan jet

- Turbofan, or aircraft powered thereby (colloq.).

fan lift

- Jet V/STOL system using large axial fans inside wings and fuselage covered by shutters above and below which are opened only in hovering mode.

fan mapping

- Aerial survey using fan of cameras.

fan marker

- Radio position-fix beacon radiating in vertical, fan-shaped [ellipse or dumbell] pattern, keyed for identification (see radio beacon, Z-marker, FM-marker).

fanned-beam antenna

- Unidirectional antenna so designed that transverse cross-sections of major lobe are approximately elliptical.

fanning beam

- Radiant-energy beam (eg radar) which sweeps back and forth over a limited arc (see scan).

Fanpac

- Fan-noise prediction and control.

fan ramjet

- See augmented turbofan.

FANS, Fans

- Future air navigation system[s]; several variants with suffix letter or number (ICAO).

fan straightener

- Radial vanes in front of and/or behind fan in wind tunnel to introduce or remove flow rotation usually counteracting that of fan.

fan stream burning

- Thrust boosting by burning fuel in airflow downstream of fan; in some vectored engines same as PCB, in ejector lift and RALS after travel along large pipe.

FanWing

- Patented VTOL lift/propulsion system based on powered ‘paddlewheels’ rotating on transverse axes.

FAO

- Fabrication assistée par ordinateur (F).

FAOR

- Fighter area of responsibility.

FAP

- 1 Fleet average performance.
  - 2 Force Aérienne de Projection (F).
  - 3 Fuel-adjusted profit.
  - 4 Frangible armour-piercing; DS adds discarding-sabot.
  - 5 Forward, or flight, attendant panel.
  - 6 Final approach, or final-approach point.
  - 7 Federation of Australian Pilots.
  - 8 Fluorinated aluminium powder.
  - 9 Federación Argentina de Paracaidismo [sport parachuting] (Argentina).

FAPA

- 1 Future Aviation Professionals of America.
  - 2 First Air Pilots Association.

FAQ

- Frequently-asked question[s].

FAR

- 1 Federal Aviation Regulation[s]; eg FAR-23 [also called Part 23] defines flight performance of private and taxi a/c ≤12,500 lb [5670 kg] MTOW, FAR-25 covers a/c above this limit, Pt 36 is concerned with noise and FAR-103 with single-seat ultralights, for example.
  - 2 False-alarm rate.
  - 3 Fighter/attack/recon. (pilot grading, USAF).
  - 4 Field assessment (or functional area) review (US).
  - 5 Force d’Action Rapide (F).
  - 6 Forward-area rearm [or rearm/refuel, P adds point].
  - 7 Federal Acquisition Regulations.
  - 8 Federatia Aeronautica Romana [office, R-70139 Bucharest] (Romania).
  - 9 Fatal-accident rate.

FARA


farad

- SI unit of electrical capacity, Symbol F; capacity of condenser (capacitor), which has potential difference of 1V when charged with 1C. More commonly used: microfarad and picofarad.

faraday

- Symbol F; non-SI unit of electric charge carried by 1 mole of singly-charged carbon-12 ions = 9.6487×10⁴ C.
Faraday waves

Faraday waves  Specific family of waves set up by fluid sloshing in confined space.

Faradex  Functional architecture reference for ATM (7) systems and data exchange (Euret).

Faraway  Fusion of radar and ADS (5) data through two-way data-link (Euret).

fare dilution  Dilution of airline revenue yield by excursion, affinity, group, seasonal or off-peak and other types of promotional fares, and by discounted or free travel to employees, or passengers on particular sectors.

fare structure  Complete range of airline fares, either approved by licensing authority such as CAB for domestic use or agreed at IATA traffic conferences for international use.

far-field boom  Supersonic N-wave boom after long travel has changed form, esp. by reducing rate of change of pressure at front and rear.

far-field noise  Noise, especially from jet engine, at considerable distance (typically 100+ metres) where higher frequencies are attenuated.

far IR, far infra-red  Wavelengths longer than 6 µ.

farm  Compact group of large number of aerals (antennas), especially protruding from aircraft.

farm-gate operations  Operational assistance and specialised tactical training provided to friendly foreign air force by United States armed forces; includes, under specified conditions, flying of operational missions by combined US and foreign aircrew as part of training when such missions are beyond recipient’s capability.

farm strip  Private airfield, usually with no facilities except hangar.

Farnborough  Location of QinetiQ/Royal Aerospace Establishment (RAE), originally Royal Aircraft Factory (UK).

Farnborough indicator  Pioneer indicator for continuously recording pressure cycles in cylinder of piston engine.

Farnham roll  Large powered machine for two-dimensional bending of sheet metal.

FARRP  Forward-area rearming and refuelling point (or FARPs, forward arming and refuelling point).

farval  Aerobatic manoeuvre in which two aircraft perform routine with one inverted above the other (thus a half-roll results in the pair changing places). See double *, (USN 1929, relaunched by Blue Angels 1962).

FAS 1 Frequency-agile subsystem.

2 Flight-attendant station.

3 Forward acquisition sensor.

4 Federasiaviationionogo Sporta (USSR).

5 Flare-activation system.

6 Fuel-advisory system.

7 Fore-and-aft scanner; S adds system.

8 Forces Aériennes Stratégiquestes (F, note plural, unlike FAT).

9 Future antenna suite.

10 Federal air surgeon (US).

11 Final-approach segment.

FASA 1 Friendly aircraft simulating aggressors.

2 Fédération Algerienne des Sports Aériens.

Fasat  Future anti-satellite (weapon).

FASGW  Future air/surface guided weapon (UK).

FASH  Future amphibious support helicopter.

FASI  Federation of air sports [Jakarta airport] (Indonesia).

FASU  

1 Fused all-sources intelligence.

Fasid, FASID  Facilities and services implementation document.

FASM 1 Forward air-support munition.

2 Fast Farnborough Air Sciences Museum (2003–).

Fasoc, FASOC  Future air & space operations concept, or capability (MoD, UK).

Fasotretragru  Officially written in capitals, Fleet Aviation Specialized Operational Training Group; DET adds Detachment (USN).

FASS 1 Fore and-aft scanner system.

2 Fixed aircrew seat standardization.

FASST  Federation of Americans Supporting Science and Technology [office, Washington, DC].

FAST, Fast 1 Fan and supersonic turbine.

2 Fuel and sensor, tactical (clip-on pack).

3 Future aviation safety team (EC, JAA).

4 Flying-ambulance surgical trauma.

5 Fuselage automated, or automatic, splicing tool.

6 Fast-acting stabilizing [refeed drogue].

7 Final-approach spacing tool.

8 Fleet-aircrew simulation training.

9 Forecasting and assessment of science and technology.

10 Fly-away satellite terminal.

11 Forward-area support team.

12 Flight-advisory service test (of civil/military ground radar).

13 Fully automatic scoring target.

14 Flexible acquisition [and] sustainment tool (USAF).

15 Fuze air-to-surface technology (USAF).

16 Future air systems tanker.

FASTA  Farnborough Air Sciences Trust Association [Mytchett GU16 6DH] (UK).

Fasta  Flugzeugabwehrstartanlage (air-defence launcher, G).

Fast-action device  Thyristor switch which brings battery on line upon failure of generator or TRU.

Fastar  Forward-area surveillance and target-acquisition radar.

FASTC  Foreign Aerospace Science & Technology Directorate Center (USAF).

Fast CAP, Fastcap  Combat air patrol by fast jet.

Fastec, FASTec  Foundation for Advancing Science & Technology Education (US).

Fasten  Provision for super-rapid [usually electrical] acceleration of gyro[s].

Fast FAC  Forward air controller in fast jet.

Fasti  First air traffic control support tools implementation (Eurocontrol).

Fastjam  Flow analysis for selective, or selected, target jamming (Darpa).

fast jet  Generic title for ATC purposes of any aircraft with typical jet speed.

fast mover  Jet combat aircraft, especially in FAC role.

fast prototyping  Techniques for getting first flight article airborne at earliest possible date, ignoring deficiencies and making maximum use of simulation.

fast-reaction weapons demonstration  Ongoing research into optimum methods of dispensing multiple miniature smart submunitions (USAF).

Fast  Flight-strip automation system for towers and Tracons.

FASU  Federation of Aeronautical Sports of Ukraine.
fatigue

fatigue test 

fatigue strength Maximum stress that can be sustained for specified number of cycles without failure. Also known as fatigue limit.

fatigue test Test in which specimen is subjected to known reversals of stress, such as alternate tension and compression, or cycle of known loads repeatedly applied and released. 

Fatmi Finnish air-traffic management integration.

FATO, Fato Final approach and takeoff [determines size of heliport].

Future Federation of Air Transport User Representatives in Europe [office, London WC2B 6TE] (Int.).

FAU Forward antenna unit.

fault-tree analysis Use of a family-tree structure in order to establish the feasibility of failure of any level or subdivision of an undergarment, as in civil derivative of military engine.

Fatac Force Aérienne Tactique (F).

fatac accident One in which at least one occupant is killed; casualties on ground do not qualify.

Fatca Federal ATC authority (Yugoslavia).

Fate Federal Aeronautics Council (US). 

2 Aircraft acceptance test equipment.

FATG Fixed to-air-ground, ie against non-moving target.

fathom Nautical unit of sea depth, 6 ft, 1.8288 m.

fatigue Weakening or deterioration of metal or other material under load, esp. repeated cyclic load; causes cracks and ultimately failure.

2 Progressive decline in human ability to carry out appointed task apparent through lack of enthusiasm, inaccuracy, lassitude or other symptoms. In any form of briefing, limits usually quantified in terms of hours or sorties.

fatigue index Arbitrary scale of airframe structure life terminating at 100, but capable of being extended to higher values by modification.

fatigue life Minimum time, expressed in thousands of hours or specified number of load cycles, that structure is designed to operate without fatigue failure.

fatigue strength Maximum stress that can be sustained for specified number of cycles without failure. Also known as fatigue limit.

FAT FCC

FAT 1  Flechette anti-tank.

2 Factory acceptance test.

F  Final-approach track.

fat 1  Overweight.

2 Material that can be removed to meet less-severe requirement, as in civil derivative of military engine.

Fatum Force Aérienne Tactique (F).

fatal accident One in which at least one occupant is killed; casualties on ground do not qualify.

Fatua Federal Aeronautics Council (US).

Fatty acid See acid, fatty.

FBI Frequency and bias injection.

FBI 1  Fly-by-light.

2 FIATA combined transport bill of lading.

BFM 1  Fleet ballistic missile (S adds 'submarine' or 'system').

BFO 1  Fixed-base operator.

2 Flights between overhauls.

3 Federal budget outlays.

FBOA 1  Fly-by-cable.

2 Fly by cable = mechanically signalled manual FCS.

FBR Fleet ballistic missile (S adds 'submarine' or 'system').

FBI 1  Fly-by-light.

2 Fly-by-waypoint.

FBIW 1  First-article verification.

FCA 1  First class.

2 Fuel cell.

3 Fuel cell.

4 Foot-candle(s).

5 Flight crew.

6 Flight cycle.

7 Fibre channel [bus].

FCS 1  Full system.

2 Functional configuration audit (software).

3 Flight-control, or -critical, avionics.

4 Fully controllable array.

5 Frequency control and analysis.

6 Frequency clearance agreement.

7 Flying Chiropractors Association [office, Johnstown, PA] (US).

FCC 1  Future cycle accumulation (engine).

2 Functional configuration audit (software).

3 Flight-control, or -critical, avionics.

4 Fully controllable array.

5 Frequency control and analysis.

6 Frequency clearance agreement.

7 Flying Chiropractors Association [office, Johnstown, PA] (US).

FCA 1  Future combat air capability (RAF).

FCAE Fibre channel avionics environment.

FCS 1  Flight-control actuation system [Bell].

2 Future combat air system.

FCB Frequency co-ordinating body.

FCBA 1  Fédération des Clubs Belges d’Aviation.

2 Future carrier-based, or -borne, aircraft (UK, replaced by FJCA).

FCC 1  Federal Communications Commission (US, from 1934).

2 Flight-control computer.

3 Flight-control center (DAIS.2).

4 Flat conductor cable.
FCSC, FC3

& 5 Flying Control Committee.
FCCC, FC3 Framework Convention on Climate Change.

FC cost Flight-crew cost.

FC (CSA) Fleet Command [Carrier Strike and Aviation] (UK).

FCD Full concept definition.

FCDA 1 Federal Civil-Defense Administration (US).

1 Federación Colombiana de Deportes [sport] Aereos [Santa Fe de Bogotá] (Colombia).

FCDC 1 Flight-control digital computer.

2 Flight-control data concentrator.
3 Flight-critical direct current.
4 Flexible confidant detonating cord.

FCDM Flow-control decision message.

FCDS 1 Flight-control display system.

FCE 1 Flight-control electronics.

2 Flight-crew environment.

3 Full cockpit emulator.

FCEM Flow-control execution message.

FCEY, FCZCY First-class and economy.

FCES Flight-control electronics system.

FCF 1 Functional check, or checkout, flight.

1 Forward centre fuselage.

FCG Fatigue-crack growth.

FCGMS Fuel and c.g. management system.

FCI 1 Fuel-consumed indicator.

2 Flight-command indicator.

FCL Flight-crew licensing (CAA).

FCLP Field carrier-landing practice.

FCLT Freeze calculated landing time (FAA).

FCM Fuel control and monitoring; C adds computer, S system.

FCNP Fire-control navigation panel.

FCNS Fiber-channel network switch (USN).

FCNU Flight-control navigation unit (UAV).

FCO 1 Formal change order (contract).

2 Fire-control operator.
3 Foreign and Commonwealth Office [London SW1A 2AH] (UK).

FCO C Fuel-cooled oil cooler.

FCOM Flight crew operating, or operations, manual.

FCP 1 Fuel cell powerplant.

2 Flight-control panel, or processor.

3 Future capability plan, or programme.

4 Fuel control panel.

5 Fatigue countermeasures program [NASA Ames] (US).

FCPC Flight-control primary computer.

FCR Fire-control radar.

FCRC Federal Contract Research Center (US).

FCRS Flight-crew record system.

FCS 1 Flight control system.

2 Fire control system, for management of weapons.
3 Failure combat system. 4 Future combat system[s] (USA).
5 Frame check sequence.

FCSC Flight-control secondary computer.

FCSS Fire-control sight system.


Fost, FCST Forecast.

FCT 1 First configuration test.
2 Foreign comparative testing (USA).
3 Flight-crew training [RM adds reference manual].

FD 1 Flight director.

2 Frequency duplex.
3 Frequency domain.
4 Flight, or final, data.
5 Flight deck [D adds documentation].
6 Full development.
7 Flight dynamics.
8 Finite difference.

F<sub>d</sub> Takeoff-distance correction factor for slush, = TOD + TOD for dry runway.

f<sub>d</sub> Doppler frequency.

FDA Flight-data acquisition; F adds function, S system and U unit.

FDAF See FDA.

FDAB Flight-control data concentrator, or centre.

FDCC 1 Frequency to digital converter.

2 Flight-director computer, or coupler.
3 Flight-data concentrator, or centre.
4 Fire direction centre; OPC adds operations planning cell.

5 Fuel-data concentrator.

FDCC 1 Forward deployed communication[s] center (USAF).

FDD 1 Flight data display.

2 Flying Display Director.

FDDE Fibre-optics distributed, or fibre distribution, data interface.

FDDEP Flight-data entry and print-out (or FDE panel).

FDFF Føringer af Danske Fabrikanter af Flugmaterial (Danish industry assoc.).

FDFF Føringer af Danske Fabrikanter af Flugmaterial (Danish industry assoc.).

FDEN Flight-data and flow management (ICAO group).

FDH Flight-deck handset.

FDI 1 Flight director indicator.
2 Flight-data interface [MU adds management units, U unit].
3 Fault detection and isolation.

FDIO Flight-data input/output.

FDIO 1 Friction coefficient.

FCTP Flight-control technology program (VTOL, at WPAFB).

FCTR Fan/core thrust ratio.

FCIS Flight-controller training simulator.

FCU Feathering, fighter, flight or fuel control unit.

F<sub>yc</sub> Yield stress in compression.
FDL

FDL 1 Full-drawn line (symbolry right across display).
  2 Flight Dynamics Laboratory.
  3 Fast deployment logistic (ship).
  4 Flight data link.
FDM 1 Frequency-division multiple, or multiplex.
  2 Fused deposition modelling.
FDMA Frequency-division multiple access.
FDMC Flight deflection measurement system.
FDMT Flight-data monitoring tool.
FDMU Flight-data management unit.
FDO Flight-deck officer.
FDOA Frequency difference of arrival.
FDM Flight-deflection measurement system.
FDMT Flight-data monitoring tool.
FDMS Flight-data management unit.

FDL feeder

feathering angle See feathering angle.
feathering button Used to feather propeller; protected by hinged cover.
feathering hinge Helicopter rotor-blade pivot which allows blade angle to be varied.
feathering pump After stoppage or failure of engine, provides hydraulic pressure to feather propeller.
feathers Wing movable: slats, Krügers, droops, flaps, ailerons, spoilers (colloq.).
FEATMS [sometimes Feats] Future European air-traffic management system.
FE@R Force elements at readiness [2005-, MoD RAF] (UK).

feature console In passenger cabin, clock, TAS readout, phone, fax etc.
feature-line overlap Series of overlapping air photographs which follow ground feature such as river or road.
FED Field-effect display.
  1 Field-effect display.
  2 Field emission display.
Fed Of radio, supplied with RF oscillations.
Fedix [sometimes called mission computer] distributes workload and output.
Fedix Federal information exchange, online.
FEDN Fondation pour les Etudes de Défense Nationale (F).
FEDP Fuel-element differential pressure.
Feds The FAA (1) [colloq.].
feed 1 To provide signal.
  2 Point at which signal enters circuit or device.
  3 Signal entering circuit or device; input.
  4 Means of supplying ammunition to gun, or chaff through dispenser.
feedback 1 Return of portion of output to input; positive * adds to input, negative * subtracts from it.
  2 Information on progress, results, field performance, returned to originating source.
  3 Transmission of aerodynamic forces on control surfaces or rotor blades to cockpit controls; also forces so transmitted.
feedback control loop Closed transmission path containing active transducer, forward path, feedback path, and one or more mixing points arranged to maintain prescribed relationship between input and output signals.
feedback control system One or more feedback control loops to combine functions of controlled signals with functions of commands to tend to maintain prescribed relationships between them.
feedback path 1 Transmission path from loop output signal to loop feedback signal.
  2 The path from output to demand.
feeder 1 Transmission line which connects aerial to transmitter or receiver.
  2 Air route or service that feeds traffic to major domestic or international routes (see commuter, third-level).
feederliner  Transport aircraft used to operate feeder, commuter or third-level services.

feeder route  Links en-route to initial approach fix.

feed pipe  Pipe supplying any liquid.

feed tank  Small tank drawing fuel from main tankage and transferring it under pressure to an engine.

feel  Subjective pilot assessment of aircraft response to flight-control commands, stability, attitudes and other factors influencing his opinion.

feeler aileron  Small manual aileron whose primary purpose is to impart feel.

feel system  Mechanism in which control feel is augmented, improved or simulated artificially rather than provided only by aerodynamic forces on control surfaces (see artificial feel).

feet dry  Code: “I am, or contact designated is, over land” (DoD).

feet per second  Fts, = 0.3048 m s\(^{-1}\), 1.09728 km h\(^{-1}\).

feet wet  Code: “I am, or contact designated is, over water” (DoD).

FEFA  Future European Fighter Aircraft (project).

FEFI  Flight engineers fault isolation (technique and handbook).

FEVG  Fan-exit guide vane.

FE(H)  Flight Examiner [Helicopter].

FEI  Federation of the Electronics Industry [office London WC1B 5EE] (UK) 300+ members.

2 Field engineering instructions (NATS).

FEIA  Flight Engineers’ International Association (US, merged into FIEO).

FEL, Fel 1  F Field-effect transistor.

2 Fibre-elastomer or elastomeric.

FELC  Field-effect liquid crystal.

FELD  Forward electrical load center (EP-3).

FELT, Felt  Free-electron laser technology; IE adds integration experiment (SDI).

felt  Non-woven materials used when properties of unidirectional fibre-reinforced plastics are not required; built up from fibres or whiskers of carbon, glass, formerly asbestos, etc.

felt strip  See moleskin.

FEM  Force effectiveness measure.

2 Finite-element model/mesh/method.


femto  Prefix: multiplied by \(10^{-15}\), one thousandth of a fermi.

fence  Line of readout or tracking stations for communication with satellite.

2 Line or network of radar stations, on land or round periphery of surface fleet, for detecting enemy aircraft or missiles.

3 Wall-like plate mounted on upper surface of wing, often continuing around leading edge, substantially parallel to airstream and used to prevent spanwise flow, esp. over swept wing at transonic speeds.

Fenda  Federacion Nacional de los Desportes Aéros (Spain).

FENE  Fixed exit nozzle engine.

Fenestron  Helicopter tail rotor with numerous blades rotating in short duct inset into fin.


FEP  Front-end processor.

fermi  Unit of length, \(10^{-15}\)m.

Ferpic  Ferrelectric photoconductive image ceramic.

FEPS  Flight-envelope protection system.

ferret  Aircraft, ship or other platform equipped for detection, location, recording and analysis of hostile EM radiation (Elint mission).

Ferris scheme  Carefully designed paint scheme using two shades of colours to make it difficult to ascertain aircraft attitude (secondarily, aircraft type and direction of travel).

ferrite  Magnetic ceramics composed of salts of iron and another divalent metal; because of low eddy-current losses, cores constructed of sintered powders of these materials are widely used for rod aerials and cores of inductors for RF and video.

ferrite paint  See iron paint.

ferritic  Of ferrite.

ferrous  Derived from iron.

Ferrocube  Proprietary non-metallic insulating magnetic materials which have extremely high resistivity and low eddy-current losses but do not become permanently magnetised.

ferrule  Small metal fitting or wire wrapping used to prevent loosening of wire terminal.

ferry flight  Flight whose purpose is to reposition aircraft at a different place.

ferry pilot  One responsible for delivering aircraft from one place to another; eg from manufacturer to customer.

ferry range  Distance unladen aircraft can be ferried; specified with or without ferry tanks.

ferry tank  Extra fuel tank for ferry flight over range greater than normal limit.

fertile material  Not itself fissile by thermal neutrons, can be converted into fissile material by irradiation; two are U-238 and Th-232, partially converted into Pu-239 and U-233.

FES  Flexible elastomer skin.

FESC  Forward electrical/electronic service centre.

Fescolizing  Patented electroplating of Cd, Cr or Ni.

FESG  Forecasting and Economic-Support Group.

FEST  Foreign emergency support team (USAF).

FET  Field-effect transistor.

2 First engine to test (date).

3 Fighter engine(s) team.

FETAP  Fédération Européenne des Transports Aériens Privés.

FE(T)  First engine to test, date of first run of first complete engine of new type; confusingly sometimes said to mean first engine Type-Test, which might be years later.

FEW 1 Fighter Escort Wing.

2 Few clouds, usual = 1 to 2 oktas.

The Few  Collectively, the fighter pilots defending the UK between 10 July and 31 October 1940.

few  Up to 7 hostile aircraft (DoD).

FEWP  Federation of European Women Pilots.

FEWSG  Fleet EW Support Group.

FF  Final fix.

FF, ff  Fuel flow.

F/F  First flight.

fr  Frequency to which digital filter is tuned.

FFA 1 Flying Farmers Association [office, Shobdon airfield, HR6 9LT] (UK).

2 Foam-filled aluminium.

3 Flygtekniska Föröksanstalten; aeronautical research institute, merged 2001 into FOI (Sweden).
FFAM

Fédération Française d'Aérostation [ballooning; office, F-75116 Paris] (F).

FFAM Fédération Française d'Aéro-Modélisme.

FFAR 1 Folding-fin aircraft rocket (2.75-in calibre).

2 Rarely, free-flight, or forward-firing, aircraft rocket.

3 Feel forces/stick angle relationship.

FFAS French-language rendition of ADSL.

FFATC Free-flight [phase] air-traffic control.

FFBW Fully fly-by-wire.

FFC 1 Fan-failure clutch.

2 For further clearance.

FFCC Forward-facing crew cockpit.

FFCC 1 Formation-flight control system.

2 Fly-by-wire [primary] flight-control system.

3 Free-fall control system (air-dropped ICBM).

FFD 1 FMS (1) flight data.

2 Free-form deformation.

FFDO Federal Flight-Deck Officer.

FFF 1 Film-forming foam (extinguishants).

2 Free-form fabrication.

FFFD Free-flight [phase]

FFFU Fuel flow/fuel used (panel instrument).

FFG Code: guided-missile frigate (USN).

FFH For further headings.

FFI 1 Freedom from infection.

2 Forsvarets Forskningsinstitutt [defence research, Kjeller N-2007] (Norway).

FFIS Formation-flight instrumentation system.

FFK Full-function keyboard.

FFL Forces Française Libre, so-called “free French” [WW2].

FFM 1 True-mass fuel flowmeter.

2 Far-field monitor.

FFMRRR, F’MR 1 Folded fibreglass-mat rapid runway repair system.

FFN Far-field noise.

FFNAC Fédération Française des Navigants de l’Aviation Civile.

FFO 1 Furnace fuel oil.

2 Fixed-frequency oscillator.

3 Full fuzing option.

FFP 1 Firm fixed price.

2 FOV/focus/polarity.

3 Flight fine pitch.

4 Fédération Française de Parachutisme [office, F-75012 Paris] (F).

5 Frequent-flyer programme.

6 Free Flight Phase, followed by -1 or -2 (FAA).

7 Free-fall parachuting.

FFPB Free-fall practice bomb.

FFPLUM, FF-Plum Fédération Française de Planeur Ultra-léger Motorisé [office, F-94700] (F).

FFPS FFP(7) site.

FFPV1 Fédération Française de Parachutisme Vol Libre (hang gliding).

2 Full flight regime, ie operative throughout each flight.

3 Full flight release (engine certification).

FFRAT Full-flight-regime autotrottle.

FFRDC Federally Funded R&D Centers (US).

FFS 1 Full flight simulator.

2 Fee for service.

3 Formation Flight System (Honeywell), or formation-flying system [a TCAS].

FFISR

National Aeronautics and Space Administration (US).

FFIS 1 Formation-flight instrumentation system.

2 Free-form deformation.

FFITC United States Air Force Test Pilot School.

FFJ 1 Flight wall.

2 Fog, defined as visibility ≤½ mile.

3 Fuel-carrying glider (USAAF, 1944–47).

4 Formation-flying system [a TCAS].

FFK 1 Full flight release (engine certification).

2 Functional clearance.

FFL 1 Full flight release (engine certification).

2 Functional clearance.

FFM 1 True-mass fuel flowmeter.

2 Far-field monitor.

FES 1 Fire今天的

2 Formation-flight control system.

FFSS Fire Fighting and Safety School (RAF).

FFT 1 Fast Fourier transform.

2 Full-scale fatigue test [S adds specimen].

FFFTTEA See F²TT²EA.

FFTx Fuel-flowmeter transmitter.

FFVC Forward-facing video camera.

FFVV Fédération Française de Vol à Voile [gliding; F-75006 Paris] (F).

FG 1 Fighter Group (USAAF, USAF).

2 Fog, defined as visibility ≤½ mile.

3 Formation-flight control system.

FGS 1 Formation-flight control system.

2 Free-form fabrication.

FGC Flight Guidance and Control System.

3 Formation-flight instrumentation system.

FGF 1 Formation-flight control system.

2 Full flight release (engine certification).

FGFA Fighter, ground attack (role prefix, UK).

FGAS Flight guidance and autopilot system.

FGC Flight guidance computer.

FGM Field-gate programmable array.

FGN 1 Fighter, ground attack (role prefix, UK).

2 Fog, defined as visibility ≤½ mile.

3 Formation-flying system [a TCAS].

FGR 1 Fighter, ground attack, reconnaissance (role prefix, UK).

2 Fog, defined as visibility ≤½ mile.

3 Formation-flying system [a TCAS].

FHS Flight guidance and control system.

FH 1 Flight hour(s).

2 Frequency-hopping.

3 Formed by.

FI 1 Flight hour(s).

2 Functional clearance.

FFI 1 Freedom from infection.

2 Fog, defined as visibility ≤½ mile.

3 Formation-flying system [a TCAS].

FFJ 1 Formation-flight control system.

2 Full flight release (engine certification).

FFM 1 True-mass fuel flowmeter.

2 Far-field monitor.

FFN 1 Furnace fuel oil.

2 Full flight release (engine certification).

FFP 1 Firm fixed price.

2 FOV/focus/polarity.

3 Flight fine pitch.

4 Formation-flight instrumentation system.

5 Functional payload [or cargo] block (R).

6 Free Flight Phase, followed by -1 or -2 (FAA).

7 Free-fall parachuting.

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3 Formation-flight control system.

FFG 1 Fighter Group (USAAF, USAF).

2 Fog, defined as visibility ≤½ mile.

3 Gas turbine [aeroplane, UK].

4 General Aviation.

1 Fédération Internationale des Associations de Translantes ou Assimilés [International Federation of
FIB

Freight Forwarders’ Associations; office, CH-8050 Zurich (Int.).
FIB Forwarding information base.
FIBDATD “Fix it but don’t alter the drawings”.
Fiberloy Family of composite materials based on boron fibres bonded in various resinous or plastics adhesives (Dow Chemical).
FibeX Computer-placed carbon-fibre epoxy (Spectrum).
Fibre Word used loosely of FBL and other systems employing optical fibres for all data transmission [US fiber].
Fibredux Family of CFRP and hybrid prepreg resins (Ciba-Geigy).
Fibrefrax H High-temperature ceramic-fibre insulating material, available as bulk fibre, blanket, felt or paper.
Fibreglass Glass-fibre, either raw fibre (many forms) or bonded into matrix and moulded or otherwise formed [capital F in UK, in US fibreglass].
Fibrelam Plastic honeycomb sandwich panel mechanically resistant to spike heels and not affected by galley or other spillage (Ciba/Geigy).
Fibre optics Branch of optics concerned with propagation of light along thin fibres each comprising core and sheath of different glasses or other transparent material; light entering one end is transmitted by successive internal reflections. In practice extremely fine fibres a few microns in diameter are made up into bundles of 100,000 or more.
Fibre-optics gyro Instrument (not a gyro at all) for measuring rotations by means of coherent light passed simultaneously both ways around a loop (typically 300–500 m long) of monomode optical fibre, rotation being measured instantly and precisely by phase shift at output.
Fibroscope Fibre-optic borescope.
Fibs, FIBS Flight information billing system.
Fibua Fighting in built-up areas.
FIG 1 Flight information center, or centre.
  2 Finance committee (ICAO).
  3 Film integrated circuit.
  4 Flying [or flight] instructor course.
  5 Frequency/identification/course.
  6 Flight inspection computer, compares aircraft position with that derived from navaux.
Fican Federal Interagency Committee on Aviation Noise (US).
Fick’s law Basic law of gaseous diffusion; mass flux \( j = D \frac{\partial C_1}{\partial y} \) where \( C_1 \) is concentration of gas 1 and \( y \) is distance from surface.
Ficon Fighter conveyer, fighter carried to target by large bomber, to offer protection (USAF).
Fidag Federazione Italiana Dipendenti Aviazione Generale.
Fidelity 1 Accuracy with which electronic or other system reproduces at output essential characteristics of input signal. 2 Handling * is degree to which flight simulator replicates handling of real aircraft.
FIDO 1 Flight dynamics officer.
  2 Fog Investigation and Dispersal Operation, UK method of dispersing fog in WW2 by burning fuel along runway edges.
  3 Field integrated design and operations (Mars vehicle).
Fids, FIDS 1 Fault identification and detection system.
  2 Flight information display set (ATC radar) or system [for passenger information].
  3 Fire detection and suppression system.
Fiducial marks Index marks on camera which form images on negative to determine position of optical centre or principal point of imagery; collimating marks.
FIE Flight instrument examiner.
field 1 Airfield, as in * length.
  2 Region of space within which each point has definite value; examples are gravitational, magnetic, electric, pressure, temperature, etc. If quantity specified at each point is vector, field is said to be vector *.
  3 Customer service, thus * service, * rep, * report.
  4 Operation at advanced base with austere facilities (military), thus * maintenance.
field alignment error In ground DF station, error introduced by incorrect orientation of aerial elements.
field coils Two fixed coils of DF goniometer at right angles to each other and connected to two halves of aerial system.
field extension Organizational element performing operating functions that must be retained under direct control of parent staff office (USAF).
field-handling frame Portable frame attached to airship on ground to afford grasp to large handling crew.
field inventory Portfolio of used aircraft, parked and immediately available.
field length Distance required for takeoff and landing, accelerate/stop, RTO and other operations as specified in flight manual (see balanced *).
field maintenance That authorised and performed in field (4) in direct support of operational squadrons and other units; normally limited to replacement of unserviceable items.
field modification One made in field (4), usually by FMK.
field of regard Total angular coverage of sensor; with fixed installation same as FOV (2, next), but if gimbaled depends on FOV plus slawing and elevation limits.
field of view 1 Angle between two rays passing through perspective centre (rear nodal point) of camera lens to two opposite sides of format. Not to be confused with angle of view.
  2 Total solid angle available when looking through sight, HUD or other optical system. In the case of a TV, FOV is defined as: wide, 4°; narrow, 0.9°; underscan, 0.45°.
field operation From forward airfield, esp. with unpaved runways.
field performance That associated with takeoff and landing, esp. in context of certification.
field site Completely unprepared stretch of terrain used in Harrier training.
field strength 1 Flux density, intensity or gradient; also called field intensity, although this term does not follow strict radiometric definition of intensity (flux per unit solid angle). 2 Electric field strength, units Vm⁻¹.
  3 Signal strength; magnitude of electric or magnetic component in direction of polarization.
  4 See magnetic *.
field takeoff From airfield, not ship or catapult [naval a/c].
field traffic Surface vehicles on airfield.
field training detachment

Established to provide maintainance-orientated technical training, at operational location, on new systems and their aerospace ground equipment (USAF). FIES Factor of initial engine spares. FIF Fluorescent inspection fluid. 

$\xi_n$ Intermediate frequency (superhet. receiver). 

FIFO 1 Fail-isolated/fail-operative. 

2 First in, first out. 

FIFOR, Fifor Flight forecast (Int.). 

15-m class Most restrictive of the Ostiv/FAI classes for competitive gliding, including span not greater than 15m (49 ft 2 in). 

15-3-3-3 Alloy 76 Ti, 15 Va, 3 each Al, Cr, Sn. 

fifth freedom traffic Picked up by airline of country A from country B and flown to country C (see freedoms). 

tenth wheel Vehicle [e.g., baggage trolley] steering by pivoted full-width axle. 

FIG 1 Fighter intercepter group. 

2 Flight-idle gate. 

fighter Aircraft designed primarily to intercept and destroy other aircraft. 

fighter affiliation Training exercise carried out by bombers, other heavy aircraft, ground or naval forces, in co-operation with fighters. 

fighter-bomber Fighter able to carry air-to-surface weapons for ground attack and interdiction. 

fighter controller Officer on staff of tactical air controller charged with co-ordination and evaluation of warning reports and operational control of aircraft allocated to him. Also known as fighter director (see also air controller, tactical air controller, tactical air director). 

fighter cover Patrol of fighter aircraft over specified area or force for purpose of repelling hostile aircraft. 

fighter-direction aircraft Equipped and manned for directing fighter operations. 

fighter escort Force of fighters detailed to protect other aircraft from attack by enemy aircraft. 

fighter sweep Offensive mission by fighter aircraft to seek out and destroy enemy aircraft or targets of opportunity in allotted area. 


fighting harness Seat harness [fighter and similar a/c 1920s]. 

fighting kite Used in sport [originally China] in which objective is to cut rival’s control cords. 

fighting top Cockpit box for gunner(s) on upper wing of large early bombers, accessed by ladder from fuselage. 

fighting wing Combat formation which allows wingman to provide optimum coverage and maintain manouverability during max-performance manouevres. 

FIGS, Figs Formation integrated gateway subsystem. Integrates radars, com. and airport systems gateways with VME-bus and LAN connections. 

figure 8 fuselage See double-bubble. 

Figure-9 loop Self-explanatory, aircraft progressively reducing [vertical-plane] turn radius to describe a 9. 

figure of 8 Self-explanatory manouevre in the horizontal plane, in many countries required for A-licence. 

figure of merit 1 Single numerical value describing quality of real system as percentage or decimal fraction of ideal or theoretical ideal. 

2 In particular, helicopter ideal hover power divided by actual. 

FIH Flight information handbook. 

FLIPAé Fédération Internationale des Journalistes Professionnels de l’Aéronautique. 

FIFI Flight into known icing. 

FIL Fountain-induced lift. 

FILA, Fila Fighting intruder[s] at low altitude. 

Fila Federazione Italiana Lavoratori Aviazione Civile. 

filament winding Manufacture of pressure vessel (eg rocket-motor case) by winding continuous high-strength filament on mandrel, bonded by adhesive. 

File Feature identification and location element (OSTA). 

filed flightplan That filed by pilot or his designated representative, without any subsequent changes. 

FILG Filling. 

fil, filling Threads in fabric which run perpendicular to selvege; weft. 

fillers 1 Paste or liquid used for filling pores of wood prior to applying paint or varnish. 

2 Pulse pairs generated by random noise in unsaturated DME beacon to maintain 2,700s. 

fillet 1 Aerodynamic fairing giving radius at junction of two surfaces, especially wing trailing edge and fuselage or hull. 

2 Fill which traditional weld makes at intersection of two parts. 

3 Increased area of pavement at junctions of taxiways and runways to facilitate high-speed turn-offs and other manouevres. 

filling Increase in pressure in centre of low (meteorological); opposite of deepening. 

filling sleeve See inflation sleeve. 

film chip One incorporating thin or thick-film technology. 

film cooling Cooling of body by maintaining thin fluid (liquid, vapour or gas) layer over surface. 

filmed IIT coated with ion-barrier film to prevent feedback damaging delicate photocathode. 

film-return satellite Reconnaissance satellite which [possibly in a constellation of sensors] includes a camera using physical film, returned to Earth. 

Filour Flying innovative low-observable unmanned research. 

FILS, Fils Fault-isolation and location system, integrates Bite with other systems. 

FIILT Federazione Italiana Lavoratori Trasporti [trade union; office, I-00163 Rome (Italy)]. 

filter 1 See balance *, momentum separation *, dynamic particle *. 

2 Capacitance and/or inductance and resistance designed to pass given band of RF only. High-pass, low-pass, band-pass and band-stop * pass frequencies respectively above, below, between and outside desired frequencies. Frequencies at which attenuation falls by more than 3 dB are termed cut-off frequencies. 

3 To study air warning information and eliminate any not of interest. 

filter centre Location in aircraft control and warning system at which information from observation posts is filtered (3) for further dissemination to air-defence control and direction centres (DoD).
filter crystal

filter crystal Quartz crystal resonator used to control filter characteristics.

filter element Cleansing medium in filter (1) with dry matrix or liquid (often oil) film.

filtering 1 Analysis of signal into harmonic components. 2 Separation of wanted component of time series from unwanted residue (noise).
3 Suppression or attainment of unwanted frequencies.
4 Cleansing of fluid flow of solid particles.
5 Process of interpreting reported information on vehicle movements to determine probable true tracks and, where applicable, heights or depths.

Filur Flying innovative low-observable unmanned research.

FIM 1 Fault-isolation monitoring [or manual]. 2 Field-ion microscope.
3 Full indicator movement.
FIN Functional identification [or item] number.
fin Vertical or inclined fixed aerofoil, usually at rear or on wingtip to increase directional stability.
2 Projecting flat plate to increase surface available to reject unwanted heat.
3 Those parts of stabilizers of kite balloon providing stability in pitch.
4 Shallow sharp-edged ridge around fixed or [more often] rotating part of gas turbine core, which in successive stages almost eliminates air or gas loss. The outer radius may be sealed by oil or abradable material.
FinAF Finnish air force.
“final” Inbound to active runway, called verbally by pilot when 4 nm from visible threshold.
final approach 1 IFR, flightpath inbound, beginning at ** fix and extending to active runway or to point where missed-approach procedure is executed.
2 VFR, flightpath in direction of landing along extended runway centreline from base leg to runway; hence “on finals”.
final approach altitude Height at start of final approach.
final approach fix That from or over which published final IFR approach is executed.
final approach gate Position on extended runway centreline above which landing aircraft is required to pass at time assigned by approach control.
final approach point Start of final-approach segment of non-precision approach.
final approach segment Final approach (1).
final assembly Assembly of major structural and sub-units which form completed aircraft; erection.
final assembly drawing Undimensioned drawing calling out all major installations on aircraft; complete index to particular model or sub-type (see callout notes).
Final clearance Unambiguous authorization to V-bomber crew to make attack with NW, also called PRM (RAF).
final controller Radar controller employed in transmission of PAR (previously GCA) talk-down instructions, and in passing monitoring information to pilots not using PAR.
final mass Mass of rocket after burnout or cutoff.
final monitor aid Program for management of parallel runways (FAA).
final procedure turn Links base leg to approach.
finals Final approach (colloq.).
FIR  Flight-information Region.
FIRAMS  Flight-instructor refresher clinic.
Fire  Flammes infra-rouge embarquées, IR payloads.
Firing pass  Flight of combat aircraft towards air or ground target in which weapons are fired.
Firing test  Static operation of rocket.
Firing time  Time between application of d.c. voltage to vacuum tube or solid-state device and start of current flow.
Firing unit  Basic subdivision of large SAM system (ie not infantry-operated), usually with four to 12 launchers at one location.
Fire up  To start engine, especially first test of new type previously subjected only to motoring tests without combustion.
Firewall  Fire-resistant bulkhead designed to isolate engine from rest of aircraft.
Fires  Firefighters’ integrated response equipment system (USAF).
Firewire  Stainless-steel capillary tube containing insulator with electric wire running down the centre. If heated above a critical temperature a current flows, triggering warnings and release of extinguishant (Graviner).
Fireball  Luminous sphere formed a few millionths of a second after detonation of nuclear weapon.
Fireballer  Fabric meeting specific requirements as barrier to fire.
Firebacker  Furnishing fabric meeting specific requirements as barrier to fire.
Fire channel  Single data highway for C3I, esp. of SAM system (eg Hawk has 2, Patriot has 10).
Fire classification  Class A, wood, paper etc; B, petrol (gasoline), oil, other fuels, except C, butane, propane, hydrogen etc.
Fire-control radar  System providing target-information inputs to a weapon fire-control system.
Fire-control system  System including radar(s) mounted on land, sea or air platform to provide exact data on target position and velocity before engagement with guns, missiles or other weapons.
Fire deluge system  Remotely controlled pipes, hoses and spray outlets, situated throughout launch-pad area of large missile or space launching site, which operate if there is a fire or explosion in the area.
Fire out  Fighter which has launched all its AAMs.
Fire floor  Essentially horizontal floor or other sheeting designed to be fireproof [at least for significant time].
Firegate  In effect, the tap that, usually under computer control, governs dispensation rate of retardant in firefighting tanker.
Firepoint  Locations in main floor of [especially pressurized] aircraft provided with visual access and light in order to inspect underfloor area and establish cause of fire warning.
Fire point  Temperature at which material will give off vapour that will burn continuously after ignition (see flashpoint).
Fireproof  Rules include ‘at least as well as steel’.
Fire pulse  Signal for remote control of fire (1); for fire (2) usually called launch pulse.
Fire resistant  Rules include ‘at least as well as aluminium alloy’.

first-limit indicator
Firs  Fire-resistant bulkhead designed to isolate engine from rest of aircraft.
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260
first-line life

unmissable unquantified readout of vital engine parameters.

first-line life 1 Operational life of hardware in first-line service.

2 Time between delivery of missile or RPV and its destruction or withdrawal. For planning purposes usually five years.

first-line service Active operation in original design role with combat or training unit, or revenue service with air carrier.

first motion First visible motion of vehicle at start of mission.

first officer Civil airline rank = second pilot or copilot.

first pilot See PIC.

first-run attack Made immediately on a surface target not seen previously.

first stage Lowest of two- or multi-stage launch vehicle, first to be fired.

first-tier customer Purchaser [or lessee] of new aircraft.

first-tier supplier One supplying direct to prime contractor.

fishtail root Usual gas-turbine rotor-blade root of tapered form with broached serrated edges providing multiple load-bearing faces.

FIS 1 Flight Information Service(s) [A adds automated, B adds broadcast, E adds en-route, O adds Officer].

2 Federal Inspection Services.

3 Flight instructors’ school.

4 Fighter Interceptor Squadron.

5 Flight-instrument system.

6 Flight inspection system

FISA 1 Fédération Internationale des Sociétés Aérophilatéliques [office, moves around Europe] (Int.).

2 Foreign Intelligence Surveillance Act (US).

FIS-A Flight information service, automated.

FIS-B Flight information service, broadcast.

fiscal year Financial year; for US, 1 October to 30 September; for Britain, 1 April to 31 March; for France and Germany, calendar year.

FIS-E Flight information service, en-route.

fishbone antenna Coplanar elements in colinear pairs, coupled to balanced transmission line.

fish-head Naval aircrew (RAF, WW2).

Fishpond Active bomber radar giving bearing/distance of hostile aircraft (RAF 1943).

fishing 1 Using control rudder to swing tail from one side to another in repeated S-turns, an alternative manoeuvre to sideslipping to steepen approach.

2 Many aircraft [the author remembers the Oxford] proceeded in a mild zig-zag, which could not be arrested.

fishtail nozzle Ends in triangular portion with narrow slit nozzle.

FISO Flight Information Service Officer.

fissile Fissionable by slow neutrons.

fission Splitting of heavy nucleus into two approximately equal parts (nuclei of lighter elements), accompanied by release of large amount of energy and generally one or more neutrons.

fissile See fissile.

fission yield Amount of energy released by fission in thermonuclear explosion as distinct from that released by fusion. The fission yield ratio, frequently expressed in per cent, is ratio of yield derived from fission to total.

Fist 1 Fire support team.

fixed point 1 Positional notation in computer oper-

2 Flight-instrument and subsystem tasks.

3 Future integrated supply, or support, supply team.

Fista Flying IR signature technology aircraft.

FIT Floating-input transistor.

fit 1 Desired clearance, if any, between mating surfaces; eg push *, shrink *, force *.

2 Total complement of avionic equipment in aircraft.

FITAP Fédération Internationale des Transports Aériens Privés.

fit check Test to ensure compatibility of mating parts, such as missile on launcher.

FITE Fusion interfaces for tactical environment.

FITO Forward indium-tin oxide.

FITS 1 Filr internal targeting system.

2 Fully integrated tactical system.

fitter Skilled metalworking tradesman.

fitting Assembly of parts mating with specified fit (1).

FITVC Fluid-injection thrust-vector control.

five by five Radio reception loud and clear. First figure denotes volume and second intelligibility, so “five by three” means loud but not very clear.

Five-Power Defence Agreement UK/Australia/ Malaysia/NZ/Singapore.

FIW Fan in wing [V/STOL].

fix 1 Aircraft position established by any independent means unrelated to a previous position.

2 In particular, aircraft position established by intersection of two position lines. See absolute *, outer *, running *.

3 Solution, possibly temporary, to technical problem (colloq.).

fixed aerial Aerial [antenna] in form of wire fastened to aircraft at both ends.

fixed-area nozzle One whose cross-section cannot be adjusted.

fixed-base operator Business operation at American airport usually including flying school, charter flights, sales agency for particular light aircraft and accessories, fuel/oil, maintenance and overhaul facilities and, sometimes, third-level or commuter airline.

fixed-base simulator One in which cab does not move.

fixed-displacement pump Fluid pump handling uniform volume on each repetitive cycle.

fixed distance marker Located 300 m (1,000 ft) from threshold to provide marker for jet aircraft on other than precision instrument runway.

fixed-geometry 1 Aircraft that does not have variable-sweep wings.

2 Engine that does not have variable inlet or nozzle.

fixed gun Gun fixed in aircraft to fire in one direction, usually forwards.

fixed-gun mode One for close-range snapshooting in which sightline is boresighted to gun line.

fixed landing gear One not designated to retract.

fixed light Constant luminous intensity when observed from fixed point.

fixed-loop aerial Not rotating relative to aircraft.

fixed munition 1 One used against a fixed target.

2 Gun ammunition in which projectiles are held in propellant cases.

fixed-pitch propeller One that has no provision for changing pitch of blades, and hence efficient at only one flight speed.

fixed point 1 Positional notation in computer oper-
fixed-price contract

ations in which corresponding places in different quantities are occupied by coefficients of same power of base (see floating point).

2 Notation in which base point is assumed to remain fixed with respect to one end of numeric expressions.

fixed-price contract One which either provides for firm price, or under appropriate circumstances may provide for adjustable price; several types, designed to facilitate proper pricing under varying circumstances (DoD).

fixed-price incentive contract Has provision for adjustment by formula based on relationship which final negotiated total cost bears to negotiated target cost as adjusted by approved changes (DoD).

fixed satellite See geostationary.

fixed slat Forward portion of aerofoil ahead of fixed slot built into structure.

fixed station Telecommunication station in aeronautical fixed service.

fixed tank External tank that is non-jettisonable.

fixed target One that does not move relative to local Earth's surface.

fixed weight Total mass of aerostat in flying order without fuel, oil, dischargeable weight or payload.

fix end End of holding pattern flown over fix (1) at which aircraft enters pattern.

fixer network Radio or radar direction-finding stations which, operating in conjunction, plot positions of aircraft; fixer system (obs.).

fixture Small jig for detail subassembly.

fixturing The process of loading a workpiece into a fixture, determining its precise position and orientation, and adjusting the machinery program to accommodate future variations.

fizzer To be on the * = to be on a disciplinary charge (RAF, WW2).

FJ 1 Fuel jettison.

2 Fast jet; DIC adds directed IR countermeasures, MAWS missile-approach warning system, OEU Operational Evaluation Unit, PT pilot training, TS test squadron.

FJ-1 Fuel-engine thrust.

FJA Forward jamming antenna.

FJCA Future joint carrier [or combat] aircraft (UK).

FJ(0) Fourier transform of a function of time.


FTF Fast Jet Training Fleet (RAF).

FTS Fast Jet Test Squadron (ATEC).


FKR Cosmonauts federation (R).

FL Flight level, usually expressed in hundreds of feet; thus FL96 = 9.600 ft.

FLL Forced landing (RAF).

FLA Future large aircraft [aeroplane].

2 Foot-launched aircraft.

flare Fan blade.

Flag, FLAG 1 Floor level above ground.

2 Flemish Aerospace Group (Belg.).

3 Four-mode laser gyro, see Flagship.

flame stabilizer flag Small brightly coloured plate, often Day-Glo red or orange, or diagonally striped yellow/black, which flicks into view in panel instrument, spacesuit instrument or any other subsystem or device, to give visual warning of fault or impending difficulty such as loss of electric power or low fuel or signal level.

flag carrier 1 Airline designated as part of bilateral agreement to fly international route(s).

2 National state airline.

flag, FLAGE Flexible lightweight agile guided experiment (anti-missile).

flagman 1 Person carrying chequered flag (formerly) employed at US airports, and still seen in Russia and other CIS, to direct arrivals to signalman or airport marshall for parking.

2 Person carrying bright flag on tall mast to guide aviation pilot towards end of each run.

flag operator Flag carrier.

flagship 1 Normal meaning can apply to airline service or individual aircraft, or [American, 1930–59] whole fleet.

2 Four-mode laser gyro software/hardware implemented partitioning, comprising Adiru, ADM, CDU, GNSSU and MSU.

flag stop Special unscheduled stop by scheduled airlift mission aircraft to load or unload traffic (USAF).

flag tracking Method of tracking helicopter rotor by holding fabric flag against blade tips coated with wet paint.

flak AAA fire.

flak curtain Self-explanatory protection of occupant[s] or vital equipment, usually multi-ply nylon fabric.

flak ship Small German warship tasked with defending other vessels against air attack (WW2).

flak-suppression fire Air-to-ground fire used to suppress AA defences immediately before and during air attack on surface targets (DoD). This definition should be amended to allow use of ASMs, cluster bombs etc.

FLAM Future land-attack missile.

flame attenuation Attenuation of radio signal by ionisation in rocket exhaust.

flame bucket See flame deflector.

flame chute Concrete and metal duct carrying flame and gas from bottom of silo or test pit to surface.

flame damper 1 Pre-radar shroud or extension to piston engine exhaust pipe to prevent visual detection at night.

2 See flame trap.

flame deflector Deflects hot gas of vertical-launch rocket engine from ground or from launching structure.

flame float Pyrotechnic marker that burns on water surface. Principal purpose is to facilitate measurement of drift at night.

flame front Boundary of burning zone progressing through combustible mixture. For kerosene, the flow velocity must not exceed c10m (33ft)s⁻¹.

flame hardening Hardening metal surface by flame.

flameholder Body mounted in high-velocity combustible flow to create local region of turbulence and low velocity in which flame is stabilized.

flameout Cessation of combustion in gas turbine or other air-breather from cause other than fuel shutoff.

flamer Aircraft on fire in air, especially in air combat.

flame-resistant Not able to propagate flame after ignition source is removed.

flame stabilizer Flameholder.
flamestat

flamestat Sensor detecting abnormal high temperature in a [e.g. air conditioning] duct.

flame trap Filter in piston engine induction system to prevent passage of flame upstream after blow-back or backfire.

flame tube 1 Perforated tube designed for mixing of fuel and air, in which fuel is burnt in gas turbine; usually inserted as inner liner in combustion chamber for diluting and cooling flame (UK).

2 Interconnector between combustors or between afterburner gutters (US).

Flap Flying/floating local-area network.

flanking machine Metal-forming machine with high-speed plunger which bends up successive small portions of flange on moving workpiece.

flank 1 Lower side of fuselage or other aerodynamic body.

2 Sides of lower (inner radius) end of compressor or turbine blade.


flap 1 Movable surface forming part of leading or trailing edge of aerofoil, esp. of wing, able to hinge downward, swing down and forwards, translate aft on tracks or in some other way after wing camber, cross-section and area in order to exert powerful effect on low-speed lift and drag. See following types: double-slotted, dive-recovery, Fowler, Googe, Junkers, Krüger, leading edge, maneouvre, plain, slotted, split, triple-slotted, Youngman and Zapp.

2 Side walls of thrust-augmenting ejector in powered-lift system, in fighters part of a retractable structure.

3 Hinged segment forming part of primary or secondary nozzle of afterburner.

4 Urgent activity (UK colloq.).

flap angle Angle between chord of flap and that of wing.

flap blowing Discharge of HP compressor bleed air over lowered flaps to prevent airflow breakaway. Normally air issues at about sonic speed through slit facing across flap upper surface, flow attaching to flap through Coanda effect. Also called Attinello flap (see BLC, super-circulation).

flaperon Surface combining roll-control function of aileron with increased lift and drag function of flap; can be differentially operated.

flap fan Experimental concept in which flaps carry small fans driven by engine bleed air (perhaps eight fans on each flap) to maintain attachment and provide powered lift.

flaplet 1 Loosely, any small flap.

2 Narrow-chord flap with circular-arc LE and flat top/bottom forming TE of Coanda CCW.

flappery Surface, especially if prominent on Stol aircraft (colloq.).

flapping Angular oscillation of helicopter rotor blade about flapping hinge.

flapping angle Angle between tip-path plane and plane normal to axis.

flapping hinge Sensibly horizontal pivot on helicopter main-rotor hub which allows blade tip to rise and fall.

flapping plane Plane normal to plane of each flapping hinge axis.

flap-retraction-height Variable but always over 1,000 ft (305 m) with aircraft at or above FUSS.

flaps 1 Force-level automated planning experiment (AAFCE).

2 Flat-aperture parabolic surface (antenna or mirror).

flap setting Predetermined angle of flap (1) for takeoff, landing or other flight condition.

flaps-extended speed The highest speed permissible with flaps in a prescribed extended position.

flaps-up safety speed Minimum TAS at which aircraft maintains positive ROC with flaps retracted.

flap-type control The common type of flight control surface.

FLAR Federatsi Lyubitelei Aviatsii Rossii, Federation of aviation amateurs (R).

Flair Fixed low-altitude intermediate-range, surveillance radar.

flare 1 Noun and verb, final nose-up pitch of landing aeroplane to reduce rate of descent close to zero at touchdown. It starts at the point of departure from the glideslope.

2 Distance sides of planing bottom of marine float or hull flare out from centreline.

3 Pyrotechnic aerial device for signalling or illumination; parachute * illuminates large area when released at altitude; wingtip * illuminates ground when landing.

4 Inverse taper (ie opening out) at tail of cylindrical body, as at base of rocket vehicle.

5 Eruptions from Sun’s chromosphere, which may appear within minutes and fade within an hour; eject high-energy protons, cause radio fadeouts and magnetic disturbances on Earth.

6 Fixed source of ground or water illumination, of several types, usually burning kerosene or related fuel (generally obs.).

flare-augmentation system Electronic feedback on fixed-wing STOL to achieve minimum landing field length.

flare demand Coded Autoland signal commanding flare (1).

flare dud Nuclear weapon which detonates with anticipated yield but at altitude appreciably greater than intended; a dud in its effects on target (DoD).

flare out See flare (1).

flare path 1 Line of flares (6) or lights down one side or both sides of runway to provide illumination (generally obs.).

2 In the modern world this means the trajectory described in a landing flare (1).

flare-path dinghy Attends flare path laid out for water for marine aircraft.

Flash 1 Folding lightweight acoustic sonar [or system] for helicopter.

2 Flying laser self-defence system against seeker-head missiles.

flash 1 Basically rectangular pattern of vertical bars in national colours painted on military aircraft, usually covering portion of fin.

2 White semicircular or circular badge worn in headgear of aircrew cadet.

flashback Sudden upstream travel of flame in flow of combustible mixture in enclosed system.

flash/hang/smoke Signifies training target disabled.

flash burn Caused by radiation from nuclear explosion.

flasher unit Regular make/break switch in circuit of light which flashes rather than rotates.

flushing light Intermittent aeronautical surface light in which light periods are clearly shorter than dark, with repeated cycle. Usually has published frequency.
flexible air-data system

flexible air-data system

from tail. Anti-spin parachute can assist positive recovery.

flat template Representation on two-dimensional material of dimensions, areas and other characteristics of curved part; also known as layout template.

flattening out 1 "In alighting, the transition between the approach glide and the horizontal motion before making contact with the earth” (BSI).

2 Many authorities add recovery from a dive to level flight.

flat-top Aircraft carrier (colloq.).

flat zone Zone within indicated course sector or ILS glidepath sector in which slope of sector characteristic curve is zero.

FLAVIR Flapless air vehicle integrated industry research (UK).

FLC Fuel and limitation(s) computer.

FLB Association of airline operators (Austria).

FLCH 1 Flechette(s), for piercing armour.

2 Change in flight level.

FLD Fault location device (wiring).

fld Field.

FLE Future logistics enterprise.

FLEEP Flying lunar-exursion experimental platform.

One-man rocket-powered platform intended to enable astronaut to make quick hops on lunar surface.

fleet All aircraft of one type used by same operator. Hence * age, * youth, average flight time of fleet.

fleet ballistic missile submarine Submarine designed to launch ballistic missiles.

fleet carrier CV, large surface vessel equipped to launch, recover and maintain powerful fixed-wing aircraft in any theatre.

fleet leader Aircraft in [usually airline] fleet having greatest flight time.

fleet noise level Average noise level throughout fleet.

fleet performance monitoring Confidential use of quick-access recorders to inspect actual way pilots fly [airline] aircraft, and in particular whether airspeeds, rates of descent, etc, are within limits.

Flem Fly-by-lading excursion mode.

Flettner Aileron tab.

Flettner control See servo tab.

Flettner rotor Cylinder spinning on axis normal to airstream, generating transverse thrust/lift. In theory could provide both lift and thrust, but no successful * aircraft has been flown.

FLEX Flexible takeoff.

Flexadyné Proprietary (Rocketdyne) formulation of solid propellant.

Flexar Flexible adaptive radar.

flexbeam Torsionally compliant spar, typically of CFRP laminates, attaching helicopter rotor blade to hub and flexing to accommodate varying blade pitch and coning angles.

flexibility Ability of hardware, including aircraft, to operate efficiently over wide range of conditions; eg long or short sectors, high or low level.

flexibility factor Used in helicopter rotor stress calculations to make up for structure's flexibility.

flexible air-data system Versatile microprocessor-based...
**FLID**

DADC outputting MIL-1553B, Arinc 429, analog and IFF transponder.

**flexible blade** 1 Helicopter rotor blade with trailing-edge or balance tabs.

2 Helicopter rotor blade in which pivots are replaced by flexible structure.

**flexible elastomer skin** Reduces RCS by hiding joints and discontinuities.

**flexible flight deck** Post-WW2 concept of aircraft carrier whose aircraft would need no landing gear.

**flexible gun** Clearly a nonsensical idea: what is meant is pivoted, ball-mounted or in any other way manually aimed independently of the aircraft.

**flexible takeoff, FTO** Takeoff technique in which for TOW below MTOW, less than maximum engine thrust is selected. For given WAT condition, this thrust is computed by intersection of TOW and aircraft performance to comply with regulations, giving a theoretical “ambient temperature” Ty. Thrust selected is that which would be available at full power at Ty. FTO saves engine costs, reduces noise and extends engine life.

**flexible tank** Bag-type tank.

**flexible [flex] targeting** Mission is launched by local commander with choice of targets and weapons to attack suddenly seen target.

**flexible wall** Used in wind tunnels, engine air inlets and other ducts subject to large range of flow and Mach number; may be perforated to extract boundary layer.

**Flex-tracks** The first step towards complete user-preferred routing, available [2006] on a trial basis over routes from Australia to Asia, and the US Pacific coast.

**flexural axis** Locus of flexural centres, points at which applied load produces pure bending without twist (note, on swept wing pure bending results in apparent twist, ie loss of incidence).

**flexural wash-out** Apparent reduction in angle of incidence from root to tip as swept wing deflects upward under load.

**flexure** Bending under load.

**flex-wing** Foldable or collapsible single-surface wing for micro or hang glider.

**FLG** 1 Flashing light.

2 Falling (also Flg).

**FL1** 1 Fighter lead-in.

2 First-limit indicator.

**flicker** Subjective sensation resulting from periodic fluctuation in intensity of light at rates less than about 25/30 times a second, preventing complete continuity of images.

**flicker control** See bang-bang control.

**flicker marking** Various black-white schemes to render rotating propeller blades more visible on ground.

**flicker rate** Refresh rate for CRT information below which flicker becomes noticeable; dependent on eye’s persistence of vision and persistence of CRT phosphor.

**flicker vertigo** Caused by light occulting (flickering) at frequencies from four to 20 per second (eg with single-propeller aircraft headed towards Sun at low rpm), producing nausea, dizziness or unconsciousness.

**flick roll** 1 Essentially a horizontal spin, made by slowing to spin-entry speed with engine throttled back and then applying hard back stick and full rudder. Result should be a controlled very rapid 360° roll.

2 “A rapidly executed roll” (B.S., 1940).

**FLID** Flight identification.
flight crew Personnel assigned to operate aircraft.

flight cycle Sequence of operations and conditions, different for airframe, propulsion and each system or equipment item, which together make up one flight.

flight data recorder See flight recorder.

flight deck 1 Compartment in large aircraft occupied by flight crew.

flight department Part of large company responsible for providing air travel [executive aircraft or airline] whenever needed.

flight despatcher See despatcher.

flight director 1 Flight instrument generally similar to attitude director giving information on pitch, roll and related parameters.

flight director attitude indicator Manned-spacecraft display indicating altitude, attitude error and rate of pitch, yaw and roll.

flight duty period See crew duty time.

flight dynamics General subject of motion of aerodyne and laws which govern it.

flight effects Changes in relationships as an aircraft accelerates from rest to cruising speed, notorably velocity shear at jet boundary.

flight engineer Aircrew member responsible for powerplant, systems and fuel management, and also sometimes for supervising turnaround servicing. Today rare except R and military.

flight envelope 1 See gust envelope.

flight information service Service giving advice and information useful for safe and efficient conduct of flights. In good weather provides listening watch only.

flight inspection 1 By specially equipped aircraft, of accuracy of nav aids.

flight mechanics Pre-1935 title of flight engineer.

flight mechanics One of the two components of flight dynamics, whose role is to establish the right balance between stability, manoeuvrability and control power.

flight line 1 Ramp area of airfield, where aircraft are parked and serviced.

flight Mach number Free-stream Mach number measured in flight.

flight management system Automatic computer-controlled system with autothrottle, possible Mach-hold, and complete control of navigation, including SIDs and STARs. Offers "menus" for minimum cost, minimum fuel burn or other objectives. Relieves workload, increases precision. Hence FMST, * trainer, synthesizes all these functions.

flight manual Book prepared by aircraft manufacturer and carried on board, setting out recommended operating techniques, speeds, power settings, etc, necessary for flying particular type of aircraft. Known to airlines as operations manual.

flight mechanic Person assigned to operate aircraft. Known to airlines as flight engineer.

flight mechanical One of the two components of flight dynamics, whose role is to establish the right balance between stability, manoeuvrability and control power.

flight office On a GA airfield, centre for booking pleasure flights and carrying out domestic business, but not concerned with ATC or visiting pilots.

flight panel Accepted definition: panel grouping all instruments necessary for continued flight without external references. Preferable: panel grouping available flight instruments.

flight information service Service giving advice and information useful for safe and efficient conduct of flights. In good weather provides listening watch only.

flight inspection 1 By specially equipped aircraft, of accuracy of nav aids.

flight eleven protection System in FBW [Airbus] aircraft which cannot normally be over-ridden by [e.g. hijacker] pilot which automatically commands climb or turn to avoid hitting an obstacle.

flight fine pitch Finest propeller blade angle available in flight. Weight on wheels may remove * stop, enabling drag to be increased.

flight flutter kit Installation, together with instrumentation, of ‘bonkers’ or other devices to induce flutter in flight-test aircraft.

flight-following Maintaining contact with specified aircraft to determine en route progress.

flight idle Lowest engine speed available in flight, set by ** stop, mechanical limit released to ground-idle position at touchdown.

flight indicator Instrument combining lateral inclinometer, fore-and-aft inclinometer and turn indicator (obs.).

flight indicator board Display in airport terminal showing arrivals and departures of airline flights.

flight information centre Unit established to provide flight information service and alerting service.

flight information region, FIR Airspace of defined dimensions within which flight information and alerting services are provided by air traffic control centre.

flightpath deviation Angular or linear difference between track and course of an aircraft (H).
flightpath recorder

**flightpath recorder** Instrument for recording angle of flightpath (V) to horizontal.

**flightpath sight** In HUD, direct aiming point showing distant point through which aircraft will pass (V, H).

**flightpath vector** Prediction of future flightpath which replaces traditional flight director in advanced EFIS, especially to protect against windshear.

**flight plan** 2 Specified information relating to whole or portion of intended flight (2); filed orally or in writing with air traffic control facility.

2 Common working document, both in spacecraft and at all ground stations during manned or unmanned space flight. Separate **2** issued for lunar or planetary surface operations.

**flight-plan correlation** Means of identifying aircraft by association with known flight plans.

**flight platform** See helped.

**flight profile** Plot of complete flight (2) in vertical plane, usually altitude plotted against track distance.

**flight process board** In ATC centre, displays all current FP strips.

**flight-progress strip** ATC aide-memoire: paper strip typically 25 mm × 200 mm, coloured for traffic direction, giving one flight’s c/s, FL, ETA as amended; slid into FP board until passed to colleague at handover.

**flight-proximity demonstration** Flight in which a receiver aircraft formsates behind a tanker even though neither may be equipped [yet] to supply or receive fuel.

**flight rating test** One in which member of flight crew demonstrates ability to comply with requirements of particular licence or rating.

**flight-readiness firing** Short-duration test of in-service space launcher, or other rocket vehicle, on launcher.

**flight recorder** Device for automatically recording information on aircraft operation. Main type is flight data recorder (FDR), also colloquially called crash recorder or ‘black box’, although invariably bright orange. Records 50 or more parameters, including following mandatory channels: altitude, airspeed, vertical acceleration, heading, elapsed time at 1s intervals (UK also requires pitch, and usually control-surface positions, high-lift surface positions, engine speeds and flight-crew speech are also included). Such recorders are designed to survive crash accelerations, impacts, crushing and fire, and often carry underwater transponders or beacons. Normally recording medium, eg multi-track steel tape, is recycled every 25 h. Cockpit voice recorder (CVR) stores all speech on flight deck or cockpit, including intercom and radio. Maintenance recorders, eg AIDS, are linked by serial data highways to hundreds of transducers and other inputs recording many kinds of information (temperatures, vibrations, pressures and electronic parameters) to yield advance information of impending fault conditions or failures and improve system operation and economy. Highways lead to various logic and acquisition units, some for quick-look and others long-term; separate highway to protected FDR often provided.

**flight reference card** Carried in cockpit to provide quick detailed list of vital actions in event of all system failures or emergencies commonly encountered, with recommendations, suggestions and prohibitions.

**flight regime** State of being airborne, governing many systems and modes unavailable on ground.

**flight time**

**flight release certificate** Issued for aircraft with Permit to Fly (UK CAA).

**flights** Always plural, the offices [usually on the air side of hangars] and nearby aircraft parking areas of operational units on a permanent RAF station (becoming archaic usage).

**flight-safety information management system** Proposed unclassified database of accidents, incidents and malfunctions reported by participating air forces to improve safety of military aircraft.

**flight schedule monitor** Shared by FAA and user community, is the decision-making tool that forms basis of current flight information and air-traffic demand at each airport.

**flight service station** Facility providing flight assistance service (FAA).

**flight shed** Traditional British term for hangar in which prototypes are completed and readied for flight and subsequently are kept. Not normally associated with series production.

**flight simulator** Electronic device that can simulate entire flight characteristics of particular type of aircraft, with faithful reproduction of flight deck; used to test and check out flight crews, esp. in coping with emergencies, and (military) in completing combat missions according to role; or as design and engineering tool during aircraft development.

**flight sister** Female nursing officer trained for aeromedical duties.

**flight space** Space above and beyond Earth available for atmospheric or space flight.

**Flight Standards District Office** Handles all matters within assigned geographic area (FAA).

**flight station** 1 Flight crew position away from flight deck.

2 Base for marine aircraft (WWI).

**flight status** Indication of whether a given aircraft requires special handling by air traffic services.

**flightstick** The inceptor of an entertainment or educational simulator; not normally in an aircraft.

**flight strip** 1 Auxiliary airfield on private property, farmland or adjacent to highway.

2 See flight progress strip.

**flight structural mode excitation** Allows pilot to command deterministic signals, such as swept-frequency sine waves, from FCC to excite all aircraft’s flexural modes.

**flight suit** One-piece overall garment with various pockets, zips and velcro.

**flight supplement** Added to price of airline ticket to cover such factors as additional fuel burn and airport time-slot charges.

**flight surgeon** Physician (invariably not surgeon) trained in aeromedical practice whose primary duty is medical examination and care of aircrew on ground.

**flight test** 1 Test of vehicle by actual flight to achieve specific objectives.

2 Test of component mounted on or in carrier vehicle to subject it to conditions of flight.

**flight rating test**.

**flight test vehicle** Special aircraft, missile or other vehicle for conduct of flight tests to explore either its own capabilities or those of equipment or component parts.

**flight time** 1 Elapsed time from moment aircraft first
**flight-training device**

moves under its own power until moment it comes to rest at end of flight. For flying boats and seaplanes, buoy-to-buoy time (see **block time**).

2 For gliders and sailplanes, time from start of takeoff until end of landing.

3 For vehicles released in flight from parent carrier, measured from moment of release.

4 Aggregate of ** of all flights made by same basic structure or other hardware item.

**flight-training device** Invariably, this is synonymous with flight simulator.

**flight vector** Direction of travel; except in still air, not the same as azimuth of longitudinal axis. Essentially = track.

**flight visibility** Average forward horizontal distance from cockpit (assumed at typical light-aircraft **FL**) at which prominent unlighted object may be seen and identified by day and prominent lighted object may be identified by night.

**flightway** The airspace immediately beyond the end of a runway or other takeoff path; this concept has fallen into disuse.

**flight weight** Similar to production item; not a battleship test construction.

**flightworthy** Ready for flight; for aircraft, airworthy.

**Flight Zero** Brief unplanned flight, caused by sudden event during fast taxi or other testing prior to Flight 1.

**flimsy orders** Printed on onion-skin paper, can be eaten.

**flinger ring** Uses centrifugal force to inject W/M [in some Turbomeca engines, fuel] from entry to engine compressor.

**FLIP, Flip** 1 Flight information publication.

2 Floated lightweight inertial platform.

**flip-flop** 1 Bistable multivibrator; device having two stable states and two input signals each corresponding with one state; remains in either state until caused to flip or flop to other.

2 Bistable device with input which allows it to act as single-stage binary counter.

**flipper** 1 Elevator (US colloq.).

2 Before turning on final, flaps, pitch, power [some add roll].

**FLIR, Flir** Forward-looking IR.

**FLIS** Federal Logistics Information Systems (US).

**Fli** Fighter lead-in training (USAF, Holloman).

**FLL** 1 Flight line (two words) level (UK/NATO).

2 Für Versorgung mit Luft und Schiffbau (G).

**FLM** 1 Flightline maintenance, or mechanic (US).

2 Foot-launched microlight.

3 Focused-lethality munition.

**FLMETS** Flight line maintenance test set (Kollsman).

**FLO** 1 Flow control [of traffic]. -E adds East, -W West (ICAO).

2 Defence logistics organization (Norway); /Luft adds Air.

3 Floodlights available on landing.

4 Local-oscillator frequency.

**float** 1 Horizontal distance travelled between flare and landing or alighting (see **ground effect**).

2 Watertight body with planing bottom forming alighting gear of * seaplane. Also wingtip *

3 Ability of control surfaces to trail freely in airstream except when commanded by input; reckoned negative when surface deflected away from relative wind and posi-

tive when (because of overbalance ahead of hinge axis) surface moves against it.

4 Buoyant capsule in carburettor [carbureter].

**floateration** See **floation**.

**float displacement** Mass of water displaced by totally submerged seaplane float.

**floated gyro** Floating gyro.

**floated position** That assumed by flight-control surface [esp. manual] in absence of pilot input.

**float gear** Floats (2) applied as modification to landplane.

**floating ailerons** Designed to float (3).

**floating gudgeon pin** Free to rotate in both piston and connecting rod.

**floating gyro** Mass supported by hydrostatic force of surrounding liquid.

**floating lines** In photogrammetry, lines connecting same two points of detail on each print of stereo pair; used to determine whether or not points are intervisible, and drawn directly on prints or superimposed by transparent strips.

**floating mark** Mark or dot seen as occupying position in three-dimensional space formed by stereoscopic pair, used as reference in stereoscopy.

**floating point** EDP (1) positional notation in which corresponding places in different quantities are not necessarily occupied by coefficients of same power; eg 186,000 can be represented as 1.86 × 10^5. By shifting ** so number of significant digits does not exceed machine capacity, widely varying quantities can be handled.

**floating reticle** One whose image can be moved within FOV.

**float light** See **flare** (3).

**floatline** See **float seaplane**.

**float seaplane** Aeroplane supported on water by separate floats (2), usually 2 or 3.

**float-type carburettor** Head of fuel supplied to jet is controlled by float (4) and needle valve.

**float valve** Fluid valve regulated by float acting on level in container.

**float volume** Ratio of seaplane gross weight to mass of unit volume (traditionally 1 ft³) of water.

**FLOLS** Fresnel-lens optical landing system.

**flood** To overflow float chamber of carburettor, hence flooded.

**flood control** Simple inceptor, usually a pull-wire, with which piston-engine float chamber can be flooded manually to provide rich mixture for starting.

**flood flow** 1 Unrestricted supply of hot high-pressure air to cockpit either for demist/deicing, or in emergency, or by auto switch triggered by excessive cabin altitude.

2 Has similar (various) meanings in oxygen systems.

**floodlight** Light providing general illumination over particular area.

**flood valve** Controls flow of fire extinguishant.

**floor** Notionally, the hangar *; thus, place of work, esp. for A&P.

**floor-loaded** Aircraft is in factory for refurbishment or rework.

**floor loading** 1 Actual number of aircraft being modified.

2 Maximum [or actual] number of passengers.

**floor locks** Rows of attachments which interface with seating or VLDs.
floor vents

**floor vents** Pass used cabin air to pressurized or non-
pressurized lower fuselage.

**flops** Floating-point operations per second, hence M-\*.

**Giga-\***.

**FLT, Flt** Forward line of own troops (formerly
called Feba, forward edge of battle area).

**flotation** Quality of a wheel landing gear of operating
from soft ground.

**flotation bags, collars** Inflatable bags used to provide buoy-
ancy and stability for sea-recovered spacecraft.

**flotation gear** Inflatable bags carried inside RPV,
target or missile test vehicle to provide buoyancy after
ditching.

**2** Emergency inflatable bags surrounding landing gear
of shipboard helicopter [or, historically, carried on, or in,
carrier-based landplane].

**Flo Trak** Patented arrangement of large-area plates
fitting around landing-wheel tyre for enhanced flotation,
esp. to permit combat aircraft to use soft surface.

**flow augmenter** Usually means ejector, but also applied
to inducer at entry to centrifugal pump.

**flowback** Runback of water from wing leading edge in
icing conditions.

**flow chart** Graphical symbolic representation of
sequence of operations.

**flow control** Measures designed to maintain even flow of
traffic into airspace or along route. Chief feature is
acceptance of each aircraft into pre-booked slot at entry
to controlled airspace, at agreed gate time, to provide
ordinarily ATC service which does not become overloaded.

**flow control system** One form of main control for gas-
turbine engine: fuel-pump delivery pressure is function of
rpm, output being controlled to maintain set δp across
throttle valve for any set air-inlet condition; ancillaries
take care of transients and limitations. See proportional *,
flow disrupter Small hinged or retractable plate intended
to promote intentional stall.

**flowdown** The multi-stage process by which a set of
requirements are progressively subdivided into the
smallest indivisible hardware items. Essentially synony-
ous with Work breakdown structure.

**flow fence** Kevlar fabric shield surrounding top and
sides of ejection-seat occupant.

**flowmeter** Instrument which measures fluid (gas or
liquid) flow; numerous types based on venturi pressure
drop, speed of free-spinning turbine, pitot pressure and
many other principles; measure can be velocity at point,
near-average velocity or, with density input, mass flow.
See integrating *.

**flow rate** See rakes.

**flow regime** Particular type of fluid flow (see continuum *
free-molecule *, laminar *, slip *, turbulent *).

**fl oz** Fluid ounce.

**FLPFM** Foot-launched powered flying machine, eg,
Fluid ounce.* free-molecule *, laminar *, slip *, turbulent *.

**FLS** Future Launcher[s] Preparatory [or Preparation]

**FLRCM** Future long-range cruise missile (UK).

**FLR** Forward-looking radar.

**FLRE** Flare.

**FLS** Future Liaison Staff (MoD).

**FT, Flt** Flight (unit).

**FLTA** Forward-looking terrain-avoidance.

**flush air-data system**

**FLTCAL** Flight calibration.

**FLTCK** Flight check.

**FLT CON, Fit Ctrl** Flight control.

**FLTP** Future launcher technology programme (ESA,
1999, never implemented).

**Fit Pln** Flight plan.

**FLTR** Flightline tape-reader.

**FLTS** Flight Test Squadron (USAF).

**FltSatCom** Fleet satellite communication system; also
dubiously written all capitals (USN).

**FLTW** Flight watch outlet.

**FLUC** Fluttering.

**fluorics** See *fluidics*.

**fluid** Liquid or gas.

**fluid dynamics** Study of fluid motion.

**fluid element** Second or supporting element in fluid four.

**fluid four** Tactital formation in which second element is
loosely spread in both vertical and horizontal planes to
enhance manoeuvrability, look-out and mutual support.

**fluid gallon** See gallon.

**fluidic nozzle** Jet-engine nozzle in which fluidic control is
used to vary vectoring, profile and area.

**fluidics** Branch of technology akin to electronics but
using instead of electrons air or other fluid flowing at low
pressure through pipes, valves and gates for control of
external systems; one advantage is relaxed upper temper-
ature limit.

**fluidity** Reciprocal of viscosity.

**fluidized bed** Container of finely divided solid particles
supported in liquid-like state by upcurrent of air or other
gas.

**fluid mechanics** Study of static or moving fluids and
reactions on bodies (includes aerodynamics, aerostatics,
hydrodynamics, hydrostatics).

**fluid ounce** Non-SI unit of volume, UK δ = 1/160 Imp.
gal. = 28.4131 cc; US * δ = 1/160 US gal. = 23.6588 cc.

**fluid resistance** See drag.

**fluid seal** Normally refers to a labyrinth shaft seal in
which the peripheries of the sealing rings on the inner shaft
are slightly immersed in oil in a rotating outer casing. See
hydraulic seal.

**fluorescein** Proprietary chemical supplied as solid block
attached by lanyard to aircrew dinghy. When dropped
into sea stains surface fluorescent greenish yellow.

**fluorescence** Emission of photons, esp. visible light,
during absorption of radiation of different wavelength
from other source; photoluminescence (see *luminescence*,
phosphorescence, scintillation).

**fluorescent testing** Examination of item coated in
fluorescent ink by UV light, to reveal crack as a bright line.

**fluorine** Reactive yellow-green gas, used as liquid (BPt
–188°C) oxidant in rockets (ISP 410 with LH2) or in many
cryogenic compounds such as oxygen difluoride (OF2); +35
is radionuclide of half-life 110 min.

**fluorocarbons** Generally resemble hydrocarbons, but F
instead of H makes them more stable; many uses.

**fluoroscope** Instrument with fluorescent screen supplied
by processed signals from X-ray tube, used for immediate
indirect viewing inside metal or composite structures.

**fluoroscopy** X-ray TV.

**flush air-data system** One whose sensors do not protrude
beyond the skin of the aircraft.
flush antenna  
One conforming with external shape of vehicle.

flush deck  
Whole ship upper deck at same level.

flush intake  
Not protruding, orifice in skin of vehicle.

flush on warning  
Take off immediately radar evidence suggests hostile missile attack so that, when airfield is hit, aircraft are just out of dangerous radius of thermonuclear warhead.

flush rivet  
Head is flush with surface into which it is countersunk.

flush weld  
Plug or butt weld which leaves no weld material on surfaces.

fluted  
Skin stiffened by evenly spaced parallel semicircular channels. External * cannot be aligned with complex slipstream.

flutter  
High-frequency oscillation of structure under interaction of aerodynamic and aeroelastic forces; basic mechanism is that aerodynamic load causes deflection of structure in bending and/or twist, which itself increases imposed aerodynamic load, structure overshooting neutral position on each cycle to cause load in opposite direction. Distinguished by number of degrees of freedom (bending and torsion of wing, aileron and other components are considered separately), symmetry across aircraft centreline, and other variables. When heating involved subject becomes aerothermoelasticity (see classical *).

2 Radio beat distortion when receiving two signals of almost same frequency.

flutter model  
Flexible model with mass distribution, flexure and other features designed so that flutter occurs.

fluvial  
Adjective meaning that seaplane [widest meaning] is intended to operate from calm water only. Opposite = maritime.

flux  
1 Generally, quantity proportional to surface integral of normal (90°) field (eg, magnetic) intensity over given cross-section.

2 Volume, mass or number of fluid elements or particles passing in given time through unit area of cross-section; eg luminous *, measured in lumens (abb. lm).

3 Magnetic * can be thought of as number of lines of force passing through particular coil or other closed figure; symbol Φ, unit weber (Wb.)

4 Materials used in welding, brazing and soldering to clean mating surfaces, and/or form slag, which helps separate out oxides and impurities by flotation and exclude oxygen.

flux density  
1 Unit of magnetic ** is Wb/m², or tesla (T).

2 Neutron **, and particle physics generally, is particles per unit cross-section per second multiplied by velocity, ∆n/∆t = nv.

fluxgate  
Sensitive detector giving electrical signal proportional to intensity of external magnetic field acting along its axis, used as sensing element of most remote-indicating compasses; also called fluxvalve.

fluxgate compass  
Uses fluxgate to indicate, subject to corrections, direction of magnetic meridian.

fluxvalve  
See fluxgate.

FLW  
Forward-looking [i.e. predictive] windshear radar.

2 Follow[s].

flying position  
fly a desk  
Retirement from professional flying (e.g., senior officer).

fly-away cost  
Published retail price of GA aircraft, with specified avionics fit, ignoring spares, training or support.

fly-away disconnects  
Launch-vehicle umbilicals on rigid arms which swing clear under power.

flyback  
Controlled descent through atmosphere of returning aerospace-plane.

fly-back period  
That during which CRT spot returns from end of one line to start of next when in raster-scan mode.

fly-back time  
Time, usually ns or μs, for each fly-back period.

fly-back vehicle  
Space vehicle intended to be reusable.

flybar  
Flying by auditory reference.

fly before buy  
Philosophy of flight evaluation of new aircraft type, esp. by (military) (government) customer for combat aircraft.

fly-by  
Interplanetary mission in which TV and instrumented spacecraft passes close to target planet but does not impact or orbit it.

2 Slow flight past tower to verify aircraft configuration or possible damage.

fly-by-cable  
Mechanical links join cockpit to PFCUs.

fly-by-light  
Flight-control system with signalling by optical fibres.

fly-by-speech  
Flight-control system with input signalled by voice of pilot (various research programmes).

fly-by-wire  
Flight-control system with electric signallng.

flyco  
Abbreviation for Wing Commander, Flying, at an RAF station.

2 Position aboard aircraft carrier from which all aircraft launches and recoveries are controlled.

Flygtekniska Föreningen  
Society of Aeronautics (Sweden).

Flygtekniska Försökanstalten  
Aeronautical Research Institute (Sweden).

fly-in  
Informal gathering of private and club aircraft at particular airfield, usually with a relaxed programme of events and competitions.

fly blind  
Piloting without external cues.

fly boat  
Seaplane whose main body is a hull with planing bottom; US = boat seaplane.

fly cable  
Connects captive or kite balloon to winch.

fly club  
Civilian group formed to assist its members to fly light aircraft as owner, hirer, pupil or passenger. It need not itself own an aircraft, or an airfield. First UK was Midlands Aero Club, 3 September 1909.

fly controls  
See control system.

fly diameter  
Overall diameter of circular parachute canopy in normal operational descent.

Flying Farmers  
Association of over 400 airstrip owners [not necessarily farmers] (UK).

fly grading  
See grading.

fly machine  
Powered aerodyne; common pre-1914, today humorous or derogatory.

fly order book  
Set of rules governing the flying of aircraft owned by a club (UK usage), or by club members.

fly pay  
Extra emoluments payable to military aircrew when actively engaged in flying operations.

flying position  
Attitude of aircraft when lateral and longitudinal axes are level or in flight attitude; esp. when
flying qualities

a aircraft on ground is supported in this attitude. Note: flight attitude varies with airspeed.
flying qualities Loosely, stability and control as perceived by the pilot; documented in MIL-1797, previ-
ously MIL-F-8755C (US).
flying rigging Distributes loads into balloon from flying
cable.
flying roundup Event, usually annual, at which pas-
sengers, usually handicapped children, are given flights, often in vintage transports (US).
flying saucer Popular, descriptive, name of the most
common species of UFO.
flying shears Rotary system for cutting long web of sheet
metal or other material moving at high speed.
flying speed Loosely, minimum airspeed at which
aeroplane can maintain level flight (preferably, positive
climb) in specified configuration.
2 Another definition: speed reached on takeoff at which
pilot has full control [but only for climbing straight
ahead]. In modern terms V:
flying spot Rapidly moving spot of light, usually gener-
ated by CRT, used to scan surface containing visual
information.
flying stovepipe Ramjet (colloq.).
flying-tab control See servo tab, Flettner.
flying tail Use of whole horizontal tail as primary
control surface.
flying tested Aircraft or other vehicle used to carry new
engine or other device for purpose of flight testing.
flying the ball Loosely, flying IFR, from traditional
turn/dip indicator.
2 Correctly flown VFR carrier approach using mirror
sight.
flying the needle Navigating along airways by VOR.
flying time See flight time.
flying weight See flight weight (engine).
flying wing Aeroplane consisting almost solely of wing,
reflecting idealised concept of pure aerodynamic body
providing lift but virtually devoid of drag-producing
eccentricities.
flying wires Diagonal cables/wires placed under tension
in 1g flight and used to join lower anchor (low on fuselage
or within biplane cellule) to higher anchor further
outboard on wing; also known as lift wires.
fly-off Competitive in-flight demonstration of perfor-
mance and other qualities between two or more rival
aircraft built to same requirement to determine which will
be chosen for procurement.
2 Without hyphen, to take off from a ship, esp. by free
takeoff.
fly-over noise Noise made by aircraft over particular
point, usually near airport on inbound/outbound track,
chosen for noise measurements. Approach/taak noise.
flyover reference location A point chosen for measure-
ment of flyover noise.
fly space Simulated volume of sky, especially above a
terrain board.
FM Loosely, of flight management or modulated; instan-
taneous frequency of EM carrier wave is varied by
amount proportional to instantaneous frequency of
modulating (intelligence-carrying) signal, amplitude and
modulated power remaining constant.
2 Frequency measurement.
3 Fan marker.
FMQG

Fuel measurement and quantity-gauging; C adds computer, S System.

FMS 1 Flight-management system; T adds trainer.
  2 Field maintenance squadron (USAF).
  3 Frequency-multiplexed subcarrier.
  4 Foreign military sales (DoD).
  5 Federation of materials societies.
  6 Fuel-management system.
  7 Flexible manufacturing systems.
  8 Full-motion simulator.

FMSC Frequency Management Sub-Committee (NATO).

FMSP Flight-mode selector panel.

FMST Flight-management system trainer.

FMT Full-mission trainer.

FMTAG Foreign Military Training Affairs Group (US).

FMTI 1 Future missile-technology initiative (USA).
  2 Fixed/moving target indicator.

FMTIS Fleet [of aircraft] management and tracking system (Aero-C).

FMU 1 Flight-management unit.
  2 Fuel-metering, or management, unit.
  3 Flow [of air traffic] management unit.

FMV Försvarets Materielverk (Defence Materiel Administration, Sweden).

Fns Nozzle drag correction.

Fon 1 Net thrust.
  2 Receiver noise.

FNA 1 Fédération Nationale Aéronautique (parent body of flying clubs, F).
  2 Final approach.

FNBA Fédération Nationale Belge d’Aviation.

FNBDT Future narrow-band digital terminal.

FNC Favoured-nation clause.

FNCP Flight navigation control panel.

FNL 1 Flight Navigator’s Licence (UK).
  2 Fleet noise level.

FNLN Fine line, on radar indicating significant turbulence.

FNMOC Fleet Numerical Meteorology and Oceanography Center.

FOP Fusion point.


FNS 1 Strategic nuclear forces (F).
  2 Fortified Navier-Stokes algorithm.

FNT Front [GNS = frontogenesis = front forming; LYS = frontolysis = decaying]

FNY French Navy [Anglicised usage].

FO 1 Foreign object.

FOA 1 Field Operating Agency, unit of USAF distinct from major command.
  2 Follow-on attack (no precise definition).

FOB 1 Net thrust.

FOD 1 Försvarets Forskningsanstalt, Swedish defence research establishment (merged 2001 into FOI).
  2 Future offensive aircraft (C adds capability, S system).
  3 Future offensive air capability.
  4 Future offensive air capability.

FOAC 1 Flag Officer, Aircraft Carriers.
  2 Future offensive air capability.

FOAES Future Organic Airborne Early-Warning.

foam carpet Layer of foam put down on runway or other space by fire tenders to cushion impact of aircraft making wheels-up landing.

foamed plastics Foaming agent provides minute voids to create low-density material used for insulation (thermal, mechanical shock etc), or to increase structural rigidity; often foamed in place within structure.

foam monitor Turret-mounted foam gun on crash-fire vehicle.

foaming space Free vapour volume above fuel in tank.

foam strip Foam carpet.

FOARC Fractional Ownership Aviation Rulemaking Committee.

FOAS Future Offensive Air System [more recently, Support] (UK).

FOB 1 Forward operating base.
  2 Fuel on board (suggest undesirable usage, confusion with established non-aero acronym free on board).

FOBS Fractional-orbit bombardment system.

FOC 1 Foreign-object check.
  2 Full (or final) operational, or operating, capability.
  3 Flares/off/chauff.
  4 Faint-object camera.
  5 Fibre-optic control, or cable, or computer.
  6 Final operational clearance.
  7 Fuel/oil cooler.
  8 Flight-operational commonality, making possible mixed-fleet flying.

FOC 1 Foreign-object check.

FOC 1 Foreign-object check.

FOCA Federal Office of Civil Aviation (Swiss).

Focal lengths Distance from optical centre of lens or surface of mirror to principal focus.

focal plane That parallel to plane of lens or mirror and passing through focus.

focal point 1 See focuses.

Foci 2 Air Staff agency or individual designated as central source of information or guidance on specific programme or project requiring co-ordinated action by two or more Air Staff agencies (USAF).

Focus, FOCAS 1 Fibre-optic communications for aerospace systems (USAF).

FOC 2 Flight Officer Carriers and Amphibious Ships (RN).

FOC 3 Fractioned or fragmented operation.

FOC 4 First operational delivery.

FOC 5 Fractional ownership.

FOC 1 Fractional ownership.

FOC 2 First operational delivery.

FOC 3 First operational delivery.
Fodcom

Fodcom Flight Operations Department communication, issued as necessary (CAA).

FODCS Fibre-optic[es] digital control system.

FODMS Fibre-optic[es] data multiplex system.

FODD Duty of removing from taxiways and runways anything that might cause FOD.

FODS Flood/overheat detection system.

FODT Fibre-optic data transmission.

FOES Fibre-optic engine sensor.

FOFA Follow-on forces attack.

FOFC Flame-on/flare-out.

FOF3 Flag Officer 3rd Flotilla, responsible for all naval aviation (UK, RN).

FOG Fibre-optic[es] guidance.

FOG 1 Fibre-optic[es] gyro.

FOG-J Flight-operations group (RAEs).

fog Form of cloud in surface layers of atmosphere caused by suspended particles of condensed moisture or smoke, reducing visibility to less than 1 km. Advection * results from arrival of warm humid air over cold surface; radiation * from cooling of water vapour created by evaporation during day by cold ground on clear night; sea * by condensation of moisture in warm air over cold sea (essentially advection). See cabin *.

Foil Finding obscured ground targets using laser imaging of the target environment (USAF + industry).

FOG-M, Fog-M Fibre-optic[es], guided missile (USA).

Fog of war Notional idea invented to explain ‘own goals’ in recent conflicts (US).

FOHE Fuel/oil heat exchanger.

Föhnel, foehn Dry wind with strong downward component, warm for season, characteristic of mountainous regions.

FOI 1 Follow-on interceptor (USAF).

FOI 2 Totalförsvarets Forskningsinstitut [defence/aerospace research, Sweden].

FOL 1 Flight Operations Inspectorate (CAA).

FOM 1 Figure of merit.

FOMC Flag Officer Maritime Aviation (UK).

FOMA Flag Officer Maritime Aviation (UK).

FOMA Flag Officer Maritime Aviation (UK).

Fonda Future optical network distribution for aerospace (AgWestland).

Foot Telephone (FAA).

Foot fighters UFOs (US, 1946–60).

FOO 1 Follow-on observer (FAC2).

FOO 2 Area covered by airline route network [generally relevant to hub/spoke and similar regional carriers].

FOOS Fail-operational, fail-operational, fail-safe.

Foot Non-SI unit of length, = 0.3048 m by definition.

Foot-candle Non-SI unit of luminance = 1 lm/sq ft = 10.76 lux.

Foot-launched See lambert.

Foot-launcher Micro or powered parachute strapped to pilot’s back.

Foot motor Foot-operated hydraulic motor used to energise wheel brakes.

Foot-pound Unit of work or energy, = 1.35582 J.

Foot-poundal Unit of work or energy, = 0.042140 J.

Foot-pound-second system Non-SI system of units still used in US; also called Imperial.

Footprint 1 Area around airport enclosed by selected contour for LPN, EPNL, NNI or other noise measure.

Footprint 2 Possible recovery area for spacecraft plotted from re-entry point. See lambert.

Foot-pound-second system Non-SI system of units still used in US; also called Imperial.

Footing Recess in outer skin of [usually combat] aircraft, often covered by spring-loaded flap, to enable crew to board without ladder.

FOP 1 Forward operating paid.

Fop Foliage penetration, or penetrating (SAR, TUT).

F😉 procession Serial production immediately subsequent to completion of development or previous production batch.

Folta Forward operating location training area.

Foracs

Foracs Field of regard.

Forafs Fired outside parameters.

Fopen Foliage penetration, or penetrating (SAR, TUT).

FOQA Fleet [airline] or flight-operations, or operational, quality assurance (FAA).

FOQH Forecast regional QNH.

FOR 1 Fail-operative redundant.

Fost Field of regard.

Foracs Fleet operational readiness and calibration system.
For-cap

For-cap Force CAP, combat air patrol maintained over-head a task force (USN).


force SI unit is Newton (N), which gives mass of 1 kg acceleration of 1 m s$^{-2}$ = 0.101968 kgf, 0.22482 lbf, 7.230658 pdl, 3.597 ozf, 10$^5$ dynes; reciprocals include 1 lbf = 4.44822 N, 1 kgf = 9.80665 N.

force balance transducer Output from sensing member is amplified and fed back to element which causes force-summing member to return to rest position.

force coefficients Aerodynamic forces, eg lift and drag, divided by dynamic pressure ½ρV$^2$.

force combat air patrol Patrol of fighters maintained to protect task force against enemy aircraft.

forced convection Process by which heat is transported by mechanical movement of air (cooling systems, meteorology).

force diagram Vector presentation of force(s) acting on object, length and direction of each vector representing magnitude and direction of one force. If diagram forms closed polygon, forces are in equilibrium. If diagram fails to close, gap indicates unbalanced force. Hence, force polygon.

forced landing Made when aircraft can no longer be kept airborne, for whatever reason.

forced oscillation One in which response is imposed by excitation; if excitation is periodic and continuing, oscillation is steady-state.

forced vibration See preceding entry.

force fit Mating parts in which male dimension exceeds female (see fit).

force gradient Relationship between pilot input force and aircraft response, e.g., degrees roll per second per pound of lateral force on stick.

force majeure Literally, no choice; reason for crossing a frontier at other than a designated point of entry (now archaic).

force rendezvous Navigational checkpoint at which formation of aircraft or ships joins main force.

force-sensing controller Pilot’s primary flight-control input (stick/pedals) which senses applied force without noticeable movement.

force structure Currently effective operational inventory (US).

force vector Line in force diagram representing force magnitude, direction and point of application.

Fords Fleet [airline] operational reliability data system.

fore-and-aft level Gravity-controlled indicator of pitch attitude (arch.) Usually a glass tube in form of triangle part-filled with coloured liquid.

forebody The front portion of a body in atmospheric flight; in *strake can mean front half of fuselage.

2 Planing bottom of float or hull upstream of step.

forebody strake Low-aspect-ratio extensions of wing at root along sides of fuselage; like LERX and glove [which taper more sharply] they generate powerful vortices at high AOA to improve handling in extreme positive-acceleration manoeuvres.

forecast Statement of expected meteorological conditions at given place during specified period; air-navigation includes wind velocity at selected heights, cloud, visibility, precipitation, ice formation, and barometric pressures at airfields and sea level.

form, fit and function

foreflap Leading member of double or triple-slotted flap.

foreign air carrier One registered in foreign country, except in case of multinational carriers (eg SAS or Air Afrique) in collaborating countries.

foreign military sales Portion of United States military assistance authorised by Foreign Assistance Act (1961 as amended); differs from Military Assistance Program Grant Aid in that it is purchased by recipient country.

foreplane Horizontal aerofoil mounted on nose or forward fuselage to improve take-off and low-speed handling, esp. of delta aircraft where wing lift is lost because of upward movement of elevons. * Can be fixed or retractable, fixed-incidence or rotating, and have slats, flaps or elevators.

forerudder Rudder at front of aircraft.

Forester F open [foliage-penetrating] reconnaissance, surveillance, tracking and engagement radar (USA).

forging Shaping metal softened by heating by slow, rapid or repeated blows, with or without a shaped female die or male/female dies.

forked rod Piston engine connecting rod having forked bearing on crankshaft, fitting over big end of matching blade-type rod.

forklift capacity Of cargo item, provided with an integral pallet, timeways or forklift entries.

FORM First-order reliability method.

formability Unquantified measure of ease with which material can be shaped through plastic deformation.

Fomac Fibre-optic medium-access controller.

format 1 Size and shape of map, chart or photo negative or print.

2 One of several selectable types of presentation for instrument (eg ADI or HSI) or display, such as moving map, radar map, alphanumerics, attitude indication, instrument (eg ADI or HSI) or display, such as moving map, radar map, alphanumerics, attitude indication, flight planning or en route.

Fortran matrix abstraction technique.

formation Ordered arrangement of two or more vehicles proceeding together, especially in a geometric pattern.

formation flight More than one aircraft which, by prior arrangement between pilots, navigate and report as single aircraft; FAA formation limits are no more than one mile laterally or longitudinally and within 100 ft vertically from leader.

formation-flight control system Developed at UCLA to perfect autonomous formation flight.

formation light(s) Fitted to aircraft to enable other aircraft to formate on it at night.

formatted Electronically processed to be compatible with particular format (2).

form block Block or die usually made of wood, zinc, steel or aluminium, over or into which sheet metal is formed.

form die One which performs bending and sometimes light drawing operations upon flat blank.

form drag Pressure drag minus induced drag.

former Light secondary structure added to maintain or improve external shape; eg around basic box fuselage to give curved cross-section, or extra false wing ribs ahead of front spar to maintain profile where curvature is sharp.

form factor Physical overall dimensions of a body, especially one carried externally, taken into account not so much aerodynamically as to avoid hardware conflicts.

form, fit and function F³, essentially self-explanatory, the
forming

three baseline factors determining whether a new hardware item can immediately replace its predecessor in a functioning system.

forward compatibility The degree to which a device or system will meet future legislation or be compatible with future development.

forward controller Member of tactical air control party who, from forward ground or airborne position, controls aircraft engaged in close air support of ground troops (DoD).

forward control post Mobile tactical air control radar used to extend coverage and control in forward combat area.

forward compatibility The degree to which a device or system will meet future legislation or be compatible with future development.

forward lock Prevents selection of reverser except after landing: disabled by oleo deflection or, if possible, bogie-beam tilt.

forward oblique Oblique photograph of terrain directly ahead.

forward operating base Airfield used indefinitely to support tactical operations without establishing full support facilities.

forward operating location Forward operating base.

forward path In a functioning system, the path from demand to output.

forward scatter Scattering of radiant energy into hemispherical space bounded by plane normal to incident radiation and lying on side toward which radiation was advancing; opposite of backward scatter.

forward slip See sideslip.

forward speed Component of speed in horizontal plane.

forward stagnation point Point on leading edge of body in airstream which marks demarcation for airflow on either side: boundary-layer air is stationary.

Fourier series

forward supply point En route or turnaround station at which selected aircraft spares are prepositioned for support of assigned mission(s).

forward sweep Opposite of sweepback, wing tips being further forward than roots.

forward tilt Of helicopter rotor, forward angular deviation of locus of centroid of blade sections from plane of rotation.

forward tilt wing See slew-wing aeroplane.

FOS 1 Fail-operational, fail-safe.

2 Faint-object spectrograph.

3 Fibre-optics sensor (or sensing, or system).

4 Family of systems.

5 Fleet operations standards.

6 Forward observer system.

FOSA Fondation des Oeuvres Sociales de l‘Air (F).

FOSC Fibre-optic satellite communications.

FOSI 1 Formatting output specifications instance.

2 Family of systems integration, or integrator (AFRL).

FOSON Follow-on stand-off weapon.

FOSS, Foss Fibre-optic sensor, or sensing, systems.

FOST Flag Officer, Sea Training.

foster parent Company contracted to provide service support, possibly extending to major modification and update, for an imported type of military aircraft.

FOT 1 Frequency of optimum transmission.

2 Fibre-optic twister for making inverted image upright.

3 Flight-operations Telex.

4 Follow-on operational test (USAF).

5 Future-oriented technologies.

FOT&E Follow-on test and evaluation (continues after entry to service, USAF).

FOT&FOE Inserts final operational.

FOSS Fibre-optic towed decoy.

FOTM Flight operations training manager.

fouling Unwanted deposition on points of piston engine spark plug.

fount Range of characters for electronic display.

fountain Vertical rising column of hot air, usually plus entrained debris, formed by jets of VTO jet aircraft hovering at low level; on impact with fuselage can exert undesired suckdown effect; alternatively, can be made to increase lift.

fountain sheet Vertically rising wall between adjacent jets in hovering VTO.

four-bank eight Flight training manoeuvre similar to figure of eight except that outer portions of loops are not circular but consist of two 45° turns linked by short, straight flightpath.

four-course beacon See radio range.

4-D 3-D plus time, usually latitude, longitude, altitude and time.

4-D R-nav Terminal guidance sufficiently accurate to put arrival’s wheels on runway within guaranteed window of ± 10 s.

four greens Gear locked down and landing flap setting.

Fourier expansion Expansion of waveform or other oscillation in terms of fundamental and harmonics.

Fourier integral Representation of (x) for all values of x in terms of infinite integrals.

Fourier series Representation of function f(x) in interval (– L, L) by series consisting of sines and cosines with...
four-wing configuration

four-wing configuration See cruciform wing.

four-way cross Aircraft equipped with such an engine.

four-wing configuration See cruciform wing.

FOC Field of view; EA adds eye angle relative to head.

FOVE Fleet operations versatile environment [cockpit interface].

FOW I Family of weapons.

FP A Field-programmable gate array.

FPSA Freezing-point depressant.

FPDA Five-Power[es] Defence Agreement, or Arrangements [which see].

FPDS Feasibility pre-definition study.

FPDZ Free-fall parachute drop zone; A adds activity (CAA, UK).

FPF Fédération des Pilotes Européennes (federation of European women pilots).

FPFPM Floor proximity emergency-escape-path marking.

FPFA Field-programmable gate array.

FPD Force per g.

FPG \* Field-programmable gate array.

Flight path.

flight path.

Flight-plan advisory system.

flight path.

Flight-plan processing system.

flight path.

Flight-profile advisory system.

flight path.

Flight-profile comparator.

Flight-profile control coupling.

Flight-profile control system, or (F-15 S/MTD) set.

Flight protection command and control.

Flight planning.

Flight-planning document.

flight path.

flight path.

Flight-path angle.

flight path.

Flight path.

flight path.

flight path.

flight path.

flight path.

flight path.

Flight phase related mode.

flight path.

flight path.

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flight path.
FP70

FP70  Low-expansion firefighting foam, hydrolized protein plus perfluorocarbon surfactant (Angus).
FPSP  Flight-progress-strip printer.  
FPSS  Foot-pound-second Rankine, traditional British system of engineering units.  
FP strip  Flight progress.  
FPTR  Forward propagation by tropospheric scatter.  
FPU  Fin processor unit.  
FPV  Flight-path vector.  
FQGS  Fuel-quantity gauging system.  
FQHE  Fractional quantum Hall effect.  
FQI  Fuel-quantity indicator, or indication.  
FQIS  FQI switch or system.  
FQMS  Fuel-quantity management system.  
FQP  Flow quality probe.  
FQPSK  Fisher-patented phase-shift keying.  
FQPU  Fuel-quantity processor, or processing, unit.  
FR 1  Function reliability.  
F/R 2  Function reliability.  
FRA 3  First-run attack.  
FRA 4  Flight-readiness acceptance test.  
FRA 5  First-run attack.  
FRA 6  Fuel-risk aversion.  
FRC 7  Flight-readiness acceptance test.  
FRCI 8  Flight-rules computer [air-launched missiles].  
FRCII 9  Flight-rules computer [air-launched missiles].  
FRCI 10  Flexible reusable carbon insulation.  
FRCII 11  Flexible reusable carbon insulation.  
FRCI 12  Field-replaceable connector system.  
FRCII 13  Field-replaceable connector system.  
FRA 14  Flight-readiness acceptance test.  
FRA 15  First-run attack.  
FRA 16  Fuel-risk aversion.  
FRA 17  Flight-readiness acceptance test.  
FRA 18  Flight-readiness acceptance test.  
FRA 19  First-run attack.  
FRA 20  Fuel-risk aversion.  
FRA 21  Flight-readiness acceptance test.  
FRA 22  Flight-readiness acceptance test.  
FRA 23  First-run attack.  
FRA 24  Fuel-risk aversion.  
FRA 25  Flight-readiness acceptance test.  
FRA 26  Flight-readiness acceptance test.  
FRA 27  First-run attack.  
FRA 28  Fuel-risk aversion.  
FRA 29  Flight-readiness acceptance test.  
FRA 30  Flight-readiness acceptance test.  
FRA 31  First-run attack.  
FRA 32  Fuel-risk aversion.  
FRA 33  Flight-readiness acceptance test.  
FRA 34  Flight-readiness acceptance test.  
FRA 35  First-run attack.  
FRA 36  Fuel-risk aversion.  
FRA 37  Flight-readiness acceptance test.  
FRA 38  Flight-readiness acceptance test.  
FRA 39  First-run attack.  
FRA 40  Fuel-risk aversion.  
FRA 41  Flight-readiness acceptance test.  
FRA 42  Flight-readiness acceptance test.  
FRA 43  First-run attack.  
FRA 44  Fuel-risk aversion.  
FRA 45  Flight-readiness acceptance test.  
FRA 46  Flight-readiness acceptance test.  
FRA 47  First-run attack.  
FRA 48  Fuel-risk aversion.  
FRA 49  Flight-readiness acceptance test.  
FRA 50  Flight-readiness acceptance test.  
FRA 51  First-run attack.  
FRA 52  Fuel-risk aversion.  
FRA 53  Flight-readiness acceptance test.  
FRA 54  Flight-readiness acceptance test.  
FRA 55  First-run attack.  
FRA 56  Fuel-risk aversion.  
FRA 57  Flight-readiness acceptance test.  
FRA 58  Flight-readiness acceptance test.  
FRA 59  First-run attack.  
FRA 60  Fuel-risk aversion.  
FRA 61  Flight-readiness acceptance test.  
FRA 62  Flight-readiness acceptance test.  
FRA 63  First-run attack.  
FRA 64  Fuel-risk aversion.
free-fall(ing) bomb To deploy parachute at pre-set altitude.

Worn by parachutist in free-fall jump

water could enter.

the loaded waterline to the lowest opening through which

freeboard surface of envelope.

free atmosphere That portion of Earth’s atmosphere, above planetary boundary layer, in which effect of Earth’s surface friction on air motion is negligible, and in which air is usually treated (dynamically) as ideal fluid. Base usually taken as geostrophic wind level.

free balloon One floating untethered.

free-balloon concentration ring Ring to which are attached ropes suspending basket and to which net is secured; also known as load ring.

free-balloon net Distributes basket load over upper surface of envelope.

freeboard In a marine aircraft, the vertical distance from the loaded waterline to the lowest opening through which water could enter.

free-body principle Stress-analysis procedure that involves isolating structure, considering it to be held in equilibrium by loads acting upon it.

free-call Change frequency [non-mandatory ATC advisory].

free canopy Cockpit canopy that is non-jettisonable.

freedoms Basic rights for the air carriers [airlines] of all nations, negotiated between governments:

1 To fly across another’s territory, without landing.
2 To make technical [non-traffic] stop, landing at another’s territory to refuel or for any other non-traffic reason.
3 Right to set down, to bring passengers or goods to another country.
4 Right to pick up, to bring passengers or goods from another country.
5 Right to fly to a foreign state, pick up traffic and convey it to third state. In US often called Beyond rights.
6 Right to pick up traffic from a foreign state, convey it to a third and return to one’s own.
7 Right to carry traffic between two foreign states without calling at one’s home territory.

free drop Dropping packaged equipment or supplies without parachute.

free electron Not bound to an atom.

free fall Fall of body without guidance, thrust or braking device.

2 Free motion along Keplerian trajectory, in which force of gravity is counterbalanced by force of inertia.
3 Parachute jump in which parachute is manually actuated at discretion of parachutist, or automatically at pre-set altitude.
4 Acceleration g under standard conditions, \( g = 9.80665 \text{ m s}^{-2} \).

free-fall altimeter Worn by parachutist in free-fall jump to deploy parachute at pre-set altitude.

free-fall(ing) bomb Bomb without guidance.
free streamline

free streamline One passing well away from moving body. Streamline separating fluid in motion from fluid at rest.

free-stream Mach number Mach number of body measured in free stream, unaccelerated by body’s presence.

free-stream velocity Usually means difference between body’s velocity and undisturbed air, symbol V∞.

freestyle Aerobatic routine selected by pilot, not preset. Similarly * skydiving, not following a preset sequence.

free takeoff From aircraft carrier, not using catapult.

free turbine One that drives output shaft to propeller or helicopter rotors, and is not connected to compressor.

free vortex compressor Axial compressor designed to impart tangential velocities inversely proportional to radius from axis.

free vortex flow Persisting in fluid remote from source or solid surface, eg tornado.

freewheel Sprag clutch or other device which permits helicopter rotor system to continue to rotate even if input shaft from main gearbox is arrested.

freewing Shaft from main gearbox is arrested.

freeswinging Wing freely able to rotate about spanwise axis, thus having incidence determined by relative wind while AOA remains constant [the reverse of conventional aeroplane].

freeze 1 To arrest dynamic operations, eg in simulator training.

  2 Radar mode which, once commanded, permits one more scan; emissions then cease and display remains active but frozen until * button is pushed a second time.

  3 See freezing.

freeze-out Method of controlling humidity by condensing water vapour, and possibly carbon dioxide, over cold surface.

freezing 1 Stage in design when all major features are irrevocably settled, thus enabling detail design to start.

  2 Manually arresting input to display, leaving static (prior) situation for study.

  3 Sudden locking of flight-control system, preventing movement.

  4 Sudden onset of panic causing pilot [usually pupil] to ‘lock solid’ on flight controls, possibly with abnormal strength.

free zone Customs-free area.

freight Cargo, including mail and unaccompanied baggage but excluding express.

freight consolidating Process of receiving shipments of less than carload/truckload size and assembling them into carload/truckload lots for onward movement to ultimate consignee or break-bulk point.

freight container See container.

freight doors Designed to take freight, vehicles or containers.

French landing With plenty of power on.

Frensor freezing-point sensor.

Freon Trade name for family of halogenated hydrocarbons containing one or more fluorine atoms, including CFCs, widely used as refrigerant medium (eg in vapour-cycle air conditioning), as fire extinguishing and as aerosol propellant.

freq, FREQ Frequency.

frequency 7 Reciprocal of primitive period of time-periodic function, symbol f, units (SI) Hz, (fps units) cycles per second.

frequency response 2 Number of services operated by airline per day or per week over particular route.

frequency agility The ability to generate an output whose frequency is variable. This is a basic ECCM technique. In the case of radars the magnetron or other waveform generator can be tuned to give a different frequency on each scan. There are many other FA methods for communications and other emissions. The objective is invariably to prevent hostile jamming.

frequency band Continuous range of frequencies extending between two limiting values; EM bands are listed in Appendix 2.

frequency bias Constant frequency added to signal to prevent its frequency falling to zero.

frequency channel 1 Band of frequencies which must be handled by carrier system to transmit specific quantity of information.

  2 Band of frequencies within which station must maintain modulated carrier frequency to prevent interference with stations on adjacent channels.

  3 Any telecommunications circuit over which telephone, telegraph or other signals may be sent.

frequency departure Variation of carrier frequency or centre frequency from assigned value.

frequency deviation 1 Maximum difference between IF (1) of FM wave and frequency of carrier.

  2 In CW or AM transmission, variation of carrier frequency from assigned value.

frequency distortion Produced by unequal amplification of signals or reproduction of sounds of different frequency; usual criterion for high-fidelity reproduction is level amplification over 20-15,000 Hz.

frequency division multiplex Telecommunications allowing two or more signals to travel on one network simultaneously by modulating separate subcarriers, suitably spaced in frequency to prevent interference.

frequency drift Slow change in frequency of oscillator or transmitter with time.

frequency equation Relates phase speed to wavelength and to physical parameters of system in linear oscillation; also known as dispersion equation.

frequency hopping Unpredictable continual and rapid changes of frequency of radar or other military electronics to defeat hostile ECM.

frequency modulated radar One in which range is measured by interference beat frequencies between transmitted and received FM waves.

frequency modulation, FM Instantaneous frequency of modulated wave differs from carrier by amount proportional to instantaneous value of modulating wave. Combination of phase and frequency modulation commonly referred to as FM.

frequency monitor Stabilized receiver giving audible or visual indication of any departure of transmitter from assigned frequency.

frequency pairing Association of each VOR frequency with a specific DME channel to reduce workload and errors.

frequency parameter Ratio of airspeed to product of frequency of oscillation and representative length of oscillating system.

frequency response 1 Portion of EM spectrum sensed within specified limits of error.

  2 Response as function of excitation frequency.
friction wake

friction wake Pattern of radar-antenna movement formed by successive beams having different azimuth and frequency.

friction-selective Response only to narrow frequency band.

friction-selective surface Large family of frequency filters made up of band-pass or band-stop designs, eg loaded slots of various geometries, or doubly periodic arrays of metal elements or apertures in a conductive frame creating a plane-wave transmission with properties which are frequency-dependent. Fighter radomes are becoming treated with, on the outside [fragile] because internal * could be destroyed by lightning strike.

friction shift-keying System of telegraph signalling in which keyed signal imposes small frequency shift on carrier; frequency changes of received signal are converted to amplitude changes.

friction swing Peak difference between maximum and minimum frequencies of FM signal.

friction tolerance Extent to which carrier (or centre of emission bandwidth) is permitted to depart from authorized frequency because of instability.

friction-wild Electric power system whose frequency is not stabilized but varies with rotational speed of generators.

frequent flyer Fare-paying passenger rewarded for being good customer. [Varies with carrier].

FRES Future rapid-effects system.

Frescan Frequency scanning.

Fresnel lens Form of echelon lens for generating parallel beam [familiarly used in lighthouses].

Fresnel mirror Two planar mirrors joined at one edge, angle between them being almost 180°, for generating interference fringes.

Fresnel zone Any spatial surface between transmitter and receiver, or radar and target, over which increase in distance over straightline path is equal to integer multiple of half wavelength. Loosely, the antenna near field.

Frespid Frequency response identification (software).

FRET, Fret First round effect[s] on target.

fretting Rubbing together of solid surfaces, esp. slight movement but high contact pressure.

FRF 1 Frequency-response function.

FRG Full-range flow control.

FRFI Fuel-related fare increase.

FRGN Foreign.

FRH Flap-retraction height.

friction Force generated between solids, liquids or gases opposing relative motion.

friction coefficient Friction (static, on point of relative motion, or dynamic) divided by perpendicular load pressing surfaces together.

friction horsepower Indicated horsepower minus brake horsepower.

friction layer Planetary boundary layer.

friction lock Device in which friction is used to prevent unwanted movement; eg of throttle levers. Usually adjustable up to a positive lock.

friction range For a given longitudinal trim setting, the range of airspeeds that can be flown stick-free due to FCS friction.

friction wake That downstream of streamlined non-lifting body.

frontogenesis

frontogenesis

friction welding Welding by rotating two parts together under load until surfaces are on point of melting and then forcing together to squeeze out joint material, simultaneously arresting rotation.

friendly Functional requirement identification development methodology (Euret).

friendly Not hostile, contact positively identified as such (DoD).

FRG Freighted (or integrating) gyro.

Friso aileron Aileron having inset hinges and bevelled along upper leading edge; when lowered forms continuation of wing upper surface but when raised nose protrudes below wing, increasing drag and equalising aileron drag in banked turn.

FRL 1 Fuselage reference line.

2 Flyover reference location.

FRM 1 Failure-related mode.


i Flammability-reduction means [tank explosion].

FRMALS Fédération Royale Marocaine de l’Aviation Légère et Sportive [Rabat Chellah] (Morocco).

FRMG Forming (weather report).

FRMN Formation (weather report).

FRMR Frame reject[ion].

FRNS Fatigue risk management system.

FRN Federal Radionavigation Plan, to phase out non-satellite navaisds from 2010 (US DoT).

FRNG Firing.

FRO Failure requiring overhaul.

FROB Failure Review Oversight Board.

FROD Functionally related observable differences.

FROG Free rocket over ground.

frog Free-fall sport-parachuting position with body horizontal face-down, arms stretched parallel horizontal and lower legs vertical.

front 1 Boundary at Earth’s surface between two contrasting air masses; usually associated with belt of cloud and precipitation, and more or less sharp change in wind (see cold *, occluded *, stationary *, warm *).

2 Occupant of front cockpit of tandem-seat aircraft, especially if aircraft commander (colloq., usually US/NATO).

frontal area Projected cross-section area of body viewed from front.

frontal attack Air intercept which terminates with head-on crossing angle greater than 135° (DoD).

frontal weather To be expected in front; clouds, rain, temperature variation and other phenomena.

front casing Where this term is used in connection with a turbofan engine, it means that position of the fan case actually surrounding the fan, designed to survive FBO.

front course sector That situated on same side of localizer as runway.

front crew This usually means pilots.

front end Various meanings, including (1) system location (actual geometry immaterial) where EDP program is developed, and editing, compiling and peripheral access take place. (2) Start of major design process, long before appearance of hardware.

front enders Flight crew members, esp. in military transport (colloq.).

front ignition Solid rocket motor with igniter at end of filling or grain furthest from nozzle.

frontogenesis Process which produces discontinuity in
frontolysis

atmosphere or increases intensity of existing front, generally caused by horizontal convergence of air currents possessing widely different properties.

frontolysis Process which tends to weaken or destroy a front.

front stagnation point See forward stagnation point.

Fropa Frontal passage.

Frost Fast read-out optical storage technology.

drost Small drops of dew which freeze upon contact with object colder than 0°C such as aircraft passing from cold air into warmer humid air. Glazed * (rain ice) is layer of smooth ice formed by rain falling on object at below 0°C. Hoar * is white semi-crystalline coating.

frost point Temperature of air at which frost forms on solid surface at same temperature.

Froude efficiency Basic element of propulsive efficiency;

\[ \frac{V}{U} \]

where U is TAS and V is velocity of propulsive jet or propeller slipstream relative to the aircraft.

Froude number Non-dimensional ratio of inertial force to force of gravity for fluid flow; reciprocal of Reech number; \( N_{fr} = \frac{V}{\sqrt{U}} \), where V is characteristic velocity and 1 characteristic length (may be given as square root of this ratio).

frozen No further design changes permitted.

frozen smoke Acoustic/thermal insulation [colloq. airogel said to be lowest-density semi-rigid material, able to support \( 10^3 \times \) own mass].

frozen stick Terrifying situation in which pilot cannot overcome stick force needed to recover from steep dive.

FRP 1 Fibre-reinforced plastic(s) or plywood.

2 Flight-refuelling probe.

3 Fuselage replacement programme.

4 Federal radio navigational plan.

5 Fares and Rates Panel.

6 Full-rate production.

7 Fleet response plan.

FRPA Fixed reception pattern antenna.

FRPC Federal Research and Production Centre, [English rendition] (R).

FRQ Frequent, frequency.

FRR Flight-readiness review.

2 Final readiness review.

FRS 1 Fan rotation speed (Nf).

2 Fighter, reconnaissance, strike (role prefix, UK).

3 Fleet Replacement Squadron (USN, USMC).

4 Flying Refresher School (RAF).

5 Field Repair Squadron (RAF).

6 Flammability reduction system.

7 Flight reconstruction system (FOQA).

FRSI Flexible reusable silica, or surface, insulation.

FRST Frost.

FROTO Flight radio-telephone operator.

FRTOS Flight radio temporary operating license.

2 Flight R/T operator licence (UK).

FRTV Forward repair and test vehicle.

FRU 1 Forward Repair Unit (RAF).

2 Fleet Requirements Unit (RN).

fruiting SSR responses of aircraft to interrogation by other stations or responses of different aircraft to interrogation by other stations, in either case not synchronized with desired response by aircraft interrogated by own station; hence defruiting usually simple.

FSDG

fruit salad Impressive rows of medal ribbons (UK, colloq.).

FRUSA Flexible rolled-up solar array.

FtW Friction welding.

FRWD Fast-reaction weapons demonstration.

FRZ 1 Freeze (information or display).

2 Flight Restricted Zone [e.g. within 15 n.m. of Washington Reagan] (FAA).

FS 1 Fuselage station.

2 Frame station.

3 Fail-safe.

4 Fighter Squadron.

5 Front spar [often F.S.].

6 Flight simulator.

7 Feasibility study.

8 Full-supercarge gear.

9 Factor[s] of safety.

10 French standard [approach lighting].

Fs Fractostratus.

f s Signal frequency.

2 Shear stress [up to near u.t.s.].

f s Not acceptable for ft/s.

FDA 1 Final squat angle.

2 Force-structure aircraft (US).

3 Fuel-savings advisory; S adds system and see FSA/CAS.

4 Frequency-spectrum availability.

5 Future strike aircraft (USAF).

6 Flight spoiler assembly.

FSA Flight simulator for advanced aircraft (NASA).

FSA/CAS FSA (3) cockpit avionics system.

FSAF Future surface-to-air family (title often in French) (Int.).

FSAGA First sortie after ground alert.

FSAS 1 Fuel-savings advisory system.

2 Flight-service automation system.

FSAT 1 Full-scale aerial target.

2 Federal service of air transport (R).

FSB 1 Fan-stream burning.

2 Fasten seat-belts.

3 Flight Standardization Board (US).

4 Federal security service (R).

FSC 1 Force-sensing controller.

2 Fuel-saving[s] computer.

3 Forward shaped-charge warhead.

4 Flight Safety Committee (UK).

5 Flight-safety critical.

FSCC Flap/slat control computer[s].

FCSC Fire-support co-ordinating line.

FSCM Federal supplier [or supply] code of manufacturer, or for manufacturers (US).

FSAS Fasten seat-belts.

FSB 1 Fan-stream burning.

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4 Flight Safety Committee (UK).

5 Flight-safety critical.

FSCC Flap/slat control computer[s].
FSDO

FSDO Flight Standards District Office (FAA).
FSDFS Flight service data-processing system (FAA).
FSE 1 Fleet-supportability evaluation.
2 Field-service engineer, or evaluation.
FSED Full-scale engineering development.
FSEMCE Flight Simulator Engineering and Maintenance Conference [Ann Arbor, MD21401] (US).
FSEO Fire Support Element Officer (MAOC).
FSEU Flapset electronics unit.
FSF 1 Flight Safety Foundation ['provides leadership to over 600 member organisations in 75 countries'; main office, Alexandria, VA22314-1756] (US, Int.).
2 Svenska Flygsportförbundet (Sweden).
3 Full-scale fatigue; S adds specimen, T test.
4 Forward Supply Flight (RAF).
FSG 1 Flight Strip Printing Module.
2 Fans stakeholder group.
3 Flight Simulation Group (RAeS, C adds Committee).
FSI Field service instruction.
FSII Fuel system icing inhibitor.
F-Sims, FSIMS Flight-safety information-management system.
FSK Frequency-shift keying.
FSL 1 Full-stop landing, aircraft brought to halt.
2 Forecast Systems Laboratory (NOAA).
3 Fast serial link.
FSM Flight schedule monitor.
FSME Flight structural-mode excitation.
FSN 1 Factory serial number.
2 Federal stock number.
3 Field-service notice.
4 French-speaking nations.
FSO 1 Free-space optical (USAF).
2 Front-sector optronics.
FSOL Flight-safety occurrence list.
FSOV Fuel shut-off valve.
FSP 1 Flight [progress] strip printer.
2 Flexible sustainment program.
3 Fragment-simulator projectile (test of armour).
4 Function signalling panel.
5 Fire-stabilized payload.
6 Flight-screening program (USAF).
FSF Military production authority (Iraq).
Fspill Inlet spillage drag correction.
FSPM Flight-strip printing module.
FSPUPT Flight-screening program and undergraduate pilot training (USAF).
FSQP Feasible sequential quadratic programming.
FSR 1 Frequency set-on receive; S adds system.
2 Field-service representative.
3 Flight safety reporting.
4 Further special refit.
FSRI Florida Space Research Institute (Federal funding, US).
FRS 1 Frequency-selective receiver system.
2 Flight-safety recording system.
FSS 1 Flight Service[s] Station (FAA).
2 Flight Standards Service (FAA).
3 Flying Selection, or Support, Squadron (RAF).
4 Frequency-selective surface[s].
5 Fixed satellite service[s], or fixed-service satellite.
6 Micro class, single-seat.
7 Fire-suppression system.
8 Flow-separation suppression; E adds element.
9 Flight-support system.
10 Flight Superintendent, Simulators.
FSSP Forward-scattering spectrometer probe.
FSSR Federal Safety Standard Regulations.
FST 1 Flight-simulation test.
2 Fuel-spike test.
3 Full-scale tunnel.
4 Fuel-system trainer (F-22).
FSTA Future strategic tanker aircraft.
FSTP Full-spectrum threat protection.
FSU 1 Flight sensor unit.
2 File server unit.
Fw Ultimate shear strength.
FSVLF Fédération Suisse du Vol Libre (Switzerland).
FSTV Federal service of air transport; equivalent to FAA (R).
FSTW 1 Forward-swept wing.
2 Friction-stir welding.
FT 1 Fault-tolerant.
2 Fast-track.
3 Fourier transform.
4 Functional test.
5 Terminal forecast.
6 False target; G adds generator, I imagery, L lock-on, R rejection.
7 Feet [concluding].
F-T Flight-time (diagram).
ft Foot, feet.
ft(0) Function of time.
FTA 1 Fatigue-test article.
2 Fast tactical attack.
3 Fire-track area.
4 Fault-tree analysis.
F-TAAS Fast-time acoustic-analysis system.
FT-ADIR Fault-tolerant air-data inertial reference; $ adds system, U unit.
FTAE First-time-around echo.
F-TAJ Frequency/time ambiguity jamming.
FTB Flying, or flight, testbed.
FTC, ftc 1 Fast time constant.
ftc Foot-candle [contrary to SI].
FTCA Future Tactical Combat Aircraft.
FTCCP Flight-training candidates checks program (US Dept. of Justice).
FTD 1 Field Training Detachment (USAF).
2 Foreign Technology Division (USAF).
3 Flight-training device[s].
4 Flight-test development [usually preceded by pre-], or display.
FTDC Fault-tolerant distributed computing.
FTDW Flying Training Development Wing (RAF).
FTE 1 Flight-test engineer.
2 Flight technical error.
3 Full-time equivalent (personnel).
FTEP Full-time error protection.
FTESS Fixed trailing-edge secondary structure.
FTF Flygtekniska Föreningen (Sweden).
FTG 1 False-target generator.
2 Fitting.
FTH 1 Full-throttle horsepower.
2 Further.
FTI 1 Fixed time interval.
2 Fixed target imagery, or indicator, or indication.
FTIR

1 Fast tactical imagery.
2 Flight test instrumentation.
3 Fictional threat image.
4 Flight-training instructor.
5 Association of aeronautical engineers (G).
6 Flight-time integration.
7 Federal Telecommunications Infrastructure (FAA).

FTX

Field training exercise.

FTW

Flight test vehicle.

FUE

Fuel

Substance used to produce heat by chemical or nuclear reaction; usual chemical reaction is combustion with oxygen from atmosphere or from rocket oxidant (see kerosene, petrol, propellant).

fuel accumulator

Container for storing fuel expelled during starting cycle to augment flow momentarily at predetermined fuel pressure.

fuel additive

Any material or substance added to a fuel to give it some desired quality; eg tetraethyl lead added as an anti-detonation (‘knocking’) agent.

fuel advisory departure

Procedure to save fuel by holding aircraft prior to engine start, rather than at destination stack.

fuel-air explosive

Selected liquid fuels which on warhead impact are scattered in fine cloud of large volume along-side target; this is then detonated (combining with atmospheric oxygen) less than 1 s after impact with blast effects generally greater than that of same mass of conventional explosives.

fuel-air mixture analyser

Measures piston engine air-to-fuel ratio. Chemical *** measures absorption of CO2 by substance such as sodium or potassium hydroxide; physical (electro-chemical ****) measures difference in electrical resistance between two sampling cells, one open to air and other to exhaust.

fuel blending facility

One having authority to mix hydrocarbon fractions to produce piston or turbine fuels to specification, with correct additives.

fuel burn

Fuel consumption.

fuel bypass

Maintains fuel pressure in carburettor float chamber of supercharged piston engine at fixed level above carburettor air pressure.

fuel capacity

Unless otherwise stated means actual volume of tank(s), not of system, and has no relevance to usable capacity.

fuel cell

Device which converts chemical energy directly into electricity; differs from storage battery in that reactants are supplied at rate determined by electrical load.

fuel chop

Sudden cutoff of supply, for whatever reason.

fuel consumption

Measured on volume and mass basis; 1 mpg = 0.354 km/1 (UK), 0.425 km/1 (US); 1 gal/mile = 2.825 1/km (UK), 2.353 1/km (US); including payload, 1 tonne-km l−1 = 2.868 UK ton-miles/UK gal; reciprocal is 0.348.

fuel control and monitoring computer

Measures and indicates fuel volume and mass, controls refuelling to selected levels whilst monitoring pumps and valves, monitors and controls tank temperatures, and controls tank utilization sequence to minimize wing bending moment and control c.g.

fuel control unit

Governs engine fuel supply in accordance with pilot demand, ambient conditions and engine limitations.

fuel-cooled

Cooled by fuel, either en route to engine or recirculated back to tank (see regenerative cooling).

fuel cost

Cost of fuel as proportion of total DOC, typically [all gas-turbine aircraft] 20 to 25 per cent.

fuel cut-off

Device for cutting off the supply of metered fuel to cylinders or a combustion chamber.

fuel dipper

Automatic adjustment of fuel flow to turbine

fudge factor

Multiplying factor to allow for unknowns (colloq.).

FU

Fuel uplifted.

2 Fire unit.

3 Forecast upper wind.

FU

Smoke (ICAO).

fu

Fuel used.

FUA

Flexible use of airspace (UK, 2004–).

FUCE

Far-ultraviolet camera experiment.
fuel dumping
engine, usually triggered to reduce flow at specific time, eg when firing guns or when any kind of upset disturbs inlet airflow to cause rapid rise in TGT.

fuel dumping Release of fuel in flight to bring weight down to MLW in emergency.

fuel flowmeter See flowmeter.

fuel-flow regulator Central element of gas-turbine engine CASC, driven by engine and incorporating two governors, pressure-drop and speed control, and two variable-orifice sliding valves, the VMO and the PDC (6).

fuel grade Quality of piston engine petrol (gasoline), esp. as defined by anti-knock rating: previously called octane number. Usual grades are 80 (dyed red), 100 (green), 100L (green or blue, lower TEL content) and 115 (purple).

fuel injection Inevitable in diesel or compression-ignition engines; term normally refers to Otto-cycle piston engine with mechanical injection of measured quantities of fuel either into carburation induction system or directly to cylinders. Unlike carburettor, unaffected by aero- dynamic or evasive manoeuvres and not prone to icing or fire hazards.

fuel jettison Rapid discharge of fuel from aircraft in emergency.

fuel-jettison time That required to reduce weight from MTO to MLW.

fuel lag Deliberate short delay in injection of one propel- lant into rocket thrust chamber to establish particular ignition sequence.

fuel-lubricated Use of aircraft fuel as sole lubricant of a [usually rotating] item; usually the item is designed to continue to run in the absence of fuel.

fuel manifold Peripheral main pipe with branch pipes distributing fuel to all burners of gas turbine.

fuel metering unit In modern gas-turbine aircraft, the [usually electronic] device which responds to signals from the EEC to modulate fuel flow according to engine demand. Part of a Fadec, if this is fitted.

fuel nozzle In a gas turbine engine these atomise or vaporise the fuel to ensure very rapid burning in a short linear distance; see Simplex, Duplex, Lubbock, airspray, vapersizing.

fuel-pressure switch Ensures full current is not applied to electric starter until fuel pressure has reached predetermined level.

fuel pump In a traditional piston-engined aircraft, usually a single gear-type pump driven by the engine, often supplemented by a priming pump operated manually. In a modern jet aircraft, usually an electrically driven LP pump (often called a tank booster pump), commonly inducer+centrifugal, delivering to an HP on the engine (commonly gear type driven off the engine HP shaft). Other * include the ejector pump.

fuel-quantity indication Simple aircraft still often use a float-type gauge, but most fuel systems have one or more capacitance or ultrasonic probes in each tank, their output being shaped and summed electronically to convert level to mass.

fuel savings advisory Provides command to pilots using flight-path optimization algorithms and Flight Manual data for L/D and thrust. An additional mode can be preset for T-O/D parameters.

fuel shift Gross long-term movement of fuel [eg, caused by prolonged steep climb], can be very dangerous.

fuel shut-off See cut-off.

full-pressure suit

fuel sink Total heat capacity of fuel as receptacle for surplus onboard energy; unit should be J.

fuel sloshing Gross short-term movements of fuel or oxidant in part-empty tank.

fuel spike test Tests engine surge margin.

fuel starvation Fuel in tank[s] is for some reason prevented from reaching engine[s].

fuel state The precise quantity of fuel in the tank[s] of an aircraft; quality of the fuel is irrelevant.

fuel tank See bag tank, integral tank, rigid tank, drop tank.

fuel tester Hand-held transparent tube, incorporating slot-head and Phillips-head drivers, for checking contamination.

fuel trimmer An adjustment on gas-turbine fuel control to achieve a precise value of N 2 (NPC), adjusted to ISA sea-level for a particular engine, repeated after major overhaul and recorded on data plate.

fuel vent Small pipe used to equalize pressure inside and outside tank.

FUF Favourable unbalanced field.

fufo, FUFO Full-fuzing options (NW).

FuG Radio equipment (G).

fuh Fuel mass at given height (usually rocket).

Führer weather Sunshine, blue sky (WW2 Luftwaffe).

Fu L, FuL Führungstab der Luftwaffe (G).

full annealing Heating above critical temperature, or crystalline-transformation point, followed by slow cooling through range of transformation; results in relief of residual stress, greater ductility, increased toughness but lower strength.

full-authority control Control system, today usually electronic but could be fluidic, which provides complete management function [of engine(s), system(s), or complete aircraft], with pilot serving as passive observer. Early example is Fadec, from which FAFC differs in lacking transient control intelligence, eg to control compressor airflow.

full flight regime Designed to operate throughout each flight, eg FFR autothrottle.

full-flight simulator Provides total reproduction of flight deck, qualified to FAA Level D.

full-flow oil system Gas-turbine [usually advanced turbofan] lubrication system without a pressure-relief valve, filters and coolers being protected against extreme pressures by bypasses.

full fuzing options For NW, air drop, air burst, ground burst, contact burst, time-delay after parachute-retarded, laydown retarded or free-fall.

full house No parking stand left at terminal.

full indicator movement Micrometer readings may be taken at any point on a part being measured.

full lateral Describes FMC or FMS (1) exercising total authority via AFCS from just after takeoff until final approach.

full mission trainer Simulator capable of duplicating complete mission [initially for F-22] with any malfunction; can network with others.

full performance level Category of most highly qualified air traffic controllers (FAA 1).

full-pressure suit Completely enclosing wearer’s body and able to sustain internal gas pressure convenient to human functions (see partial pressure suit, water suit, spacesuit).
full rudder, aileron or elevator

full rudder, aileron or elevator  Hard-over demand signal by pilot or flight-control system moving surface to limit of travel.

classic aerial target  Expendable target for air-combat training with size similar to manned fighter. Invariably means a retired fighter converted as an RPV.

classic development  Period when system or equipment and items for its support are tested and evaluated; intended output is pre-production system which closely approximates final product, documentation for production phase, and test results which demonstrate product will meet requirements (USAF).

classic tunnel  Wind tunnel for testing complete aircraft.

classic stall  1 In the case of a wing, self-explanatory, a stall extending from tip to root, or root to tip.  
2 In an axial compressor, a stall affecting the full radial dimension (span) of each rotor and stator blade.

classic wave rectifier  Two elements in split circuit rectify both positive and negative halves of waveform, currents combining unidirectionally at output.

fully active  See active.

duly developed flow  Flow of viscous fluid over solid surface on which boundary layer has reached full thickness and velocity distribution remains constant downstream.

duly expanded nozzle  Normally, nozzle of jet engine, esp. rocket, whose supersonic divergent portion expands jet to ambient pressure at exit plane.

duly factored  Multiplied by ultimate factor of safety.

fully FBW  No mechanical backup, because aircraft could not be flown manually.

duly feathering  See feathering.

duly grown dimension  Dimension of part after process that results in enlargement, esp. high-temperature creep under tensile load.

duly ionised plasma  All neutral particles have lost at least one electron. With hydrogen no further ionisation is possible; other atoms can be further excited.

duly FBW  Multiplied by ultimate factor of safety.

duly FUSE  Far-Ur Spectroscopic Explorer.

duly fuse  Linkage in operating system or structure so designed that, if the system or structure becomes overloaded, it fails at this place. Without a suffix, a weak link in an electrical circuit, usually a conductor with a low MP. Not to be confused with face.

duly fuse bolt, fuse pin  Mechanically weak link at a point of high stress in a structural system, such as attachment for engine or landing gear.

duly fusee  Pyrotechnic squib installed in solid-propellant case to ignite charge over whole length.

duly fuselage  Main body of an aerodnyne, absent in all-wing designs, when tail is attached to booms, called nacelle; with planing bottom called hull.

duly fuselage dihedral effect  Effect of the fuselage on roll stability in sideslip, generally positive with a high wing.

duly fuselage number  Identity of aircraft (R, USSR).

duly fuselage reference line  Straight line used as reference from which basic dimensions are laid out and major components located; usually along plane of symmetry and at convenient height.

duly fuselage shielding  Disturbance to normal ram airflow into side-mounted intake to fuselage engine in yawed flight.

duly fuseline  Strong non-redundant pin attaching engine, or engine pylon, to airframe.

duly fusible plug  Several types, most important being fitted in

fundamental frequency  1 Of periodic quantity, lowest component frequency of sinusoidal quantity which has same period.  
2 Of oscillating system, lowest natural frequency; normal associated mode of vibration is fundamental mode.  
3 Reciprocal of period of wave.
**fusion**

Main landing wheels; if temperature rises to dangerous value (at which tyre could burst) after excessive braking, **blows and releases pressure in controlled manner.**

**fusion**

1. So-called thermonuclear process whereby nuclei of light elements combine to form nucleus of heavier element, releasing very large amounts of energy; can be controlled and sustained.

2. Collection and integration of outputs from all of a range of sensors and warning systems, hence **IDF.**

**fuselage**

1. Generally, data processing.

**fusion bomb**

One using energy of thermonuclear fusion.

**fusion power density**

Power generated per unit volume in controlled thermonuclear plasma; using deuterium at 10^9 particles/ml and 60 kV, *** is about 1 kW, as kinetic energy of reaction products.

**fusion reactor**

Reactor in which thermonuclear fusion takes place.

**fusion welding**

Fusing edges of two base metals by using a welding flame to melt edges of metals, and a welding rod, which is similar in composition, to fuse or weld two metals together.

**FUSS**

Flaps-up safety speed.

**future air-navigation systems**

Wide range of incoming nav aids including satnavs, Glonass, GNSS, FMS, FNC, new R-navs and Mode-S.

**future cycle accumulation**

Number of LCF or operating (mission) cycles operator plans to accumulate on given hardware.

**FUV**

Far ultra-violet.

**fuze**

Device or mechanism designed to start detonation of high explosive under proper conditions of heat, impact, sound, elapsed time, proximity, external command, passage of electric current or other means, and usually without danger of detonation before weapon is armed.

**fuzzy logic**

Programming based on instructions not precisely specified numerically but on best estimates between 0 (false) and 1 (true).

**FV**

1. Flight visibility.

2. Prefix to three-figure designators of alloys [mainly stainless steels] developed by Firth-Vickers (UK).

3. Finite volume [mesh code].

**FVA**

Federación Venezolana de Aeroclubes (Venezuela).

**Fvac**

Vacuum thrust.

**FVB**

Fleet Viability Board (USAF).

**FVC**

Forebody vortex control [T adds technology].

**FVD**

Fluorescent vacuum display.

**FVLPR**

Hang-gliding federation (Puerto Rico).

**FW**

1. Fiscal week.

2. Fixed wheel (sailplane).

3. Failure warning.

4. Filament-wound, see filament winding.

5. Fighter Wing (USAAF, USAF).

6. Frequency-wild.

**fw**

Full wave.

**FWA**

Flight watch area.

**FW&A**

Fraud, waste and abuse.

**FWC**

1. Filament-wound cylinder, or case.

2. Flight, or fault, warning computer.

3. Flight watch centre.

**FWCS**

Flight-watch control station.

**FWD**

Falling-weight deflectometer.

**fwd**

Forward.

**FWE**

1. Foreign weapons evaluation (US).

2. Fighter Wing Equivalent.

**FWETE**

Foreign weapons equipment technology evaluation (US DoD).

**FWF**

Firewall forward, the engine compartment of single-engine tractor aeroplane.

**FWHM**

Full wave, half modulation.

**FWOC**

1. Forward wing operations centre (RAF).

2. Fleet Weather & Oceanographics Centre (UK).

**FWS**

1. Fighter Weapons School (USAF).

2. Flight warning system.

3. Fire warning system.

4. Filter wedge spectrometer.

**FWW**

Fighter Weapons Wing.

**FWWS**

Food, water and waste subsystems.

**FX**

Fuel type unspecified.

**Fx**

Helicopter aerodynamic force parallel to plane of rotor disc [disk].

**f(x)**

Function of x (math).

**FXML**

Federated extensible markup language.

**FY**

Fiscal year; US government runs 1 Oct. to 30 Sept.

**F/Y**

First-class and economy or tourist.

**FYDP**

1. Five-year defence plan.

2. Future years defense program (US).

**FYDS**

Flight director/yaw-damper system.

**F/Y ratio**

Fission/yield ratio.

**Fz**

Helicopter aerodynamic force normal to plane of rotor disk [disc].

**FZ**

Freezing.

**FZDZ**

Freezing drizzle.

**FZFG**

Fog.

**FZRN**

Rain.

**fZ**

Transverse VSI (magnetic) component.

**FZP**

Fresnel zone plate.
G

G 1 Giga, multiplied by $10^9$.
2 Geostrophic force.
3 Geared (US piston engines).
4 Universal gravitational constant $= 6.6705 \times 10^{-11}$Nm$^2$kg$^{-2}$.
5 Stress imposed on body due to applied force causing acceleration.
6 Gun (US DoD).
7 Shear modulus, rigidity.
8 Aircraft category, single-engine transport (USN 1939–42).
9 Aircraft category, glider (USA 1919–26 and USAF 1948–55).
11 Role prefix, air-refuelling tanker (USN 1958–62).
12 Role prefix, parasite carrier (USAF 1949–55).
13 Status prefix, permanently grounded (US from 1924).
14 Guard (suffix to serial on secret aircraft, UK, or to radio frequency).
15 Uncontrolled (airspace).
16 Green.
17 Gust[s].
18 Ground control.
19 Gain (radio).
20 Group.
21 Geschwader (G).
22 Sonobuoy size 419-mm long.
23 Conductance (also $\Omega$); unit, siemens.
24 Graphite.
25 Gauss.
26 Generator.
27 Record category: parachuting (FAI).
g 1 Acceleration due to Earth gravity, international standard value being $9.80665$ m/s$^2$, assumed at standard sea level in atmosphere; often $g$, italic.
2 Gram[m]s.
2 Grid.
4 Suffix, gauge pressure.
5 Suffix, height AGL.
G$^1$ Gadolinium-gallium garnet.
G$^2$ Grid [degrees].
g-break Sudden change of aircraft trajectory away from previous straight line in lateral or upward direction, eg following fast low-level run over airfield before landing.
G-display Rectangular, target is at centre (when radar aerial is aimed at it) and grows lateral ‘wings’ as range is closed; aiming errors result in appropriate displacements of blip from centre.
g-force Inertial force, that needed to accelerate mass, usually expressed in multiples of gravitational acceleration.
G-layer Layer of free electrons in ionosphere occasionally observed above $F_2$ layer.
g-loc Pilot blackout and LOC induced by severe and sustained vertical acceleration.
g-meter Indicates acceleration, usually in vertical plane.

G-seat, g-seat Seat simulating $Z$-axis acceleration, occupant normally wearing g-suit.
G-Star A spatial temporal anti-jam receiver for GPS-guided weapons.
g-suit Worn by pilot or astronaut; exerts pressure on abdomen and lower parts of body to prevent or retard collection of blood below chest under positive acceleration. Not necessarily pressure suit.
g-tolerance Tolerance of subject, human or device, to acceleration of specified level and duration. In case of human, usually vertical [head/foot direction].
GA 1 General aviation.
2 Gas analysis.
3 Gimbal angle.
4 Group accounting.
5 See general-arrangement drawing.
6 Go-around.
7 Military code for lethal nerve gas developed (G, 1937) as Tabun.
8 Ground attack aircraft category (US 1919–24).
9 Goggle autojector.
10 Grazhdanska Aviatsiya, civil aviation (R).
11 Grid amplifier, or array.
12 Genetic algorithm[s].
G/A 1 Ground to air.
2 Glycol/alcohol.
G* In flight-control channel, the equivalent transfer function for differential ailerons.
GAA 1 General Aviation Association, [office, Bankstown, NSW] (Australia).
2 General Aviation Alliance [October 2004–] (UK).
GAAC 1 General Aviation Airworthiness Consultative Committee (UK).
GAAG 1 General Aviation Airworthiness Consultative Committee (US).
GAACS 1 General Aviation Authority for Civil Security (R).
GAS 1 General Aviation Safety (USA).
GASG 1 General aviation safety guide.
GASTS General aviation and small transport.
gat A general-purpose acoustic tracking receiver.
gba A geographical area.
gc A general-arrangement drawing.
gc-facility A general-purpose facility.
gc-deficiency A general-purpose deficiency.
gc-deficiency A general-purpose deficiency.
gc-solution A general-purpose solution.
GCA 1 Ground control.
2 Go-around.
GCAA 1 General Authority of Civil Aviation (Saudi Arabia).
GACC 1 Group attack control capability.
2 General Aviation Consultative Committee (CAA, UK, from 1997).
GACS 1 General Aviation Commission (USA).
GACW 1 General aviation control weather.
gadget Code, radar equipment; type of equipment indicated by letter, followed by colour to indicate state of jamming: green *, clear; amber *, sector partially jammed; red *, sector completely jammed; blue *, completely jammed (DoD).
GADO General Aviation District Office (FAA).
gadolinium Lanthanide metal, Gd, isotopes are alpha-emitters.
GADS
GADS Generic aircraft display system.
GAF German air force [UK usage].
Gafact German air force ATM co-ordination tool.
Gafor General-aviation forecast for VFR, met. briefing service in many European countries.
GIA/G Ground to air to ground.
gage Gauge (US).
gaggle Group of aircraft (say, five to 20) flying together but with no semblance of formation.
GAIN, Gain Global aviation [or analysis and] information network (US, collects safety information).
gain 1 General term for increase in signal power in transmission, usually expressed in dB.
  2 Increase or amplification; antenna *( * factor) is ratio of power transmitted along beam axis to that of isotropic radiator transmitting same total power; receiver *(video *) is amplification by receiver. Calculation for radars is usually equal to area of sphere of unit radius divided by area subtended on that sphere by solid angle equal to the 3-dB beam.
Gains, GAINS GPS air-data [or aided] laser inertial navigation system.
GAIS General ATC information system [mainly Wx].
GAIT General aviation infrastructure tariff (Australia).
  2 Ground-based augmentation and integrity.
gaiter Fireproof flexible cover over a pipe or tube, e.g. to prevent ingress of abrasive dust.
Gal, gal Non-SI unit of small acceleration, gal (Galileo) = 10−2 ms−2 = 1,000 mgal.
Gal, Galt, Galat Groupement Aviation Légère de l’Armée de Terre (F).
GALCIT Guggenheim Aeronautical Laboratory, Caltech.
galena Lead sulphide, PbS, used in IR cells.
galerkin One of the most rigorous methods of solving structural dynamics problems.
gallery 1 Gas-turbine fuel manifold.
  2 Fluid conduit formed within three-dimensional volume of material, eg drilled through body of pump.
galley Aircraft kitchen with provision for heating prepacked meals.
galling Pitting or marring of finished surface, esp. bearings surface, because of fretting.
gallium White metal, Ga, density 5.9, MPt 29.78°C, *-68.4°C, half-life 68 min.
gallon Non-SI unit of liquid volume. Imperial * = 4.546087 litres = 277.42 cu in = 1.20095 US *; US * = 3.785412 litres = 231 cu in by definition = 0.83267 Imperial *
galvanic corrosion Electrolytic action caused by contact of dissimilar metals or formation of oxygen cell in contact with metal.
galvanising Coating of metal, esp. steel sheet, by dipping in bath of molten zinc; protects from galvanic corrosion.
galvanometer Instrument which measures electric current passed through pivoted coil in magnetic field. With shunted external resistance, used as ammeter; with series resistance, voltmeter.
GAM 1 GPS-aided munition[s].
  2 Ground-attack missile.
  3 Ground-to-air missile, = SAM.
  4 German army [UK usage].
GAMAA Gate management and airport analysis (software).
Gambica Association for the instrumentation, control and automation industry [London SE1 7SW] (UK).
Gambit General anti-material [US materiel] bomblet with improved terminal effects.
GAME Generalised automated maintenance environment (USN).
Game GPS approach-minima estimator.
Games GPS anomalies monitoring equipment suite.
GAMM Generalised air (or airlift) mobility model, baseline study using real military cargo spectrum (USAF, USA).
gamma 1 γ Ratio of specific heats of gas.
  2 Logarithmic function; ratio of contrast of transmitted scene to that of received display.
  3 Flight path angle.
  4 SI unit of very small changes in magnetic flux density; *(not abbr.) = 1nT.
gamma rays High-energy, short-wavelength EM radiation; very penetrating, similar to X-rays but nuclear in origin and usually more energetic. Symbol γ.
GAAMS General airline management simulation.
GAN Global area network.
GaN Gallium nitride.
G&C Guidance and control.
gang drill Series of drill presses in close proximity on one bed, or drills operated simultaneously through interconnected chucks.
gang start All [multiple] engines start simultaneously.
gantry Large crane for erection and servicing of launch vehicles; * straddles vehicle and runs on tracks crossing launcher and work area.
GANTT General Agreement on National Trade and Tariffs.
GAO 1 General Accounting Office (US).
  3 Groupe Aérien d’Observation (F).
GAP/Gap General-aviation propulsion (NASA/industry).
  2 GPS airborne pseudolite.
  3 Ground-accident prevention (FSF).
  4 Gas analysis package.
  5 Distance between chords of any two adjacent superimposed wings of same aircraft, measured perpendicular to chord of upper wing at any point on its leading edge.
GAPA 1 Ground-to-air pilotless aircraft.
  2 General Aviation Pilots’ Association (US).
Gapan Guild of Air Pilots and Air Navigators [1 October 1929, livery company of City of London since 1936; office, London WC1R 5DJ] (UK).
gap coding Precise gaps in radio transmissions, or intervals of silence, used to represent letters, words or phrases.
GAPCU Ground and auxiliary power control unit, combines GPCU/APU-GCU.
GAPE, Gape General-aviation pilot education (FAA).
gap-filler

gap-filler Radar used to supplement long-range surveillance radar in area where coverage is inadequate.
gaping Discontinuity of skin profile caused by distortion or deflection of landing-gear doors, access doors and other separate panels intended to lie flush.
gapless ice guard Fitted within intake mouth; used in conjunction with automatic alternative inlet.
GAPP 1 Geometric/arithmetic parallel processor, or processing.
  2 Ground-accident prevention programme.
gapped ice guard Mounted forward of air intake to provide a gap which does not ice up.
gapping Gap [increased clearance, intended or otherwise] between TE of compressor rotor blades and LE of next stator.
GAPS Generic acoustic processing system (DSTL).
gap-squaring shears Tool used for squaring and cutting sheet metal; similar to squaring shears but able to slit long sheet.
GAPU 1 Group auxiliary power unit.
GAPU 2 Ground abort rate.
  3 Geopotential altitude range.
GARA 1 General Aviation Revitalisation Act, passed by US Congress 1994 to limit manufacturers' product liability, especially for aircraft over 18 years old.
garbage 1 Miscellaneous hardware in orbit or deep space; usually material ejected or broken away from launch vehicle or satellite.
  2 EDP (1) software or program which has been degraded or in any other way rendered imperfect or unreliable, or output therefrom.
garbling Indecipherable responses from two aircraft both at exactly same slant range of about 4 km (corresponding to 20.3 μs pulse interval) to SSR interrogation; caused by fact both sets of reply pulse trains are synchronised and superimposed (see degarbling).
garboard strake That section of plating on a seaplane garboard strake.
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gas-bag alarm Indicates when predetermined gas-bag pressure has been reached.
gas-bag net Mesh of cordage or wire to retain bag in position.
gas-bag wiring Mesh of circumferential and longitudinal wiring enclosing each bag to take pressure and transmit lift.
gas bearing Bearing for rotating assembly, usually high-speed, in which all forces are reacted by dynamic forces generated in contained volume of dry filtered gas, often He or N.
gas bleedoff Bleeding-off of hot combustion gas from rocket engine for pressurising or driving turbomachinery.
gas-operated

GASC Ground Air Support Command (USAAF).
gas cap Gas immediately in front of hypersonic body in atmosphere; compressed and heated, and if speed is sufficiently high becomes incandescent.
Gasco 1 General-Aviation Safety Council [formed 1965 as GAS Committee, office, Rochester Airport, ME5 9SD] (UK).
  2 Ground Air Support Command (GASC was preferred).
gasculator Filter fitted at lowest point of fuel system [archaic US usage].
gas constant Constant factor R in equation of state for perfect gas; kJ/kg K = 185.863 ft-lbf/lb °R; 8,314.34 J/kmol/K for particular gas; specific ** r = R/m where m is molecular weight (see Boltzmann).
gas dynamics Study of gases under high velocity, temperature, ionisation and other extreme conditions prohibiting compliance with aerodynamic laws.
gaseous electronics Study of conduction of electricity through gases, involving Townsend, glow and arc discharges, and collision phenomena on atomic scale.
gaseous fuels Those stored in aircraft in gaseous form, GH1 being possible example (see Blaugas).
gaseous rocket Bipropellant or monopropellant rocket utilising gaseous fuel and/or oxidiser.
GASF General Aviation Strategy Forum [being formed 2006] (Europe).
gas film Boundary layer on inner surface of combustion chamber.
gas generator 1 Device for producing gases, hot or cold, under pressure. In some tip-drive helicopters * comprised gas-turbine core engines.
  2 Gas-turbine core engine, eg turbofan minus LP turbine and fan or turboprop minus LP turbine, gearbox and propeller.
  3 Major component supplying working fluid for turbopump of liquid rocket engine.
gash Surplus, or pilfered (RAF, WW2).
gash hood Cowl or ports in outer cover of airship through which gas can escape from inside hull.
gasifier Machine for producing flow of hot gas, normally by combustion of fuel compressed by mechanisms extracting energy from flow; free-piston and other systems but not gas turbine.
Gasil General-aviation safety information leaflet [published quarterly by CAA] (UK).
gas laser One in which lasing medium is gaseous, eg HeNe, CO2, Ar.
GASP
ward motion of moving parts, unlocking breech, is caused by piston moved by gas bled from barrel.
GASP General Aviation Strategic Plan, being developed for 2004–08 (TSA).
gasper system Low-pressure fresh-air supply piped to individual controllable outputs above each passenger or serving each crew-member.
gas pressurization Feeding liquid propellant for rocket engine by piping high-pressure gas to dispel it from tank, with or without use of flexible liner; eliminates need for turbopump.
gas producer See gas generator (1) or (3).
Gasreg Universal rendition of GASRWG.
gas ring Spring ring for maintaining gastight seal between piston and cylinder.
gas rudder See gas vane.
GASS 2 Garde Aérienne Suisse de Sauvetage (Switz.), same initials in Italian but SRFW in German.
2 General air and surface situation (NATO).
gas starter Early (1920 onwards) method of starting multi-engined aircraft using airborne compressor set supplying compressed air or over-rich mixture to cylinders of each engine in correct sequence.
gas temperature TET is usually measured between first stator and rotor, TGT at a point between stages and EGT can be same as JPT.
Gaston Génération d’APT (auto-programmed tool) standard pour trajectoires d’outils normalisées (F).
gas triode See thyratron.
gas trunk Duct between gas-bag valve and gas hood.
gas tube Electronic tube (valve) containing gas under very low pressure.
gas turbine Engine incorporating turbine rotated by expanding hot gas. In usual form consists essentially of rotary air compressor, combustion chamber(s), and turbine driving compressor.
gas-turbine numerology Stations within an engine are designated by numbers used as inferior suffixes which vary with engine configuration; in a simple turbojet the numbers are: 1, entrance to inlet duct; 2, entrance to compressor; 3, compressor delivery; 4, turbine entry; 5, turbine exit; 6, entry to nozzle; 7, in plane of nozzle. A two-spool engine with afterburner has numbers 1 to 10. A different set of suffixes identifies the shafts in a multishaft engine; 1 being LP, 2 HP or IP, and 3 HP or free-turbine in a three-shaft engine.
gas valves Both rigid and non-rigid airships require valves to enable excess pressure in the gas bags or ballonets to be relieved. Lifting gas is released automatically or manually at the top, and air from valves on the underside.
gas vane Aerodynamic TVC in jet of rocket (see jet vane).
gas volume Volume of aerostat gas at SL.
gas welding Fusion welding with hot gas flame; eg oxy-acetylene on steels and oxy-hydrogen on aluminium.
GAT 2 General air traffic.

gating
2 General aviation terminal.
3 Greenwich apparent time.
Gatco, GATCO Guild of Air Traffic Control Officers [195+, office GU1 2ND] (UK).
GATE, Gate German Airport Technology and Equipment ev (association, 34 members).
gate 1 Point of passenger disembarkation at airport.
2 At which commercial flight starts, or enters new sector of controlled airspace.
3 Removable lock to limit maximum travel of control lever (eg throttle) under normal conditions.
4 Position(s) on extended runway centreline above which inbound aircraft are required to pass at time assigned by approach control.
5 In air intercept: ‘Fly at maximum possible speed for limited period’ (DoD).
6 Control electrode of any device, esp. input connection to FET.
7 To control passage of signal in electronic circuits.
8 Circuit having output and input so designed that output is energised only when required input conditions are met, eg AND-*, OR-*, NOT-*. 9 Circuit designed to receive signals in small fraction of principal time interval in radar or control system.
10 Range of fuel/air ratios through which combustion can be started.
11 Of trajectory, eg speed-record run, specified transverse apertures in space through which aircraft must pass to comply with regulations.
12 Of space mission, transverse aperture(s) defined in width and height at particular time or distance from liftoff or related to other body in space, through which vehicle must pass if mission is to accomplish objectives.
gated 1 EM pulse permitted to function only under control of another pulse, usually synchronized.
2 Limited by gate (3).
gate guardian Aircraft publicly displayed at entrance to major establishment, esp. air force base.
gate hold Departure held at gate, common if delay exceeds 5 min.
gate position Particular gate (1) numerically assigned to flight (7).
gate reader Rapid checker of ticket and boarding pass located at gate (1).
gate time 1 Agreed time at which flight enters new sector of controlled airspace.
2 Time at which aircraft passes particular point on track.
gate-to-gate 1 ATC is usually considered to be effective between gates (2).
gate valve Valve controlling fluid flow by flat plate having linear motion across flow channel.
gateway Customs airport, through which pax/cargo can enter country.
gathered parasheet Parasheet whose periphery is constrained by hem cord.
gathering Process of bringing guided missile into narrow pencil beam for subsequent guidance.
gating 1 Process of selecting portions of EM wave which exist during one or more selected time intervals or which have magnitudes between selected limits.
2 Use of Q-switching or other control to permit laser to emit only during exact specified time intervals, esp. when used in rangefinding mode.
Gatip

3 Imposing mechanical stop on piston engine throttle below selected pressure altitude.

Gatip Global air-traffic interoperability project (FAA / Eurocontrol).

Gatling Originally (1861) Gatling, automatic rapid-fire gun having a rotating assembly of several parallel barrels brought in succession in front of a single breech.

GATM Global air-traffic management.

Gator 1 GPS ability to overcome resistance.

2 Ground/air task-oriented radar.

Gatorizing Isothermal forging process for high-nickel turbine rotor blades and other super-alloys.

GATR Ground/air transmit/receive.

GATSI GPS-aided targeting system; /GAM adds GPS-aided munition(s).

GATSS Global air-transportation systems and services (R. CIS).

GATT 1 Gate-assisted turnoff thyristor.

2 General agreement on tariffs and trade.

GAU Gun, aircraft unit.

GAUC GA Users Committee (LGK, LHR).

gauge (US gage) 1 Any pressure-measuring instrument.

2 Hand comparator for GO/NO GO check on an exact dimension or screwthread.

3 Standard measures of sheet and wire thickness.

Gauged fuel Sum of fuel-gauge readings; fuel state, gauged fuel.

Gauge pressure Indicator reading showing amount by which system pressure excedes atmospheric.

Gauss Non-SI unit of magnetic induction (flux density), \( \text{JT} \).

GAV Guild of Aviation Artists [office, Farmborough GU14 6TF] (UK).

GAVC Ground/air visual code (FAA).

GAVRS Gyrocompassing attitude and velocity reference system.

GAWG General Aviation Working Group (Natmac).

GAZ State aviation factory [almost 1,000] (USSR).

GB 1 Gain/bandwidth.

2 Groupe de Bombardement (F).

3 Aircraft category, glide bomb (USAAF 1942–47).

4 Lethal nerve gas first produced as Sarin (G, 1938) and later by US.

Gb Gigabyte[s].

G\text{b} \text{b} In flight-control augmentation, a bending-mode filter.

G\text{b} \text{s} Grid bias.

GBA Groupe de Bombardement d’Assaut (F).

GBAD Ground-based air defence; BC adds bridging capability, WS adds weapon system(s).

GBAS Ground-based augmentation system, for precision approach.

GBCS Ground-based common sensors.

GBD Greener by design (UK).

GBDM Ground-based data management; S adds system.

GBI Ground-based intercepter(s).

GBIB Ground-based integrity broadcast.

Gb\text{ts}/s Gigabits \((10^9)\) per second, not to be confused with Gb.

GLB 1 Ground-based laboratory.

2 Ground-based laser.

3 Government bill of lading.

GBMD Global ballistic-missile defence.

GBMI Graphite/bismaleimide composite.

GBM levels Gough, Beard and McEvoy pioneered investigation of upper limits of force a pilot could be expected to exert on particular flight-control inputs (NACA).

GBP Great Britain pound[s] Sterling.

GBR Ground-based radar; P adds prototype (US NMD).

GBRAS Ground-based regional augmentation system.

GBS 1 Global broadcast service.

2 Ground-based software; T adds tool.

3 Ground-based sensor[s].


GBTS Ground-based training system.

Gbte Gb.

GRU Glide-bomb unit.

GC 1 Groupe de Chasse (fighter wing, F).

2 Great circle.

3 Goggles-compatible (NVG).

4 Gyrocompass.

5 Ground control.

GCA 1 Ground-controlled approach.

2 General controlled airspace, from 1990 called Class E (FAA).

GCAA General Civil Aviation Authority (UAE).

GCAM Ground collision-avoidance module.

GCAS, G-cas Ground collision-avoidance system.

GCB 1 Generator circuit-breaker, or control breaker.

2 Gun-control box (helicopter).

3 See next.

GC brag Great-circle bearing.

GCC 1 Graduated combat capability.

2 Goggles- (ie, NVG) compatible cockpit.

3 Gulf Cooperation Council (Inmarsat).

4 Global climate change; I adds initiative[s].

5 Ground-cluster controller (Aercar).

GCCS Global command and control system (DoD).

GCF Ground-conditioning fan.

GCHQ Government Communications HQ (Cheltenham, UK).

GCI Ground-controlled interception.

GC/IMS Gas chromatography/ion mobility spectrometry.

Gcm\text{3} SI unit of density.

GCMS Gas-chromatograph mass spectrometer.

GCOS Global climate observing system.

GCP General conditions of purchase.

GCR 1 Generator-control relay.

2 Ground-clutter reduction.

CGS 1 Ground-control station[s].

2 Ground-clutter suppression.

G\text{e}s Gigacycles = GHz.

GCSC Great-circle steering cue.

GCSS Global combat-support system (USAF).

GCT 1 Government competitive test.

2 Greenwich Civil Time.

GCU 1 Generator control [and protection] unit.

2 Ground control unit [UAV].

3 Guidance control unit.

GCV Ground check vehicle [navalaid].

GD 1 Lethal nerve gas first produced (G, 1940) as Sarin (also GB).
General Flying Test

Gee-H Secondary-radar navaid which enabled aircraft to determine position with precision by simultaneously measuring distances from two beacons.

GEEIA Ground Electronics Engineering Installation Agency (USAF).

GEF General Engineering Flight (RAF).

Gefra Group of experts on the future regulatory arrangements [for international air transport].

gegenschein Faint light area of sky opposite Sun and celestial sphere; believed to be reflection of sunlight from particles beyond Earth’s orbit.

GEH Graphite-epoxy honeycomb.

GEI Groupement d’Economique Interêt (see GIE, which is more common).

Geiger counter Geiger-Müller gas-filled tube containing electrodess; ionising radiation releases short pulse of current from negative to positive electrode, frequency of pulses indicating intensity of radiation.

GEJ Group of Experts on Jurisprudence (ICAO).

GEL Graphite-epoxy laminate.

GELIS, Gelis Ground-emitter location and identification system.

GEM 1 Ground-effect machine (ACV).

GEN 1 Ground-data-link; P adds processor.

2 Global data-link; P adds processor.

3 Global decision support, controls worldwide airlift; S adds system (USAF).

4 Ground, or general, distribution system (Sita).

5 Goldstone.

6 Guided, or guidance, enhanced missile.

7 Graphic [piston-] engine monitor, typically pictures CHT and EGT.

8 GPS-embedded module.

GEMS, Gems 1 Grouped engine monitoring systems.

2 Global environment management system (noise).

3 Global expeditionary medical system (USAF).

4 Generic Earth-station management system.

GEN 1 Generator.

2 General [not the rank].

3 General information (AIP).

Gen, gen 1 Information, latest knowledge (colloq. RAF WW2).

2 Generation, a complete phase of development.

Gen2, Gen 3 New ‘generations’ of helicopter visionsics.

genav General aviation.

GENE, Gene GPS – enhanced navigation equipment.

general air traffic All traffic excluding OAT (3), special military (eg lo-level training) and local pleasure flights not notified for ATC purposes.

general-arrangement drawing Usually three-view (front, side, plan) outline, in some cases with addition of dimensions, ground line, and broken lines giving additional information.

general aviation All civil aviation except air transport for hire or reward; largest sectors are private (including company transport), agricultural and aerial work. Term introduced in US by CAA in 1951.

General Belgrano Head office of the CAA [colloq.] (UK).

general cargo Loose items, excluding large unit loads, not containerized or palletized. Head office of the CAA [colloq.] (UK).

general inference General meteorological situation and future forecast.

General Flying Test Taken at different levels by candidates for PPL, BCPL and CPL.
general-purpose aircraft

Military aircraft intended to fill multiplicity of roles; nearest modern equivalent is armed utility.

generate  To get a combat aircraft airborne and thus a sortie.

generation Family of all examples of particular hardware species designed at same time to meet similar requirements; after first hard to define, and word generally used to impress audience of prior experience of particular manufacturer in field concerned.


2. Device for producing clearly visible smoke, e.g. for aerobatics or for wind-tunnel.

generator line contactor Main circuit-breaker between generator (ie, alternator) and AC bus.

generic A particular meaning: using same region of EM spectrum for land, sea and air stations.

Genova General overall validation for ATM (7) (Euret).

gentle turn Primary flight manoeuvre in which bank angle does not exceed 25°.

Gen-X A particular meaning: using same region of EM spectrum for land, sea and air stations.

GEO Gener-X angle does not exceed 25°.

GEODSS Ground-based electro-optical deep-space surveillance system.

geneodetic Height above the surface of the Earth (represented as an oblate spheroid) measured along a normal to the surface, symbol h.

geneodetic equatorial plane The plane of the equator of the Earth.

geneodetic latitude The angle between the geodetic equatorial plane and the normal to the surface, positive in N hemisphere, negative in S, symbol φ.

geneodetic position Location of a point on the surface of the geosphere, defined by geodetic latitude, longitude and height.

genographic poles North or south points of intersection of Earth’s surface with axis of rotation, where all meridians meet.

geoid Earth as defined by that geopotential surface which most nearly coincides with MSL.

ggeolocation Finding where fixed targets are on the land surface, if possible near-instantaneously.

g geomagnetic cavity Volume moving through solar wind occupied by Earth and surrounding magnetic field (magnetosphere).

g geomagnetic co-ordinates System of spherical co-ordinates based on best fit of centred dipole to actual terrestrial magnetic field.

g geomagnetic dipole Hypothetical magnetic dipole (bar magnet) located within Earth in such position as to give rise to actual terrestrial field.

g geomagnetic equator Terrestrial great circle everywhere 90° from geomagnetic poles (should not be confused with magnetic equator).

g geomagnetic poles North and south antipodal points marking intersection of Earth’s surface with extended axis of geomagnetic dipole; north ** is 78½°N, 69°W, and south ** is 78½°S, 111°E. Should not be confused with magnetic pole.

g geomagnetism 1. Magnetic phenomena exhibited by Earth and surrounding interplanetary space.

2. Study of magnetic field of Earth.

g geometric dilution of precision See dilution of precision.

g geometric pitch Distance propeller-blade element would advance in one revolution when moving along helix to which line defining blade angle of that element is tangential; ** of fixed-pitch propeller at standard radius is pitch of that propeller, and is marked on it.

g geometric transition absorber Family of RAM (2) structures, most common being pyramidal type. Others include cones and sine waves.

g geometric twist Variation along span of aerofoil of angle between chord and a fixed datum (see aerodynamic twist).

g geometry-limited Restriction placed on aircraft attitude or configuration by geometric considerations; eg scraping tail on take-off or (variable-geometry aircraft) undergoing stores fouling tailplane at max sweep.

geophones 7. Sensitive acoustic sensors for detecting sound transmitted through Earth’s crust.

2. Seismic sensors buried along edge of runway to measure point of touchdown, severity of impact and bounces on landing (see ALMS).

g geopotential altitude where R, = Earth radius and H is geometric altitude [Z can be ignored at low altitude].

4. Space occupied by Earth and surrounding magnetic field (magnetosphere).

Geodetic experimental ocean satellite[s] (NASA).

GeoSAR Geographic synthetic-aperture radar (NIMA).

g geophere Solid and liquid portions of Earth’s lithos-
GEOSS

GEOSS Global Earth Observation System of Systems [2005–] (U.N., int.).

geostationary altitude That at which body is in geostationary orbit. Accepted value is c35,880 km, 22,300 miles.

geostationary orbit Orbit in which satellite remains over same point on surface of Earth. Thus, period = 24 h; V is 3.07 kms⁻¹, 1.91 mile/s.

geostationary satellite Satellite in geostationary orbit; also called synchronous satellite.

gi

Ground fog.

GHW

Ground-handling wheels.

GIA

General [or ground] handling.

GIAE

Globostrisic airship for testing missile countermeasures.

GIAF

Gaseous hydrogen.

GIAFAC

2 Ground forward air controller, ie not airborne.

GIB

GIB

Digital format code (U.S.).

G-124

Radiometer, ionospheric (Perkin-Elmer).

G-125

Similar to G-124, but for electron temperature (Perkin-Elmer).

G-126

Radar, 400 MHz, 5 W, i.e. 100 MHz, 5 W.

G-127

Glasco electronics module (Decca System).
GIBEA, Gibea

- 2 GNSS integrity broadcast.

GIBE, Gibe Guilde Belge des Electroniciens de l’Aviation (Belg.).

Gibli Hot dry wind in N Africa, similar to Sirocco.

Gibson criteria A series of assessments, such as attitude gain or frequency response plotted against phase angle, in an attempt to avoid PIOs.

GIC GNSS, or GPS, or GPS/WAAS, integrity channel.

GICB Ground-initiated comm-B, radio plus DME.

GID Government Inspection Division (CAA).

GIDEP, Gidep Government/industry data exchange program (DoD, US).

GIDS, Gids Gate information display system.

GIE Groupement d’Interêt Economique.

GIEL Groupement des Industries Electroniques [office, Paris] (F).

GIES Ground imagery exploitation station.

GIF 1 Guy in front (see GIB).

2 Graphie[s] interchange file, or format.

Gilas, GIFAS Groupement des Industries Françaises Aéronautiques et Spatiales [aerospace industries trade association 200+ members; office F-75782 Paris] (F).

Gilt Geosynchronous imaging Fourier transform spectrometer.

GIG 1 GPS integration guidelines.

2 Global information grid (DoD).

giga Prefix, symbol G, $= 10^9$.

GIG-BE GIG(2) bandwidth expansion, links centres with 10 Gbits/s fibre optics.

GIGO, Gigo With 10 Gbits/s fibre optics.

GIG(2) bandwidth expansion, links centres.

GIG-BE General imagery grid (DoD).

GII Ground-initiated handoff.

GII Ground information infrastructure.

GHTS General imagery intelligence training system.

GILA Generalised integrated learning architecture (Darpa).

Gilham Code Gray code.

gill Non-SI unit of liquid measure. UK $= 1.42065 \times 10^{-4}$ m$^3$; US $= 1.18294 \times 10^{-4}$ m$^3$.

gills Hinged flaps at rear of engine cowling or other compartment to control cooling airflow.

Gimads Generic integrated maintenance diagnostics (USAF).

gimbals 1 Mounting with at least two, and usually three, mutually perpendicular and intersecting axes of rotation.

2 Gyro support which provides spin axis with degree of freedom.

3 To pivot propulsion engine for TVC.

4 To mount on *.

gimbals freedom Maximum angular displacement about gyro output axis, expressed in degrees or in equivalent angular input.

gimballed chamber Rocket-engine thrust chamber mounted on gimbal (3) so that it can swivel about one axis (or two perpendicular axes).

gimballed lock Condition of two-degrees-of-freedom gyro wherein alignment of wheel spin axis with axis of freedom removes degree of freedom, rendering gyro useless.

Gins 1 GPS/INS.

2 Gravimetric INS.

GIP 1 Ground instructor pilot.

2 Generic interface processor.

3 Government/industry partnership.

GIPS Geospatial information production system (NIMA).

GIBEA, Gibea glaze finish

GIRA Groupe d’Instruction des Reserves de l’Air (F).

GIRD, Gird Group for study of reaction (ie, rocket) engines (USSR, 1932–34).

GIRL Rapid-action link which in emergency transfers upper attachment of an escape slide from a door to the door sill.

GIRTS Generic IR training system (ASD).

GIS 1 Geographical information system(s) (civil, US).

2 Graphic[al] information system.

Gismo Globally integrated satellite mobile operating system.

GISS Goddard Institute for Space Studies (NASA, New York City).

GIT General interface terminal.

GICT Guns in the cockpit.

GIUK Greenland/Iceland/UK, supposed air-defence gap.

GIVS Groupe Interministeriel des Vols Sensibles, charged with security of commercial flights (F).

GK Loop gain, plan > compensator [many suffixes].

GKAP State committee on aviation industry (USSR, R).

GKAT State committee on aviation technology (USSR, R).

GKO State defence committee (USSR, R).

GKS Graphic[al] kernel system (WMO).

GL 1 Ground level.

2 Group length.

GLA Gust load alleviator.

GLAADs Gun low-altitude air-defense system (USA).

GLAM Groupe de Liaisons Aériennes Ministérielles (F).

gland Short tube fitted to airship’s envelope or gas bag through which rope may slide without leakage.

Glare Glass-fibre prepreg tape reinforced aluminium alloy [usually multi-ply].

glareshield Overhanging lip above instrument panel to protect pilot’s night vision from bright reflections on windscreen.

G- Lars Guided launch and recovery system; /PLS adds precision landing system.

GLAS Gust-load alleviation system.

glass aircraft One with high proportion of GRP in airframe, including skin.

glass cockpit One featuring electronics displays in place of traditional instrument (colloq.).

glass-fibre Produced by melting glass and spinning on revolving drum, fibres being typically 0.025 mm diameter. Fibreglass is registered name. Produced in many forms for structural or optical properties.

glass floor Zero accidents or reportable incidents.

Glasshouse Detention centre, military prison (UK, colloq.).

glass wool Produced by forcing molten glass through orifices of approximately 1 μ diameter.

Glazia Large-ray large-area space telescope.

Glaez factor Increase in lift coefficient due to fluid being compressible, $= (1 - M^2)^{-1/2}$.

Glavkosmos Chief Administration of Space Launch Services (R).

Glavkovia Chief Administration of Aviation (USSR).

Glazed frost Rain ice, layer of smooth ice formed by fine rain falling on sub-zero surface.

Glaze finish Vitreous enamel coating on metal.
glaze ice

Transparent or translucent coating with glassy surface formed by contact with rain; part freezes on impact, most flowing back and freezing over surface.

GLC  Generator line contactor.

GLCM  Ground-launched cruise missile.

GLCS  Global launch control system (DoD).

GLD  Glider (ICAO).

gld  See GLLD.

glide  1 Controlled descent by aerodyne, esp. aeroplane, under little or no engine thrust in which forward motion is maintained by gravity and vertical descent is controlled by lift forces. Rate of descent is given by \( \frac{V}{L} = -\frac{(D/L)\,V}{g} \) where \( D \) is drag, \( L \) lift and \( V \) TAS.

2 Flightpath of *.

3 To descend in *.

glide bomb  Missile without propulsion but with aerofoils to provide lift and guidance; released from aircraft.

glide landing  No-flare landing.

glide mode  Flight-control system mode in which aircraft is automatically held to centre of glideslope.

glidepath  1 Flightpath of aircraft in glide, esp. when making ILS landing.

2 Glideslope.

glidepath angle  That between local horizontal and straight line representing mean of glideslope.

glidepath indicator  ILS outer, middle or inner marker.

glidepath bend  Aberration in electronic glidepath.

glidepath controller  ILS panel instrument.

glidepath localizer  Contradiction in terms (see localizer).

glidepath sector  Sector in vertical plane containing glideslope and extended runway centreline, limited by loci of points at which DDM is 0.175.

glider  Fixed-wing aerodyne designed to glide, ordinarily having no internal propulsion (see sailplane).

glide ratio  Ratio of horizontal distance travelled to height lost; \( \text{TAS} \times \text{Vs} \) (in same units). A common symbol is \( R_\text{g} \).

glider flight time  Includes time on tow.

glider train  Two or more gliders towed in tandem behind one tug.

glider tug  Aircraft used to tow gliders.

glideslope  Radio beam in ILS providing vertical guidance (see ILS).

gliding angle  1 Angle between local horizontal and glidepath. Traditionally \( \gamma = \tan^{-1} \frac{D}{L} \) where \( D \) is drag and \( L \) lift.

2 Shallowest possible * of sailplane.

gliding range  Maximum distance that can be reached from given height in normal glide; also known as gliding distance.

gliding turn  Spiral flight manoeuvre consisting of sustained turn during glide; also known as spiral glide.

glim lamp  Source of illumination dim and local enough for use during blackout, esp. airfield lighting.

Glint  1 Geostationary Earth orbit light-imaging national testbed (US).

2 Gated-laser illumination for night TV.

glint  Pulse-to-pulse change in amplitude of reflected radar signals, caused by reflection from object whose radar cross-section is rapidly changing.

GLIT, Glit  Chief State flight-test centre, Akhtyubinsk (R).

glitch  Small voltage surge affecting sensitive device; later general colloq. for technical problem.
GMC
GMC Ground movement control, or controller.

GMCS Ground-manoeuvring camera system.

GMD Ground-based midcourse defense; S adds segment or system; in 2002 this replaced NIM as planned national defence against ballistic missiles (US).

GMDS Global maritime distress and safety system(s).

GMMES Global monitoring or [or of] environment and security [EC + ESA] (2008-).

GMFSC Ground mobile forces satellite communications.

GMH Goddard management instruction.

GML Gross moving load.

GMLA Guided missiles and launch assemblies.

GMLRS Guided multi-launch rocket system.

GMLS Guided-missile launcher system.

GMLTS Guided-missile launcher test set.

GM-1 Nitrous oxide, piston-engine boost system (G, WW2).

GMP Ground-movement planning.

GMR 1 Ground-mapping radar.

2 Giant magnetoresistance.

GMRP Guided-missile round pack.

GMS 1 Geostationary meteorological satellite.

2 Groupement des Missiles Stratègiques (F).

3 Ground-based midcourse system.

4 Ground monitoring station.

GMSI Global multi-nation support platform.

GMT Greenwich mean time, or Zulu, now replaced by UTC.

GMTI Ground moving-target indicator (or indication).

GMTT Ground moving target tracking.

GMU GPS-based measuring, or monitoring, unit.

GMVLS Guided-missile vertical launch system.

GN See GN2.

Gn Green.

gn Standard value for gravitational acceleration.

GNA General network architecture.

GN&C Guidance, navigation and control.

G-nav Navigation direct from A to B not on promulgated airway but crossing radials yet still using VOR/DME; name from graphic navigation, using computer-produced charts or hand-held equipment to give pilot a picture derived from VOR/DME inputs. Basic method of cross-radial navigation.

GNC 1 Graphic numerical control.

2 General navigation computer.

3 Global navigation chart.

GNCS Guidance navigation control system.

GN, gnd Ground [CK adds check, CON control, FG fog].

GND, gnd Ground [or] [or of] environment and security [EC + ESA] (2008-).

GNE 1 Gross navigational error.

2 Global distribution system new entrants (Int.).

GNLS GPS navigation and landing system.

GNLU GPS navigation and landing unit.

GNN Government News Net (UK).

gnomonic projection Created by projecting from centre of Earth surface features on plane tangent to surface; distortion severe except near origin (point where plane touches Earth) but great circles are straight lines.

GNR Global navigation receiver.

GNS 1 Global navigation system.

2 Global navigation satellite [P adds panel, S system, SA supervisory authority, SP system panel, SU sensor unit]; general term for all such spacecraft.

3 Glassfibre/Nomex sandwich.

GNT Gross nozzle thrust.

GN2 Gaseous nitrogen.

GNY German navy [UK usage].

GO 1 Geared, opposed (US piston-engine designation).

2 General Order (military).

3 Groupe d’Observation (F).

GO3 Gaseous oxygen.

go-ahead Point in government programme at which prime contractor receives written authorization to proceed with full-scale development. Not an official term.

go-around Overshoot; see going around.

go-around mode Terminates aircraft approach and commands climb; also known as auto overshoot.

GOC Generator over-current.

GOCE Gravity-field and steady-state ocean explorer.

Goco, GOCO Government owned, contractor-operated (US).

GODAE Global ocean data assimilation experiment.

Goddard Space Flight Center Greenbelt, Maryland, centre for NASA tracking and communications network.

Godsave See GHA.

Goes, GOES 1 Geostationary, or geosynchronous-orbit, or global, operational environmental satellite, suffixes East or West.

2 Gyrostabilized opto-electronic system.

go for broke To fire all weapons in one pass of target.

go gauge Dimensional gauge which must fit close, but without being forced, on or in the part for which it is intended.

go-home mode Emergency RPV flight-control mode used following loss of navigation or command link.

going around: 1 Overshoot straight ahead (UK civil).

2 Make another circuit (RAF).

Gold General on-line diagnostic.

gold Au, malleable metal with density 19.3, MPt 1,064°C, aerospace use mainly thermal-reflective coatings.

goldbeaters’ fabric Layer of cloth fabric cemented to one or more layers of goldbeaters’ skin, making it gas-tight.

Gold C Gliding certificate second only to Diamond C, requiring flight of ≥300 km and other achievements.

golden arm Supposed attribute of pilot whose ability and experience master all simulations and are acknowledged by peers.

golden handcuffs Large cash sum to induce military pilot to extend period of service (UK, colloq.).

gold film Extremely thin vapour-deposited electrically conductive film used for thermal anti-icing of transparencies.

Goldfish Club Club open to aircrew whose lives have been saved by dinghy made by UK company RFD Ltd. (1940-).

goldie Verbal code: “Aircraft automatic flight-control system and ground-control bombing system are engaged and awaiting electronic ground commands” (DoD).

goldie lock Verbal code: “Ground controller has electronic control of aircraft” (DoD).

gold plating Introduction of what (generally ignorant or partisan) politicians claim to be costly and unnecessary features in weapon systems (US).

Goldstein 1929 put forward two theories to simplify propeller calculations: the trailed vortex sheet is a helix of constant pitch; and the resultant velocity is the vector sum...
Goldstone

of the induced velocity and the velocities of rotation and forward motion.

Goldstone DSIF stations NE of Barstow, CA.
golf ball Turbulence control structure.
GoMats Gulf of Mexico advanced traffic surveillance.
gondola Car of airship.
gong Medal or decoration (RAF colloq.).
gonio VHF/DF (F).
gonometer An instrument for measuring angles between reflecting surfaces of crystal or prism.
gore Shaped sector of parachute canopy normally formed from two radii struck from the same apex.
gore* panel, *diaphragm.
2 Electromagnetic transformer used with fixed and rotating aials for determining bearing of radio station.

Motor-driven instrument used with four stationary aials to determine radio direction for use in VOR.
go/no-go Step-by-step basis on which manned spaceflights are flown, with flight crew and mission control jointly making positive decision whether to continue into each new phase of mission.
go/no-go check list Written guide for flight crews to determine go/no-go situation on any given subsystem deficiency (USAF).
go/no-go gauge Dimensional gauge for checking whether part is within upper and lower tolerance limits.

Go-NoGo Line Geographical line beyond which aircraft carrying live NW could penetrate only after receipt of Positive Release Message [in case of RAF 1953–80 this was 8°E longitude].
go/no-go test equipment Provides only one of two alternative answers to any question, e.g. whether given signal is in or out of tolerance.
good engine One that continues to operate after other[s] failed.

Goodman diagrams Various graphical plots used to determine parts life under repeated cyclic loads, most common having per cent alternating stress/endurance strength as ordinate and per cent mean stress/rupture strength as abcissa.
good parachute Fully and correctly deployed.

Goodrich de-icer Original patented pulsating rubber de-icer for leading edges, intermittently inflated with air to break up ice.

Goodrich rivnut See Rivnut.
goofer Audience on island of carrier.
goofers Written promise of reward if downed aircrew member is returned intact [UK Imperial, esp. North West Frontier, 1920–50].
goon Guard at PoW Stalag Luft (RAF WW2).
goose neck flare Type of runway flare mounted on slender stem designed to bend easily if struck by aircraft.
GOPS, Gops Giga [10^9] operations per second.
GOR General Operational Requirement.

Guy on the right, in side-by-side military aircraft, normally navigator or electronic-warfare officer.

3 Ground occurrence report.

Gorac Ground collision-avoidance system operational requirements and certification (Euret).
gore 1 Shaped sector of parachute canopy normally bordered by two adjacent rigging lines.

2 Shaped section of airship envelope or gas bag, or balloon envelope.

2 Radial panel in airframe, esp. pressure bulkhead, hence *panel, *diaphragm.
GOS 1 General operator station.

2 Grade of Service.

GPIAA 3 Gate-operating system.
4 Global observing system.

Gosat Greenhouse-gases observing satellite.

GOSC General Officer Steering Committee.

Gost State commission for space research (USSR, R).

GosNII State scientific research institute (USSR, R); -A or Aeronavigatsiya adds ATC/navigation/landing aids; -AS adds avionics; -GA adds all aspects of civil aviation; -PAS adds ground test of aircraft systems.

Gospar State commission for space research (R).

Gosport tube Flexible speaking tube used in tandem open-cockpit trainers connecting instructor’s mouthpiece with pupil’s helmet or vice versa.

Gost State research institute for fuels and lubricants (USSR, R).

Gothic-arch bearing Became the preferred type of ball bearing in gas-turbine mainshafts, this runs the balls between races each formed from two radii struck from slightly different centres.

Gothic delta Wing whose basic triangular shape is modified to resemble Gothic window; also known as ogival delta.

GOTS Government off the shelf.

Göttingen-type tunnel Wind tunnel with return-flow circuit but open working section.

GO2 Gaseous oxygen.

Gouge flap Flap whose upper surface forms part of cylindrical surface; thus as flap rotates immediate movement is rearwards to increase area.

GOX, gox Gaseous oxygen.

GoXML Universal meta-language converting almost any data format into XML and back.

GP 1 General purpose (bomb, or former RAF squadron role prefix).

3 Geographical position.

4 Glidepath.

Gp Group.

GPa Gigapascal.

GPADIRS Global positioning air-data inertial reference system [U adds unit or replaces system, GPIRS omits AD].

GPADS Guided-parafoil aerial [or air or airborne] delivery system.

GPALS General protection against limited strikes.

GPA& C Global positioning and communications.

GPB Ground-power breaker.

GPBC Gold-plated beryllium copper.

GPC Government Procurement Code (US).

GPDU General-purpose control and display unit.

GPCU Ground-power control unit.

GPD General-purpose digital computer.

GPEP Global-positioning experiments program.

GPEC Global-positioning air-data inertial reference system [U adds unit or replaces system, GPIRS omits AD].

GPEX Global-proximity extraction system.

GpFL Group flashing light.

gp, GPH Gallons per hour.

GPI 2 Ground-positioning indicator.

3 Glide-path indicator.

4 Global positioning inertial; N adds navigation, RS reference system, RU reference unit, SS sensor system.

5 Gas-penetrant imaging, or inspection.

GPIAA Accident-investigation authority (Portugal).
GPIB

GPIB General-purpose instrument bus, or interface board.

GPIIA Groupe Professional des Industriels Importateurs de l’Aéronef (F).

GPI Positioning Global Positioning System, or satellite (Navstar).

GPIO General-purpose input/output.

GPIRS See GPADIRS.

GPM 1 Glass polycarbonate mix.

2 Global positioning measurement.

3 General-purpose processing module.

gpm Gallons per minute (also gal/min).

GPMG General-purpose machine gun.

GPMS GPS performance-monitoring system.

GPP 1 Graphic part-programming; technique for communicating with computer by words and diagrams, conveying pictures of shape required and operations necessary to produce it.

2 Generative process planning, basis for implementing FMS (7).

3 General-purpose processor.

GPPE General-purpose processing element.

GPPP A Groupement Pour la Préservation du Patrimoine Aérien (F).

GPR Glider Pilot Regiment [1942-57] (UK).

GPRA Glider Pilot Regimental Association [1945--; Beafilet SS7 3JQ] (UK).

GPRS General packet radio services; see packet (3).

GPS Global positioning system, or satellite (Navstar); ANT adds antenna, L1/L2/L3 see these entries.

GPSCS General-purpose satellite communications system.

GPS-HMU GPS height measuring unit.

GPSI GPS interferometer.

GPSS General-purpose simulation software.

GPSSU GPS sensor unit.

GPT Glidepath tracking.

GPTE General-purpose test equipment.

GPON General-purpose telephone network.

GPU 1 Ground power unit.

2 Gun pod unit.

GPV1 Graphic[s]-processor video interface.

GPW Ground-proximity warning [C adds computer, S system, SU sensor unit].

GR 1 Green run.

2 Ground attack, reconnaissance (role prefix, UK current).

3 General reconnaissance, ie Coastal Command (role prefix, UK, WW2).

4 Ground relay, or router.

5 Groupe de Reconnaissance (F).

Hail.

Gr 1 Net climb gradient.

2 Graphite.

3 Graphof number.

G. G. G. Ruddler actuator.

GRA Geared rotary actuator.

grab Tendency of wheel brakes to increase power suddenly without pilot input.

grabbit Long boathook carried on large marine aircraft.

grab line See handling line.

Grace Gravity recovery and climate experiment (US/G).

GRAD, Grad Gradient.

Grand Slam

grad Non-SI unit of plane angle, = 0.9° = 1.5708 × 10⁻² rad.

grade 1 Of fuel, see fuel grade.

2 Unit of plane angle, defined as 0.9°.

Grade-A Standard aircraft; cotton propellant, long staple with 80 threads per inch across both warp and weft (US = fill).

graded fibre Standard form of reinforcing-fibre raw material supplied according to diameter, length or other variable.

gradient 1 Of net flightpath, has normal meaning, h/D%; note runway * = slope.

2 Space rate of decrease of function; if in three dimensions, vector normal to surfaces of constant value directed towards decreasing values. Ascendent is negative of *.

3 Loosely, magnitude of either * or ascendent.

4 Rate of change of quantity, or slope of curve when plotted graphically.

gradient distance Linear distance from encounter with gust to point of peak intensity.

gradient of climb See climb gradient.

gradient wind Along isobars with velocity exactly balancing pressure gradient; equilibrium between force directed towards region of low pressure and centrifugal forces.

gradient wind speed Calculated as for geostrophic but taking into account curvature of trajectory.

grading curve In determining propeller performance by Drazewski theory, forces on infinitely small blade element are determined: curve of these forces (as the ordinate) against blade radius is **, from spinner or root and reaching maximum between 70%–90% tip radius.

Gradu Gradual[v]

Graetz number, Gz Heat-transfer measure = Cp (specific heat at constant pressure) times mass flow divided by thermal conductivity and a length characteristic of body concerned.

Grafil Registered name (Courtaulds) for carbon-fibre raw materials.

grain 1 Entire case or extruded charge for solid rocket motor.

2 Particle of granular solid propellant, usually in gun ammunition.

3 Particle of metallic silver remaining in photographic emulsion after developing and fixing; these form dark area of image.

4 Non-SI unit of weight = 0.0648 g = 1 7000 lb.

grain orientation Direction of solidification of metal.

GRAM, Gram GPS receiver application module.

gramme Fundamental SI unit of mass [gram in US], abbr. g.

gramme-molecule Mass in grammes of substance numerically equal to its molecular weight.

gramophone grooving Close-pitch grooves in female part to form abradable seal round high-speed rotating member.

Grandfather rights Permanent certificates for their existing route networks awarded US domestic airlines by CAB on its formation in July 1940. Hence Grandfather routes. Today loosely extended to all nations on basis 'If you've had this right in the past, you'll probably succeed in a fresh application'.

Grand Slam RAF 22,000 lb [9,979 kg] deep penetration bomb of 1944.
**grand slam**

Verbal code: “All hostile aircraft sighted have been shot down” (DoD).

**Grand Tour** Planned unmanned exploration of series of outer planets with same spacecraft using planets’ gravitational fields to turn spacecraft from one to another; possible only once in each 180 years.

**granularity** General measure of structure of very large EDP system based on number of processors used.

**Grashof number** Heat-transfer parameter, $Gr = \frac{VT^3}{v^4}$ where $V$ is velocity, $T$ is temperature, $g$ is gravitational acceleration, $T_0$ and $T_1$ are temperatures, and $L$ and $g$ are length and gravitational acceleration.

**Gravitational constant** $G$ Also called Newtonian constant, $G = 6.6732 \times 10^{-11} \text{Nm}^2\text{kg}^{-2}$; other published values include 6.664, 6.669, 6.670 and 6.6705, in each case $\pm 10^{-11}$.

**graviton** Hypothetical elementary unit of gravitation.

**gravity** Attraction experienced in vicinity of a mass, especially Earth. Standard value for terrestrial acceleration $g = 9.80665 \text{m} \text{s}^{-2} = 32.1740 \text{ft} \text{s}^{-1}$

**gravity drop** Departure of inert projectile from initial trajectory.

**gravity drop angle** Angle in vertical plane between gun line at moment of firing and straight line to a future projectile position.

**gravity feed** Relying on fact liquids tend to flow downhill, unassisted by pump.

**gravity seat** Simulator seat giving sensation of ‘pulling-g’, see next.

**gravity suit** Aircrew suit, closely related to g-suit, with elements inflated/deflated by external system to give sensation of flight manoeuvres.

**gravity tank** Container relying on gravity for feed, hence may be inoperable when inverted.

**Grau** State rocket and artillery directorate (USSR, R).

**grouse** To damage aircraft or vehicle (UK, colloq.).

**graveyard dive** One entered too close to the ground.

**graveyard spiral** Without blind-flying instruments most simple aircraft, on entering cloud, can enter increasingly steep spiral, pilot under 1g and wings apparently level.

**Graviner** Maker of fire extinguishers, became term for an extinguisher (RAF WW2).

**gravipause** Point between two bodies where their gravity fields are equal and opposite.

**gravireceptors** All sensors in human body for attitude, gravity and acceleration.

**gravitation** Assumed universal property of all masses of attracting all other masses with force $GMm/r^2$ where $G$ is universal constant, $M$ and $m$ are two masses and $r$ is mutual distance apart.

**Ground readout equipment.**

**GRBM** Gamma-ray burst; CN adds co-ordinates network.

**GRBL** Green-raster brightness level.

**GRBM** Gamma-ray burst monitor.

**GRC** 1 Glenn Research Center (NASA, Cleveland, Ohio).

**GrCCS** Guardrail common sensor.

**GRDC** Gulf Range drone control; US adds update system.

**GRDS** 1 Ground-roll director system, based on PVD.

**GRT** 1 Generic radar display system.

**GRE** 1 Ground readout equipment.

2 Ground runup enclosure.
grease

Grease 1 Lubricants based on hydrocarbon soaps emulsified in petroleum oils.
2 To make a greaser.

great circle 1 Circle (usually small portion) on surface of sphere whose plane passes through sphere's centre.
2 Intersection of Earth's surface and plane passing through Earth's centre.

great-circle chart One on which all GCs are straight lines.
great-circle course See next.
great-circle route Shorter of two great circles linking all pairs of points on Earth's surface, giving minimum distance to fly; GC course is a misnomer because except along Equator or meridians course (hdg) is constantly changing.
great-circle track See great-circle route.

Greatrex nozzle Pioneer noise-reducing jet nozzle having several (typically six to eight) radial petal-like segments to increase length of periphery.
green 1 Signal to proceed given by Alids or similar lamp aimed at aircraft.
2 Friendly.
3 Coloured light[s] on instrument panel, esp. 3 * = landing gear down and locked.
green aircraft Flyable but still lacking interior furnishing and customer avionics, and still in * protective surface coat, awaiting painting.
green airway One running essentially E-W.
Green channel Airport route for arriving 'nothing to declare' passengers without dutiable possessions.
green density That of compacted powder prior to sintering.
green endorsement Written in logbook of aircrew member in green ink, showing exceptional ability, esp. for landing crippled or dangerous aircraft.
greenfield site Site considered for new airport or other facility where no structures exist at present.
Green Flag Tac-air war exercises strongly emphasising EW (USAF).
green flag In signals area = right-hand circuit.
greenhouse Long glazed canopy over tandem cockpits (colloq.).
greenhouse effect Filtering and reflective effect of Earth's atmosphere on solar and other radiation akin to that of glass panes; part of incoming spectrum penetrates to Earth, where it heats surface and causes reradiation of longer wavelengths, some of which are absorbed by greenhouse gas (glass) like water vapour and again reradiated.
greenlight To authorise start of expenditure on a programme (US).
green, red, blue A common landing check, meaning gear [undercarriage], mixture, propeller[s].
green run First run of new or overhauled engine or other item.
green suit(er) Soldier (USA).
green tube Unfurnished passenger aircraft.
Greenwich Earth's prime (0°) meridian, hence * apparent time (GAT), * hour angle (GHA), * mean time (GMT) and * sidereal time (GST).
green zone Traditionally, intersection between green and crossing airway at which it is traffic on crossing route that has responsibility for ensuring height separation.
grey body Unknown hypothetical body absorbing constant fraction of all wavelengths of incident EM radiation.
grey code Gray Code.
grey literature Technical documents produced by universities, laboratories and professional and government bodies, not normally available to public.
greyout Blurred vision under high positive acceleration less than that producing blackout.
grey scale, grey shades Standard series of achromatic tones linking black to white, typically 64 on modern display.
grey water Waste from hand basin; this can be fed to drain mast, unlike waste water.
grey wedge Standard filter whose opacity increases in known fashion across width, usually L to R; used in determining pulse distribution and other variables on CRT and other displays.
grf, g.r.f. Group repetition frequency.
GRG Ground-roll guidance.
GRI Group repetition interval.
Grib Gridded-binary data [chart of forecast weather].
grid / Perforated electrode between cathode and anode of thermionic valve controlling flow of electrons into fine beam.
2 Metal cylinder at negative potential in CRT designed to concentrate electrons.
3 System of two sets of parallel lines crossing at 90° to form pattern of squares each identified by number and/or letters in margins; superimposed on maps, charts, photographs and multi-sensor outputs so that any point can be located by letter/number code. Usually also permits accurate measures of distance and direction. Often called military *, though most are civil.
grid bearing Direction of one point from another measured clockwise from grid (3) north.
grid bias Constant potential in series with input circuit between grid (1) and cathode to hold operation to one part of characteristic curve.
grid convergence Angle between true north and grid (3) north.
grid co-ordinates Rectilinear measures about two axes in flat plane of grid (3) facilitating conversion of lat/long and other Earth measures on to flat sheet by routine plane surveying.
grid heading Aircraft heading measured relative to grid (3) north.
grid leak Resistor allowing grid (1) charge to drain to cathode.
Grid Lock Automatic precise geo-registration of imagery from airborne sensors to create target co-ordinates within minutes, later within seconds (USAF).
grid magnetic angle Angle between magnetic north and grid (3) north, measured E/W from latter; also known as grivation (= grid variation).
grid modulation AM achieved by applying modulating signal to grid (1).
grid north Zero datum of grid (3), close to true north.
grid ring

grid ring  Round top of traditional magnetic compass, rotated by hand when setting course.
grid ticks  Small marks on neatline or along grid (3) lines showing alternative grid system(s).
grid variation  See grid magnetic angle.
Griffith crack  Supposedly ideal crack in structure, where minor axis = 0.
Griffith wing  Subsonic wing of very deep section with powerful suction slit on upper surface at about 70% chord to induce airflow to follow discontinuity between upper surface ahead of slit and thin trailing edge. Never successfully used.
Grip  Global reach improvement program.
grip range  Range of thickness of material joinable by particular blind rivet or other fastener.
GRIS  Global reconnaissance information system.
GRM  Ground-roll monitor.
GRMS  Ground reference and monitor station (DGPS).
GRND  Ground.
GRO  Gamma-ray observatory.
grommet  1 Rigid or reinforcing eyelet closed on to flexible surface.
2 Flexible ring set into rigid surface, often by peripheral groove matched with sheet thickness, providing bearing surface for pipe, cable or other line (1, 2) or control cable.
grooved runway  One whose surface is traversed by one of four standards of shallow grooves tailored to climate, crossfall and other factors, along which water can escape even in heavy rain and strong wind to make critical aquaplaning depth extremely unusual.
groover  Machine with large wheel, usually diamond-dressed saw, for cutting runway grooves.
GROS, Gros  Civil Experimental Aeroplane Construction Organization (USSR).
gross area  Area of projected surface of aerofoil, edges being assumed continuous through nacelles, fuselages, pods or other protuberances. Where tapered wing meets fuselage, edges projected in to meet at centreline, except in case where angle is extreme (eg, with glove, Lex, strake), where end of root is taken across at 90°.
gross ceiling  Altitude at which gross climb gradient (see gross performance) is zero.
gross dry weight  Traditional measures of powerplant weight which included propeller hub (metal hub on which wooden propeller was mounted), all starters, primers, exhaust systems, fluid filters, air inlets and accessories, but excluding cooling system, fluid tanks and supply systems and instruments.
gross flightpath  Gross profile in climb-out segment.
gross flight performance  See gross performance.
gross height  Height of any point on gross flightpath.
gross lift  Biocny in ISA (1) of aerostat under standard conditions of inflation and with allowance for humidity.
gross liftoff weight  Actual mass of spacecraft at moment of liftoff.
gross moving load  Total moving mass of simulator, including upper baseplate and actuators.
gross performance  That actually measured on one aircraft of type, adjusted by small factor to reflect guaranteed rating and fleet minimum performance.
gross profile  Side elevation of aircraft trajectory, esp. following takeoff, corresponding to gross performance.
gross thrust  That developed by propulsion system in ideal conditions, not allowing for inlet momentum drag, inlet shock losses, duct losses, tailpipe losses, cooling drag, propeller slipstream drag, torque effects or any other effects.
gross upset  Major uncommanded departure in AOAV/altitude/attitude.
gross weight  Traditional measure usually defined as maximum flying weight permitted; today MTOW.
gross wing area  Gross area.
ground  1 US = earth.
2 To declare object or person unfit for flight.
3 Personnel on apron connected to aircraft by interphone cord.
ground-adjustable propeller  One whose pitch can be changed only by ground crew.
ground air vehicle  One designed for ground mobility but which can fly for short periods (ASCC).
ground alert  Status of aircraft fuelled and armed and crews able to take off within specified period, usually 15 minutes.
ground angle  1 That between local horizontal and major axis of parked fuselage.
2 Maximum usable nose-up angle on landing, limited by tail scrape.
ground board  Flat surface representing the ground in wind tunnel.
ground clearance  1 Vertical distance between airfield or deck and tips of helicopter main rotor blades in no-lift position.
2 Vertical distance between airfield or deck and specified part of aircraft or external stores.
ground clutter  Unwanted returns on radar display caused by direct reflection from ground.
ground collision avoidance system  To prevent airborne aircraft from flying into the ground, not for preventing taxing accidents.
ground contact  Glimpse of Earth sufficient to assist navigation.
ground control  Control tower position or other authority assigned to control all vehicles, including taxing aircraft, on airfield movement area.
ground-controlled approach, GCA  Ground radar installation able to watch approaching aircraft and direct them to safe landing by radio (so-called talkdown) in bad visibility; and landing thus directed.
ground-controlled interception, GCI  Interception (1) controlled by ground radar and radio (usually voice-language) advice.
ground crew  1 Personnel assigned to cleaning, replenishment, servicing or maintenance of aircraft at turnaround, between missions or in other routine situation.
2 Personnel assigned to manoeuvre aerostat on ground (see landing crew).
ground cushion  1 Region of increased pressure beneath landing aeroplane caused by forward motion, proximity of ground and trapping of air ahead of flaps and under fuselage (can affect flow over tail and, for this and other reasons, cause pronounced pitching moment).
2 Region of increased lift under helicopter or jet V/STOL in low-altitude hovering mode caused by reflec-
ground delay program

tion of downwash, jets, entrained air and possibly entrained solids or liquids from ground.
ground delay program Implemented to control traffic to airport where acceptance rate is reduced [expected to last a significant time, e.g. because of severe weather or an accident] by prohibiting flights to that airport to depart until a delayed EDCT.
ground Earth station Aeronautical ground station.
grounded Legally prohibited from flying.
ground effect Increased wing lift when flying in close proximity to ground, especially with low-wing aircraft.
ground idle Governed running speed for engine with aircraft stationary.
ground hold Hold (1) for ATC purposes taken on ground before starting engines.
ground horizon Theoretical distance of horizon from sea level (see horizon).
ground idle Governed running speed for engine with throttle fully closed; lower rpm than flight idle.
ground-imagery exploitation station Each GIES comprises an IIW, an MD/RWW and an RRW (RAF reconnaissance).
ground lag See lag.
ground liaison Officer specially trained in offensive air support (DoD) and/or air reconnaissance (NATO, CENTO, IADB); organized as member of team under ground commander for liaison with air and/or navy.
ground line A notional airfield surface used in design [in theory, the same as the actual surface at any time].
ground loiter Helicopter saving fuel by resting on ground between particular military tasks, in friendly or hostile territory.
ground loop Involuntary uncontrolled turn while moving on ground, esp. during takeoff or landing, common on tailwheel aeroplanes with large ground angle, caused by directional instability; if at high speed, landing gear would normally collapse before turn had reached 180°.
ground marks ICAN and other bodies decreed what information should be written [usually in letters/numbers 6.09m (20ft) high] on the ground or on buildings to aid pilots.
ground movement control Military unit assigned to control of transport by land, esp. of air forces.
ground moving target indication Separation of ground moving targets from clutter background by using their different Doppler shift, especially when looking ahead at small angles from track.
ground nadir Point on ground vertically beneath perspective centre of camera lens when exposure was made; coincides with principal point in vertical photo.
ground observer Trained person forming part of organization providing (DoD) visual and aural information on aircraft movements over defended area, (UK) information on fallout after nuclear attack.
ground occurrence report Monitors failures [ground or inflight] traced to lapses by engineers.
ground-performance aircraft One able to move itself on ground without using flight propulsion system (ASCC).
ground plane Earthed system of conductors forming horizontal layer (mesh, sheet, radial rods etc) surrounding ground nadir.
ground plot A calculated ground position.
ground position Point on Earth vertically below aircraft.
ground-position indicator Device fed with data from compass, ASI etc and giving continuous readout of DR position (obs.).
ground power unit Source of power, usually electric and possibly pneumatic/hydraulic/Shaft, supplied to parked aircraft.
ground-proximity extraction system Standard technique for low-level airdrop of palletized cargo using shock-absorbing ground coupling which engages with hook suspended from pallet.
ground-proximity warning system Uses forward-looking radar and sensitive altimeter(s) to give aural and/or visual warning, and in most systems, if ignored, to command violent pull-up to [typically] 30° climb. See EGPWS.
ground radar aerial delivery Method of air-dropping cargo, usually in A-22 (US) containers, from high altitude to avoid hostile fire, mountains or other hazards, with full parachute deployment delayed to increase accuracy.
ground readiness Status of aircraft serviceable and crews standing by so that arming, briefing etc can be completed within any specified period (longer than 15 min of ground alert).
ground resonance Dangerous natural vibration of helicopter on ground caused by stiffness and frequency of landing-gear legs amplifying primary frequency of main
ground return

Rotor; potentially catastrophic unless designed out, and even with certificated helicopter can occur as a result of severe landing shock.

ground return See ground clutter.

ground roll Distance travelled from point of touchdown to runway turnaround, stopping or other point marking end of landing.

ground run Distance from brake-release to unstick, not same at TO (see takeoff).

ground safety lock Retraction lock.

groundschool This is increasingly being spelt as one word. It usually refers to classroom instruction for GA pilots, especially on executive aircraft.

ground sheet Radial-wall flow of hot gas along ground beneath VTO [esp. jet-lift] hovering in ground effect.

ground signals Bold visual symbols displayed in signal area.

groundspeed, GS Aircraft speed relative to local Earth.

groundspeed mode Flight-system mode holding constant GS.

ground spoiler Spoiler available only after landing, usually as lift dumper.

ground start Supply of propellants to large rocket vehicle from ground during ignition and hold-down so that at liftoff main-stage tanks are still full.

ground stop Holds flight [usually scheduled, but in any case already cleared] at departure. Reasons might be closure of destination or to allow for implementation of longer-term solution to a destination problem, such as a GDP.

groundstrafing Attack by aircraft on tactical surface target, esp. by gunfire.

ground support 1 Air power deployed for immediate assistance of friendly army, ie close air support; hence designation * aircraft.

2 Hardware needed to facilitate operation of aircraft, eg ladders, chocks, refuelling, replenishing and rearming equipment, loaders, tie-downs, blanks (4) and ground conditioning and power supplies; and use thereof.

ground support equipment, GSE Ground equipment required for operation of aircraft [especially military], RPV or missile.

ground swing envelope Plot of ground where obstructions would foul nose or tail of longest aircraft in most extreme positions on curves of taxiways or apron.

ground test Test of ground of equipment or system normally used in air.

ground test coupling Connections enabling airborne system to be tested on ground for fluid pressure and functioning, supply voltage or any other variable.

ground track Path on Earth’s surface vertically below aircraft or satellite.

ground upset Accident caused to light aircraft or other vehicle by jet blast or large propeller slipstream.

ground visibility Prevailing visibility along Earth’s surface as reported by accredited observer or measured by RVR.

groundwash Outward flow of wake turbulence from engines or wingtips of large aircraft on ground.

ground wave Radio or other EM waves taking direct path from ground transmitter to ground receiver (in practice mix of ground, ground-reflected and surface waves); subject to refraction in ducts in troposphere.

ground wire 1 US term for earthing wire.

2 Winched cable emerging from top of mooring mast and connected to airship mooring cable; US = mast line.

ground zero, GZ Point on Earth nearest to centre of nuclear detonation (which may be below, at or above GZ).

group 1 Military air formation consisting of two or more squadrons (DoD), or two or more wings (RAF).

2 Several sub-carrier oscillators in telemetry system.

3 Major portion of aircraft (eg. wing*) assigned to * (4).

4 Team of engineers assigned to design, stress, develop and possibly cost major portion of aircraft, often remaining intact to work on same part on successive programmes; common in US, where * titles are wing, fuselage, tail/controls, weight, electrical, hydraulic, armament and often others.

group flashing light, GpFL Light with regular emission of two or more flashes or Morse letter(s).

group technology General term for philosophy that links CAD with CAM to give CIM, based on recognising similarities between discrete parts.

group velocity Symbol U, that of entire disturbance of waves, equal to phase speed c minus wavelength 1 times dc/dt.

growl Missile tone heard in pilot headset indicating IR head locked on to target.

growler 1 Test equipment for short circuits in electrical machines (colloq.).

2 ECM aircraft, or a member of its crew.

growth Development to increase performance, hence * engine; this may or may not be physically larger.

GRP 1 Glass-reinforced plastics.

2 Geographic reference point.

GRR Glycol recovery and recycling.

GRS 1 Government rubber synthetic, Buna-S type.

2 Global reconnaissance strike (US).

3 Gamma-ray spectrometer.

GRSF Ground Radio Servicing Flight (RAF).

GRT Gross registered tonnage, measure of capacity of ship, = 100 ft3 = 2.832 m3.

GRU Main intelligence directorate of General Staff (USSR).

groun manoeuvre One involving high g (colloq.).

groupe Group (G), equivalent to RAF wing.

GRV Glycol recovery vehicle.

GRVD Grooved runway.

GRVL Gravel runway or surface.

Gr wt Gross weight.

Gryphon FBMS/shore communications system.

GS 1 Ground speed.

2 Glideslope.

3 Ground plus station (costs).

4 Ground supply (usually electrical).

5 General schedule.

6 Galley service vehicle.

7 Ground stop.

8 Gliding School.

G/S 1 Ground speed.

2 Glideslope.

Gs Small hail or snow pellets.

GSA Gunsight, surface-to-air.

GSARS Ground-surveillance airborne radar system.

GSC 1 Ground switching centre.

2 Ground-station controller.
GSD

GSD 1 Graphics system design.
2 Grey-[gray]-scale definition.
3 Ground sample distance.

GSDI  Ground speed and drift indicator.

GSE 1 Ground support equipment.
2 Ground swing envelope.
3 Global sensitivity equation[s].

GSF  Gross square feet [undesirable].

GSFC  Goddard Space Flight Center, Greenbelt, MD (NASA).

GSG 1 Group of Soviet Forces in Germany (NATO name).

GSGA  State service of civil aviation (R).

GSGG  Gadolinium scandium gallium garnet.

GSI 1 Grand-scale integration (microelec.).
2 Government source inspection.
3 Glide slope indicator.
4 Grid security infrastructure.

GSIF  Ground-station information frame.

GSL  Geostationary [or geosynchronous] satellite launch vehicle (India).

GSM 1 Ground-station module, or mobile.
2 Global-station module.
3 GPS sensor module.
4 Global-systems mobile, or global system for mobile communications.

GSMC  Global system for mobile communications.

GSMS  Ground-station management system.

GSN  Guidance unit (R).

GSO  Geostationary orbit.

GSOCC  German Space Operations Centre, Oberpfaffenhofen.

GSP 1 Ground service plug (= socket).
2 Glareshield panel.

GSQA  Government source quality assurance (US).

GSS 1 Ground surveillance radar.
2 General Staff requirement (UK, Army).

GSSS  Gyrostabilized sight system.

GST 1 Greenwich sidereal time.
2 General Staff Target.
3 General skills test (proposed for NPPL).

GSTF  Global Strike Task Force (USAF).

GSTP  General support technology programme (ESA).

GSTRS  Ground safety tracking and reporting system.

GSTS  Ground-based surveillance and tracking system (SDI).

GSU 1 Group Support Unit.
2 Group Standardisation Unit (RAF).

GSV  Gray-scale voltage[s].

G-switch  Activated by severe acceleration or impact.

GT 1 Group technology.
2 Rate, eg kg/h, of fuel consumption (USSR).
3 Gas temperature.
4 Greater than.
5 Gain/thermal noise ratio, also G/T.
6 Aircraft category, glider torpedo (USAAF 1942–47).

G, Gain of radar aerial (dB).

GTA  General terms agreement.

GTACS 1 Ground-target attack control system.
2 Ground-theater air control system (JFACC).

GTAW  Gas tungsten-arc welding.

GTC 1 In IFF, group time cycle.
2 Gyro time constant.

GTE 1 Grupo de Transporte Especial [government air carrier] (Brazil).

GTF 1 Ground test facility.
2 Geared turbofan.

GTL  Gas to liquid [fuel].

GTM  Ground targeting mode.

GTN  Global Transportation Network [web-based control system, to be upgraded to * 21] (US DoD).

GTO  Geosynchronous (or geostationary) transfer orbit.

GTOW 1 Ground take-off weight.
2 Confusingly, gross take-off weight.

GTP  Gun time per engagement.

GTR 1 Gulf Test Range.
2 General technical requirements.
3 Greater.

GTRE  Gas Turbine Research Establishment (India).

GTRI  Georgia Tech. Research Institute.

GTS 1 Gas-turbine starter.
2 Glider Training School.

GTSIO  Geared, turbocharged, direct injection, opposed.

GTSS  Ground-target sensor surveillance.

GTU 1 Ground test time.
2 Guidance test vehicle (helicopter).
3 Glide test vehicle.
4 Guidance test vehicle (missile).
5 Glide test vehicle.
6 Ground test valve (hydraulic system).
7 Gravity unit, standard unit for geophysical and MAD calculations, = 10^-6 m^2.

GUAP, Guap Chief Administration of Aviation Industry (USSR).

guaranteed rating Minimum power or thrust which manufacturer guarantees every engine of type will reach.

Guard  Category of aircraft of secret type, or containing secret equipment, requiring armed guard when parked (UK, WW2).

guard Emergency VHF channel usually monitored as a secondary frequency by all air and ground stations in geographical area.

guarded switch One protected against inadvertent operation by hinged cover or shroud.

guard frequency Guard.

guardroom Police post at entrance to RAF airfield or other military establishment (UK).

guardship 1 Armed escort helicopter.
2 Planeeguard helicopter.

guidepin pin Links piston to connecting rod (US, wrist pin).

GUDN Guarnylurea-dinitramide.


GUL, GUI Graphics, or graphic[al], user interface.

guidance Control of vehicle trajectory, esp. that of unmanned, or of manned but according to external inputs (see active homing, beam-rider, command *, electro-optical *, inertial *, IR *, laser *, midcourse *, passive homing, radar command *, semi-active homing, wire *).

guidance radar One dedicated to providing pencil beam for beam-rider or radar command guidance or illumination beam for semi-active homing.

305
**guidance system**

**guidance system** Complete system providing guidance signals to flight-control system which steers vehicle.

**guide ailerons** Small wing-tip ailerons providing normal feel on aircraft with plug-type spoiler ailerons.

**guided bomb** Free-fall missile with guidance, esp. modified bomb.

**guided missile** Vehicle able to deliver warhead to target; normally not including those travelling over land surface or entirely through water (torpedo) but including all with some form of aerial trajectory.

**guided weapon** Guided missile (UK).

**guide rope** See drag rope.

**guide-surface canopy** Any of several families of parasol deployed from pack but able to be steered through air with translational motion.

**guide vane** 1. See stator blade.

2. Radial aerofoil struts at gas-turbine inlet designed to add or reduce swirl to airflow.

**Guidonia** Large aeronautical research centre formerly (pre-1944) run by Italian defence ministry.

**Guinea Pig Club** Members of Allied air forces in WW2 who had been critically burnt or injured and operated on semi-experimentally.

**GULF, Gulf** Graphical user interface load-control facility.

**gull wing** One having pronounced dihedral from root to c15–20% semi-span, then little dihedral or even anhedral to tip.

**gull-wing canopy** In left/right halves, opened along centreline.

**gull-wing door** One having pronounced curvature, concave on outer face, hinged parallel to aircraft longitudinal axis.

**gully** Deep axial channel, eg. between two separated engines in fuselage of twin-jet aircraft.

**gulp** Irreversible consumption of lubricating oil.

**gun** General term for viscous residues formed in gasolines from propellant deficient in unburned oxygen which if ingested by engine suddenly alters operating conditions.

**gun gas** Emitted from muzzle, mix of initially incandescent gases from propellant deficient in unburned oxygen which if ingested by engine suddenly alters operating conditions.

**gun jump** Angle between gun bore line at firing and projectile trajectory as it leaves muzzle.

**Gunk** Registered commercial solvent for oils and greases.

**gun perfection coefficient** \( T - m \)

60-M

where \( m \) is mass of projectile, M mass of gun and T shots per minute.

**gunship** Specially designed helicopter with slim two-seat fuselage, extensive protection and wide range of armament for roles in land warfare.

2 Large transport aircraft equipped with night sensors and guns for use against poorly defended ground targets.

**gun sight line** LOS to aiming point through gunsight fixed optics.

**gun time per engagement** Usually firing duration in seconds, aggregate of separate bursts, against one aerial target.

**gun-type weapon** Nuclear weapon triggered by firing together at maximum velocity two or more subcritical fissile masses.

**gunwales** Pronounced gunnels, the upper edge of the sides of a marine-aircraft hull or float [with a rounded top, hardly applicable].

**Guppy** Aircraft with grossly swollen or bulged fuselage, eg, for conveyance of space-launcher stages and wide-body components (colloq.).

**Gusen** Generic unified systems engineering metamodel.

**gusset** Small flat member used to reinforce joints and angles.

**gust** 2. Sudden increase in velocity of horizontal wind (see gustiness factor).

2 Sudden encountered region of rising or falling air, causing moving aerodyne to experience sudden increase or decrease in angle of attack, \( \gamma \) gust velocity \( u \) = airspeed \( V \).

Vertical gust can theoretically be sharp-edged (instantaneous change from zero to maximum \( u \)) but normal design/airworthiness based on l-cosine (gradual) gust curve to which gust-alleviation factor applied.

**gust alleviation** Dynamic system for reducing effect of vertical gust on aeroplane (rarely, other aircraft) (see active ailerons, Softride).

**gust-alleviation factor** As aeroplane encounters gust it pitches (depending on wing/tail or foreplane geometry) and wing does not generate full extra lift until it has travelled several chord lengths into gust, both of which reduce sudden structure load below instantaneous encounter. BCAR assumes *** 0.61, ie assumptions are based on 61% of true sharp-edged gust.

**gust curve** Assumed plot of gust (invariably 2) velocity relative to surrounding air mass against horizontal distance from undisturbed air to position of peak \( u \).

**gust envelope** Basic aircraft design plot, vertical axis being structural load factor (1) and horizontal axis airspeed; normal boundaries are positive-stall curve, peak positive gust (normal non-SI = 50 ft/s) to \( V_c \), line to meet gust of half this strength ± 25 ft/s at \( V_o \), then vertical \( V_o \) to negative half-strength gust, line to – 50 ft/s gust at \( V_c \), and straight line at this negative gust value to meet positive stall at point less than 1 g. Recently new boundaries have been established at \( V_b \) at ±66ft/s. Increasingly now called flight envelope.

**gustiness factor** Measure of gust (1), = difference

\( \text{gustiness factor} = \frac{u - u_0}{u} \)
**gust loading**

between maximum gust and lull expressed as percentage of mean wind.

**gust loading** Increased structural loads caused by gust (1, 2).

**gust locks** Particular control locks preventing movement of flight controls of parked aircraft.

**gust response** Aircraft encountering gust (1, 2) experiences vertical acceleration made more severe by high speed, low wing loading (esp. large span, discounting flexure effect of wing) and some other factors. Normal measure of ** is number of 0.5 g vertical accelerations experienced by pilot’s seat per minute under specified conditions at high (Mach 0.9) speed at low level.

**Guti** Rare clag in Zimbabwe.

**gutter** Afterburner flameholder having cross-section generally in form of V, open side to rear, to create strong turbulence sufficient to keep flame attached; see vapour *.

**Guttman** Original scaling technique used to assess community noise response assuming that any positive answer implies positive answer to all questions of lower order; final Guttman scale is normally: no action; sign petition; attend meeting; contact officials; visit officials; help organize action group.

**GUVVF** Chief Administration of Air Fleet (USSR).

**GV** Grivation.

**GVC** Girls Venture Corps; -AC or (AC) adds Air Cadets [1939–, incorporates WJAC; office Sheffield S9 1UD] (UK).

**GVE** Graphics vector engine.

**GVF** Civil Air Fleet (USSR, R).

**GVI** General visual inspection.

**GVLLD** Ground/vehicle laser locator designator.

**GVLS** Ground vortex length scale.

**GVPF** Geared variable-pitch fan.

**GVR** Gross vehicle weight [airport vehicle].

**GVRC** GPS volume receiver card.

**GVS** 1 Ground velocity subsystem. 2 Global voice service.

**GVL** Gain of transponder RF amplifier.

**Gxyz** Shear modulus of a composite panel with fibres crossing at 45°.

**gyro** Gyroscope.

**gyro angling gain** $CG = H/c$, $H$ sense (7).

**gyrocompass** Compass based upon space-rigidity of gyroscope; no true long-term instrument exists but see directional gyro and Gyrosyn, and sensing element of fluxgate compass is gyro-stabilized.

**gyrocopter** Autogyro (US).

**gyrodyne** Aerodyne having engine power transmitted to lifting rotor(s) and propeller(s) used for thrust; convertible plane has wing in addition.

**gyrograph** Graphical plot of gyro drift against time.

**gyro gunsight** Sight for fixed guns using one or more gyro's (and RAE-developed Hooke's joint with two degrees of freedom) to provide automatic lead computation by measuring rates of sightline spin while remaining insensitive to rotation about sight axis itself caused by roll of host aircraft.

**gyro horizon** See artificial horizon.

**gyro log** Form used to calculate and record gyro drift and drift rate (ASCC).

**gyromagnetic compass** Directional gyro whose azimuth datum is maintained aligned with magnetic meridian by precession torquing from magnetic detector.

**gyro pilot** See autopilot.

**gyroplane** Becoming a common US term for an autogyro.

**gyroscopic manoeuvre** Flight manoeuvre by aerodyne in which the aircraft tumbles, rotating about all three axes but capable of controlled recovery.

**gyrostabilized** Held in fixed attitude relative to space, subject to precession and wander.

**gyrostat** Hughes-developed technique for satellites of great length spinning about minor axis.

**Gyrosyn** Registered name for gyrosynchronized compass comprising DI (2) slaved to magnetic meridian by fluxgate.

**gyro time constant** $GTC = J/c$.

**gyro vertical** Local vertical indicated by vertical gyro.

**GZ** Ground zero.
H

H 1 Hour.
2 Total pressure.
3 Enthalpy.
4 High (synoptic chart).
5 High-altitude-class Vortac/Tacan or Route Chart.
6 NDB 50-1,999 W.
7 Angular momentum.
8 Helicopter mission category, USAF since 1948, USN since 1962, or helicopter qualification [PPL].
9 US military aircraft modified mission prefix, search/rescue and aerial recovery (DoD).
10 Magnetizing force; horizontal component of Earth's field, See H below.
11 Stored in silo but raised to surface for launch (DoD, ICBM).
12 Hard temper (light-alloy suffix).
13 G/S home from CP.
14 Airway or map prefix, helicopter route.
16 Transfer function.
17 Health (facility or RAF).
18 Piston engine with two crankshafts and parallel opposed cylinders.
19 Hard surface [airfield].
20 Haze.
21 Homing [beacon].
22 Hold, followed by direction.
23 Heavy.
24 Hazard.
25 Heliport.
26 Geometric altitude, or height of aircraft c.g. when on ground.
27 Hydrogen [see H2].
28 Maximum section height (tyre).
29 Propeller pitch [P more common].
30 Aircraft category. VTOL aircraft [but see category M] (FAI).
31 Hankel function.
32 High-intensity [airfield lighting].
33 H1 Hour(s).
34 Prefix hecto = 10^2.
35 Hexode, heptode (ambiguous).
36 Hangarage available.
37 High (synoptic chart).
38 Heater (electronics).
39 Height above MSL, or height difference in flight trajectory.
40 Specific enthality.
41 Planck constant, \( \hbar = 6.62559 \times 10^{-34} \)Js.
42 Opertor, 120° (electrical).
43 CC blowing jet slit height (also hj).
44 Distance measured across chord from leading edge divided by MAC.
45 Subscript, hover.

H+. H- Hours plus or minus minutes, eg related to H-hour.

H\textsuperscript{+}, H\textsuperscript{-}
Vertical velocity. Suffixes for glide-slope (GS), flare trajectory (FL) and reference trajectory (REF).

H\textsubscript{2}, H\textsubscript{3}
Gaseous hydrogen.

H24, H24
Continuous-service airfield or facility.

H2S
Original PPI mapping radar (UK, WW2).

H2X
Development of HsS at shorter wavelength in US (see mickey, BTO).

H-83282
Highly stable non-inflammable synthetic hydraulic fluid (USN).

H-bomb
Hydrogen bomb.

H-display
B-display with elevation angle indicated; target appears as bright line with slope proportional to sin elevation.

h-dot
See h1, h2

H-engine
Piston engine with left and right rows of vertical opposed cylinders, two crankshafts geared to central output.

H-force
Helicopter main-rotor drag.

H-hour
Start of war, esp. time first landing aircraft reaches LZ, or similar clearly defined action.

H-film
Kapton hi-temperature polyimide.

H-plane
Plane of antenna's magnetic field, normal to E-plane.

H-Pres
Pressure altitude.

H-tail
One having twin fins on tips of tailplane.

HA
1 Height of apogee.
2 Hour angle.
3 High altitude.
4 Housing allowance.

ha
Hectare[s], \( = 10^4 \) m\(^2\).

HAAP
Helicopter approach aiming point.

haarp
Hf active auroral research program (ONR).

HAARS
High-altitude airdrop resupply system.

HAATR
Highly accurate autonomous target recognition [C adds capability].

HAB
Heliport acquisition beacon.

HABM
Hypervelocity air-breathing missile.

haboo
Line squall causing severe dust storm.

HABV
Hypersonic air-breathing vehicle.

HAC
1 House Appropriations Committee (US Congress).
2 Hover/approach coupler.
3 High-acceleration cockpit.
4 Hélicoptère anti-char (F).
5 Helicopter aircraft controller.
6 Helicopter active control.
7 Heading alignment cone.
8 Helicopter Association of Canada.

Hacienda
Office of Aerospace Research (USAF, colloq.).
section pipe. Equal to \( u = \frac{P}{\mu} \rho \left( \frac{a}{r} \right) \)

where \( u \) is local velocity, \( P \) pressure drop per unit length, \( \mu \) coefficient of viscosity, a radius of tube, and \( r \) radius at point concerned. Equation denotes parabolic velocity distribution.

\[ \text{HACP} \quad \text{High-altitude communications platform [unmanned airships].} \]
\[ \text{HACS} \quad \text{Helicopter armoured crashworthy seat.} \]
\[ \text{HACT} \quad \text{Helicopter active-control technology.} \]
\[ \text{HAD} \quad \text{Hybride analog/digital.} \]
\[ \text{HAD} \quad \text{1 Helicôptère d’Appui-Destruction (F).} \]
\[ \text{HAD} \quad \text{2 Hardware architecture document.} \]
\[ \text{Hadas} \quad \text{Helmet airborne display and sight.} \]
\[ \text{Hadec} \quad \text{Highly-adaptive digital engine control.} \]
\[ \text{HADF} \quad \text{High-accuracy direction finder.} \]
\[ \text{HADS} \quad \text{1 High-accuracy digital sensor.} \]
\[ \text{HADS} \quad \text{2 Helicopter air-data system.} \]
\[ \text{HAE} \quad \text{High-altitude endurance.} \]
\[ \text{HAF} \quad \text{Hellenic air force [UK usage].} \]
\[ \text{HAFSS} \quad \text{Heliborne aerial firefighting system.} \]
\[ \text{Hafnium} \]
\[ \text{HAE} \quad \text{1 Hellenic air force [UK usage].} \]
\[ \text{HAE} \quad \text{2 Helicopter Association International [office, Alexandria, VA 22314–2818].} \]
\[ \text{HAHO, Haho} \quad \text{Points, whose locus is normally closed ring, where radiated power from antenna is half lobe maximum.} \]
\[ \text{half-power points} \quad \text{Total angle at antenna between two opposite half-power points measured in plane containing lobe peak.} \]
\[ \text{half-residence time} \quad \text{Time for quantity of delayed fallout (weapon debris) deposited in particular part of atmosphere to decrease to half original value.} \]
\[ \text{half-reverse Cuban} \quad \text{Aerobatic manoeuvre: two left rolls up–45 line, two flick rolls to right, increase trajectory to vertical to zero airspeed, tailslide followed by other manoeuvres on down–45.} \]
\[ \text{half-rotation} \quad \text{Rotation of aircraft sensibly about longitudinal axis through 180°, usually from upright to inverted attitude or vice versa; can be half of barrel roll or of slow roll.} \]
\[ \text{half-thickness} \quad \text{Thickness of absorbing medium which transmits half intensity of radiation incident upon it.} \]
\[ \text{halftone screen} \quad \text{Fine opaque grating usually scribed on glass to break up photographic image into halftone dot pattern, for printing or digitising purposes.} \]
\[ \text{halftone tube} \quad \text{CRT containing conventional gun for writing separated from screen by fine-mesh electrode and storage plate.} \]
\[ \text{half-view} \quad \text{Drawing showing half a symmetrical object.} \]
\[ \text{half-wave rectification} \quad \text{Use of single-phase rectifier which passes only half of each alternate wave from input.} \]
\[ \text{Hall effect} \quad \text{When current-carrying material is subjected to magnetic field (or when conductor is moved through magnetic field) potential difference is set up perpendicular to magnetic field (or when conductor is moved through magnetic field) potential difference is set up perpendicular to both current (or motion) and field; small in metals but important in semiconductor systems and in study of electricity in ionosphere. Since 1990 the operating principle of some space thrusters.} \]
\[ \text{Halo} \quad \text{1 High-altitude, low-opening (parachute system).} \]
\[ \text{Halo} \quad \text{2 High-altitude large optics.} \]
\[ \text{Halo} \quad \text{3 High altitude [or agility], low observable.} \]
\[ \text{Halo} \quad \text{4 Hypersonic air-launched option.} \]
\[ \text{Halo} \quad \text{5 High altitude, long operation.} \]
\[ \text{halo} \quad \text{1 Any of several species of part-circular phenomena caused by ice crystals in upper atmosphere, chief of which is 22° radius around Sun or Moon.} \]
\[ \text{halo} \quad \text{2 Coloured ring or disc seen on cloud in direction away from Sun, ie with aircraft shadow at centre; also called pilot’s *.} \]
\[ \text{halo} \quad \text{3 Reflection of cockpit instrument seen in canopy at night.} \]
\[ \text{halo effect} \quad \text{Ability of SST service to generate or attract additional first-class subsonic traffic to same carrier on same route(s).} \]
\[ \text{Halon} \quad \text{Family of halogen-based fluids, mainly BCF, to same reduction in brightness, and various characteristics of storage tubes and displays.} \]
\[ \text{half chat} \quad \text{Vaguely, any partial power setting [colloq.].} \]
\[ \text{half-Cuban} \quad \text{Aerobatic manoeuvre consisting of up–45 line, half-roll followed by remainder of loop [many variations and additions].} \]
\[ \text{half glidepath} \quad \text{ILS glidepath within points at which DDM is 0.0875.} \]
\[ \text{half-life} \quad \text{Time required for decomposition of half original mass or number of atoms of radio-active material.} \]
\[ \text{half-million} \quad \text{Aeronautical chart series on scale 1:500,000 [ICAO].} \]
\[ \text{half-period zone} \quad \text{See Fresnel zone.} \]
\[ \text{half-power points, rings} \quad \text{Points, whose locus is normally closed ring, where radiated power from antenna is half lobe maximum.} \]
\[ \text{half-power width} \quad \text{Total angle at antenna between two opposite half-power points measured in plane containing lobe peak.} \]
Halsol

stored as liquid under pressure and used as fire extinguish-
ant and for inertia space above fuel in tanks.
Halsol High-altitude solar [-powered aircraft].
HALT, Halt Highly, or hardware, accelerated life test(s).
halteres Twin vibrating prongs used in certain time-
keeping systems.
hammer Sudden violent excursions in pressure caused by reflected shockwaves in closed fluid (esp. hydraulic) system.
hammerhead 1 Large circular paved area at end of runway to facilitate turning.
2 See next.
hammer stall Extreme stall turn in which aircraft rotates
within a 5° of vertical plane; depending on aircraft, power
retained until point of stall at apex. Also called hammer-
head stall.
Hamots High-altitude multiple-object tracking system.
han Hydroxyl ammonium nitrate.
handbook problem One requiring in-flight consultation of
flight manual for numerical answer.
hand bumping Use of hand tools and backing dollies to
shape sheet metal.
hand controller Human interface to automatic or semi-
automatic system, eg to HUD, multi-mode radar or large
display; usually incorporates stick, rolling ball or triggers.
hand-crafted Still used to mean IC (4) is custom-
designed for particular application, even though design is
entirely via computer graphics.
hand cranking Direct mechanical connection between
 crank and piston engine or small gas turbine (in latter case
via step-up gears) for starting.
hand flying Piloting autopilot-equipped aircraft in
fully manual mode.
hand starting Arrangement for starting engine by hand
other than by swinging propeller.
hand-starter magneto Separate hand-controlled auxil-
ary magneto carried to aircraft and used to supply
powerful spark when starting piston engine.
hand-turning gear Connection for a hand-crank, eg on
same shaft as centrifugal breather to give maximum
mechanical advantage. In piston engine can be same as
manual or hand starter.
hangar Shelter for housing aircraft on ground.
hangarette 1 Hangar tailored to single aircraft, esp. hard
shelter [HAS 1 now almost universal].
2 Weatherproof cover over missile launcher or similar
installation.
3 Pre-fabricated hangar flown to FOL and rapidly
erected.
hangar flying Social chat about flying by those involved
in it, esp. pilots.
hangar queen Particular aircraft notoriously prone to
unserviceability requiring major maintenance.
hangar rat Young enthusiast [self-explanatory].
hangfire Fault condition in which rocket missile fails to
fire; vehicle or missile thus affected.
hang glider Large class of simple ultra-light aerodynes,
broadly divided into those with flexible wings (most of
Rogallo type) and those having wings with preformed
aerofoil section (called rigid); majority have no controls
and manoeuvre by translation of pilot mass to shift c.g.
Can be monoplane or biplane, and may have rear tail,
canard or auxiliary engine. Demarcation line with glider
or ultra-light aeroplane becoming blurred.
hang up 1 Externally or internally carried store which
fails to release when thus commanded.
2 Gas-turbine engine which starts but fails to spool-up;
also called hung start.
11,000 lb/sq in (c 75 MPa) for hardest concrete silo.

tance to overpressure, which varies from c 2 lb/sq in

tests for precise quantified readings.

Moh's scale for non-engineering (eg geological) materials,

hard data

pages, as distinct from tape, microfilm or software.

hard copy

Helicopter and aeroplane radar detection.

HARD

Helicopter and aeroplane radar detection.

hard copy

Immediately readable input, eg printed pages, as distinct from tape, microfilm or software.

hard data

Remains in memory when power switched off.

hard deck

The ground, especially in air combat at low altitude.

hardened

Protected against blast, ground shock, overpressure, EMP, radiation and possibly other effects of nuclear explosion, and (DoD only) likely to be protected against chemical, biological or radiological attack (see hardness).

2 More recently, protected against terrorist attack, eg cockpit or LD3 container.

3 Of avionics, protected against EMP and any other powerful external EM effects which in particular would normally degrade or destroy most memory cores.

# Of metal, physically * by precipitation, quenching or cold working.

hard flutter

Normally well damped but extremely violent over one narrow range of conditions.

hard intervals

Precisely scheduled service/overhaul periods, as distinct from on-condition.

hard intervals

Precisely scheduled service/overhaul periods, as distinct from on-condition.

hard-iron magnetism

That induced into all magnetic parts of aircraft during manufacture, esp. by hammering or riveting, orientation and polarity depending on assembly heading and terrestrial latitude.

hardlander

Spacecraft designed to free-fall to surface of heavenly body.

hard landing

Conventional aircraft landing with excessive rate of descent, esp. that results in damage or overstressing.

2 Arrival of hard lander on lunar/planetary surface.

hardness

2 Various measures of physical * such as Moh’s scale for non-engineering (eg geological) materials, and Rockwell, Vickers, Brinell and many other standard tests for precise quantified readings.

2 Any of five measures of nuclear hardening; eg resistance to overpressure, which varies from c 2 lb/sq in (c 14 kPa) for aircraft parked in open to over 11,000 lb/sq in (c 75 MPa) for hardest concrete silo.

hardover runway

Sudden unwanted operation of system, esp. flight-control channel, to extreme limit of travel.

hardover signal

Fault condition resulting in full demand for unidirectional system operation unrestrained by normal feedback.

hardpoint

Anchorage built into aircraft structure for heavy external load, usually via intermediate pylon, MER or launcher.

hard radiation

High penetrating power from very short-wavelength; usual definition is ability to pass through 100 mm of lead.

hard recovery

Landing under difficulties, eg barrier crash into net in bad weather with tower out of action (probably colloq.).

hardstanding

Paved parking area (US, often hardstand).

hard target

1 One that is hardened (1).

2 In air-to-air or surface-to-air firing practice, a rigid drone, as distinct from a sleeve or banner.

hard-target functional defeat

Use of air/ground weapons to disable deeply buried installations without necessarily killing humans.

hard temper

Modification of light-alloy properties, eg by cold working, denoted by scale such as 3/4H (= 75% fully hard); increased tensile strength is usually accompanied by reduced ductility, which in airframes tends to be equated with shorter fatigue life.

hard time

Period, usually an inspection interval, precisely written into service/overhaul documentation and mandatory. Today increasingly replaced by flexible routines such as OCM.

hardtop

Paved with permanent all-weather surface.

dhard turn

Planned turn in air combat at rate governed by angle-off and range.

hard vacuum

High vacuum, pressure below $10^{-2}$ Nm⁻² (10⁻¹ torr).

hardwall hose

Does not collapse under atmospheric pressure when used for suction; not necessarily armoured.

hardware

Originally introduced to distinguish mechanical parts of EDP (1) systems from software, today useful to imply manufactured items of any kind that exist, as distinct from software, system concepts, paper designs and proposals, simulations, capabilities and functions.

2 In narrow sense, small fasteners and similar small parts.

hardware in the loop

Flight-motion simulation system incorporating portions of actual aircraft dynamics.

hard wing

1 One with simplified leading edge compared with particular previous wings, eg no slat.

2 Any wing with fixed geometry leading edge.

3 In combat mission, wing man locked-in to follow leader in (almost) all circumstances.

Harm, HARM

High-speed anti-radiation missile.

Harmattan

Dry, dust-filled NE wind (W Africa).

harmonic

Component of sinusoidal or complex wave-form or tone whose frequency is integer multiple of fundamental frequency.

harmonic analyser

Device, typically variable-frequency filter, which can resolve waveform into harmonic constituents.

harmonization

Boresighting of all guns fixed to fire in same basic direction (eg ahead) so that all are correctly aligned with respect to aircraft axes, usually so that all gun axes converge at specified distance from aircraft.

2 Adjustment of flight-control system so that effect of
harness

controls about each axis matches that about others at all airspeeds; in particular so that handling about each axis in terms of rate of pitch, roll or yaw, and load (real or synthetic) experienced by pilot appear to be in harmony.

harness

1 Assembly of straps with which member of flight crew can be secured to seat.
2 Assembly of straps with which parachutist can be attached to parachute, which may or may not be permanently attached to *.
3 System of straps and other restraining members with which cargo pallet or container is secured to cargo floor in cases where there is no inbuilt anchorage. Not restraint net.

Hasp

Huygens atmospheric-structure instrument.

HASIC

HASG

tion, lookout; prior to spin or other harsh manoeuvre.

Hasell check

Height, airframe, security, engine(s), location, etc.

House Armed Services Committee (US).

HASC

HASA

Helicopter Association of Southern Africa.

HARS, Hars

HART

1 A particular aerospace meaning is: likely to threaten the continuation of safe flight.

Hazard awareness system.

6 Heading and attitude (reference) system (or heading/attitude sensors).

Hazard beacon

Warns of permanent danger to air navigation.

Hazardous air traffic report(ing).

HATS

1 Helicopter automatic targeting system.

HAW

1 Hypersonic aerodynamic weapon.

HAWC

Homing and warning computer.

Hawflcar

Helicopter adverse-weather fire-control acquisition radar.

Hawk

Homing all the way killer.

hawkwing the deck

To fly closely past carrier on right (starboard) side to check deck state before landing on.

Hawtads

Helicopter all-weather target-acquisition and destruction system.

Haybox

Helicopter jetpipe incorporating IRCM (colloq.).

hazard alert

Broadcast to all affected operators of existing or impending failure in hardware of nature likely to imperil safety of flight, usually as result of fault discovered on inspection; fault can be structural or in system operation, but invariably affects part of aircraft.

hazard beacon

Hazardous air traffic report(ing).

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hazard beacon

Diesel Airline

Helicopter Airworthiness Review Panel.

Hasp

High-altitude route system.

HARP, Harp

Helicopter anti-submarine (UK).

Hood, aircrew survival.

HATS

1 Heavy Aircraft Test Squadron (UK, WW2).

hatted

Appointed as a military commander (US coloq.).

Have

Permanent first word in code names of AFSC projects (USAF).

have numbers

Radio code: “I have received and understood wind and runway information for my inbound flight”.

HAW

1 Hypersonic aerodynamic weapon.

HAWC

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hazard beacon

Diesel Airline

Helicopter Airworthiness Review Panel.

Hasp

High-altitude route system.
$b_h$

- Aircraft category, heavy bombardment (USAAC 1925-27).
- Height of burst.
- $h_b$ Height of bump on runway.
- HBA Hybrid buoyant aircraft.
- HBAW Handbook bulletin for airworthiness (FAA).
- HBB Hollow-bladed blisk.
- HBC 1 Hot-bonding controller.
- 2 Heave by cable.
- HBD Hollow-bladed disk.
- HBF Handbook.
- HBN Hazard beacon.
- HBP High-band prototype.
- HBR 1 Human-behaviour representation.
- 2 High-bite-rate.
- HBS 1 Hot ball and socket.
- 2 High-band subsystem [DU adds demonstration unit].
- 3 Hold-baggage screening.
- HBT Heterojunction bipolar transistor.
- HC 2 Hexachloroethane, ECM aerosol also usually containing ZnO and Al powder.
- 2 Hand controller.
- 3 Helicopter, cargo (UK) and USA (1959–62, became CH).
- 4 Critical height [ch preferred].
- 5 High-capacity [bombs, WW2].
- 6 Hydrocarbon[s].
- 7 Crane helicopter (USN 1952–55).
- He Height change.
- $hc$, $h_c$ Distance from leading edge at MAC (1) to c.g.
- HCA 1 High-cycle aircraft, specimen which has completed more flights than any other of same type.
- 2 Hot compressed air (airfield snow clearance).
- 3 Historic cost accounting.
- 4 Helicopter Club of America.
- 5 Hypersonic-cruise aircraft.
- HCC High-thermal conductivity composite.
- HCCS Human-centred control system[s].
- HCDK House of Commons Defence Committee (UK).
- HCDR High channel density receiver.
- HCF 1 High-cycle fatigue.
- 2 Hollow carbon fibre.
- HCHE High-frequency direction-finding (facility).
- HCI 1 Human/computer interface.
- 2 Helicopter Club of Ireland.
- HDA Heave by cable.
- $h_{ET}$ US usage for chordwise location of centre of mass.
- HCMM Heat-capacity mapping mission (spacecraft).
- HCN Hydrogen cyanide.
- HCMOS High-density CMOS.
- HCP 1 Head-up control panel.
- 2 Hélicoptère de combat polyvalent [= multirole] (F).
- HCS Host computer system.
- HCT Helicopter control trainer.
- HCTS Helicopter collective training system (British Army).
- HCU 1 Heavy Conversion Unit (RAF, WW2).
- 2 Hydraulic control unit.
- HCV Hypervelocity, or hypersonic, cruise vehicle.
- HCW Heavily cold-worked [seamless tube].
- HD 1 Height difference, usually in attack mission between IP and target.
- 2 Distilled mustard gas code (USA).
- 3 Hydrogen decrепitated powder, for sintered and polymer-bonded magnets.
- 4 High-drag [bomb].
- 5 Hourly difference.
- 6 Home Defence [i.e., of UK, WW2, esp. civilian].
- 7 High-definition [TV].
- 8 Decision height (F).
- HDA High-density acid (usually nitric).
- HDAS Hypersonic deep attack system.
- HDB High-density bombing, rebuild of bomber designed for nuclear warfare to carry heavier loads of conventional bombs.
- HDBK Handbook.
- HDBT Hard [and] deeply buried target [DC adds defeat capability].
- HDD Head-down display, ie a display inside cockpit, usually CRT raster plus symbology and TV overlay.
- HDDR Head-down display radar, or recorder.
- HDEP Haze depth.
- HDF 1 Hot-drape forming.
- 2 High-frequency direction-finding (facility).
- HDFPA High-density focal-plane array.
- Hdg Heading.
- Hdg C Compass heading.
- Hdg Sel Heading select.
- HDI Homeland defense interceptor.
- HDIP Hazardous-duty incentive pay (US).
- HDK Hard disk.
- HDL Hybrid datalink.
- HDLC High-density multitrack recording.
- HDMC Hourly direct operating cost.
- HDOP Horizontal dilution of precision.
- HDP Hardware development plan.
- HDPE High-density polyethylene.
- HDR 1 High data rate.
- 2 High-density rule [busy airports].
- HDS 1 Helicopter delivery service.
- 2 Hard-disk subsystem.
- 3 Horizontal driveshaft.
- HDT High damage tolerance.
- HDTA High-density traffic airport (FAR 93).
- HDTS Helmet-display tracking system.
- HDTV High-definition TV.
- HDU 1 Hose-drum unit for in-flight refuelling.
- 2 Horizontal display unit.
- HDV Hydrant dispenser vehicle.
- HE 1 High explosive [43 suffix acronyms].
- 2 High-energy [ignition].
- 3 Handling equipment.
- He Helium.
- $He$, $H_{E}$ Altitude error.
- $h_e$, $H_e$ Energy height, $h + v^2/2g$.
- HEA Head equipment assembly [HUD].
- HEACE Health effects in aircraft cabin environment [2001-] (EU).
- head 1 Complete hub of helicopter rotor (main or tail) including flight-control linkage and all auxiliaries (nitrogen pressure signal, anti-icing connection, lights etc).
head-down

2 Cutter and positioning piece in most machine tools, esp. those in which workpiece is stationary.
3 Loosely, downwind end of runway.

head-down

Looking into cockpit as distinct from outside aircraft.

head-down display

See HUD.

header tank

Inserted at highest point of coolant circuit of liquid-cooled piston engine, receiving hot coolant from engine and passing it to radiator[s].

heading

Angle between horizontal reference datum and longitudinal axis of aircraft expressed as three-figure group 000°-360°; in UK also called course. Datum can be compass north, magnetic north or true north. Not to be confused with track [one dictionary actually calls * the direction of an aircraft path], precisely what it is not.

heading alignment cone

Imaginary cone of 18,000-ft upper diameter serving to guide Orbiter or STA(s) to runway.

heading hold

Flight-control mode which maintains selected heading.

heading-orientated map

One held in hand so that heading is towards top of sheet.

heading select

Flight-control mode in which aircraft automatically turns to and holds any inserted *.

head-level display

Immediately below HUD.

head moment

Total turning moment transmitted through head(1) in helicopter manoeuvre.

head-on

Flying directly towards other aircraft on reciprocal track.

head resistance

Drag.

headset

Control of RPV or UAV without having it in view.

headset

Receive/transmit interface with radio communications or other system (eg aural warning or missile launch tone), either worn separately or built into helmet. Normally includes earpieces or earshells, noise-cancelling microphone on boom and binaural cable.

heads up

1 Airborne intercept code: “Hostile force, whole or in part, got through defences” or “I am not in position to engage” (DoD).
2 Occasionally used to mean head-up [only one human head can use a HUD at any one time].

head-up display

See HUD.

health

Generally everyday meaning but applied to hardware; thus * monitoring, can be equated with inspection, health evaluation and risk tabulation.

HEAO

High-energy astronomical observatory.

heap cloud

Cloud with pronounced vertical development, e.g., cumulus family.

Heart

Health evaluation and risk tabulation.

heart-cut distillate

Particular family of kerosene fuels, in particular JP-6.

HEAT

1 High-enthalpy ablation test.
2 High-explosive anti-tank, shaped-charge warhead.
3 Helicopter electric-actuation technology.
4 High-energy advanced trainer.

Heat

Armament panel switch selection for IR AAMs.

heat

Measure of atomic/molecular kinetic energy, but not to be confused with temperature. Symbol Q. unit joule, J = 0.238846 cal.

heat barrier

Supposed barrier to increasing flight Mach number due to kinetic heating.

heat capacity

1 Of a solid [usually metal] object, its mass multiplied by the specific heat of the material. See next.
2 Quality of high-power lasers which permits sustained firing followed by brief cooling period.

heat-engine

Prime mover in which energy is extracted from thermodynamic system in which gas passes through cycle from which closed PV or T-entropy diagram can be plotted. Perfect * has reversible (Carnot) cycle; all practical ** have lower-efficiency irreversible cycle. Nearly all aviation ** are constant-pressure gas turbines or Otto-cycle piston engine.

heater

Afterburner (colloq.).

heat-exchanger

Radiator in which two fluids are brought into close contact (eg, cold air and hot oil) so that one can reject heat to other.

heat flow rate

Synonymous with power. SI unit is watt, W = 3.41214 Btu/h = 0.85985 kcal/h; Btu/h = 0.293071 W.

heat load

Rate of heat transfer, = heat flow rate.

heat of ablation

Measure of value of ablating material, rate of heat input divided by rate of mass loss.

heat pipe

Contains fluid which is alternately evaporated and condensed, transferring heat [in spacecraft, to space].

heat pulse

Total heat to be absorbed, dissipated, radiated or otherwise transferred from original kinetic energy of body on re-entry.

heat-seeking

Sensitive IR detector and homing guidance system.

heat shield

Usually non-structural layer protecting primary structure from high-temperature environment which would degrade strength, such as around aeroplane afterburners, at base of large rocket vehicle and, esp., over upstream face of body on re-entry (later is invariably ablative).

heat sink

1 Any location to which heat may be removed from thermodynamic system.
2 Specifically, mass of metal, fuel, oil or other material which can accept unwanted heat.

heat treatment

Heating metals above specific temperatures followed by slow or rapid cooling to improve mechanical properties (see carburising, case hardening, nitriding, precipitation **, solution **).

heave

1 Vertical movement without rotation (simulator).
2 Motion of taxiing aircraft [esp. marine] in vertical plane, fuselage [ball] remaining level.

heavier than air

Having density much greater than that of air, thus aerostatic buoyancy ignored in calculating lift, which is assumed generated wholly by aerodynamic or propulsive forces; aerodyne.

Heaviside layer

D, E, F, and F1, layers in upper atmosphere (ionosphere) where UV solar radiation ionises gas molecules, allowing conduction of electricity.

heavy

1 Flight control; difficult to move.
2 Maintenance, major and prolonged.
3 Warning to ATC of wake turbulence, aircraft MTO \( \geq 300,000 \) lb (136,080 kg).
4 US [becoming universal] civil radio traffic, any large transport, esp. large jet.
5 AA gun, \( \geq 40 \)-mm calibre (WW2); also, of course, can mean intense fire from many guns of all calibres.
6 Propeller aircraft, \( \geq 5,700 \) kg [12,566 lb] MTOW.
7 Air in balloon envelope close to density of local atmosphere.
8 Large firefighting tanker, as distinct from Seat.

heavy alloy

One tailored to have exceptionally high
heavy bomber

density; most consist chiefly of tungsten, but osmium, iridium and depleted uranium are important.

heavy bomber Aircraft designed to deliver heavy load of conventional ordnance to targets in enemy heartlands (arch.).

heavy dropping Delivery by system of parachutes of exceptionally bulky or heavy load, suitably packaged and cushioned.


heavy landing See hard landing (1).

heavy maintenance Maintenance taking 30 days or longer.

heavy metal Classic warbird, esp. large and powerful (colloq.).

Heavyside E-layer.

Heavy Wagon Designated routes for lo military flights within Conus; 300 series for various nav/electronic systems evaluation and 400 Series for nav. training and weather evaluation at 500 ft (152 m) down to MOCA, normally not over 500 kt (USAF, USN).

HECS High-performance engine control system.

hectare Non-SI unit of large areas = 100 are = 10^4m^2.

hecto Prefix, multiplied by 10^2, symbol h.

hectopascal Pressure of 100 Nm^-2 = 1 mb, symbol hPa.

hedging Increasing one’s stock of a commodity (especially fuel) in the belief price will rise.

Heli, HEDI High-endoatmospheric defense interceptor (SDI).

HEDP Ammunition, high-explosive incendiary.

HEEDR Helicopter emergency-egress lighting; s adds piercing.

HEDP Helicopter emergency-egress lighting; s adds piercing.

HEDP Helicopter emergency-egress lighting; s adds piercing.

heliopause Frontier beyond which Sun has little or no influence.

heliocentric Centred on the Sun.

helicopter Helicopter, armed (sortie).

helicopter lane Safety air corridor reserved for helicopters (DoD, NATO).

helideck Operating platform for helicopters, e.g. on oil rig.

helidrop Discharge of passengers/cargo/weapons while hovering.

heliospheric Region of solar influence.

heliosynchronous Satellite orbit inclined at 90° to give precise height of distant target; has nodding aerial giving multi-lobe beam.

height lock Function of autopilot or flight system in holding (after in some cases capturing) selected height h.

height ring Visible on most displays of weather/mapping/AW/cloud-collision warning and other forward-looking radars as bright ring beyond zero-range ring formed by direct reflection from Earth’s surface.

height/velocity curve Fundamental plot of IAS against altitude included in helicopter flight manual; indicates region(s) from which safe autorotative descent is possible, normally assuming zero wind, sea level, MTOW.

Heim joint Universal coupling in torque tube.

Heine mat Flexible mat towed by support vessel on to which marine aircraft taxies before being hoisted on board.

HEIPT Helicopter engines integrated product team.

HEI-SAP High-explosive incendiary, semi-armour-piercing.

HEIT Ammunition, HE incendiary, tracer.

HEJOA Heathrow Executive Jet Operators’ Association.

HEL High-energy laser [A adds applications, also see HELCM, Helex, HELJTO, Hels, HELSTF and Heltads].

Helarm Helicopter, armed (sortie).

HELCM HEL countermeasures.

HELD Helicopter [or high-energy] laser designator.

Helex HEL experiment[al].

Heli Helicopter.

Heliare Inert (helium) gas welding technique patented by Northrop 1940.

helical compressor Diagonal-flow compressor.

helical gear Spur gear with teeth arranged diagonally; contact begins at one end of tooth and proceeds diagonally across width, two teeth, normally transmit load at any time. Double * (herringbone) gear eliminates axial load.

helical tip speed Actual airspeed at tip of propeller, taking account of vehicle’s airspeed.

Hei-Coil Patented hard-steel thread inserted in soft metal or to repair stripped female thread.

helicopter Rotorcraft deriving both lift and control from one or more power-driven rotors rotating about substantially vertical axes. Rotors are driven as long as engines operate above certain minimum input speed, and airflow through rotor(s) is downwards except in autorotative engine-failure mode.

helicopter approach-path indicator Hapi, ground optical aid giving steady white for correct [0.25-0.75°] glidepath, with green and flashing green above and red and flashing red below. Signal width 24°.

helicopter lane Safety air corridor reserved for helicopters (DoD, NATO).

helideck Operating platform for helicopters, e.g. on oil rig.

helidrop Discharge of passengers/cargo/weapons while hovering.

helio-centric Centred on the Sun.
helipad  complete Earth coverage, each pass having the same illu-
mination angle.
helipad  Prepared area designated as take-off/landing area
for helicopters; need have no facilities other than painted
markings.
heliport  Facility for operating, basing, housing and
maintaining helicopters; if civil, includes passenger facili-
ties and usually mail/cargo channels.
heliport acquisition beacon  Marks landing pad[s] by
white flashing Morse H.
helistat  Aerostat with added helicopter rotor(s).
helistop  Helipad served by civil helicopter.
helitanker  Large firefighting helicopter.
helitow  Towing by helicopter, normally applies to
minesweeping.
helium  Inert gaseous element, He, density 0.0001785
(0.1785 g/l \(\times 10^{-3}\)), 0.01114 lb/ft\(^3\), Bpt 3.2\(°\), 4.2\(°\) K (two
isotopes), helium 3 (three atomic nuclei) being important
as lunar-source material for fusion power.
helix angle  \(\theta\) Of gear, measured between line tangent to
tooth heel at PCD and shaft axis.
\[ 2 \text{ Of propeller, see effective*}. \]
\[ 2 \text{ Of wingtip in steady roll, } P_v \text{ [roll rate } \times \text{ span] } + 2V \]
[TAS]
HELJTO  High-energy laser joint technology office.
Heliads  High-energy liquid laser area-defense system
[airborne].
Hellas  Helicopter laser [radar].
helmet  Individual fairing over piston-engine cylinder,
ence helmeted cowl.
helmet sight  Any of several systems which attempt to
interface between human aircrew looking at surface (or
other) target and aiming of armament system; usually
wearers’s head is in some way accurately aligned with rigid
flight helmet whose orientation is then automatically
monitored to give output signals fed to weapon-aiming
system.
Helmholtz resonator  Hollow volume connecting with
outside via small orifice, single-frequency output.
Helmore light  Powerful air-to-air searchlight [RAF, not
adopted, 1940].
Helms  Helicopter malfunction system.
heio  Helicopter (colloq.).
HELP, Help  Hybrid electronic lightweight packaging.
Helps  Helicopter protection and support.
Heltraps  Heliborne long-range active [acoustic-path]
sonar.
Heltras  Helicopter long-range sonar.
HELS, Hels  High-energy-laser system [TF adds test
facility] (USA).
HELSTF  High-energy-laser test facility, at
WSMR (USA).
Heltads  High-energy-laser tactical air-defense system
(USA).
Heltraps  Helicopter towed-array support.
Helweps  High-energy laser weapon system (TRW/
USN).
HEMA  High-explosive medium-capacity.
Hemes  Helicopter Hospital Emergency Medical
Evacuation Service (USAF, USA).

**HETE**

hemispherical engine  Piston engine whose combustion
spaces at TDC are hemispherical.
hemispherical radar  Mounted at nose and tail of aerial
platform to provide complete 360\(°\) (2 \times 180\(°\)) azimuth
coverage.
hemispherical resonator gyro  Senses changes in vibration
patterns in thin-wall glass shell when subject to acceler-
ination angle.
hemispheric rule  For IFR, and VFR between FL30-290,
alitude assignments are determined by magnetic bearing.
Hemloc  Helicopter emitter/locator countermeasures.
Hemp  Name of khaki-ochre colour [BS.4800-10B-21] of
large patrol and tanker aircraft (RAF).
Hems  Helicopter emergency medical service.
HEMT  High electron mobility transition.
HEND  High-energy-neutron detector.
He-Ne  Helium/neon laser.
henry, H  SI unit of inductance, that of closed circuit in
which 1 V is generated when current varies at steady 1 A/s;
in other units \(H=kg \cdot m^2/A\); plural henrys.
HEOR  Hostile electronic order of battle.
HEO  Highly elliptical [Earth] orbit; P adds payload.
HEP  High-explosive plastic.
HEPA  High-efficiency particulate air, or arrester.
HEPL  High-energy-pulse laser.
heptane  Basic member of straight-chain (alkane) hydro-
carbons (see paraffin series) with seven carbon atoms and
thus 16 of hydrogen; zero-octane reference fuel.
HER  1 Harsh [or high] environment recorder.
2 Helicopter experimental radar.
Herald  Helicopter equipment for radar and laser
detection.
Herbst manoeuvre  Post-stall [70\(°\) AOA] 180\(°\) turn using
vecteded thrust (X-31).
Hercules  Large range of fibre-reinforced materials [US
company name].
Herid  High-energy railgun integration demo, (USAF).
Hermes  Helicopter energy/rotor management system;
automatically computes limiting payload.
Hermitt  Harsh-environment robust micromechanical
technology.
HERO, Hero  Historical evaluation and research
organization.
herringbone gear  Double-helical (see helical).
HERT  Headquarters emergency relocation team.
Hertz, Hz  SI unit of frequency, \(= \) cycles per second;
hence kHz, mHz, GHz etc.; in the US, increasingly hertz.
Hertz pressure  Contact pressure between mating gear
teeth.
Hesh  High-explosive squash-head.
hesitation roll  Aerobatic rolling manoeuvre, normally
based on slow roll, in form of succession of quick aileron
applications between which rate of roll is suddenly
arrested; positions of arrest called points, and common **
are 4-point, 8-point or 16-point, 16 being difficult and
care.
HESSI, Hessi  High-energy solar spectroscopic imager.
HeSTOR  Helicopter simulator for technology
operations and research.
HET  1 Helicopter environmental technique, to increase
safety and reduce disturbance by avoiding dwellings, and
certainly urban areas.
2 Hall-effect thruster.
HETE  High-energy transient Explorer.
Hete High-energy transient experiment.

Heterodyne Mixing of two alternating currents (eg radio signals) to generate third equal to sum or difference of their frequencies; verb or adjective.

heterojunction II logic Microcircuits with inverted gates in which transistor is embedded [integrated injection] in epitaxial GaAs layer.

Heterosphere Earth atmosphere above c100km (62 miles).

HEU 1 Highly enriched uranium; MF adds Materials Facility.

2 HUD electronics unit.

heuristic Leading towards solution by trial and error (see algorithm).

HEUS High(er)-energy upper stage.

HEW 1 Heliborne, or helicopter, early warning.


HEWS Helicopter electronic-warfare suite, or system.

HEXAL Hexagonal aluminium bomb filling.

Hexapod Usual mounting for cabin of flight simulator: two superimposed triangles (both horizontal when at rest) displaced spatially by 60° with corners joined by six actuating jacks to give 6-DoF motion.

Hexcel Mix of RDX, TNT and powdered aluminium. Hexagonal aluminium bomb filling.

Hexogen RDX.

Hexotonal Mix of RDX, TNT and powdered aluminium.

HF 1 Human factors; see HFE, HFM, HFR(2), HFRT, HFS.

2 Helicopter flight- or fire-, control system.

HFAC Helicopter flight- or fire-, control system.

HFCS Helicopter flight- or fire-, control system.

HFD 1 Head-up flight display, S adds system.

2 High-frequency data; CR adds communications radio, L link, R radio, RS radio system, U unit.

HDFD 1 High-frequency direction-finding.

2 Hydrogen fluoride/deuterium fluoride.

HFDL HF datalink.

HFDM HF data modem.

HFDP High-frequency differential protection.

HFDR HF data radio.

HFDs Head-up flight display system.

HFE 1 Human-factors engineering.

2 Heavy-fuel engine.

HFG High-floating [landing] gear.

HFG-WR H.f. ground-wave [OTH] radar.

HF1 Helicopter Foundation International.

HFIP H.f. improvement programme (NATO).
hi Flight at tropopause or above, adopted by gas-
turbine combat aircraft flying for range outside hostile
environments.
HIA Held in abeyance.
HIAOC High-integration air-data computer.
HIAP  High-intensity approach lighting; S adds system.
2Highlands & Islands Airports Ltd [Inverness IV2 7JB] (UK).
HIAPER, Hiaper High-performance instrumented [or
instruments] airborne platform for environmental
research (NCAR).
HIB Helicopter identification by [AT adds acoustic
techniques Hibar, IRD adds IR detection Hibird, RAD
adds radar detection Hibrad].
hibernate To remain on station in space or in orbit with
as many subsystems as possible switched off until reacti-
vated by Earth command.
Hibird Helicopter identification by IR detection.
Hibrad Helicopter identification by radar detection.
HIC Head impact criteria.
Hi-camp Highly calibrated aircraft measurements
program (Darpa).
Hicar Acrylonitrile to DTD.5509.
Hi-CAT CAT above 55,000 ft (16.8 km).
HICT Hand-held imaging communications terminal.
HICU HIPSS interface control unit.
Hidar High instantaneous dynamic acoustic range.
Hidas Helicopter integrated defensive-aids system, or
suite.
hide Locally constructed aircraft shelter of posts, net
and camouflage.
Hidcar See Hydync.
HIDL High-integrity data-link (UAV).
HIDSS Helmet integrated display sighting [or and
sight] system.
Hiduminium Family of duralumin-type alloys, including
RR (Rolls-Royce) formulations, often also containing
nickel and iron; developed for piston engine pistons and
similar applications, also used in supersonic airframes (in
Concorde also known by French designations such as
AU2GN).
Hidyn See Hidyne.
HIE Helicopter-installed equipment.
Hi-Ex High-expansion [typically volume factor of
1.000] firefighting foam.
HIF Horizontal integration facility (space launchers).
HiFast High-frequency active suppression technology.
HiFR Helicopter in-flight refuelling from ship, also
rendered hover in-flight refuelling.
HIG, Hig Hermetic integrating gyroscope.
HIGE Hover[ing] in ground effect.
Higger High-integrity GPS guidance enhanced receiver
(blind STOVL).
high Region of high atmospheric pressure, anticyclone.
high altitude Above 10 km (32.800 ft) (NATO).
2 Between 25,000 and 50,000 ft (7.6–15.2 km) (DoD).
High-altitude airship To remain geostationary
at 70,000 ft (21.34 km) for six months (US).
High-altitude bombing Level bombing with release at
over 15,000 ft (4.57 km) (DoD).
high-altitude burst Nuclear weapon explosion at over
100,000 ft (30.5 km).
high blowers See high supercharger.
high boost Piston engine operated at high inlet-manifold
pressure, esp. one well above SL atmospheric pressure for
takeoff.
high boss Variable stator vane outer bearing.
high BPR Bypass ratio exceeding 5.
high-capacity bomb Large thin-case bomb for demo-
lition of major soft target.
high cloud Extremely loose classification, typical band
being 6–8 km (20,000–60,000 ft) in tropics, 5–13 km
(16,000–43,000 ft) in temperate, 3–8 km (10,000–26,000 ft)
poles. Always mainly ice crystals, Ci, Cc, Cs.
high compressor HP compressor (US).
high-cycle fatigue That due to high-frequency
vibrations, flexure or rotation of machinery, typically at
rate many times per second.
high-density focal-plane array EO sensor with thousands
of 2-D IR elements integral in substrate with CCD
readout and processing circuitry.
high-density rule Applied at four busy US airports to
limit arrival rates [from 1 Non. 04] (FAA).
high-density seating Normally, that giving greatest
practical number of passengers, more even than all-
conomy, tourist or other classifications.
high-density tunnel One having closed circuit filled with
air or other gas under pressure, power required for given
Mach/Reynolds combination being inversely propor-
tional to density.
high-energy laser No lasting definition; varies with
family, whether continuous, pulse or gated, and with
rapid progress, which by 1980 had made GW output not
uncommon.
higher harmonic control Reduction of helicopter stress,
nose and vibration by using dynamic absorption
methods.
high-flash fuel See Avcat.
higher heating value Gross calorific value of fuel.
high-flotation gear Landing gear having geometry and
other characteristics suitable for operation from soft soils,
sand and similar surfaces.
high-flotation tyre One of low inflation pressure and
very large contact area; not necessarily used on high-
flotation gear.
high frequency See Appendix 2.
high-frequency pulse detonation Proposed propulsion
systems based on pulse detonation at frequencies not less
than 2 kHz, pioneered by Moscow State University.
high-gain aerial Usually means strongly directional,
designed to transmit or receive along single axis.
high gate Different meaning in different programmes
(lunar landing, air speed record runs, etc) but always a
specified rectangle in exact relation to surface of Earth or
other body through which vehicle must pass, often at
precise time, for mission to be successful (see gate [10. 11]).
high gear High supercharger gear.
high-incidence stall Uneaccelerated symmetric stall at
highest angle of attack, normally with high-lift config-
uration.
high-inclination mission Usually means satellite inclina-
tion from about 63° to 99° to Equator.
high-lift System, device, configuration or mode giving
lift greater than in clean or cruise configuration. Normal
* devices include leading-edge flaps, droops, slats,
highly blown engine

Krügers, trailing-edge flaps, flap blowing and variable-sweep; other forms include BLC, EBF, USB, Jet Flap, vectored thrust and tilt-wing.

highly blown engine  Piston engine in which supercharger is used to achieve high inlet manifold pressure at low altitudes. Terminology can be ambiguous; high and low-blown can mean high and low rated altitudes (critical heights).

highly supersonic  Mach 4 to Mach 6.

high-Mach buffet  Experienced when critical Mach number is exceeded on aircraft not designed for transonic flight; can affect control surfaces and primary structure, and cause trim changes which automatically either remove or intensify condition.

high-Mach flight  Flight at high subsonic Mach number.

high-Mach trimmer  See Mach trimmer.

high oblique  Oblique reconnaissacne or other aerial photograph in which portion of apparent horizon is visible.

high-octane  Fuel grade: Not defined, but typically over 100.

high pitch  Coarse-pitch.

high-pressure area  Region of atmosphere where pressure significantly exceeds that of surroundings, esp. one bounded by enclosed isobars; anticyclone.

high-pressure compressor  Applicable only to an engine with two or more compressors on separate shafts. High-pressure turbine likewise.

high-pressure fuel pump  The HP pump is normally that mounted on the engine.

high-pressure shut-off valve  See pressure-raising shut-off valve.

high-ratio engine  Engine having high BPR.

high route  Area-navigation route extending from 18,000 ft AMSL to FL450 (FAR. 1).

highudder  See top rudder.

high-Shear rivet  Patented close-tolerance steel threadless bolt held by swaged ring closed around groove.

high-speed alloys  Brasses, steels, light alloys and other metals which can either be machined easily at high linear speed, or which retain strength at high temperature and can edge cutting tools (two almost opposite meanings for same term).

high-speed exit  High-speed turnoff.

high-speed stall  Accelerated stall in which stalling angle of attack is reached at relatively high airspeed; height well below aircraft ceiling is implied.

high-speed tunnel  Traditionally, one in which effects of compressibility can be observed.

high-speed turnoff  Taxtway forming transition curve from landing runway enabling aircraft to leave runway at earliest possible moment.

high-speed warning  ADC-triggered subsystem giving aural and visual indication (usually duplicated) of inadvertent speed excursion beyond threshold usually set at just above Mso; can be overridden to demonstrate Mso/Vdcr but aircraft thus equipped is not airworthy without it.

high-subsonic  In the range of Mach numbers where sonic speed is locally exceeded at peak sections, and compressibility effects, if any, are manifest; in older aircraft can be Mach 0.8, today higher values can be reached with no significant change in handling or trim (beyond 0.9 there may be major trim changes automatically countered by Mach trimmer). Hence * aircraft, general category of jet aircraft other than those designed for supersonic performance.

high supercharger gear  In older high-power piston engine with mechanically driven supercharger it was common to have two drive ratios, high gear being automatically clutched in by aneroid at preselected height, thus giving power/altitude curve with two major discontinuities; high gear unavailable at lower levels.

high-tailed aircraft  Aeroplane with horizontal tail on top of fin; T-tail.

high-test peroxide, HTP  Not aqueous solution but almost pure hydrogen peroxide, used in MEPUs, rocket engines and other applications as monofuel rapidly decomposed by silver-plated nickel into superheated steam and free oxygen in which kerosene or other fuel is also often burned.

high-time item  That particular engine, aircraft or other hardware item that has flown more hours or completed more operating cycles than any other of same design.

high tow  Towing a glider, especially over a long distance, at an altitude higher than the tug.

high turbine  HP turbine (US).

high vacuum  Pressure less than 10⁻⁶ Nm⁻²(10⁻⁷ torr).

high-velocity drop  Airdrop in which conventional parachute system is not used, and speed of descent lies between 30 ft/s (low-velocity) and free-fall; requires retarding means plus stabilization to ensure impact on cushioned face.

highway  Generalised term for channel for data in EDP (1) or other dynamic system.

high wing  One attached at top of fuselage; see parasol, shoulder.

HII  Heterojunction integrated injection logic.

HIIK  Heading index knob.

Hikoden  Wing (= UK group) (J).

hilit plane  That across the face of an externally mounted jet engine nacelle; hl forms suffix to R [radius] or D [diameter].

The Hill  The seat of government, esp. The Capitol (US).

HILL  Hardware-in-the-loop simulator.

HIM  Horizontal integrity limit.

Himad  High to medium (altitude) air defence [s adds system].

Himat, HiMAT  Highly manoeuvrable aircraft technology (research programme).

Himes, HIMES  Highly manoeuvrable experimental space [vehicle] (J).

hinged wing  General term for wing not always rigidly fixed but able to fold, vary sweep or incidence, slew or rotate in any other way relative to fuselage.

hinge moment  Force required to rotate aerodynamic surface or resist incident air load on it, Ch = total aerodynamic load on surface (varies as square of airspeed) multiplied by distance from hinge axis to cp.

HIO  Highly-inclined orbit.

HIOC  Hourly indirect operating cost.

Hipar 1 High-power acquisition radar.
HMGP

.J Heavy machine gun.
.HMGP Heavy machine-gun pod.
.HMHH Helmet-mounted HUD.
.HMHT Heavy helicopter squadron (USMC).
.HMI Human/machine interface.
.HML Hard mobile launcher.
.HMLA Helicopter squadron, light attack (USMC).
.HMM Helmet-mounted sight (USMC).
.HMOB Hardened main operating base.
.HMOS High-density MOS.
.HMOSP Helicopter multimission optronic stabilized payload.
.HMP HMG (3) pod; – RL adds rocket launcher.
.HMR HMR.
.HMRT Health-monitor[ing] recorder.
.HMRU Helmet-mounted sight; / D adds display, S system.
.HMST Helmet-mounted sensory technologies [PO adds program office).
.HMT Helmet Training Squadron (USMC).
.HMTAS Helmet-mounted target-acquisition sight.
.HMTDS Helmet-mounted target designation system.
.HMTSIS Helmet-mounted targeting and indication system (R).
.HMU Hydraulic unit.
.HMU Helmet-mounted unit.
.HMSS Helmet-mounted symbology system.
.HMST Helmet-mounted sensory technologies [PO adds program office).
.HN Helm.
.HN Heavy (adj).
.HNSC House of Representatives National Security Committee (US).
.HNVS Helicopter night-vision system.
.HO Operation.
.HOA One carried out while vehicle, rocket motor or other device is mounted on test stand.
.HOJ Homing jamming: fundamental ECM technique.
.HOG Hermann Oberth Gesellschaft eV (G).
.HOL Hol.
.HOL High[er]-order language [see HOLWG].
.HOLG Hol.
.HOMOA One carried out while vehicle, rocket motor or other device is mounted on test stand.
.HOJ Homing jamming: fundamental ECM technique.
.HOLL Hol.
.HOLG Hol.
.HOLP Hol.
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holding off

holding off In landing an aeroplane, the final moments of flight when the pilot keeps increasing pull on control column to postpone landing/alighting in order to do so either at lower speed or (tailwheel aircraft) in three-point attitude.  

holding pattern Racetrack pattern of precisely known location, two parallel legs joined by turns at 3°/s or at 30° bank.

holding point 1 See holding area.  
2 Designated point for holding on airfield, especially before entering active runway.

holding room Airport lounge.

holding side That side of holding course on which pattern is flown.

hold short Land and stop before reaching any runway intersection.

hole 1 Vacant space left by electron missing from crystal lattice, hence any positive charge (fixed or mobile, in latter case flow of + cloud through p-type semiconductor).
2 Air pocket (colloq.).

hollow charge See shaped charge.

hollow spinner Propeller spinner in form of annular ring through which passes airflow for engine, cooling or other purpose.

hollow-stem valve Piston engine exhaust valve stem in form of tube filled with sodium or other material of high specific heat for conducting heat from head.

holography Photographic record produced by interference between two sets of coherent waves. Many unique properties, one of which is 3-D nature of image.

Hols Holidays.

HOLWG High-order language working group [1975] (DoD).

HOM 1 High-orbit mission.  
2 Harmony order management (software).

home 1 To use matched-wavelength seeker and error-sensing flight-control system in order to fly automatically towards source of radiation.  
2 To steer aircraft manually towards particular point navaid or other emitter.

homebuilt Difficult to define, but generally accepted as powered aircraft designed for construction by amateur. Majority are designed professionally, with plans approved by EAA or other authority and then duplicated and sold to homebuilders. In some cases successful * is put into commercial manufacture for sale, removing it from category. Excluded; modifications of existing types, replicas, restorations or copies of commercial designs.

Homeland Security Effective October 2002, US Department exceeded in size only by Defense, with c170,000 personnel integrated from Coast Guard, federal Emergency, Customs, Immigration & Naturalization, Border Patrol and Secret Service.

home-in See home (2).

home plate Base airfield to which aircraft are to recover after mission.

homer VHF/DF station.

homing 1 Procedures for bringing two radio or other EM stations, at least one airborne, together.  
2 Guidance which causes a vehicle [e.g. aircraft or missile] automatically to fly towards a particular source of radiation.

homing beacon One on which pilot can home (2).

homing guidance System enabling unmanned vehicle to home (1), typically based on use of IR, IIR, EO/TV, ARH, SARH, or SALH.

homing receiver Radio receiver indicating aurally/visually when heading (rather than track) is not towards transmitter.

homodyne Reception of DSB in which local oscillator generates output synchronized with original carrier.

homosphere Earth atmosphere below a height of about 100 km (62 miles), composition being almost constant.

homotron Soft failure.

HOMP Helicopter operations monitoring program.

HOMS Homing optical missile system.

Honcho Big chief, hence fighter ace or high-ranking military or company officer (US, colloq.).

honeycomb 1 Low-density structural technique and materials based on hexagon-cell honeycomb sandwiched between two sheets too thin for stability alone; can be all-metal, or any of the three components can be of various other materials, joined by various adhesives. Can be supplied as standard sheet, or parts can be made individually with any form. Nid d’abeilles, NdA (F).
2 Grid of thin intersecting aerofoils or flat plates across tunnel or other duct intended to remove turbulence from fluid flow.

honking Being airsick, hence honk bag (cabin-staff term).

HOO Helicopter offshore operations.

hood see canopy.

hoodoo Hose-drum unit (RAF, colloq.).

HOP 1 Hours of persistence.  
2 Full circuit in advance of official first flight.  
3 Jump from one EM frequency to another by ECCM

Hop H2 orbiting plane experiment [not same as next] (Japanese NAL).

Hope - X High-orbiting plane experiment.

hoop 1 Small receptacle in oil tank for hot or diluted oil to assist cold-weather start.  
2 Container in ag-aircraft for dust (powdered chemical).

Hops Helmet optical position sensor.

Horizon 1 Horizontal.  
2 Horizon.

Horizon Hélioptère d’Observation Radar et d’Investigation sur Zone (F).
horizon 1 Actual boundary where sky and planetary body appear to meet: visible *.
2 Apparent boundary as modified by atmospheric refraction, terrain, fog or other influence: apparent *.
3 Great circle on celestial sphere at all points 90° from zenith and nadir: celestial *.
4 Line resembling apparent * but above or below: false *.
5 Locus of points at which direct rays from terrestrial radio transmitter become tangent to Earth: radio *.
6 Artificial horizon (instrument).

horizontal and pitch scale  HUD symbology comprising a horizon line, parallel lines above and below (±2° or 5°) for pitch information, and heading marks at 5° intervals.

horizon bar  Fixed horizontal reference in most types of horizon (6), HSI and attitude-displays.

horizontal sensor  Radiometer or other sensitive passive receiver used to align one axis of spacecraft or satellite with apparent horizon of Earth or other body; also called *-seeker.

horizontal  Used in Hotol to mean short or vertical takeoff with fuselage substantially level; used in Hotol to mean takeoff along runway (CTOL) instead of straight up in vertical attitude.

horizontal error  Error in range, deflection or miss-radius which weapon system exceeds on half of all occasions when firing on target on horizontal plane. When trajectory at arrival is near-vertical ** is CEP; where trajectory slanting, giving elliptical dispersion, ** is probable error.

horizontally opposed engine  Piston engine with left and right rows of horizontal cylinders and central crankshaft.

horizontal parallax  Geocentric parallax of body on observer’s horizon, = angle subtended at body by Earth radius at equator.

horizontal plane  Usually that through longitudinal [OX] axis and perpendicular to vertical.

horizontal projecton  One in which hierarchy in design/project team is minimised and each member works full-time on single project.

horizontal scanning  Scanning in azimuth only at near-0° elevation; rare (see scanning).

horizontal situation indicator, HSI  Standard pilot panel instrument for all except small GA aircraft; includes Hdg (T, M), angular deviation from VOR, INS or other track, Tacan/DME or INS display, and alphanumeric readout of G/S and possibly other data.

horizontal stabilizer  Tailplane.

horizontal tailplane  Tailplane.

horizontal technology integration  Using common hardware, such as sensors, scanners/windows, stabilization and software shared between two or more systems, such as FJIR, IRST, LST, etc.

Hormoconis resinae  By far the most common jet-fuel fungus.

horn 1 Operating arm of simple manual flight-control surface to which cable is attached.
2 Microwave aerial coupling waveguide to free air to give directional pattern; three basic forms are pyramid, sectoral and biconical, first two having rectilinear funnel appearance.
3 Acoustic emitter tube whose varying cross-section and final area control acoustic impedance and directivity.
4 Small area of control surface ahead of hinge axis, usually at tip, sometimes shielded at low deflection angles by fixed surface upstream and usually housing mass-balance; when surface deflected provides aerodynamic force assisting deflection.

horn aerial  See horn (2).

horn balance  See horn (4).

horn check  Verify correct functioning of landing-gear warning horn.

Hornet  Hazardous-ordnance engagement toolkit, to defeat terrorist SAM (US).

horsal  Horizontal ventral fin (originally on XF10F).

horsepower  Non-SI unit of power; traditional hp defined as 550 ft-lbs = 0.745700 kW; metric * called ch or PS] defined as 75 kg-m/s = 0.7355 kW. There is also electric * defined exactly as 0.746 kW. Brake * is measured at output shaft by applying known retarding torque; indicated * calculated from area of indicator diagram and rpm; fractional * is indicated minus brake *; equivalent * is turboprop bhp plus addition factored from residual jet thrust. Aircraft engines also have various * ratings, as do some nations’ pilot certicates.

horsepower loading  See power loading.

horseshoe  Revetment having this shape in plan.

horseshoe vortex  Combination of finite wing plus trailing vortex from each tip, forming circulation of approximate square-cornered U-shape in plan. The flow above and below the wing can be divided into any number of local *.

horseshoe vortex 2 Semi-toroidal flow of ground sheet ahead of VTO hovering in headwind.

Horus  Hypersonic orbital return upper stage.

HOSG 1 Human operator simulator.
2 Helitow observation system.

hose  Flexible conduit for fluid (liquid or gaseous).

hose 2 Verb, to fire long burst of gunfire at or ahead of hostile or challenged aircraft.

host aircraft  That acting as carrier to test installation, or parent to UAV/drone.

host computer  One to which remote terminals or I/O devices are connected.

hostile  Target known or assumed to be enemy, esp. one seen on remote display.

hostile track  One which, based upon established criteria, is determined to be enemy airborne, ballistic or orbiting threat.

host nation  One whose territory houses infrastructure forming part of an international system or aircraft of a friendly air force.

HOT  Higher-order term.

Hot  High-subsonic, optically tracked, teleguided.

hot 1 Fast-landing (collog.).
2 With afterburner in operation.
3 With combustion in operation (pressure-jet tip drive or HPV/hydrocarbon rocket).

hoz 1 Operating arm of simple manual flight-control surface to which cable is attached.
2 Acoustic emitter tube whose varying cross-section and final area control acoustic impedance and directivity.
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**Hotac**

Hotac Hotel accommodation to provide sleep for civil flight crews.

**hot-air balloon** Balloon rendered buoyant by heating the air contained in the envelope, thereby reducing its density.

**hot and high** Airfield or helicopter platform where high altitude above MS is combined with high ambient temperatures. These both reduce engine power and the lift from a wing or rotor.

**Hotas** Hands on throttle and stick, design of cockpit of air-combat fighter so that pilot has every control switch, button or trigger needed in any combat on these two handholds [A adds aid]. See Hotac.

**hot bird** Fully functioning satellite.

**hot box** Stolen item of avionics, for intelligence or commercial profit.

**hot bucket** Turbine rotor blade (colloq., US).

**hot chaff** Pyrophoric material for IRCM dispensed in covert [not emitting at visible wavelengths] manner.

**hot day** Standard ISA condition for engine rating, aircraft performance certification and other temperature-dependent lawmaking.

**hot dimpling** Dimpling of holes pre-heated to avoid cracking.

**hot end** Portion of gas-turbine subjected to high temperatures from combustion, normally all parts to rear of compressor (which itself can be hot enough to require special refractory alloys in final stages but is never included in this definition); called hot section in US.

**hot fire** Hot test.

**hot-gas recirculation** Any mechanism by which hot gas from a propulsion or lift jet can return to engine inlet.

**hot-gas system** One energized by gas bled from combustion of solid fuel, or from operating solid rocket motor.

**hot gas valve** One used to control hot gas pressure for TVC purposes.

**hot gun** Aircraft scrambled with loaded gun[s].

**hot isostatic pressing** Temperature/pressure cycle for close to precise net shape.

**hot leg** Presentation, or flypast, on which target simulates IR of hostile jet aircraft.

**hot mission** Particular test (flight or otherwise) which involves hazards precluding other activity in same area.

**Hotol** Horizontal takeoff and landing (spacecraft launch).

**hot pit** Air refuelling in which fuel is transferred (UK colloq.).

**hot rock** Inexperienced pilot eager to show off (colloq.).

**hot rocket** One in which fuel is burned.

**hot round** Rocket vehicle equipped with operative propulsion, in test programme where many are not.

**HOTS** Hands on throttle and stick; Hotas is more usual.

**hot section** Total of all parts of gas-turbine engine subjected to high temperatures from combustion of fuel, in modular engine exactly defined and normally including associated external dressing which in fact remains relatively cool.

**hot shot** Method of igniting afterburner fuel [which would not otherwise ignite reliably, especially at high altitude] by spraying extra dose of fuel into engine combustion chamber to create hot flame which passes through turbine to afterburner; * lasts too short a time to damage turbine.

**hot soak** Standardized tests in which an item is baked at a selected high temperature for a specified period.

**hot spot** I Place much hotter than environment, showing on 3–5 micron IR.

* 2 Local area on radar target giving intense return.

**hot stand-by** Satellite (Comsat, navsat) available for instant use should operating satellite malfunction.

**hot start** I Attempted start of gas turbine abandoned because of overtemperature indication.

* 2 Start, or attempted starts, of piston engine soon after previous run, often thwarted by vapour lock.

**hot streak** Method of igniting afterburner by injecting fuel from special (normally inoperative) nozzle in main combustor, causing long flame to pass through turbine into afterburner primary zone. Can be synonymous with hot shot.

**hot-stream nozzle** That from core engine in turbofan without mixer.

**hot test** Static test of rocket engine in which actual firing takes place.

**hotwell** Tank or portion of larger tank in which hot liquid collects.

**hot winchback** Aircraft pulled into HAS with engines running.

**hot-wire anemometer** One measuring current by IR heating of fine wire; hence * galvanometer, * voltmeter.

**hot-wire anemometer** Measures airspeed or wind speed down to 10 mm/s by heating platinum wire to about 1,000°C and either measuring current I for constant T or resistance at constant I.

**hot-wire ignition** Use of suddenly heated (but not exploded) resistance wire to set off rocket engine or gun ammunition.

**hot-wire probe** Hot-wire anemometer.

**hot-wire transducer** Detects and measures sound waves by change in resistance of heated wire.

**hour angle** Bearing of object on celestial sphere; angle at pole between hour circles of observer and object, abb HA (see local **, Greenwich **, sidereal **).

**hour circle** Great circle of celestial sphere formed by projecting Earth meridian.

**House** House of Representatives (US).

**house aircraft** One used for research or development and property of user, normally a manufacturer.

**HOV** Autopilot mode maintaining zero lateral/longitudinal groundspeed.

**hover** I To fly (usually at low altitude) stationary relative to Earth, airspeed being that of local wind.

* 2 Exceptionally, to fly with zero airspeed, carried along at speed of wind in horizontal plane (while holding height constant).

* Uncommon use, to be on station in geostationary orbit.

* To operate or travel in air-cushion vehicle; obvious contradiction in terms.

**Hovercraft** The original [registered] name of pioneer air-cushion vehicles, still popularly used without initial capital.
hovering ceiling

hovering ceiling  Greatest altitude at which helicopter under specified conditions can hover (2), normally defined as IGE (in ground effect) or OGE (out of ground effect).

hovering point  Location where V/STOL aircraft picks up or sets down load without landing.

hovering rig  Free-flying rig comprising open spaceframe in which are mounted jet lift engines and supporting systems planned for future aircraft to facilitate development of control systems in low hovering flight. These qualify as aircraft.

hover pit  Test facility for jet VTO or STOVL aircraft.

HOW  Handover word.

HOWD  Helicopter obstacle warning device.

towin  Open gunner’s cockpit above upper wing of large aircraft pre-1930.

Howe truss  One having upper and lower chords joined by verticals plus diagonals inclined outwards from bottom to top on each side of mid-point.

howgozit  Basic graphical plot of particular flight for planning purposes, always on basis of distance and with vertical scale flight level; includes weights, W/V and ambient T, and is amended as flight progresses (often arch.).

howler alert  Warns interphone handset is not properly seated.

Hows  Hostile-weapons location system; versatile phased-array radar.

Hows  Hostile-weapons location system; versatile phased-array radar.

HPT  / High-pressure turbine.

HR  / High-resolution.

HRD  High-rate of descent.

HRF  / High-response force, since 2005 also often called HR4.

HRGM  High-resolution ground map.

HRM  High-resolution magnetometer.

HRC  Historical-reconnaissance.

HRE  / Hyper-resolution.

HROD  High-resolution ocean depth.
HRP

HRP  Headset-receptacle panel.
HRR  1 High-resolution radar.
   2 High-range resolution; GMTI adds ground MTI.
HRS  1 Horizon-reference system.
   2 High-resolution stereoscopic.
   3 Hemispheric radar system.
hrs, Hrs  Hours.
HRSAR  High-resolution SAR(2).
HRSCMR  High-resolution surface-composition mapping radiometer.
HRSI  High-temperature reusable surface, or silica, insulation; Si-fibre tiles protected by fretted borosilicate glass with pigment for desired absorption/emission ratio.
HRSI  High-temperature reusable surface.
HRSI  High-temperature reusable surface, or silica,
HRSI  insulation; Si-fibre tiles protected by fretted borosilicate glass with pigment for desired absorption/emission ratio.
HRTS  High-resolution telescope and spectrograph.
HRZ  Helicopter restricted zone.
HRZN  Horizon.
HS  1 Scheduled hours only.
   2 Anti-submarine helicopter designation prefix (USN 1951–62).
   3 Helicopter Squadron.
   4 Hold short (command).
Hs  Maximum shoulder height of tyre [tire].
h  1 Total height of a stringer.
HSA  1 Horizontal-stabilizer actuator.
   2 Homeland Security Agency (US, 2002).
HSA  1 Heavy-store[ses] adapter beam.
HSCB  1 NDB with automatic weather broadcasts.
HSCAC  Helicopter Safety Advisory Committee/Conference [office, Houston, TX 77205] (US).
HSCASE  HSA control electronics.
HSCAD  High-speed anti-radiation demonstration.
HSCAD  High-speed anti-radiation demonstration.
HSCAS  Homeland security advisory system.
HSCS  High-specific creep-strength; M adds material[s].
HSCST  High-speed commercial transport; usually = M2.2-M5.
HSCU  Horizontal-stabilizer control unit.
HSD  1 Hard surface, dry (runway).
   2 Horizontal-situation display.
HSDB  High-speed data bus.
HSDC  High-speed data channel; E adds extension.
HSE  Health and Safety Executive (UK).
HSEC  High-stability engine control.
HSEF  Half sampling frequency.
HSEFD  High-speed flight demonstration.
HSEFES  High-Speed Flight Research Station (NACA Muroc, became NASA Dryden).
HSEF-RSAD  High-speed [film] frame, relay service access device.
HSe  1 Horizontal-situation indicator.
   2 Hot-section inspection.
   3 Hours since inspection.
   4 Hyperspectral imagery, or imaging.
   2 High-speed impulsive noise.
HSIC  High-speed integrated circuit.
HSIT  Hardware/software integration test.
HSKT  Hunter standoff-killer team.

HTCU

HTCU  1 Hover trim control unit.
HSL  Heading select.
HSLA  High-strength low alloy steel.
HSLV  High-speed low-voltage (LSI).
HSM  1 Hard-structure munition, conventional munition intended to have maximum effect on hardened targets.
   2 High-speed machining.
   3 Hardware security module.
HSMF  High-strength modified fluoropolymer.
HSSU  Hydraulic system[s] monitoring unit.
HSN  Hot-stream nozzle.
HSOS  Helicopter stabilized optical sight.
HSP  1 High-speed [1,300 m/s] penetrator, or penetration; T adds technology.
   2 Head-shrinkable polyolefin.
   3 Hard spark[ing] plug.
HSR  1 High-speed research.
   2 High-stability reference.
   3 High sink-rate.
HSPR  Hot-standby routing protocol.
HSS  1 Helicopter support ship.
   2 Helicopter stabilized sight.
   3 Homeland security sensor, or suite.
   4 Hypersonic sound.
HSSL  Helicopter self-screening launcher.
HSSS  Helicopter secure-speech system.
HST  1 Hypersonic transport.
   2 Heat-shrinkable thermoplastics.
   3 High-speed tunnel, or turnoff.
HSTA  Horizontal-stabilizer trim actuator.
HSTF  High-strength toughened fluoropolymer.
HSU  1 Hartridge smoke unit.
   2 High-speed unit (satcom).
HSSV  Highly supersonic vehicle.
HSV  1 Horizontal-station video display.
HSW  High-speed weapon[es].
HSTW  High-speed wind tunnel.
HT  1 High turbine (US for HP turbine).
   2 Hard time, thus * life.
   3 Helicopter, training (US for HP turbine).
   4 History tape.
   5 Horizontal tail.
   6 High tension [h.t. preferred].
HTB  Hub-tip ratio.
ht  Height.
ht  High tension (electrical).
HTA  1 High-time aircraft of type.
   2 Horizontal target attack.
   3 Heavier than air.
   4 Hand-entered terrain altitude.
   5 Helicopter type allowance.
HTAD  Hard-Target Attack Division (USAF).
HTADS  Helmet target-acquisition and designation system.
HTC  1 Hard-target capability.
   2 See HTCU.
   3 Human to computer.
   4 Highest two-way channel.
HTCU  1 Hover trim control unit.
Hucks starter
Device, often locally made, for starting piston engines. On a car or truck chassis a drive is taken from the engine to a long shaft whose height and inclination can be varied. This terminates in lateral pins (dog clutch) which engage with a bayonet clutch on the end of the propeller shaft (suggest obs.).

Hung start
45.3592 kg.
Hung round  Rocket or other missile which fails to release from aircraft.

Hung stall  After compressor stall, engine fails to recover immediately.

Hung start  Starting of main turbine engine which, for any reason, automatically or under manual control is arrested after ignition but before self-sustaining speed is reached.

Hunter  Head-up navigation and targeting equipment for retrofit.

Hunter/killer  Aircraft or other platform able to seek out and kill submarines unaided.

HVAC  Heating, ventilating and air-conditioning.

HVA  Horizontal viewing arc.

HVAP  High-velocity armour-piercing.

HVCI  Hardware configuration item.

HVD  High water mark mean tides.

HVDF  High volume, low pressure [painting].

HVDR  High-volume precipitation sensor.

HVET  High-volume target; A adds acquisition.

HVT  High-value unit [surface target].

HVU  High-value target; A adds acquisition.

HWAC  Heat exchanger.

HWAP  High-altitude VOR.

HWAP  High-velocity oxygen/fuel plasma spray.

HWV  Hypersonic weapons technology.

HWVR  However.

Hx  Hypersonic missile.

HVA  Helicopter aerial.

HVA  Horizontal view.

HV  Hypervelocity missile.

HVM  Helicopter video downlink.

HVDF  High-volume fuel/air.

HVFI  Hypervelocity impact.

HVF  High-volume fuel.

HVGA  High vacuum.

HVGS  High volume.

HVH  High volume.

HVH  High voltage.

HVHS  High-volume flow.

HVHSD  High-volume hybrid system.

HVHST  High-volume hybrid system.

HVLT  High-volume laminar flow.

HVPT  High-volume power supply.

HVU  High-value unit.

HVT  High-volume target.

HVU  High-volume unit.

HVU  High-volume unit.

HVT  High-performance jet.

HYBRID  Hybrid Ram.

Hybrid RAM  One using digital techniques for large and precise arithmetic and logic beyond scope of analog machines, and analog wherever possible for highest computational speed; invariably a good compromise for large simulations and other specialized tasks [Ed.’s opinion].

Hybrid computer  Matrix reinforced by fibres of two different types.

Hybrid display  One in which alphanumerics and symbology are cursively written on top of a raster background.

Hybrid electronics  Combination in single integrated circuit of epitaxial monolithic or thin-film with one or more discrete devices.

Hybrid fan  Refined form of tandem-fan lift/cruise engine which in lift mode blows entire fan airflow through twin vectored forward nozzles and separately induced core flow through aftvectored nozzle.

Hybrid FCS  Flight-control system with digital outer loop and analog inner loop.

Hybrid helicopter  Aerodyne with VTOL capability conferred by helicopter rotor[s] but which cruises (flies in translation mode) as an aeroplane.

Hybrid IC, hybrid package  Hybrid electronics.

Hybrid laminar flow  Combination of aerodynamic design and suction.

Hybrid navigation system  This usually means GPS, INS and IFF.

Hybrid operation  See hybrid display.

Hybrid propulsion  Aircraft propelled by two or more dissimilar species of prime mover; eg turboprop plus jet, or turbojet plus rocket.

Hybrid RAM  RAM(2), especially forming integral part of airframe, combining two or more techniques to give broader bandwidth in thinner layer, eg magnetic/CA, graded dielectric/CA, etc.
hydraulic starting

of oil created by centrifugal force.

engine formed by ring-fins or flanges projecting into ring

usually, emergency input such as RAT or MEPU;

pumps, accumulators, valves, heat exchangers, filters and,

comprising closed circuits of piping, engine-driven

hydraulic system

hydraulic pump.

motor; once engine is started, motor functions as

hydraulic seal

[Russia] and AIR.320 [France] [UK], MIL-H-5606 [US], H.515 [NATO], AMG-10 [Russia] and AIR.320 [France].

There are several so-called synthetic ester-based fluids,

esters and (supersonic and missiles) alkyl silicate esters.

fuel, phosphate esters, chlorinated silicones, silicate

media originally mineral oils, today also engine

with little fluid motion, and supply power, with large fluid

incompressible liquids enclosed in closed-circuit pipe

(hydrostatics). In aerospace generally science of nearly

hydraulic power unit

Source of power to energize hydraulic system, eg when main engines inoperative.

hydraulic RAT

Ram-air turbine driving both electric generator and hydraulic pump.

hybrid RAT

Ram-air turbine driving both electric generator and hydraulic pump.

hybrid rocket

One using both liquid and solid propellants simultaneously; usual arrangement is solid fuel and liquid oxidant.

hybrid solar array

Part folding, part flexible.

hybrid trajectory

Any space trajectory intermediate between that for minimum energy or minimum time and alternatives offering greater payloads, longer launch windows or other advantages.

hybrid wave

EM wave in waveguide having both magnetic and electric components in plane of propagation.

Hycatrol

One of several trade names (FPT Industries) for rubber/metal bonded structures.

Hycorder

Hyperspectral covered-lantern optical recognition device recorder.

Hyd

Hydraulic(s).

Hydim

Hydraulic interface module.

Hydrant dispenser

Installation under apron or finger/gate area stand for refuelling aircraft without need for tanker vehicles.

Hydrant pit

Below-ground compartment, normally covered, housing connections and controls for fuel, hydraulic, lube oil or other liquid supply.

Hydraulic catapult

Hydraulic power unit used in boosted (not fully powered) flight-control system (colloq.).

hydrobooster

Hydraulic power unit used in boosted (not fully powered) flight-control system (colloq.).

hydroblasting

Abnormal resistance to movement of machine, esp. piston engine, caused by hydraulic lock in lower cylinders part-full of essentially incompressible oil; can cause serious damage.

Hydraulic lock

Use, frequently inadvertent, of essentially incompressible liquid to prevent movement of mechanical part.

hydraulic motor

Source of mechanical power, usually rotary, driven hydraulically.

hydraulic power unit

Source of power to energize hydraulic system, eg when main engines inoperative.

Hydrom

Hydraulic power unit used in boosted (not fully powered) flight-control system (colloq.).

Hydro

Symbol H, least-dense element, comprising 88 per cent of atoms in Universe. LH2 (liquid *) has density 77.0 gl–1, 4.806 lb/ft3 at 13.8K (the triple point) and 70.8 gl–1 at BPt of 20.28K, –253°C, where it becomes GH2 (gaseous *) with density 0.0008988 (0.08988 gl –1) or 0.005611 lb/ft3; isotopes are bivalent deuterium, trivalent lithium and a little tritium T. Triggering the NW emits neutrons which instantly convert the Li-6 into H+He-3+T. The He-3 and T then combine with remaining D to form more He and more neutrons, which also convert the U-238 bomb fuel into Pu-239, causing an additional (fission) reaction.

Hydrogen bomb

So-called H-bomb, or thermonuclear weapon TN or TNW; comprises NW surrounded by lithium deuteride (LiD, the lithium being isotope Li-6) and a little tritium T. Triggering the NW emits neutrons which instantly convert the Li-6 into H+He-3+T. The He-3 and T then combine with remaining D to form more He and more neutrons, which also convert the U-238 bomb case into Pu-239, causing an additional (fission) reaction.

Hydrogen bus

Airport airside buses are among the first vehicles to be powered by hydrogen, usually GH2 stored on vehicle roof.

Hydrogen economy

Hypothetical future in which Earth’s limited reserves of petroleum are replaced by gaseous and liquid hydrogen. No new technology is needed, but see next.

Hydrogen fusion

Essentially limitless power could be unlocked if mankind could emulate the Sun and build a facility which continuously converted hydrogen into helium. Conversion would yield 630,000,000,000J of energy per gram.

Hydroglider

Glider with marine alighting gear.
hydrograph

hydrograph  Hydrometer hard-copy output.
hydrokinetics  Science of liquids in motion.
hydrodynamics  Rate of decrease of atmospheric water vapour with altitude.
hydromagnetic  See MHD.
hydromechanical  Performed with mechanical elements where information exists as hydraulic flows/pressures.
hydromechanical metering unit  Fuel metering unit.
hydrometer  Instrument for determining density of liquids.
hydrometeor  Any atmospheric water in solid or liquid form; all precipitation, fog, dew, frost etc.
2 Phenomena dependent upon (1).
hydrophobic  Rain-repellant.
hydrophilic  Affinity for water, so acts as dessicant (various spellings).
hydroplane  Light boat which skims water surface on planing bottom when at high speed; erroneously misused for seaplane and/or hydrofoil.
hydropower  Plane for marine aircraft.
hydropress  Diverse family of hydraulic presses widely used in aerospace with large-area platens on which are mounted large or multiple tools around which sheet is shaped by rubber pad or mating tools.
hydroskis  Plane, usually in left/right pair and retractable, used for takeoff and landing of certain marine aircraft; have little buoyancy, so ski aircraft rests on water like flying boat when at rest.
hydrosphere  Water resting on or within crust of Earth or other body, excluding that in atmosphere.
hydrostatic bearing  Spinning shaft, sphere or other mass is supported (usually radially and axially) by filtered gas or liquid dynamic reaction, eliminating contact between fixed and moving solid surfaces.
hydrostatic drive  Transmits power, usually between rotating shafts, by pumping hydraulic fluid round closed circuit; both pump and motor usually have stroke or output infinitely variable down to zero, giving perfectly flexible dynamic link from zero to maximum output power.
hydrostatic equation  Applies when secondary effects (Earth curvature, friction, coriolis etc) ignored, leaving dp/dz = -pg where p is pressure, z geometric height and p density.
hydrostatic extrusion  Advanced technique for extrusion of steels and other materials, usually at room temperature by forcing through die under extreme hydraulic pressure.
hydrostatic fuzes  Triggered by depth-dependent water pressure.
hydrostatic test  Test of container (fuselage, solid rocket case) under high pressure using water or other liquid to minimize stored energy.
hydrovane  Instrument for recording humidity, traditionally with pen positioned by bundle of stretched human hair.
hygrometer  Determines atmospheric humidity (strictly, wet and dry bulb * is psychrometer).
ydromicroscopy  Eager to absorb moisture.
Hy-Jet/I,II,III,IV  Ester-based non-inflammable hydraulic fluids (Chevron).
Hy-Lite  Hyperspectral long-wave imager for the tactical environment.
Hyfil  Trade name for CFRP raw materials marketed in standard forms or used for inhouse production (Rolls-Royce).
Hyflex  Hypersonic flight experiment.
HyFly  Programme of Mach-6 research (Darpa/ONR).
HVE  High-yield explosive.
hygograph  Output from a recording hygrometer.
2 Instrument for recording humidity, traditionally with pen positioned by bundle of stretched human hair.
mc

3 Hyperbaric  Having atmospheric pressure or oxygen concentration greater than normal sea-level.
2 Internal body pressures greater than ambient.
hyperbola  Conic section obtained by plane cutting both nappes (normal right circular cone and its mirror-image inverted above); locus of points whose distances from two fixed points having constant difference in distance is hyperbolic equation.
hyperbolic  Based upon synchronized emissions from fixed ground stations, often called master and slave(s), which are received by aircraft at time differences which yield lines of constant time (ie range) difference in form of hyperbolic position lines. First were Gee, Loran and Decca, later developed to give instantaneous readout of position or moving-map display.
hyperbolic error  That due to assumption that waves received at all antennas of an interferometer baseline are travelling in parallel directions.
hyperbolic navaids  Based upon synchronized emissions from fixed ground stations, often called master and slave(s), which are received by aircraft at time differences which yield lines of constant time (ie range) difference in form of hyperbolic position lines. First were Gee, Loran and Decca, later developed to give instantaneous readout of position or moving-map display.
hyperbolic error  That due to assumption that waves received at all antennas of an interferometer baseline are travelling in parallel directions.
hyperbolic frequencies  Measured in several tens of GHZ.
hyperbolic re-entry  At hyperbolic speed.
hyperbolic speed  Sufficient to escape from Solar System; on Earth trajectory away from Sun about 40,597 km/h, 25,226 mph.
hypergolic  Of rocket propellants, those which ignite spontaneously when mixed.
hypermetropia  Long-sightedness.
hypermixing nozzle  In ejector-lift system, row of nozzles which alternately deflect jets in opposite directions to create large vortices promoting rapid mixing.
hyperoxia  Excess oxygen in the blood.
hypersat  Loose term for advanced small satellite(s).
hypersonic  Having Mach number exceeding 5 [another authority, M8 to M12].
Hypersonic National Plan  Co-ordinates DoD, NASA, industry and academia (US).
hypersound  Frequency greater than 10^7 Hz.
hyperstructural  Operating in several electromagnetic
bands, dividing each colour into a separate channel to give a unique signature of absorption and emission.

**hypertension**  High blood pressure.

**hyperventilation**  Overbreathing; specif. reduced CO₂ causing * syndrome, dizziness, fainting, convulsions.

**hypobaric**  Having atmospheric pressure much less than normal at sea level.

**hypocapnia**  CO₂ deficiency in blood.

**hypoid**  Bevel or helical gears transmitting power with some tooth-sliding action between shafts neither parallel not intersecting.

**hypoventilation**  Underbreathing.

**hypoxaemia**  Condition resulting from hypoxia.

**hypoxia**  O₂ deficiency in blood, from whatever cause.

**hypometric tints**  Colour gradations chosen for contrast by natural or artificial illumination (eg. for contour bands on topographic map).

**HYR**  Higher.

**Hyrat**  Hydraulic (pump-driven by) ram-air turbine.

**HySET**  Hydrocarbon-fuel scramjet engine technology.

**HYSID**  Hypersonic systems integrated demonstrator.

**hysteresis**  
1. Generally, condition exhibited by system whose state results from previous history, specif. one whose instantaneous values lag behind prediction.
2. In ferromagnetic and some other materials, lagging of magnetic flux density T behind magnetic field strength A/m causing it (see * loop).

**hysteresis loop**  Plot of magnetising field strength against magnetic flux density for ferromagnetic material; traditionally called B/H curve because flux density was called induction, symbol B, measured in gauss, and field strength (formerly in oersteds) was identified by symbol H; today’s units are (field strength) A/m and (flux density) T.

**HYT**  High year of tenure (waiver programme).

**Hytech**  Hypersonic technology.

**Hythe**  Ciné camera mounted on Scarff ring or similar base for gunnery instruction; full name * camera gun.

**Hytral**  Noise-absorbent panels of sandwich construction.

**Hyways**  Hybrids with advanced yield for surveillance.

**HZ**  Haze (ICAO).

**Hz**  Hertz, SI unit of frequency, = cycles per second.

**HZ Anlage**  System of using a piston-engine solely to drive supercharger feeding propulsion engines [G, WW2].

**Ho, H zero**  Distance from leading edge of AMC(1) to aerodynamic centre.

**HZS**  Hrvatski Zrakoplovni Savez, [aeronautical sport federation, Zagreb 10–000] (Croatia).
I

1 Electric current.; see ampere.
2 Moment of inertia, suffixes include xx roll, yy pitch, zz yaw, r rotor [of engine or helicopter etc]. θ angular momentum, and numbers for structural webs, etc.
3 Second moment of area
4 Luminous intensity.
5 Total heat content.
6 Total impulse, usually non-dimensional.
7 Intensity of turbulence.
8 Immigration.
9 Initial approach.
10 Instrument.
11 In-line.
12 Interrupted.
13 Prefix, direct-injection engine (US).
14 Aircraft category: human-powered aircraft (FAI).

i 1 Intensity of rainfall.
2 'Square root of minus 1'.
3 Instantaneous current.
4 Helicopter blade control-point index.
5-band EM radiation, 37.5–30 mm, 8–10 GHz.
6-beam One of 1 section.
7-display When radar aerial pointed at target latter appears as circle at radius proportional to range; when aerial points away from target latter appears as segment showing magnitude/ direction of error.
8-local Showing magnitude/ direction of error.
9-band EM radiation, 37.5–30 mm, 8–10 GHz.
10-section Structural beam with vertical web and flat upper and lower booms.

10hang Image-intensifying.
14hang Intelligent influence fuze.
1FS The heat generated by an electric current.
1FS hang Infra-red imaging system.
2 Integrated information system, cabin wireless LAN
3-beam EM radiation, 37.5–30 mm, 8–10 GHz.
4 Current squared times time, characteristic of trip switch.
5 A Initial approach (FAA).
6 Inspection authorization (FAA).
7 Input axis.
8 Imagery analysis.
9 Initial attack (firefighting).
10 A Anode current.
11 hang Inter-American Air Forces Academy (US).
12 hang International Association of Aviation Historians.
13 hang International Airports Authority of India.
14 hang Indonesian Aeronautical and Astronautical Institute.
15 hang International Association of Airline Internal Auditors.
16 hang Inspector of Air Accidents (Operations) [DETR, UK].
17 hang International Administrative Aeronautical Radio Conference.
18 hang International Academy of Aviation & Space Medicine Montreal.
19 hang International Association for the Advancement of Space Safety.
20 hang International Association of Air Training Centers.
22 hang International Association of Aircraft Brokers and Agents.
23 hang Integrated aircraft brake control system.
24 hang Industrieanlagen Betriebs GmbH (G).
25 hang Intelligence Analysis Center (US).
26 hang International Aerobatics Club [office Oshkosh, WI 54909–3086] (Int.).
27 hang Instrument-approach chart.
28 hang Integrated avionics computer.
29 hang See TIACA.
30 hang Instituto de Aviação Civil [20021-010 Rio de Janeiro] (Brazil).
32 hang Irish Aviation Club Ltd [Dublin 14] (Ireland).
33 hang Irish Aviation Club Ltd [Dublin 14] (Ireland).
34 hang International Air Carrier Association [head office, B-1930 Zaventem; UK: office E Grinstead RH19 4QA] (Int.).
35 hang International Association of Civil Aviation Chaplains (office JFK airport, NY).
36 hang Interstate Aviation Committee/Airaviation Register (R, CIS).
37 hang Inter-agency Air Cartographic Committee (US).
38 hang Intelligent adviser [not advisor] capability demonstrator.
39 hang International Air Cushion Engineering Society.
40 hang Inter-agency consultative group (US, USSR, Europe, Japan, space science).
41 hang Independent Association of Continental Pilots.
42 hang Integrated avionics [also air-traffic] control system.
43 hang International Aeronautical Communications Service Provider.
44 hang Integrated avionics [also air-traffic] control system.
45 hang Inter Airline Club Zurich (Int.).
46 hang Fighter Division (R).
47 hang Integrated antenna detector.
48 hang Inter-American Defense Board [Washington, DC].

332
IADF
Isopropyl alcohol de-icing fluid.

IADS
Integrated air-defence system.

IAE
1 Instituto de Aeronautica e Espaco, previously Instituto de Atividades Espaciais (Brazil).
2 Institute for Advancement in Engineering (US).
3 Institute for Aviation and Environment [Cambridge CB2 1EW] (UK).

IAEA
1 Indian Air Engineers’ Association.
2 International Atomic Energy Agency.

IAEM
Instituto dos Altos Estudos Militares (Port.).

IAF
International Astronautical Federation [office, F-75015 Paris] (Int.).
1 Initial approach fix.
2 Italian air force [UK usage].
3 Indonesian air force [UK usage].
4 Iranian air force [UK usage].
6 Independent Air Force, strategic arm of RAF, formed 5 June 1918.
7 See FAI.

IAFA
International Airfreight Forwarders’ Association (J).

IA5
International Alphabet No. 5.

IAFU
Improved assault fire unit (USA).

IAGA
Israeli Association of General Aviation [46910, Kfar Shmaryahu].

IAGC
Instantaneous automatic gain control.

IAGS
1 Inter-American Geodetic Survey.
2 Integrated Arinc ground station.

IAHA
International Air Handling Association.

IAHFR
Improved airborne high-frequency radio: NOE adds nap-of-the-Earth.

IAIM
Integrated aeronautical information management.

IAN
International Association of Institutes of Navigation.

IAIP
Integrated aeronautical information package (CAA).

IAIS
Industrial Aerodynamics Information Service.

IAL
International Air Traffic League.

IALA
International Association of Lighthouse Authorities.

IALCE
International Airlift Control Element (NATO).

IALPA
Irish ALPA [office Dublin airport PA1] (Ireland).

IAM
1 International Association of Machinists and Aerospace Workers (US, Washington, DC, and, Canada, Ottawa).
2 Institute of Aviation Medicine (UK).
3 Inertially-aided munition, free-fall device (Northrop).
4 Instrument approach minima.
5 Institute for Advanced Materials (Petten, Neth.).
6 Initial approach mode.
7 Integrated asset management [CS&S].

IAMAW
International Association of Machinists and Aerospace Workers (US, Washington, DC, and, Canada, Ottawa).

IAMMS
1 Integrated armament management system.
2 Integrated airline management system (IATA).

Iamsar
International Aeronautical and Maritime SAR Manual (ICAO).

IANA
Internet Assigned Number Authority.

IANC
International Airlines Navigators Council.

1 International Air Navigation Convention (from 1919).

I&C, I&CO
Installation and checkout.

I&E
Installations and Environment (US DoD).

I&M
Improvement and modernization.

I&T
Integration and tape.

I&W
Indications and warnings.

IANS
Institute of Air Navigation Services (Luxembourg).

IAO
1 In and out of cloud.
2 Information Awareness Office (Darpa).

IAOA
Indicated angle of attack.

IAOPA
International Council of AOPAs [1962–, office Frederick, MD 21701] (Int.).

IAP
1 Imagery architecture plan.
2 Fighter aviation regiment (USSR, R).
3 Instrument approach procedure (see * chart).
4 International airport.
5 Integrated actuation pack[age], usually an electrically driven pump.

IAPA
1 International Airline Passenger Association [Croydon, UK].
2 International Airline Passengers Association [office, Dallas TX] (Int.).
3 International Aviation Photographers’ Associations.
4 Instrument/approach procedures automation.

IAPC
1 International Airport Planning Consortium (UK).
2 Instrument approach procedure chart.

IAPS
1 Ion auxiliary propulsion system.
2 Integrated avionics processing system.

IA-PVO
Fighter aviation, air defence of the homeland (USSR, R).

IAQG
International Aerospace Quality Group (Int.).

IAR
1 Idle area reset.
2 Institute for Aerospace Research [part of NRC, Ottawa, K1A 0R6] (Canada).
3 Inspection, or intersection, of air routes.

IARO
International Air Rail Organisation (office Heathrow, UK).

IARP
Inverse-address resolution protocol.

IAS
1 Institut Aéronautique et Spatial (F).
2 Indicated airspeed (see * speed).
3 Integrated acoustic structure.
4 Interplanetary automated shuttle.
5 Impact attenuation system.
6 Ideal aerofoil/airfoil shape.
7 Integrated airport systems.
8 Institute of the Aeronautical Sciences, changed to Aerospace, and in 1962 to AIAA.
9 Institut Aéronautique et Spatial [office, Toulouse] (F).

IASS
1 International Assessment and Strategy Cemter [DC]
(US).
2 International Assessment and Strategy Center [DC] (USA).

IASS
1 International Air Shipping Association.
2 International aviation safety assessment (FAA).

IASB
Institut d’Aéronomie Spatiale de Belgique.

IASC
1 CASI (1).
2 International Assessment and Strategy Center [DC] (USA).

IASS
1 Institute of Aerospace Safety and Management (U of S California 1953, became ISSM).
2 International air-safety seminars.
IAT

**IAT** 1 International atomic time.
2 International Association of Touristic managers.
3 Initial approach track.

**IATA**  1 International Air Transport Association [1945–,
280 members and growing, many national offices; head
office, Montreal H3Z 1M1 (Int.).

**IATB** International Aviation Theft Bureau [office,
Frederick, MD, US] (Int.).

**IATF**  International Airline Theft Fund [office,
Geneva, 15] (Int.).

**IATP** 1 International Airline Technical pool.
2 Inter-American Training Plan 1941–46.

**IATS** Intermediate automatic test system.

**IATP**  International Airways Volcano Watch.

**IAU**  1 International Accounting Unit.
2 International Astronomical Union [office, Paris].
3 Interface adaptor unit.
4 Integrated avionics unit.

**IAWW**  International Airways Volcano Watch.

**IAW, I.a.w.**  In accordance with.

**IAWF**  International Association of Wildland Fire.

**IAWG**  Industrial Avionics Working Group (UK).

**IB**  1 Inbound.
2 Incendiary bomb.
3 Ion beam, thus * erosion, * engine.
4 Interconnecting box.

**IBD** 1 Burning-time impulse.
2 Helicopter blade moment of inertia about the flapping hinge.

**IBA**  1 Inbound boom avoidance.
2 Fighter/bomber aviation (R).
3 International Bureau of Aviation (Europe).

**IBAC**  International Business Aircraft Association (Europe).

**IBAC**  International Business Aviation Council [office,
Montreal H3C 5H7] (Int.).

**IBC**  1 Individual blade control.
2 Intelligent bandwidth compression.
3 Integrated broadband communications.

**IBCOS**  In-built checkout system.

**IBCT**  Interim Brigade Combat Team (USA).

**IBE**  1 Indirect battlefield effect.
2 Internet booking engine.

**Iberlant**  Iberia–Atlantic area (NATO).

**IBF**  Internally blown flap.

**IBIS, Ibis** 1 ICAO birdstrike information system.
2 Israeli boost-intercept system.

**IBIT**  Integrated, or initiated, built-in test.

**IBK**  Integrated helicopter avionics system (R).

**IBLS** Integrity beacon landing system.

**IBN**  Image-based navigation.

**IBOR**  Innovation and business opportunity review.

**IBP**  Iron-ball paint.

**IBR**  1 Integritly blade rotor (gas turbine).
2 Intra-base radio.
3 Integrated baseline review.
4 Involuntary boarding refusal.

**IBRD** 1 Inflated ballute retarding device.

**IC** 1 Internal combustion.
2 Interceptor controller.
3 Indirect cycle (sometimes i.e.).
5 Intelligence community.
6 Ice crystals.
7 Inter-Cabinet.
8 Incident commander (aerial firefighting).

**IC/C, I & C** 1 Installation and checkout.
2 Interface and control.
3 Integrated circuit.
4 Internal combustion (IC more common).
5 In charge (UK usage).
6 Intercom.
7 International Cartographic Association.
8 International Council of Airports [office, Washington, DC].

**ICAA** 1 International Civil Airports Association (Paris,
Orly).
2 International Committee of Aerospace Activities.

**ICAAS**  Integrated controls and avionics for air superior-
ity (USAF).

**ICADS, Ieads** Individual combat-aircrew display system (laptop training device).

**ICAEA** 1 International Civil Aviation English [language] Association.

**ICAF** 1 International Committee on Aeronautical Fatigue [office,
D-64289 Darmstadt].
2 Industrial College of the Armed Forces (US).

**ICAI**  Intelligent computer-assisted instruction.

**ICAM**  Integrated computer-aided manufacturing.


**ICAO**  International Civil Aviation Organization [1947–,
186 member states; office, Montreal H3C 5H7] (Int.).

**ICAOAN**  ICAO Annex[e], many titles.

**ICAOFA**  International Civil Aviation Organization.

**ICAPTAM**  ICAO Technical Assistance Mission.

**ICAP, I-Cap**  Improved capability.

**ICARS**  Complex laptop combining flight/black-box data with real-time graphics (Qinetiq).

**ICAS** 1 International Council of the Aeronautical Sciences [office, Bonn].
2 International Council of Air Shows [office, Milwaukee, WI, US].

**ICAT**  International Center for Air Transportation (MIT).

**ICATS**  Integration command and telemetry system.

**ICAVU**  International Civil Aviation University, office
Melbourne.

**ICAW**  Integrated caution, advisory and warning.
ice

ICB

ICB  International competitive bidding.
ICBM  Intercontinental ballistic missile.
ICC  1 International Control Commission.
I 2 International Chamber of Commerce.
3 International Code of Conduct (use of space).
4 Integrated command and control.
5 Initial CAOC capability.
6 Information coordination circular.
8 Integrated cargo carrier.
9 IAPS(2) card cage.
10 Interface and configuration cartridge.
ICCA BMP  International code of conduct against ballistic-missile proliferation.
ICCAIA  International Coordinating Council of Aerospace Industries Associations [office, Washington, DC].
ICCD  Intensified charge-coupled device.
ICCOP  Integrated classified combat operations process initiative (CAOC).
ICCP  Integrated communications control panel (in aircraft).
ICCS  1 Integrated command and control subsystem.
2 Integrated communications control system (on ground, unrelated to ICCP).
3 Interface, or interface, control drawing.
4 Interface control document, or device.
5 Initial, or initial, capability document.
ICDDS  Institute of Civil Defence and Disaster Studies (UK).
ICDO  International Civil Defence Organization [office, CH-1213 Geneva] (Int.).
ICDOC  Interchangeability condition direct operating cost.
ICDRIA  International Center for Decision and Risk Analysis [University of Texas, Dallas] (Int.).
ICDS  Integrated control and display system.
ICDU  Intelligent control and display unit.
ICE 1 Interference cancellation equipment.
2 Internal-combustion engine.
3 In-circuit emulator, simulates portions of external hardware during debugging of control software.
4 Improved combat efficiency [or effectiveness].
5 Independent cost estimate.
6 Institution of Civil Engineers (UK, 1818–).
7 Innovative control effector[s].
8 Integrated collaborative environment.
9 Immigration and Customs Enforcement (DHS). 
10 Internal convection enhancement turbine cooling, (GE).

times hailstones at specified flow rates. See ice rod, ice slab.

ice light  A light arranged to illuminate a region prone to icing, such as wing leading edges.

Icem  Integrated governmental Committee for European Migrations.
ICE 1  Integrated Conventional Manned Space Station (US).
ICE 2 Intercontinental missile. 
3 Intercontinental missile.
4 Improved conventional munition.
5 Inter-console marker.
6 Integrated collection management.
7 Interim control module.
8 Interline communications manual.
ICMD  Improved countermeasure[s] dispenser.
ICMP  Internet control message protocol.
ICM 1  Integrated conventional-stores management system.
2 Integrated countermeasures system, or suite.
3 Integrated combat-management system (USN).
I-CMS  Index of central maintenance system fault messages.
ICNI

ICNI Integrated com, nav, IFF.

ICNIA Integrated communications, navigation and identification avionics (USAF), or architecture [UK rendering].

ICNIS Integrated CNI set.

ICNS Integrated com/nav system.

ICO 1 Ignition cutoff.

ICO 2 Idle cutoff.

ICO 3 Intermediate circular orbit, 10,000–15,000 km.

ICO 4 Instinctive cut-out.

ICOC International Code of Conduct (ICBMs; ABMP adds against BM proliferation).

Icon Integration contract.

Iconic model A preliminary physical representation of a system, not necessarily full-scale, and not necessarily with functioning parts.

Icons Integrated control and operations network system.

ICP 1 Integrated core processor [or processing; TD adds technology demonstration].

ICP 2 Integrated control panel.

ICP 3 Initial conflict probe.

ICPA Indian Commercial Pilots’ Association.

ICR 1 In-commission rate.

ICR 2 Integrated cassette recorder, for voice/video to LAN/WAN.

ICRC International Committee of the Red Cross.

ICS 1 Improved composite structure.

ICS 2 Inverse conical scan(ning) (ECM).

ICS 3 Improved (or integrated) communications system.

ICS 4 Intercom switch, or system, or set.

ICS 5 Internal countermeasures system, or set.

ICS 6 Interim contractor support.

ICS 7 Inter-cockpit communication system.

ICS 8 Intelligent control system.

ICSA International Centre for Security Analysis.

ICSAR, Icsar Inter-agency committee on search and rescue.

ICSC International Communications Satellite Corporation.

ICSM Integrated conventional-stores management; GPS can be a suffix.

ICSM Integrated communication signalling and monitoring.

ICSM Integrated Communications System Management Agency.

ICSMS See ICMS.

ICSS Integrated communications switching system.

ICST Imperial College of Science and Technology [London SW7 2BY] (UK).

ICSU International Council of Scientific Unions.

ICT 1 Ice-contaminated tailplane [S adds stall].

ICT 2 In-country testing.

ICT 3 Interface computer, or converter, or control unit.

ICT 4 Interstation control unit.

ICT 5 Instrument comparator unit.

ICW 1 Independent carrier wave, or see I.C.W.

ICW 2 Interpersonal communications workshop.

ICW 3 Intermittent [or interrupted] continuous wave.

ICW 4 Interrupted continuous wave.

ICWAR, Icwar Improved continuous-wave acquisition radar.

ICWII Interrupted continuous-wave illumination.

ICY 1 Interchangeable Y-axis.

Identification light

2 International Co-operation Year (1965).

ICZ Interchangeable Z-axis.

ID 1 Internal or inner diameter.

ID 2 Inadvertent disconnect (flight refuel).

ID 3 Identification, identity, identifier.

ID 4 Inverse dark (video characters).

IDA 1 Istituto di Diritto Aeronautico (I).

IDA 2 Intermediate dialect of Atlas.

ID 3 Integrated digital avionics.

ID 4 Intelligence/decision/action.

IDA 5 Initial design activity.

ID 6 Integrated digital audio; CS adds control system.


Ideafly Interessengemeinschaft Deutscher Akademischer Fliegergruppen eV (G).

IDAP Integrated defensive-avionics program.

IDAS 1 Integrated defensive aids system (RWR plus jammer).

IDAS 2 Integrated design automation system.

IDC 1 Imperial Defence College (UK).

IDC 2 Interactive design centre.

IDC 3 Inner dead centre [= upper in inverted engine].

IDC 4 Indication display control.

IDC/WAN Interim deployable CAOC.

IDCSS Initial Defense Com Sat Program (DoD).

IDD Interim, or instrumented, deployment device.

IDIE Integrated development environment.

IDEA 1 Instituto de Experimentaciones Astronauticas (Argentina).

IDEA 2 Integrated digital electric airplane.

Ideal fluid Perfect, inviscid fluid; forces are perpendicular to small-parcel boundaries, no kinetic energy can be degraded to heat, boundary layer absent.

Ideal profile Flight profile and path for lowest fuel burn.

Ideal rocket Theoretical rocket with perfect operation, eg no heat transfer, no turbulence, no friction etc.

Ideas International data exchange for aviation safety (ICAO).

IDECM Integrated defensive electronic countermeasures.

IDefy, IDEFY Indefinitely.

Ident 1 Special feature in ATCRBS and I/P in SIF to distinguish one displayed select code from other codes (FAA).

2 ATC request; transponder sends extra pulse plus * code.

Identifiability Proof that a replacement PMA part duplicates the original in design, material, fit and function (FAA certification).

Identification 1 Proclamation of identity, eg by SSR or squawk.

2 Visual recognition of aircraft type.

Identification cable colour Each cable or pipeline in modern aircraft is colour coded to indicate function.

Identification feature Characteristics built into each selected code in SSR, ATCRBS and military radars for ident purposes.

Identification friend or foe Automatic interrogation and response, by coded transmission from transponder, to proclaim friendly status or identify flight on SSR.

Identification light 1 Pilot-controlled white lights visible from above or below for broadcasting identity by keying.
identification manoeuvre

Light on ground adjacent to beacon serving as identifier.

identification manoeuvre In primitive radar GCA, manoeuvre commanded by controller to establish positive identity of customer on radar.

identifier code Three-letter code unique to each airport.

Idex Imagery dissemination and exploitation [system].

IDF Intelligent data fusion, most efficient way of using large amounts of data from many sources.

2 Indigenous Defence Fighter.

1IR decol flare.

Instantaneous direction-finding.

Idflieg Inspektion der Fliegertruppen (G).

IDG Integrated-drive generator.

IDGA Institute for Defense and Government (US).

IDH Intelligent, or intelligence, data handling; S adds system.

IDI Initial domain identifier.

IDIQ Indefinite delivery, indefinite quantity.

IDIS Intelligent, or intelligence, data handling; P adds system.

IDJ Initial domain identifier.

IDL Intraflight datalink.

 idle area reset Open divergent afterburner nozzle with throttle closed [reduces temperatures].

 idle cutoff Position of piston engine mixture control that cuts off fuel supply, thus stopping engine.

 idle descent To bleed off height with engine[s] at flight idle.

 idle Gearwheel or shaft whose sole function is to transmit drive between two others.

 idles Repeated cycling of engine from idling to specified higher power.

 IDLH Immediately dangerous to life or health.

 idling Running at governed low speed consistent with reliable smooth operation, in most engines well above minimum sustaining rpm: usually two regimes, ground * being lower N1 than flight * and obtained only when oleos compressed.

 IDLS International Data Link Society (2003–).

 IDM Improved data modem.

2 Inductive debri monitor.

 IDO Initial defensive operations.

 IDP Individual development programme.

3 Integrated data-processing.

 Imagery display processor.

3 Initial domain port.

 IDPA International Deaf Pilots’ Association.

 IDPM Institute of Data Processing Management (UK).

 IDPS Interface data-processing segment (NPOESS).

 IDPU Incursion and display processing unit.

 IDR Initial design review.

 IDRF Impact-Dynamics Research Facility (crash tests, NASA Langley).

 IDRP Inter-domain routing protocol.

 IDS Interdiction/strike.

2 Integrated display set [or system].

3 Improved data set (USAF).

 Integrated dynamic system (helo).

 IR enhanced vision system.

4 Integrated diagnostic system.

 IDT Integrated decision support tool.

 IDTC Inter-deployment training cycle (USN).

 IDU Interactive, or integrated, display unit.

 IE Institution of Electronics (UK).

1 Instrument error.

3 Initial equipment (RAF).

4 Incremental ejection.


 IEAA International EAA, UK based.

 IEB Institut für Extraterrestrische Biologie (G).

 IEC International Electrotechnical Commission [office, Geneva].

2 IAPS (2) environmental control module.

3 Inertial/strategic confinement.

 IECC International Express Carriers Conference.

 IECS In-flight engine-condition monitoring system.

 IED Improved explosive device; D adds disposal.

 Insertion/exitration device.

 IEDD IED (1) disposal.

 IEE The Institution of Electrical Engineers [1871–; now the IET] (UK).

 IEEE The Institute of Electrical and Electronic Engineers [office, New York, NY08855] (US).

 IEER Improved extended echo ranging.

 IEF Interpretive execution facility (software).

 IEM Interpretive/explanatory material (JARs).

 IEMats Improved emergency message auto transmission system.

 IEN Internal engineering notice.

 IEP 1 Interim Earth penetrator.

2 Integrated electric propulsion [carrier].

 IEPE Independent European Programme Group (NATO).

 IEPR Integrated engine pressure ratio.

 IERE Institution of Electronic and Radio Engineers (UK).

 IERW Initial entry rotary-wing [ITS adds integrated training system].

 IES Image enhancement system.

3 Imagery exploitation system.

 Interface editor system (ATC).

 IES The Illuminating Engineering Society; AC adds Aviation Committee (US).

 2 Institute of Environmental Services [office, Mt Prospect, IL] (US).

 IESI Integrated electronic standby instrument.

 IESSG Institute of Engineering, Surveying and Space Geodesy.

 IET Initial entry training.

2 Interline electronic ticket.

3 Institution of Engineering and Technology [London WC2R 0BL] (UK).

 IETDS Interactive electronic training delivery system (Neth.).

 IETF Internet engineering task force.

 IETM Interactive electronic technical manual(s).

 IEU Interface electronics unit.

 IEVS IR enhanced vision system.
IEW

IEW 1 Integrated electronic warfare; S adds system, UAV adds unmanned air vehicle.
2 Intelligence/electronic warfare; CS adds common sensor, S adds system, UAV adds unmanned air vehicle.
IEW 1 Information and electronic-warfare system.
2 See IEW.

IEF 1 Intermediate frequency (often i.f.).
2 Instrument flight, or flying.
3 Intensive flying (UK, RN).
4 Independent Force (RAF, 1918).
5 Ice fog.
6 Intermediate, or initial, fix.

IEF Module Inlet and fan module.

IEA International Federation of Airworthiness; 120 members in 47 countries engaged in manufacturing, operating, insuring, etc.; Secretariat, East Grinstead RH19 1BP (Int.).

IEAA International Flight Attendants’ Association.

IFAC International Forum for Air Cargo [office, Warrendale, PA] (Int.).

IFACTs Interim future area control tools support (NATS).

IFALDA International Federation of Airline Dispatchers Associations [office, Agincourt, ON, Canada] (Int.).

IFAPA International Federation of Airline Pilots’ Associations [95 members; admin. office, Chertsey KT16 9AP, UK; Tech. Standards, Stevensville, MD21666, US] (Int.).

IFANS, IFans International Federation for the application of standards.

IFAPA International Foundation of Airline Passengers’ Associations.

IFAS See FISA1.

IFast Integrated flexibility (or facility) for avionics system test (USAF).

IFATA International Federation of Air Traffic Controllers’ Associations [office, Montreal].

IFATE International Federation of Airworthiness Technology and Engineering.


IFB Invitation for bid.

IFB 1 In-flight best procedure[s].

IFBS Individual flexible barrier system.

IFC Incentive-fee contract(ing).

IFCA International Flight Catering Association (office, UK).

IFCN/C Integrated flight-control and navigation computer.

IFCSC Integrated, or intelligent, flight-control system.

IFCPS Integrated fire/flight control system.

IFDG Integrated flight-data processing system.

IFDES In-flight duty-free shop.

IFDL Inter-/intra-in-flight data link.

IFE 1 In-flight emergency.
2 In-flight entertainment [N adds network, S system].

IFEO International Flight Engineers’ Organization [office, Chertsey, KT16 9AP, UK] (Int.).

IFESS Integrated flight entertainment and services system.

IFF 1 Identification friend or foe.
2 International Flying Farmers Inc. [office, Wichita, KS67277–9124] (Int.).
3 Institute of Freight Forwarders, (Int. office Richmond, Surrey, UK).

IFFAA International Federation of Forwarding Agent Associations (now IFFFA).

IFFCC Integrated flight and fire-control computer.

IFFCP IFF (1) control panel.

IFFCS Integrated fireflight control system.

IFFFA International Federation of Freight Forwarders’ Associations; office, Zurich.

IFFGR Information for global research (USAF).


IFI International Friction Index.

IFIAT See FITAP.

IFICS In-flight interceptor communications [or control] system.

I-file Intelligence (surveillance computer).


IFIS 1 Independent flight inspection system (for ILS, Vortac, etc.).
2 Independent frequency-isolation system.
3 Integrated flight-information system[s].

IFIM 1 Instantaneous frequency measurement.
2 In-flight monitor.
3 International Formula Midget [= Formula 1].

IFMA In-flight mission abort.

IFME In-flight medical emergency.

IFMIS Integrated force management info system.

IFMP Integrated financial management plan (NASA).

IFMR IFM (1) receiver.

IFM/SHR IFM (1) superheterodyne receiver.

IFMU Integrated flight-management unit (UAV).

IFMW Information for mobile warfare (USAF).

IFN Institut Français de Navigation [office, F-75007 Paris] (F).

IFO 1 International field office.
2 Improved first-order [approximation].

IFOBBL In-flight-operable bomb lock.

IFOG Interferometric fibre-optic gyro.

IFOP Intensive flight-operations program.

IFOR Implementation Force (NATO).

IFOSTP International follow-on structural test programme.

IFOY, IFOV Instantaneous field of view.

IFP 1 Initial flightpath.
2 In-flight performance [computer program].
3 In-flight phone.
4 Integrated flight planner.

IFPA 1 International Fighter Pilots’ Academy (Slovak Republic).
2 IFPS (1) area.
3 Indirect fire precision attack.

IFPC Integrated flight and propulsion control (STOL); S adds system.

IFPG 1 Intelligent flight-path guidance.
2 International Frequency Planning Group.

IFPL 1 In-flight power loss.
2 ICAO flight plan.

IFPM In-flight performance monitor.

IFPS 1 Integrated, or initial, flight-plan processing system.
2 Intra-formation positioning system.
IHDSS
IHDTV  Intensified high-definition TV.
IHE  Insensitive, or improved, high explosive.
IHEC  Integrated helicopter emissions control.
IHEWS  Integrated helicopter EW suite.
IHEFA  International Helicopter Firefighters Association (office in US).
IHIRSS  Improved hover IR suppression system.
IHM  International Helicopter Museum [Winston-super-Mare, BS22 5PP] (UK/Int.).
IHMDD  Integrated helmet-mounted display.
IHO  International Hydrographic Organization.
IHOOC  International Helicopter Operations Committee.
IHPA  Irish Hang-gliding and Paragliding Association.
IHRPRT  Integrated high-payoff rocket-propulsion technology.
IHTET  Integrated high-performance turbine-engine technology, principally focused on propulsion of supersonic-cruise aircraft: takes off with maximum BPR, meeting civil noise legislation with simple nozzle, accelerates with BPR ≈ 1, cruises with BPR near 3, lands at high BPR (GE/USAF/Darpa).
IHS  Integrated helmet safety system.
IHTTET  Improved high-temperature turbine-engine technology (DoD).
IITU  Inter-Service Hovercraft Trials Unit (UK, from 1962).
IHU  Integrated hull unit.
IUMS, I-Hums  Integrated health and usability monitoring system.
IHV  Improved high-velocity [ammunition].
IIE  Instrument, or instrumentation, incubator program (NASA).
IIA  Instituto de Investigaciones Aeronauticas y Espaciales (Argentina).
IIASA  International Institute for Applied Systems Analysis.
IIA  Image iconoscope.
IID  Integrated instrument display [S adds system].
IDS  1 Istituto Italiano di Diritto Spaziale.
2 Integrated instrument display system.
IIE  Institution of Incorporated Engineers (UK).
IF  Inserted in flight (data, target, destination etc).
IIM  Initial implementation of Mode-S [ES adds enhanced surveillance].
IIN  1 Istituto Italiano di Navigazione.
2 Information infrastructure network (RAF).
IP  Instrument, or instrumentation, incubator program (NASA).
IIR  1 Imaging infra-red.
2 Infra-red imaging radar (US).
3 Infinite impulse response (signal processing).
4 Incident [usually involving aircraft damage] investigation report.
IIFR  Institute for International Research (US).
IIA  Integrated inertial reference assembly.
IIRS  1 Instrument inertial reference set.
2 Imagery interpretability rating scale.
IIS  1 Infra-red imaging system.
2 Integrated instrument system.
ISA  Integrated inertial sensor assembly.
ISL  International Institute of Space Law [office, F75015 Paris] (Int.).
IISS  International Institute for Strategic Studies [London WC2R 3DX] (UK).
IIT  Image-intensifier tube.
IIFR  Inter/intra team radio.
ITTS  Infra-theatre imagery transmission system.
ITTV  Image-intensified TV.
IW  Image interpretation workstation, portion of GIES tasked with target location and selection.
IWD, I^W  Intelligence and Information Warfare Directorate (USA).
IITSMS  Interim JTIDS message standard, or structure, or system.
IK  Club of Aeronautical Engineers (Finland).
IKAT  Interactive keyboard and terminal.
IKBS  Intelligent knowledge-based systems.
IK 1 Space research institute (Soviet academy of sciences).
IKP  Initial key personnel training.
IKS  Integrated knowledge systems.
IKSANO  English rendition of Information co-ordination council on air-navigation charges debts (R).
IKW  Intercept and kill weapon.
IL  1 Infantry liaison (aircraft category, USA, 1919–25).
2 Instytut Lotnictwa [aviation institute, PL-02-256 Warsaw] (Poland).
IKPT  Inter-Service Hovercraft Trials Unit (UK, from 1962).
ILA  1 International Law Association [office London WC1B 5DR] (Int.).
2 Internationales Luftfahrt-Archiv (G).
3 Image light amplifier.
4 Instrument landing aid.
IIAA  Integrated landing and approach aid.
IIAAS  Integrated low-altitude attack subsystem.
IIAC  Intake-lip acoustic liner.
IIAD  Inner-layer air defence.
ILAF  Identical location of accelerometer and force.
ILAS  Improved limb atmospheric spectrometer.
ILC  1 Integrated laminating centre (or center).
2 Increased-life core (engine).
ILCA  International Legal Committee for Aviation (from 1909, office Paris).
IL-check  C-check plus more detailed inspection, repair and update of systems and furnishing.
ILD  Injection laser diode.
IL-EAV  Inherently low-emission airport vehicle.
ILF  In-line filter.
ILFPS  Integrated lift-fan propulsion system.
ILGH  Interessengemeinschaft Luftfahrtgeraete-Handel (G).
ILL  Internationale Luftverkehrsliga.
ILLF  Initial long-lead funding.
Illuminance  Intensity of illumination, luminous flux per unit area, symbol E, unit lux, lx = lm/m².
Illumination 1 Illuminance.
2 Lighting of target by radar or other signals, esp. to make it an emitter for SARH missile.
Illuminator  The aircraft in an attacking force charged with aiming a laser precisely at the target.
ILM  1 Independent landing monitor.
2 Intermediate-level maintenance.
ILP  Inventory logistics program[me].
ILS  1 Instrument landing system.
2 Integrated logistic (or logistics) support.
ILS integrity

> ILS integrity Trust which can be placed in correctness of information supplied by ILS (1) facility (ICAO).

ILS Point A On extended runway centreline 4 nm from threshold.

ILS Point B On extended runway centreline 1,050 m (3,500 ft) from threshold.

ILS Point C Intersection of straight line representing nominal (mean) glideslope and horizontal plane 30 m above threshold.

ILS Point D 6 m above centreline, 600 m upwind (ie towards localizer) of threshold.

ILS reference datum Point at specified height vertically above intersection of centreline and threshold through which passes straight line representing nominal (mean) glideslope.

ILS reliability 1 Facility: probability its signals are within specified tolerances.

2 Signals: probability signal in space of specified characteristics is available to aircraft.

IL-S Integrated logistics system-supply (USAF).

ILS(V) ILS with emergency voice facility.

ILT Institute of Logistics and Transport (office London) (UK).

ILS Instantaneous-lag [or lead] VSI.

ILWS International living with a star (NASA).

IM 1 Inner marker.

2 Intermediate maintenance.

3 Inventory management.

4 Intra-mural.

5 Inensitive munition(s).

6 Instant messaging [satellite].

IMA 1 Institut Médical de l’Aviation (Switzerland).

2 Intermediate maintenance activity.

3 Individual mobilization augmentee.

4 Integrated modular avionics, or architecture.

5 Integrated multifunction apertures.

6 International Museum of Airlines (Rockville, MD 20849) (US, Int.).

IMAA Irish Microlight Aircraft Association.

IMAAWS Infantry man-portable anti-armour/assault weapon system.

IMAC Integrated microwave amplifier converter.

IMACS Integrated manufacturing control systems.

IMAD Integrated multisensor airborne display (Elint).

Image Instrument for the measurement of air-traffic flow using ground environment.

Image convertor Converts image from invisible to visible wavelengths.

Image degradation That due to error in sensor operation, processing procedure or other fault by user.

Image intensifier Any of large family of electron tubes which multiply electron flow due to signal while ignoring noise; hence IIT, ** tube.

Image-motion compensation Synchronization of target image with recording sensor in vehicle, esp. low-level reconnaissance aircraft.

Imagery Representation of objects reproduced by optical or electronic means.

Imagery collateral Reference materials supporting imagery interpretation function (ASCC).

Imagery correlation Mutual relationship between different signatures on imagery of same object from different sensors.

Imagery data-recording Auto record of sensor speed, height, tilt, geographical position, time and possibly other parameters on to sensor matrix block at moment of imagery acquisition (ASCC).

Imagery exploitation Entire process from acquiring imagery to final dissemination of information.

Imagery interpretation Process of location, recognition, identification and description of objects visible on imagery (DoD, NATO).

Imagery intelligence Convey by photographs, diagrams, electronic images and other media.

Imagery interpretation key Diagrams, examples, charts, tables etc, which aid interpreters in rapid identification of objects.

Imagery pack Assembly of all records from different sensors covering common target area (ASCC).

Imagery sortie One flight by one aircraft for acquiring imagery (DoD, NATO, Centro).

IMAS Integrated mission-avionics system.

I_max Peak value of current.

IMBP State institute of biomedical problems (R).

IMC 1 Instrument meteorological conditions (UK, see IWR).

2 Image movement compensator (reconnaissance).

3 Intermetallic-matrix composite.

4 Indirect maintenance cost.

5 See Inst MC.

IMCC 1 Integrated mesoscopic cooler circuit.

2 International Military Control Commission.

IMCPU Improved master-controlling processor unit.

IMD 1 Indian Meteorological Department.

2 Integrated mechanical diagnostics.

IMDS Integrated maintenance data system[s] (USAF).

IMDT Immediate.

IME 1 Indirect manufacturing expense.

2 Integrated modelling environment.

IMEA Integrated munitions effects assessment, tool for selecting aim points.

IMechE Institution of Mechanical Engineers [1847–; office, London SW1H 9JJ (UK).]

IMEP International materiel evaluation program (US).

I.m.e.p. Indicated mean effective pressure.

IMET International Military Education and Training (NATO).

IMets Integrated meteorological system.

IMEMS Integrated missile early-warning system, or satellite.

IMF 1 International Monetary Fund (UN agency).

2 International Metalworkers Federation (trade union, office Geneva).

IMFCA Institut de Mécanique des Fluides et Constructions Aéronautiques (Romania).

IMFF Inlet mass flow function.

IMFIS, IMIFS Interoperability of military forces and information systems (Canada).

IMI 1 Immigration.

2 Implementation management group.

IMI 2 Intermediate maintenance instruction.

2 Improved manned interceptor.
Imint

- Initial maintenance interval, or inspection.
- Interactive multimedia instruction.
- Imbedded [embedded] message identifier.

Imint

Imagery intelligence.

IMIS

Integrated maintenance information system.

IMK

Increased maneuverability kit (US).

IML

International micro-gravity laboratory (Spacelab).

IMOD

Integrated ordnance disposal system.

IMMS

Improved missile point-defence system.

IMNS

Immediate mission nervous system.

IMOF

Immunofluorescence (as of tissue culture).

IMPS

Imaging microwave radiometer.

IMR

Imaging microwave radiometer.

IMSS

Imperial System of units previously standardized in UK, such as foot (ft) and pound (lb).

Imperial gallon

See gallon.

Impervious canopy

One through which ejection is prohibited.

Impingement

Impact of high-velocity air or gas on structure (eg in reverse-thrust mode).

Impingement cooling

Cooling of material by high-velocity air jets directed on to surface (usually internal surface of hollow blade or vane).

Impingement injector

Liquid fuel and oxidant jets impact on each other to cause swift breakup and mixing.

Implosion

Detonation of spherical array of inward-facing shaped charges (eg to crush fissile core of nuclear weapon).

IMPR

Improving.

Impress

To commandeering a civil aircraft into government service in time of emergency.

Improved climb T-O

Take-off at increased weight allowed by raising V2 where second segment is limiting factor and runway distance is available.

Improved conventional munition

Usually means fitted with electronic time fuze or RF proximity fuze.

IMPS

International Microelectronics and Packaging Society (Int.).

IMPT

Important.

Impulse

Rocket burn-time multiplied by burn-time average thrust; total energy imparted to vehicle.

Impulse magneto

One whose drive incorporates stops and spring-loaded coupling (bypassed by centrifugal clutch in normal running) to give series of sudden rotations and thus hot sparks during starting.

Impulse/reaction

Common form of gas turbine, combining impulse and reaction techniques.

Impulse starter

Incorporated in impulse magneto.

Impulse turbine

One whose working fluid enters at lowest pressure and maximum velocity, expands through diverging passages, and leaves at similar pressure and low velocity.

IMR

Imaging microwave radiometer.

Intermediate manufacturing release.

IMRO

Industrial Marketing Research Organization (UK).

Imron

Range of du Pont polyurethane enamels.

IMRS

Integrated maintenance recording system.

IMS

Information management system.

IMSS

Integrated multisensor system.
IMT

IMT  1 International mobile telecommunications.
  2 Immediate.[6]
IMTA  Intensive military training area.
IMTS  Integrated maintenance training system.
IMU  Inertial measurement unit.
IN  1 Inertial navigator (or navigation).
  2 Instrument navigator (arch.).
in  1 Inch, inches.
  2 When applied to airbrakes, usually means retracted, not in use.
INA  1 International Navigation Association Inc. [office, Arlington, VA 22202-0324] (Int.).
  2 Initial approach.
INACP  Integrated navigation-aids control panel.
inactivate  Of military unit, withdraw all personnel and transfer to inactive list.
InAF  Indian Air Force [UK usage].
INAS  Integrated, or inertial, navigation/attack system.
InAs  Indium arsenide.
InAsB  Indium antimony arsenide.
INB  Iron-technetium-boron magnetic alloy.
INBD, inbd  1 Inbound.
  2 Inboard.
inboard aileron  Aileron situated on inner wing between, or in place of, flaps.
inboard profile  Side-elevation drawing showing internal systems and equipment, sometimes as true section along centreline.
inboard quadrant  Inner selectable position of power (throttle) lever on left side of cockpit giving operative afterburner.
inbound  Approaching destination, thus * traffic, * controller etc.
inbound bearing  Normally QDM, not QDR or VOR radial.
INC  1 Insertable nuclear component.
  2 Interchangeability code.
  3 In cloud.
  4 Increase, increasing.
  5 Information network computing.
Inc  Incorporated (US company).
Inca  1 Intelligent correlation agent (data fusion).
  2 Integrated nuclear communications assessment.
  3 Initiative en combustion avancée, future engines (F).
InCAS  Interference cancellation system.
Incas  Integrated navigation and collision-avoidance system.
INCD  Integrated navigation cockpit display.
incedency bomb  Bomb designed to ignite enemy infrastructure.
inceptor  Cockpit control forming interface between pilot and major change in trajectory, eg stick/yoke, throttle, pedal, cyclic, collective or nozzle angle lever.
Incerfa, INCERFA  Code: phase of uncertainty (ICAO).
inch  1 To command powered actuator in rapid succession of small cycles to achieve target condition.
  2 Non-SI unit of length, = 25.4 mm exactly.
  3 Inches. Traditional US measure of piston engine manifold pressure, = * Hg (mercury), see next.
In Hg  Non-SI unit of pressure, * (at 0°C) 3.8639 × 10⁻⁵ Nm².
incidence  1 Angle between chord of wing at centreline and OX axis.

2 Generally, the angular setting of any aerofoil or other plate-like surface to a reference axis.

3 Widely and incorrectly used to mean angle of attack.
incidence instability  Divergent aerofoil load caused by wing flexure simultaneously resulting in increased incidence.
incidence wires  Diagonal bracing wires in plane of biplane interplane struts.
incident report  Normal report of incident; this falls short of an accident, takes place on ground or in air during flying operations, and usually stems from human error.
incl  Inconclusive, include[d].
inclination  Angle between isobar and wind or airflow at given point.
inclined shock  Shockwave generated by body in airflow at Mach number significantly greater than 1, with angle such as to turn flow parallel to surface of body; in air-breathing inlet generated by centrebody or sharp-edged plate and focused on lip.
inclinometer  Instrument for measuring inclination: many forms, one being spirit level on pivoted arm [and of arm shows degrees on protractor while slight curvature of sliding spirit level gives minutes]. Some authorities call this a clinometer, which see.
included angle  That between longitudinal axis of body and free-stream vector.
incoherent backscatter[ing]  Random backscatter of a signal by individual electrons in the ionosphere.
Incomap  Family of mechanically alloyed Al alloys, esp. Al-Mg-Li-C-O.
Inconel  High-nickel chromium-iron refractory alloys (Int. Nickel and Mond).
Incos  Integrated control system [Hartman ASW].
Incos  International Council on Systems Engineering (Int.).
Incospar  Indian National Committee for Space Research.
Incr  Increase.
incremental airbrakes  Capable of being controlled to intermediate positions.
incremental ejection  Dispensing chaff in discrete bundles.
incremental sensitivity  Change in received signal per unit displacement of ILS receiver from mean glidescope.
INCRSG  Increasing.
imcuent  Airline long established in the market [cf. entrant].
incursion  1 Conflict, especially between two aircraft, on runway or elsewhere on airfield [FAA adds ‘with active control tower’].
  2 Any entry by aircraft into forbidden area, either on ground or in flight.
Ind  Indicator (for wind or landing direction).
INDAO  Instituto Nacional de Derecho Aeronutica y Espacial (Argentina).
indefinite callsign  C/s assigned to individual units/facilities etc and to large groupings.
INDEFLY  Indefinitely.
independence  One meaning is Busemann’s principle that aerodynamic forces on a wing of high aspect ratio are independent of any V component in the spanwise direction.
independent  1 Military unit with complete authority over tasking [eg. UK * Air Force 1918].
independent overspeed protection

2 R&D or programme not relying on external funding.
3 Airline run by private company.

independent overspeed protection Gas-turbine engine subsystem independent of the EEC or other control which automatically shuts the engine down upon sensing rotor overspeed.

indexed wing/flaps Aerodynamic surfaces are at same angular setting to [usually missile] body, measured in transverse plane, eg all at 45° to horizontal or two vertical and two horizontal.

index error That caused by misalignment of measurement mechanism of instrument (ASCC).

Indian Hostile aircraft, esp. fighter.

indicated airspeed See airspeed.

indicated altitude That shown by altimeter set to latest known QNH.

indicated course Locus of points in any horizontal plane at which ILS Loc needle is centred.

indicated course sector Sector in any horizontal plane between loci of points at which ILS Loc needle is at FSD left or right.

indicated glidepath Locus of points in vertical plane through runway centreline at which G/S needle is centred.

indicated hold Autopilot mode maintaining present IAS.

indicated horsepower Theoretical power developed by a reciprocating engine, ignoring losses due to friction, wingage and other causes, numerically proportional to PLAN where P is the brake mean effective pressure, L is the piston stroke, A total piston area and N the rotational speed, all units being compatible. See horsepower.

indicated Mach number That shown on Machmeter.

indicator Identifying 4-letter code for every airfield [in England and Wales beginning EG].

indicator diagram Plot of piston engine cylinder pressure against piston position, often drawn by instrument attached to cylinder.

indirect air support Given friendly land/sea forces by action other than in tactical battle area, eg by interdiction and air superiority.

indirect cycle Nuclear propulsion with primary circuit, heat exchanger and secondary circuit.

indirect damage assessment Revised target assessment based on new data such as actual weapon yield and ground zero.

indirect wave One arriving by indirect path caused by reflection/refraction.

indium In, soft silver-white metal, density 7.28, M Pt 156.4°C.

individual controls Control surfaces not attached to fixed surface but cantilevered from body (guided weapons).

induced downwash angle Loosely called induced angle, the downwash angle at any radius of a propeller blade due to lift, one symbol, being $\epsilon_i$.

induced drag Drag due to component of wing resultant force along line of flight: drag due to lift. For a conventional wing in subsonic flight $C_D = C_L^2 / \pi A e$ where $\epsilon$ is an efficiency factor very close to unity.

induced flow Fluid flow drawn in and accelerated by a high-velocity jet.

induced force Usual aircraft design consideration is that caused by air entering engine inlet.

induced velocity That due to wing vortex system and downwash, normally considered proportional to lift.

inducer J Booster vanes at entry to centrifugal impeller, esp. rocket-engine turbopump.

inert booster J Bleed ejector to induce cooling airflow.

inductance Property of electric circuit to resit change in current as result of opposing magnetic linkage; see self *, mutual *.

induction I In a piston engine, sucking in air or mixture on downstroke.

2 In the overhaul process [of anything], accepting the item, plus documentation, into the overhaul facility.

induction compass Based on induction coil pivoted to rotate in Earth’s field.

induction heating Heating electrically conductive material by h.f. field.

induction manifold Pipe system conveying mixture to piston engine cylinders.

induction period Specified delay between adding catalyst or hardener and applying or spraying material (coating, adhesive or thermo-setting structure).

induction phase In pulsejet, portion of cycle when air is admitted.

induction stroke In piston engine, portion of cycle when air or mixture is admitted.

induction system In piston engine, entire flow path from combustion-air inlet to cylinder.

induction tunnel Wind tunnel driven by jet engine(s) or compressed air via ejector system.

inductive coupling J Mechanical shaft drive relying on magnetic linkage.

2 Magnetic coupling between primary and secondary coils, eg of transformer.

inductive reactance Impedance due to inductance.

inelastic collision Theoretical impact with no deformation or energy loss.

inert gas Gas incapable of chemical reaction.

inert-icer Free-spinning vanes or other device for imparting rotation to engine airflow, ice or snow being flung out away from engine inlet.

inertial coupling See coupling (1).

inertial flight No propulsion, controls locked central or free.

inertial frame A reference frame subject to Newton’s Laws.

inertial guidance Guidance by INS.

inertial gyro Gyro of characteristics and quality to meet INS requirements.

inertial navigation system, INS Assembly of super-accurate gyros to stabilise a gimbaled platform on which is mounted a group of super-accurate accelerometers – typically one for each of the three rectilinear axes – to measure all accelerations imparted, which with one automatic time integration gives a continuous readout of velocity, and with a second time integration gives a readout of present position related to that at the start.

inertial orbit Trajectory when coasting.

inertial platform Rigid frame stabilized by gyro(s) to carry accelerometer(s).

inertial restraint Of a structural beam, free at one end but with an attached mass which damps movements.

inertia starter Rotary-drive starter whose energy is stored in flywheel.

inertia welding Welding by rapid rotation and pressure between mating surfaces.

inerting Filling the space above the fuel in a tank with...
inert round

inert gas, usually nitrogen [USSR in WW2 used cooled engine exhaust, which contains oxygen].
inert round Missile or ammunition partly or entirely dummy, and lacking propulsion.
INES IUE newly extracted spectra.
INET Inertial navigation equipment tester.
INESS, Inews Integrated electronic-warfare system [or suite].
INF I Intermediate-range nuclear force(s).
Infantry Failure at start of life-cycle.
Infco Standing Committee for Science and Technology Information (ISO).
inferior planet Planet with orbit inside that of Earth.
infiltration Manufacturing stage with FRM (fibre-reinforced metal) components in which molten metal is used to fill gaps between compressed metal-coated fibres.
infinite aspect ratio Many aerofolg calculations ignore effects at the ends (tips) and accordingly true only for a wing of infinite aspect ratio (ie, it goes on forever or touches both walls of tunnel).
infinity Symbol ∞, used as subscript to denote free-stream values.
Infis Inertial-navigation flight inspection system.
inflatable aircraft One whose airframe is of flexible fabric, stabilized by internal gas pressure. Term usually applied to aerodynes.
inflatable de-icer One whose action is the repeated inflation and deflation of a flexible surface, thus breaking off accreted ice.
inflation manifold Links several sources of gas to gas-filled aerostat.
inflation sleeve Large thin-wall tube to which inflation manifold is connected.
inflator Trolley-mounted powered fan to begin inflation of hot-air balloon.
infection Point at which curve reverses direction.
in-flight advisory Sigmet/airmet broadcast to enroute pilots notifying conditions not anticipated at preflight briefing.
in-flight weight Maximum authorized weight after in-flight refuelling, can exceed MTOW.
inflow The component of velocity through a helicopter main rotor normal to the tip-path plane.
2 There are two more [rare and confusing] meanings: increase in relative speed as air is sucked into a propeller; and inwards radial velocity as air is sucked into a propeller.
inflow ratio Ratio of rotocraft TAS and peripheral velocity r at tips of blades.
influence line Graphical plot of shear, bending moment and other variables as point load moves along structure.
Info Information frame.
informatics Word gaining some ground in English from transliteration "informatique" (F) = EDP (1).
information dominance Being quicker than the enemy in assessing combat situation and launching weapons.
information operations Central method of waging war, including EW, psyops, comint and defence against cyber attack.
information pulses Those repeated parts of the transmission in SSR or IFF that convey information (eg identity, flight level).

initial attack

information technology management The ground-based portion of an ADMS.
Infossec Information security.
Infowar Information warfare.
Infraero Airports authority (Brazil).
infra-red, IR Portion of EM spectrum with wavelength longer than deep red light, thus not visible, but sensed as heat. Near * wavelengths 0.75–1.5µ, intermediate * 1.5–20µ, far * 20–1000µ.
infrasound Sound, especially at very high power, at very low frequency [<= 20 Hz] and very large amplitude.
infrasound 

infrastructure Fixed installations needed for activity (eg airfield, hangars, control tower, communications, fuel pipelines).
infrasound authority Those responsible for airfields, communications, radar and other ground installations.
infringement Violation of air traffic control or other rules regarding operation of aircraft.
goingestion Swallowing of foreign matter by engine (usually gas-turbine engine), including birds, ice, snow/slush/water, sand, rocket gas, catapult steam and metal parts; hence * test, * certification.
ingress To re-enter spacecraft after EVA, including expeditions on lunar or planer surface.
ingress route Attack aircraft track from base to initial point.
in ground effect With a [notional] impervious flat horizontal surface immediately underneath a hovering aerodyne.
inherent stability In-flight stability achieved by basic shape of aircraft.
in Hg Inches of mercury, non-SI unit of pressure = 3,386.39 Nm⁻².

inhibiting To spray interior of machine or other item with anti-corrosion material before storage.
2 To coat inner surfaces of rocket solid-propellant grain to prohibit burning over treated areas.

in IR The worst case in flight performance situations, eg instrument flight, failed engine and other adversities.
inhibitor Additive to fuel or other liquid, eg Methyl Cellosolve (often +0.4% glycerine) to protect against ice and against formation of gumming residues, corrosion or fuel oxidation.
2 Refractory inert coating to control burning of solid grain.

in, Anti-corrosion oil for long-term storage.
INI Instituto Nacional de Industria (Spain).
INIT, Init Initialization or initial.
initial altitude Altitude(s) prescribed for IA (1) segment (FAA).
inital approach 2 Segment of standard instrument arrival or STAR between IA (1) fix and intermediate fix or point where aircraft established on intermediate approach course (FAA).
2 Portion of flight immediately before arrival over destination airfield or over reporting point from which final approach is commenced (Seato, IADB).
inital approach area See initial area.
inital area Ground area of defined width between last preceding fix or DR position and either intersection of ILS, facility to be used in instrument approach or other point marking end of IA (1).
inital attack Tanker effort to contain a fire until ground firefighters can reach it (USFS).
**initial contact frequency**

**initial contact frequency** That used for ATC communication as aircraft enters new sector of controlled airspace.

**initial defensive operations** The initial deployment of an ABM system (MDA/White House).

**initial heading** That at start of rating period while using astro-gyro control (ASCC).

**initial mass**
- 1 That of rocket or rocket vehicle at launch.
- 2 That of fissile or other nuclear material before reaction.

**initial operational capability** Time at which particular hardware (e.g., weapon system) can first be employed effectively by trained and supported troops (USAF). Particular parts of the system may still be lacking.

**initial point**
- 1 Well defined fixed surface feature usable visually and/or electronically as starting point for attack on surface target (most existing definitions state ‘starting point for bomb run’).
- 2 Similar surface point where aircraft make final correction of course to pass over drop zone or other surface target.
- 3 Air-control point near landing zone from which helicopters are directed to landing.
- 4 First point at which moving target is located on plotting board or display system.

**initial radiation** That emitted from fireball within 60 s of nuclear burst, mainly neutrons and gamma rays.

**initial surface** That at start of solid-rocket burn; its area.

**initial surface/throat area** Fundamental non-dimensional characteristic of solid motor.

**initial throat area** Cross-section area of unused solid-motor throat.

**initial-value problem** One which, from given state, determines state of dynamic system at any future time.

**initialization**
- 1 Starting sequences leading to nuclear explosion.
- 2 Birth of new inbound track on air-defence system.

**initiation phase** Explosion.

**injection** Pump and injector.

**injection point** In rocket engine, = entry of propellant into combustion chamber.

**injection pump** For liquid propellant, pump and injector.

**injection velocity** That at injection point.

**injector** Point at which one or both propellants in liquid rocket enters chamber (usually many are used, distributed around chamber).

**ink** Verb, to sign a formal contract (US, colloq.).
in-phase

**in-phase** Occurring at the same point in each of a series of phugoids or other SHM or repeated cycles, but caused by external stimulus.

**in-plane bleeder** Sustained max-rate turn without change of height.

**implant** Done within factory instead of subcontracted, or relative to the factory (thus * facilities, * modification).

**INPR** In progress.

**input** 1 Point at which signal, data, energy or material enters system.
2 Signal, data, energy or material entering system.

**input axis** Axis normal to gyro spin axis about which rotation of base causes maximum output.

**INREQ** Request for information.

**INRIA** Institution Nationale de Recherches d’Informatique et Automation (F).

**INS** 1 Inertial navigation system.
2 Ion neutralization spectroscopy.
3 Immigration and Naturalization Services; PASS adds passenger accelerated service system (US).
4 Information network system.

**Insaas** Interstate airway communication station (US).

**In-Sap, IN-SAP** Intelligence special-access program.

**InSb** Indium antimonide, IR detector 3–5µ.

**INSC** Instrument comprehension.

**insensitive munition** One impossible to detonate except by its own triggering system.

**insert** 1 Small D-section body fixed inside propelling nozzle to trim area.
2 To place spacecraft in desired trajectory.
3 To convey friendly force (usually small and covert) to point on ground deep in enemy territory, usually by helicopter; hence insertion.

**inserted blades** Not forming an integral [monolithic] part of the disc.

**inset balance** Mass located within movable surface.

**inset hinge** On conventional control surface one whose axis is to rear of leading edge.

**inset light** One flush with airport pavement.

**INSI** Inertial navigation system interface.

**inside wing** That pointing towards centre of a turn.

**insolation** Solar radiation received, usually at Earth or any other planet.

**insensitivity** 1 Not forming an integral part of the disc.
2 Not to pre-ordained schedule.

**inspection** Search of hardware for evidence of existing or impending fault condition.

**inspection record** Meticulous written account of every technical event, including e.g. record of each stall or other possibly significant manoeuvre.

**inspin yaw** Yawing moment holding or accelerating aircraft into spin.

**INST, inst** Instrument.

**instability** 1 Structural condition in which strut, web or other member buckles under compressive load.
2 Aerodynamic condition in which slightest disturbance triggers gross disruption or flight of body.
3 Meteorological, normal meaning.

**integral construction**

**installation envelope** Overall three-view dimensioned outline drawings.

**instantaneous readout** System with zero lag between sensor and display.

**instantaneous VSI** One giving instantaneous readout, with accelerometer air pumps to counteract lag. Also called instant-lead.

**Inst. E** The Institute of Electronics (UK).

**INSTL** Installed, installation.

**InstMC** Institute of Measurement and Control (UK, 1944–).

**INSTR** Instruction.

**instruction to proceed** Informal document accepted as guaranteeing payment in advance of contract.

**instructor** In pilot training, pilot qualified and appointed to teach pupils.

**instrument approach** Made under non-visual guidance, normally from aids on the ground.

**instrument approach area** Volume of sky in which non-visual landing aid operates.

**instrument approach runway** One providing non-visual directional guidance for straight-in approach.

**instrument error** Difference between indicated and true value.

**instrument flight** Using instruments in place of external cues.

**instrument flight rules, IFR** Rules applied in cloud or whenever external cues are below VFR minima which prohibit non-IFR pilots/aircraft.

**instrument landing** Ambiguous but usually IMC landing without ground aids (thus, non-ILS).

**instrument landing system, ILS** Standard ground aid to landing comprising two radio guidance beams (localizer for direction in horizontal plane and glideslope for vertical plane with usual inclination 3°) and two markers for linear guidance. See headings beginning glidepath, and categories.

**instrument meteorological conditions** Conditions less than minima for VFR.

**instrument monitor** Various meanings from traditional flight-test panel camera(s) to automatic systems for notifying faults, ensuring majority vote or isolating failed instrument (rare).

**instrument rating** Endorsement to pilot’s licence allowing flight in IMC.

**instrument runway** Instrument-approach or precision-approach runway.

**insulators** Poor conductors of electricity, heat, noise or other forms of energy.

**Int** 1 Intersection (FAA).
2 Intercom.

**Inta** Instituto Nacional de Tecnica Aeroespacial Esteban Terradas (Spain).

**intake** 1 Air inlet to propulsion or internal system.
2 Narrow-chord leading member of upper flap in CCW augmentor wing, upstream of shroud and separated by a slot.

**intake duct** See inlet duct.

**intake heater** Heat exchanger inserted to prevent icing in piston-engine inlet system.

**intake stroke** See induction stroke.

**in tep** Intercept[or] or intercept.

**integral construction** Made from single slab of metal by
integral stator

machining and/or etching, or by forging and machining, to finished shape.

integral stator  Fabricating a section [typically containing six to eight vanes] of the turbine HP stator ring as a monolithic extension of a flame tube.

integral tank  Tank formed by coating aircraft structure with sealant.

integrated acoustic structure  Noise-absorbent structures forming load-bearing part of main structure.

integrated aeroplane  One in which single shape (eg Gothic delta with no separate fuselage) serves all functions, with no demarcation between parts.

integrated cargo carrier  Unpressurized payload carrier fitting cargo bay of Shuttle.

integrated circuit  Microelectronic device fabricated by successive etching, doping etc of single-crystal (usually silicon) substrate.

integrated communications control  Switches audio paths, controls and displays 40 channels of NVM, formats synthesized alerts and provides for antenna selection and BITE.

integrated decision support tool  Used in CDM to bring critical National Airspace System status and traffic management data together, graphics offering what-if capability.

integrated drive generator  Electric generator (alternator) made as one unit with CSD to give constant-frequency output.

integrated dynamic system  Combination of helicopter rotor hub, main transmission, swash plates, control system and hydraulic servos into single unit (MBB).

integrated electronic standby instrument  Solid-state replacement for pneumatic airspeed, altitude and horizon.

integrated flight system  Computer-linked FCS and panel displays which to a large degree relieve pilot of need to exercise judgement [arguable definition].

integrated flight test  Current [1990–2020] meaning is to demonstrate identification and tracking of ICBM targets in space.

integrated flight training  One meaning is ab initio use of flight instruments.

integrated instrumentation display  Combines engine, transmission, accessory systems, rotor track/balance and vibration monitoring plus caution/warning.

Integrated Modular Avionics  In the early years of the new Century IMA is the latest stage reached in avionics packaging. LRUs are replaced by uniform narrow modules in an integrated pack, sharing common power supplies. First used in the Lockheed Martin F-22. IMA saves space and power [and thus heat generation], and makes possible greater redundancy [e.g., in computer power].

integrated power unit  APU plus IDG.

integrated sensor suite  Usually means EO/IR.

integrated servovalve actuator  Flight-control power unit with integral failure-correction and only electric [or other] valve inputs, devoid of mechanical input from pilot.

integrated spar inspection system  Pressurizing the interior of a helicopter main-rotor blade so that leakage reveals the presence of a crack.

integrated surveillance system  TCAS, TAWS and weather radar with PWTD.

integrating accelerometer  Accelerometer whose output signal is first or second-order integration with respect to time (viz velocity or position).

integrating circuit  Electronic circuit whose function is to integrate (mathematically) one variable with respect to another (usually time).

integrating flowmeter  Shows not only rate of flow of fuel, or other consumable, but also quantity [mass] consumed, or remaining.

integration  Assembly of stages, boosters and payloads of spacecraft (post-1 normally means after mating of payloads).

integrated interconnectors  Device, usually digital, for giving numerical approximation to integration (mathematical).

2 Mechanical latch for devices such as an escape slide or brake chute enabling ground engineers to open up for routine maintenance.

integrity  Validity of structure or system, functioning in design role after suffering damage; usually, but not always, a mechanical quality associated with avoiding mechanical breakup. Loosely, resistance to failure.

integrity beacon landing system  Combines DGPS with ground-based pseudolites to give accuracy ± 10 cm (ESTOL).

intelligent missile  Vague popular concept normally taken to mean self-homing.

Intelsat  International Telecommunications Satellite Organization.

intensive flying  Purpose is to log flight hours on new equipment at maximum rate under operational conditions.

intensive student area  Regions of US airspace where IFR flight is restricted.

inter  Intermittent, also INTMT.

interaction parameter  Basic measure of relative dominance of fluid motion or magnetic field in MHD and plasma physics.

interactive computer  One capable of progressive dialogue with human operator, via displays and lighten or other method.

intercalation  Insertion of chemical compounds in plasma layers between planes of base material such as graphite to enhance electrical conductivity.

intercase  Intermediate case.

interception  Flight manoeuvre to effect closure upon another aircraft or spacecraft.

2 To capture and hold desired flight condition (eg, VOR radial or ILS).

interceptor  Aircraft or spacecraft designed to intercept, and if necessary destroy, others.

2 Small hinged strip to block local airflow, esp. between slat and wing or immediately to rear of slat, operated on one wing only by applying aileron.

intercept point  Computed location in space towards which vehicle (eg interceptor aircraft or spacecraft) is vectored.

interchanger  Variable gearbox in one axis of powered flight-control system.

intercom  Communication system within aircraft using crew headsets or loudspeakers but without any radio emission.

interconnectors  Tubes conveying flame from each gas-turbine combustor primary zone to neighbour [in US called flame tube, which has different meaning in UK].
intercontinental ballistic missile

intercontinental ballistic missile  Land-based, range over 5,500 nm (6,325 miles) (USAF).
intercooler  Radiator for rejecting excess heat in enclosed fluid system., e.g. downstream of piston-engine supercharger
intercostal  Short longitudinal structural member (stringer) joining adjacent frames or ribs, usually to support access door or equipment.
inter-cylinder baffle  See baffle.
intercrystalline corrosion  Originating and propagating between crystals of alloy.
interdiction  See air interdiction, battlefield air interdiction.
interface  Boundary between mating portions of system; can be mechanical (eg inlet duct and engine) or electronic (eg central computer and navigation display).
interference  1 Mutual interaction between solid bodies in fluid flow, eg upper and lower biplane wings (see Prandtl *).
interference drag  Drag caused by aerodynamic interference.
interference factor  Arbitrary drag multiplier, from 1 to 1.5, correcting for location of external bodies in proximity to aircraft [usually to the wing].
interference fit  Fit between parts where male dimension exceeds female (several exact definitions).
interference foul  Physical conflict between fixed and moving parts, esp. between control column/wheel/yoke and an obstruction.
interference strut  Obstructs cockpit if flight controls locked.
 interferogram  Display or photograph of interferometer patterns for precise measurement or aerodynamic research.
 interferometer  Optical measuring system using divided light beam later rejoined to give phase interference seen as light/dark fringes.
 interferometer array  Aerial (antenna) able to emit or receive simultaneously at large number of accurately related locations.
 interior ballistics  Branch of ballistics concerned with bodies under propulsion.
I FF technique in which pulse trains of different wavelengths are transmitted sequentially (to achieve enough transponder returns per scan it is rare to interlace more than three modes).
interline  Between different air carriers, hence interlining.
intermediate approach  That part of approach from arrival at first navigational facility or pre-determined fix to beginning of final approach.
intermediate case  1 Gas-turbine casing; several meanings, eg between two compressor spools or over compressor spool downstream of fan.
intermediate contingency  1 Turboshift power rating below emergency (max. contingency) level, usually allowed for 30 [sometimes 60] min.
intermediate gearbox  See step-aside gearbox.
intermediate maintenance  At least six meanings, the most common being maintenance performed on a military user airbase in a specialized workshop.
intermediate-pressure  Compressor/turbine spool between LP and HP in three-shaft engine, abb. IP.
intermediate range  Traditional figure for ballistic missiles is 1,500 nm, about 1,727 miles, 2,780 km (originally USAF). intermedia te rating  Intermediate contingency.
intermediate shop  Flightline fault-isolating system, esp. for avionics, synthesising all forms of EM signal for HUD, radar, etc.
intermetallics  Compounds or alloys in which atoms of two or more metals are arranged in complex structures in fixed ratios. Some are semiconductors, but immediate work is concentrated on aluminides of refractory metals.
intermittent duct  Resonant air-breathing engine; also known as intermittent jet, but more common term is pulsejet.
intermodal  Capable of use by more than one form of transport, ideally by air, rail and truck.
internal air system  All airflows and pressure differences having no direct effect on engine thrust or power.
internal balance  By control-surface area ahead of hinge [called the shelf] fitting in vented chamber in fixed structure. See compound shelf.
internal burning  Solid propellant rocket grain whose exposed surface is along centreline [e.g., star centred].
internal combustion  Originally described prime mover whose fuel was burned in the cylinder, unlike steam engine; in gas turbine and nuclear era meaning is blurred. internal combustion turbine  Accepted term for gas turbine [UK Government establishments, 1926–46].
internal efficiency  Rocket thermal efficiency.
internal engineering notice  Issued by manufacturer, esp. to customers.
internal fuel  Contained in aircraft or spacecraft, as distinct from fuel in removable or jettisonable tanks.
internal gearbox  In a two-shaft engine the starter must drive the HP spool, and this normally calls for a bevel gear inside the core. There are usually bevel gears from adjacent ends of the LP and HP shafts from which drive is taken to external gearboxes.
internal lip contraction  In an externally mounted turbofan, the ratio $\frac{h_{th}}{d_{th}}$, hitle plane to throat.
internally blown flap  1 Usually, large conventional flap through which main propulsion jet(s) or bleed air can be ducted.
interorals  2 Rarely, jet flap.
internal power  Generated in the aircraft (electrical, hydraulic, etc).
internals  1 Items inside cockpit.
intermediate range  Air route wholly within one country.
internal starter/generator  Built into centre of engine as part of it.
internal supercharger  Downstream of carburettor.
international  As applied to flight, service or route, one passing through airspace of more than one country.
International Accounting Unit

(though departure and destination may be in same country).

**International Accounting Unit** Used by NATO and in other multinational infrastructure programmes, originally equal to £ sterling prior to 1967 devaluation.

**international airport** Designated as airport of entry and departure for international traffic, and provided with necessary extra facilities (typically 12).

**international altitude** That shown by ISA-calibrated pressure altimeter set to 1013.25 mb.

**international boost** Piston engine boost control set to ISA.

**International knot** See knot.

**International power** The b.h.p. a piston engine is rated to develop at full throttle at International rpm at specified altitude.

**International rpm** Highest crankshaft speed permitted in climbing flight for period exceeding 5 min.

**International Standard Atmosphere, ISA** That agreed by ICAO and still used as common standard; defines pressure (1013.25 mb at MSL, about 29.92 in Hg), temperature (15°C at MSL) and relative density up to tropopause (see atmosphere). Hence, Standard Day.

**InterNational** Internet network information centre.

**interplane** Between eyes.

**interphone** Intercom serving crew stations, service areas and ground-crew jacks (2).


**interplane strut** Joins superimposed [biplane] wings.

**interplanetary** Between planets [assumed, within plane of their orbits].

**interpolation** Process of calculating or approximating values of function between known values.

**interpretation** Extraction of maximum intelligence from reconnaissance imagery.

**interpulse period** PRI.

**interrogate** To transmit IFF, SSR or ATC signal coded to trigger transponders.

**interrogation mode** Any mode in which signals include code to trigger transponder; eg Modes A, B and D for ATC transponders.

**interrogator** Radio transceiver scanning in synchronism with primary radar or SSR requesting replies from all cooperative airborne transponders to reply; replies sent to video displays.

**interrupted Bite** Ground test facility initiated manually via on-board control panel to enhance detection/location capability of C-Bite.

**interrupter gear** Device for enabling rapid-fire gun[s] to fire safely past blades of propeller. In contrast synchro-
nization gear matches the two frequencies. In practice the blade passing frequency was much greater than the rate of fire of even two guns, so * soon became obsolete.

**intenscan** Brief time between scans on a timebase.

**intercept** Strictly, intercept, intelligent sensors for control technologies.

**intersection** 1 Point where centrelines of runways coinci-
dence, hence * departure starts T-O at *.

2 Point on Earth, and vertical line through this point, where centrelines of airways cross.

**intercessions** Linking turbofan core to aircraft, thus * strut, * couplings, * interface.

**Intersputnik** Soviet Bloc comsat system.

**interstage** Space launcher airframe section between stages designed as major assembly housing guidance for other systems but without propulsion.

**inter-tropical front, ITF** The assumed giant front where tradewinds meet N and S of Equator, also called ITCZ; not a normal front.

**inter-turbine burner** Compact combustion system between HP and LP turbines in reheat-cycle engine.

**intervalometer** Mechanical or electronic system controlling spacing of events (eg reconnaissance photographs). In the blind Without external cues, ie no visual reference outside aircraft.

**in the groove** In the desired flight condition, esp. correctly aligned on the approach.

**in the slot** Correctly lined up for landing.

**INTL, intl** International.

**INTMT** Intermittent.

**Into** Intelligence officer.

**into engine** With asymmetric power, towards the operating engine [the other being at flight idle]; thus, when flying on L engine, the application of L aileron or rudder.

**into the mission** Measured from T-O or liftoff at end of countdown, thus 30 s ***.

**INTPS** Integrated navigation and tactical plotting system.

**INTR** Interior.

**intra-flight data-link** Secure communications between pilots and their sensors.

**intraformation positioning system** Allows aircraft to fly close formation in blind conditions.

**in-trail procedure** To be followed by large jet following another, especially when using ADS-B.

**intra-market** Market for civil air transport in particular geographical region, which can be a single large country.

**intrascope** See borescope.

**intravehicular** Between two spacecraft.

**intrrepid birdman** Jokey reference to any pilot.

**INTRG** Interrogated, interrogator.

**introscope** Another name for a borescope.

**INTRP** Interrupted, interruption.

**intraducer** Aircraft engaged on interdiction, esp. against hostile aircraft and airfields (not necessarily by night).

**2 An altitude-reporting aircraft considered to be a potential threat and processed by TCAS threat-detection logic.**

**int** Intensity.

**INTXN, intxn** Intersection.

**INU** Inertial navigation unit.

**INT** Inertial navigation unit.

2 Inertial nav/attack unit.

**inv** Inverter.

**Invar** Alloys formulated for near-zero coefficient of thermal expansion; *36 [36 per cent Ni] widely used for large CFRP moulds.

**inventory** Complete list of hardware, esp. of items assigned to military units.

**inventory carrying cost** Total cost of [airline] inventory, factored for depreciation, divided by [usually] fleet time per annum or per aircraft.

**inventory service** Assigned to operational unit, including training units, but excluding those in evaluation, development, research and other non-operational status.

**inverse monopulse** Missile or other guidance radar in which target Doppler shift is detected early in RF amplifier chain instead of at late stage.
inverse-square law

**inverse-square law** States point-source radiation and most other emissions fall off in intensity as square of distance from emitter.

**inverse synthetic-aperture radar** Use of SAR/DBS technique but using a fixed (or moving) radar to integrate successive echoes from a moving target.

**inversion** Local region of atmosphere where lapse rates are negative, ie temperature increases with height.

**inversion point** Height at which inversion ceases and normal lapse rate begins.

**inverted bipolar** Inverted gate.

**inverted engine** Piston engine with crankshaft above cylinders.

**inverted-flight valve** Commonest form is fitted in delivery from fuel tank to maintain feed under negative g.

**inverted gull wing** Seen in front elevation, slopes down from body with pronounced anhedral and then (suddenly or gradually) slopes up with dihedral to tip.

**inverted loop** See next two entries. BS: "A complete revolution in flight in a vertical plane about lateral axis with upper surface on outside of curved flight path." Some insist * must be started with aircraft inverted, thus from bottom of manoeuvre.

**inverted normal loop** Normal loop begun from inverted position.

**inverted outside loop** See hunt.

**inverted spin** Spin in inverted position. Strangely, BS: "A complete revolution in flight in a vertical plane about lateral axis with upper surface on outside of curved flight path." Some insist * must be started with aircraft inverted, thus from bottom of manoeuvre.

**inverted vee-engine** Two inclined banks of cylinders below crankshaft.

**inverter** Electrical machine or static rectifier that inverts polarity of each alternate AC sine wave to give DC output.

**investment casting** Casting complex shapes in ceramic moulds formed as coatings on wax patterns which are then melted and run out, hence term lost-wax casting.

**investment prediction** Assessment of required inventory of spares and GSE.

**inviscid** Without viscosity.

**invoco** Innovative concepts in systems engineering.

**INVOF** In the vicinity of.

**involuntary boarding refusal** Passenger denied access to aircraft, for whatever reason.

**involution** Of aircraft, caused solely by legislation, esp. environmental non-compliance.

**INVR** Institute of Noise and Vibration Research (UK).

**INVRN** Inversion [weather].

**inwales** Longitudinal members at junction of flying-boat topsides and deck. Often = gunwales.

**inward relief valve** One-way valve in fluid system triggered by abnormally low local pressure in container.

**in-weather** Flying in conditions that are wet and/or icy, but not poor visibility (USAF).

**IO** In weather.

**I/O** Input/output; C adds computer.

**Io** Mean spherical candle power.

**IOA** 1 Initial operational assessment.

**IOC** 1 International Oceanographic Commission (UN).

**IOB** International Operations Bulletin.

**IOP** imagery on-board processor.

**I-obs** Index of crew and maintenance observations.

**IOCs** 1 International Operations Bulletin (UN).

**IOE** 1 Initial Operating Experience.

**IOFP** Intensive operational flying programme.

**IOI** Item of interest/importance.

**IOIC** Integrated operational intelligence system.

**I/OCE** Input/output control element.

**IOCE** Input/output control element.

**IOCU** International Organization of Consumers' Unions.

**IOD** 1 Inflight-opening doors (Stovl engine).

**IOE** 1 Information operations planning [S adds system].

**IOF** Input/output module.

**ION** Input/output processor.

**IONA** In-orbit experience.

**IONCE** Integrated operational nuclear detection system.

**ion** Electrically charged atom or group of atoms; can be in solid or solution or free; charge can be positive (missing electron) or negative (usually through extra electron).

**ion rocket** See ion rocket.

**ionization** Conversion of atoms to ions.

**ionization potential** Work measured in eV necessary to remove or add electron in ionization.

**ionization screen** Barrier to charged particles which would otherwise damage human tissue.

**ionogram** Plot of radio frequency against pulse round-trip time, ie electron density level for reflection (approx. equal to altitude of reflective layers).

**ionopause** Ill-defined base of ionosphere; also known as D-region.

**ionosphere** Entire ionized region of Earth's atmosphere (Kennelly-Heaviside, Appleton, E and F layers). Not Van Allen Belts.

**ion rocket** Propulsor, usually small thruster, generating high-velocity jet of ions in electrostatic field.

**IOP** 1 Institute of Petroleum.

**IOP** Information operations planning [S adds system].

**IOP** Independent overspeed protection.

**IOP** Input/output processor.

**IOR** 1 Indian Ocean Region.

**I/OC** Input/output concentrator, or controller.

**IOCE** Input/output control element.

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**IOCE** Input/output control element.

**IOCE** Input/output control element.

**INVR** Institute of Noise and Vibration Research (UK).

**INVRN** Inversion [weather].

**INVRN** Inversion [weather].
IOS

IOS 1 Instructor operating [or operated] station [or system].
2 Internal operating system.
3 Innovation and opportunity selection.
IOT 1 Integrated optical spectrum analyser.
2 Integrated overhead Sitignt audit (IATA).
3 IATA, or international, operating, or operational, safety audit (IATA).
IOT 1 In-orbit test.
2 Initial officer training (RAF)
IOTE, IOT&E Initial operational test and evaluation.
IOV In-orbit validation (ESA).
IOVC In overcast.
IP 1 Initial point.
2 Intermediate-pressure.
3 Instructor (rarely, instrument) pilot.
4 Identification pulse (SSR).
5 Identification position (IFF).
6 Intellectual property (company law), R adds right[s].
7 Initial provisioning of spares.
8 Industrial participation.
9 Internet protocol.
10 Instrumented prototype [A adds aircraft].
11 Ice pellets.
12 Intercept point (radio dBm).
13 Initial production.
14 Instrument [flight] procedure[s].
IP/ Identification position (US).
IPA 1 Independent Pilots’ Association [office, Haywards Heath] (UK).
2 Instrumented production aircraft.
IPACG International Pacific ATC Co-ordinating Group.
IPAD 1 Integrated programs for aerospace [vehicle] design.
1 Improved processing and display [S adds system].
IPARS, Ipars International programmed airlines reservation system.
IPAS Integrated pressure air system.
IPAT 1 Inertial pointing-aided tracking.
2 Integrated propulsion analysis tool.
IPATS International Police Aviation Training School.
IPB 1 Illustrated parts breakdown.
2 Intelligence preparation of the battlespace, one of the pillars of PBA.
IPBS In-flight propeller balancing system.
IPC 1 Interiment positive control (ATC backup, IPS used in US).
2 IP compressor.
3 Instrumented parts catalogue.
4 Integrated processing cabinet.
5 Instrument proficiency check.
6 Integrated separation assurance (ISSA).
IPCC International Panel on Climate Change.
IPCS 1 Institution of Professional Civil Servants (UK).
2 Intelligent power-control system.
1 Ice-protective control system.
IPD 1 Instituto de Pesquisas e Desenvolvimento (Brazil).
2 Improved point defence [MS adds missile system].
3 Initial production delivery.
4 Integrated product design [by prime plus suppliers], or delivery.
5 Imagery processing and dissemination; S adds system.
6 Information processing division.
7 Initial professional development.
IPE 1 Institution of Production Engineers (UK).
2 Increased- (or improved-) performance engine.
3 Interconnect, passive and electro-mechanical.
IPES 1 Infalight passenger entertainment and communications; C adds conference, S systems.
2 Integrated planning and execution center.
IPES Individual passenger entertainment system.
Ipex Immediate-purchase excursion; low-price fare without advance booking and without guarantee of seat.
IPF Integrated, or integration and processing facility.
IPF Identification position feature.
IPFA Inspection des Programmes et Fabrications de l’Armement (F).
IPFD Integrated primary flight display.
IPG Indian Pilots’ Guide.
IPI 1 Intercept pattern for identification.
2 Inertial position insertion.
3 Initial protocol identifier.
IPID 1 IR perimeter intrusion detection.
2 Indefinite quantity, indefinite delivery.
IPK International Prototype Kilogramme, a platinum body kept at Sèvres.
IPL 1 Illustrated parts list.
2 Image Product Library (NIMA).
IPM 1 Interplanetary medium.
2 Immediate past Master (GAPAN).
IPMS 1 International Plastic (singular) Modelers (US spelling) Society.
3 Institution of Professionals, Managers and Specialists (UK).
IPN Iso-propyl nitrate.
IPNVG Integrated panoramic NVGs.
IPO 1 Initial public offering.
2 Integrated product ownership.
IPP 1 Institut für Plasma-Physik (G).
2 Information-processing panel.
3 Industrial preparedness planning (US).
4 Impact-point prediction.
IPPS Integrated power plant system.
IPR 1 Intellectual property rights, has particular relevance to software.
1 Inches per revolution.
3 Internet protocol router.
IPRA 1 Independent precision radar approach.
2 Industrial participation risk assessment.
IP/ IPress Intermediate pressure.
IPS 1 Information presentation or processing system.
2 Instrument-pointing system.
3 Inlet particle separator.
4 Intelligence and planning squadron (RAF).
5 Intermediate pitch stop (helicopter).
6 Interactive pilot station.
7 Intermittent positive control (ATC).
8 Integrated power system.
Iп-э. Instructions per second.
IPSA Infirmières-Pilotes Parachutists Secouristes de l’Air (F).
IPSE

IPSE Integrated product (or project) support environment (software).

IPT 1 Integrated project team; L adds leader (UK).
2 Integrated product team (US).
3 Intermediate-pressure turbine.
4 Integrated physiological trainer [a simulator].
5 Intelligent power terminal.

IPU 1 Interface processor unit.
2 Integrated power unit [usually electric].
3 Image processing unit.

IVP 1 Improve.
2 Icy runway, also IR.

IPW 1 Institut für Physikalische Weltraumforschung (G).
2 Ice-pellet shower.

IP/XML Internet protocol, extensible markup language.

IQA The Institute of Quality Assurance (UK).

IqAF Iraqi air force [UK usage].

IQSY International Quiet Sun Years [1964–65].

IQT Initial qualification training, or testing.

IQTG International Qualification Test Guide (ICAO).

IR 1 Infra-red.
2 Instrument rating [or route, or rules].
3 Inspection report.
4 Incident report.
5 Initial reserve (RAF).
6 Ice on runway.
7 Ice reconnaissance.
8 Implementing rules.
9 In Rotor-system inertia.

IRA 1 Inertial reference assembly.
2 Infra-red astronomy.
3 Initiated by requesting authority.
4 Intercooled recuperated aero-engine (Clean).

IRAC 1 Interdepartmental Radio Advisory Committee (US).
2 IR array camera.

IRAD 1 Investigate, research and define.
2 Independent research and development.
3 IR acquisition and designation [S adds system].

IRAN Inspect and repair as necessary.

IR&D Internal research and development, ie company funded.

IRAS 1 Interdiction/reconnaissance attack system.
2 IR astronomy satellite.

Iraser IR laser (not recommended).

Irasi, IRASI Iridium.

IR augments Flare or otherwise intense IR source

carried by vehicle to facilitate IR tracking.

IRWS IR attack weapon system.

IRB 1 Industrial revenue bonds.
2 Integrated Requirements Board.

IRBM Intermediate-range ballistic missile.

IRC Industrial Reorganisation Corporation (UK).

IRCA Integrated real time in the cockpit/Real-time out of the cockpit for combat aircraft (AFRL).

IRCAM IR camera acquisition module.

IRCC International Radio Consultative Committee.

IRCCD IR-sensitive charge-coupled device.

IRCCM IR counter-countermeasures.

IRCM IR countermeasures (sometimes rendered IRC). Measures adopted to minimise IR emissions or render them misleading (eg by ejecting flares which it is hoped

hostile IR-homing weapons will prefer instead of one’s own aircraft).

IRCS Intrusion-resistant communications system.

IRD 1 Interoperability requirements document.
2 Independent (or internal) research and development (company-funded).
3 Inlet ram drag.
4 Integrated receiver/decoder.

IR decoy Intense heat source intended to distract IR-homing missiles.

IR detector Device containing cell sensitive to IR which raises electrons (cryogenically cooled to reduce noise) to higher energy level.

IRDF IR direction-finding.

IRDS IR detecting set, or detection set, or suite, or system.

IRDT Inflatable re-entry and descent technology.

IRDU IR detection unit.

IRE 1 Institution of Radio Engineers (UK).
2 IFF reply evaluator.
3 Instrument rating examiner.
4 Internal roll extrusion.

IR/EO IR electro-optical.

Ireps Integrated refractive effects prediction system (anaprop).

IREW IR electronic warfare.

IRF 1 Immediate Reaction Force (NATO).
2 Institute of space physics (Sweden).

IRFFE Intelligent RF front end.

IRFI International Runway Friction Index.

IRFIS Inertial-referenced flight inspection system.

IRFITS IR fault-isolation test system.

IRFNA Inhibited red fuming nitric acid.

IRFPA IR focal-plane array.

IR guidance Use of IR seeker cell and combined optics and flight control to make vehicle home on suitable heat sources.

IRI Inadvertent runway incursion.

IRIA Institut de Recherche Informatique et d’Automatique (F).

Iridium Ir, hard, inert silvery metal, density 22.562, MPt 2,410°C.

IRIG Inter-range instrumentation group.

Iris IR or integrated radar imaging system.

IR guidance Looks into human eye to give unequivocal confirmation [or not] of identity.

IRJ IR jammer.

IRLS IR linescan, or line scanner.

IRM 1 Information resources management.
2 Intelligent robotics manufacturing.
3 Ion-release module.

IRMA International Registry of Mobile Assets [2001–].

IRM Inscription reference mode panel.

IRMS Integrated radio management system.

I_{nm} Effective [root mean square] current.

IRMW IR missile warning [S adds system or subsystem].

I-RNAV Boeing term for RNP-RNAV, meaning integrated-RNAV.

I-RNAV

Iron, IR-OTIS IR optronic tracking and identification system. IRP 1 Intermediate rated power. 2 Interphone receptacle panel. 3 Integrated refueling panel. 4 Intruder role player. IRPG IR plume generator. IRR 1 Integral rocket/ramjet. 2 Infra-red radiation, or radiometer. 3 Installation readiness review. IRCA Integrated real-time info into the cockpit/real-time info out of the cockpit for combat aircraft. Irreversible control Position of output governed only by input (thus, * flight control is unaffected by air load on surface). Irreversible screwjack Thread chosen so that linear position governed solely by rotation, not by operating load. IRROLA Inflatable radar-reflective optical location aid. Irrotational flow Individual elements or parcels do not rotate about own axes. IRRS IR reconnaissance system. IRS 1 Inertial reference system, or set. 2 Improved radar simulator. 3 Indian remote satellite. 4 IR signature, or spectrograph. 5 Internal Revenue Service (US). 6 Interface requirements specification. IR seeker See IR detector. IR signature Complete plot of IR emissions from given source or vehicle, usually in form of intensity plotted against wavelength. IRSM IR surveillance measures. IR telescope camera system Hand-held, on long wand, for inspection [or search for explosives or drugs] in dark places. IRSP Instrumentation radar support programme. IRST IR search and track; S adds system. IRT 1 Instrument-rating test. 2 Incident, or immediate, response team. IRTH IR terminal homing. IRTS 1 Initial radar training simulator. 2 IR threat simulator.


IS&S Integrated systems and solutions, merger of command and control intelligence and data fusion (DoD). ISAR 1 Inverse synthetic-aperture radar. 2 Integrated, or intelligence, surveillance and reconnaissance; C adds cell. ISAS 1 Institute of Space and Aeronautical Science (India). 2 Institute of Space and Astronautical Science (J). ISASI International Society of Aircraft Safety Investigators [office, Sterling VA 20164-4421 (Int.)]. ISAT 1 Integrated site acceptance test.
Isatis

- 2 Innovative space-based radar antenna technology.

Isatis

Integrated system for ATIS (1 or 2) (F).

ISAW International Society of Aviation Writers.

ISB Inspection Service Bulletin.

ISB, isb Independent sideband.

ISBA Inertial-sensor-based avionics.

IS-BAO International standard[s] for business aviation, or aircraft, operations (IBAC).

ISC 1 Integrated semiconductor circuit.

- 2 Instrumentation system[s] coupler.

- 3 Intercom set control.

- 4 Integrated systems controller.

- 5 Industry Steering Committee (Int.).

ISCA International Steering Committee for Consumer Affairs.

ISC, ISC° Integrated space command and control.

ISC® Integrated sensor control system.

ISD 1 In-service, or initial service, date.

- 2 Interim situation display (FAA).

- 3 Integrated systems development.

ISDN Integrated services digital [or data] network.

ISDOS Information system design and optimization system.

ISDR International Strategy for Disaster Reduction.

ISDS Image switching and distribution system.

- 2 IRCM, or improved, self-defense system.

ISDU Inertial system display unit.

ISDX Integrated services, digital exchanges.

ISE 1 Interconnected stabilizer/elevator.

- 2 Intelligent synthesis environment.

- 3 In-service evaluation.

ISEE International Sun/Earth Explorer.

ISEI Improved-specific emitter identification.

Iseman rivet Hollow blind rivet set by driving drift pin from manufactured-head end.

isenergetic Without change in total energy per unit mass of fluid (in bulk or along a streamline).

isentropic Without change in entropy (usually along streamline, with respect to time).

ISF 1 Internally staged fuel injector.

ISG Inflatable survival gear (esp. liferafts, escape slides).

- 2 Internal, or integrated, starter/generator.

ISH Intermediate system hello.


ISI 1 Institute for Scientific Information (international corporation, Philadelphia).

- 2 International sale indicator (IATA).

ISIP Information systems improvement program.

ISIS 1 Integrated spar inspection system.

- 2 Integrated strike and interception system.

- 3 Integrated standoff instrument system.

- 4 International satellites for ionospheric studies.

ISISP Initial single integrated space picture, to provide COP to CAOC (USAF).

ISTT Intensified silicon intensified target (sic).

ISJTA Intensive student jet training area (US armed forces).

ISL Inactive-status list.

Island Enclosed area on 2-D graph or plot.

- 2 Superstructure above aircraft-carrier deck.

ISLN Isolation.

ISLS Interrogation, or interrogator, side-lobe suppression.

ISM Institut Suisse de Météorologie (Switzerland).

- 2 Internationale Segelflugzeugmesse (Switzerland).

- 3 Inflatable space module.

ISMLS Interim-standard MLS.

ISN Inter-simulator network.

ISNS International satellite-navigation system (FAA).

ISO 1 International Organization for Standardization. [Numerous aerospace documents, eg ISO 9000, International standards for quality; ISO. 9002, 19-part qualification of companies engaged in aerospace logistics, maintenance and training; office, CH-1211 Geneva] (Int.).

- 2 Also iso, isolation, isolated.

Iso Prefix, equal.

isobar 1 Line on map or chart joining points of equal atmospheric pressure, usually reduced to MSL by ISA law.

- 2 Line on tunnel model or free-flight vehicle joining points of equal aerodynamic (surface stagnation) pressure.

isobaric range Band of flight altitudes over which cabin pressure can be held constant.

isobar sweep Angle between transverse axis and local direction of isobar (2).

isocentre Intersection of interior bisector of camera tilt angle with film plane.

isochoric Without change in volume.

isochrone Line joining points of equal time difference in reception of radio signals.

isocontour On weather radar = contour.

isodynamic Line joining points of equal Doppler velocity.

isodynamic line Line joining points of equal horizontal magnetic field intensity.

iso-echo Radar display mode in which cloud turbulence centres appear dark or coloured, width of surround indicating rain/turbulence gradient; also called contour mode.

isogon, isogonic line Line joining points of equal magnetic declination (variation).

isogrid Pattern of reinforcing webs stiffening thin sheet (machined, chem-milled etc), usually based on equilateral or isoceles triangles.

isogrid Line joining points of equal angular difference between grid and magnetic north (grid magnetic angle).

isohyet Line joining places where meteorology event has same frequency of occurrence.

isogrid Pattern of reinforcing webs stiffening thin sheet (machined, chem-milled etc), usually based on equilateral or isoceles triangles.

isogrid Line joining points of equal angular difference between grid and magnetic north (grid magnetic angle).

isohyet Line joining places of equal rainfall.

Isolane PU/AP + al (F).

isolated drag Drag of a body considered in isolation; thus * of a jet-engine pod may be significantly less than its drag when hung on the aircraft.

ISOL[D] Isolated.

isolux Line joining points of equal light intensity.
isomers

Compounds having same chemical formula but different structure.

isometric Drawing projection in which verticals are vertical, other two axes are equally inclined, and distances along all three axes are correct.

isometric switch Governs lock-on to aerial radar target.

iso-octane Hydrocarbon of paraffin series used as reference index for anti-knock ratings, normally C8H18.

iso-opinion charts Graphic attempts to portray general consensus of pilot evaluations, eg plotting undamped natural frequency against short-period damping.

ISO-PA ISO(1) protocol architecture.

isopleth Line joining points of a constant value of a variable with respect to space or time.

isopod Patented multi-mode packaging system.

isopropyl nitrate Monopropellant for rockets and fuel for starters.

isopynamic Of unchanged density, or of equal densities, with respect to space or time.

ISOR Initial statement of requirements.

ISOS Inertially stabilized optronic sensor.

isoshear Joins places of equal wind shear.

isostatic Under equal pressure from all sides.

isotach Line joining points of equal wind speed, irrespective of direction.

isotherm Line joining points of equal temperature.

isothermal At constant temperature.

isothermal atmosphere Hypothetical atmosphere in hydrostatic equilibrium with constant temperature, also called exponential.

isothermal change Change of volume-pressure humidity and possibly other variables of perfect gas or gas mixture at constant temperature.

isothermal forging Manufacturing a metal part close to finish dimensions by squeezing it as powder in a die, or between dies, under high pressure, both the die and the part being under the same high temperature. See sintering.

isothermal layer See stratosphere.

isotope Radioactive form of (normally non-radioactive) element.

isotope inspection X-ray using isotope as energy source.

isotope power Using isotope radiation as source of heat energy in closed fluid cycle.

isotran Isolator transition, isolates Gunn diode from load mismatches and couples to waveguide and coaxial conductor.

isotropic Having same properties in all directions.

ISP J Interim support plan (FAA).

ISP 2 Internet, or Inmarsat, service provider.

ISP 3 Integrated switching panel.

ISP 4 Specific impulse.

ISPA International Society of Parametric Analysts.

ISPA, Ispa International Society of Parametric Analysis (Int.).

ISpan Integrated strategic planning and analysis network (Stratcom).

ISQC Intersound quality-control facility [checks video-cassettes].

ISR 1 Initial, or intermediate, Service Release.

ISR 2 Intelligence, surveillance, reconnaissance.

ISR 3 Integrated signature reduction.

ISR 4 Image storage and retrieval.

ISR 5 Interrupt[ed] service routine.

ISRac, ISRAC Intelligence, surveillance and reconnaissance cell (NATO).

ISRBM Intelligence, surveillance and reconnaissance battle manager (USAf).

ISRC 1 International Search and Rescue Convention.

ISRC 2 Intelligence, surveillance and reconnaissance cell.

ISRC 3 Intelligence, surveillance, reconnaissance, and communications (USAf).

ISRO Indian Space Research Organization (office, Bangalore).

ISRU In situ resource utilization [space exploration].

ISS 1 Inertial, or integrated, sensor system, or suite.

ISS 2 Integrated sensor structure (Darpa).

ISS 3 Instrument subsystem.

ISS 4 Indonesian Space Society.

ISS 5 International Space Station [MCETF adds management and cost evaluation task force] (US + R).

ISS 6 Information support system (ATC).

ISS 7 Integrated Satellite System.

ISS 8 Imaging science subsystem [planetary].

ISS 9 Integrated surveillance, or sensor, system.

ISSC Integrated system support contract.

ISSI International Space Science Institute (Berne).

ISSM Institute of Safety and Systems Management, (U of S California, Pasadena).

ISSN Intermediate system subnetwork.

ISSR Independent secondary surveillance radar.

ISST ICBM silo superhardening technology.

IST Institute for Simulation and Training (University of Central Florida).

Istar 1 Integrated system test of an air-breathing rocket (NASA).

Istar 2 Intelligence, surveillance, target acquisition and reconnaissance.

ISTAT International Society of Transport Aircraft Traders/Trading [office, Arlington, VA].

ISTD Integrated space-technology demonstration (USAf).

ISTF Interfacility Satellite Telecommunications Network.

ISTP Integrated Space Transportation Plan (NASA).

ISTR Integrated systems test rig.

Istres Location of chief French Government flight-test establishment, the Centre des Essais en Vol (CEV), whose other locations are at Brétigny and Cazaux.

ISTS Integrated space transport system.

ISU 1 Intelligent, or inertial, or integrated, sensor unit.

ISU 2 Ignition servo unit.

ISU 3 Initial signal unit.

ISU 4 Intercommunication set [control] unit.

ISU 5 International Space University [F-67400 Illkirch] (F).

ISU 6 Information switching unit.

ISURSS Interim small unit remote sensing system[s].

ISV 1 Intensified silicon target vidicon.

ISV 2 In-seat video [TV screen].

ISVR Institute of Sound and Vibration Research (Southampton, UK).

ISWL Isolated single-wheel load.

IT 1 Inclusive tour.

IT 2 Information technology.

IT 3 Interactive touchscreen.

IT 4 Integral terminal, an HMI.

IT 5 Independently targetable.

IT 6 Total impulse.
I/V

I\ Va 1 Input video amplifier.
I\ da 2 Istituto del Valore Aeronautico (I).
I\ va 3 Ingeniorsvetenskapsskademien [Stockholm], (Sweden).
I\ Vc Patented process of ion-vapour deposition of aluminium on steel.
I\ Va
dependent verification and validation (software).
I\ Vd 1 Interactive video disk.
I\ Vdu 2 Interactive voice and data; M adds modem, N network.
I\ Vh Integrated vehicle health [M adds management, MS monitoring, or management, system].
I\ Vi Interchangeable virtual instrumentation (sets software standards).
I\ Vfd Institut von Kármán de Dynamique des Fluides (Int., also called VKIFD).
I\ Vmms Integrated vehicle mission-management system.
I\ Mms Integrated vehicle management system.
I\ Vr Instrumented range.
I\ Vri Intelligent vehicle research initiative (NASA).
I\ Vrs Intercept vehicle search unit.
I\ Vs 1 Intelligent vehicle system.
I\ Vst 2 Interactive video system.
I\ Vsc Integrated vehicle support, or subsystem, control(s), or controller.
I\ Vs1 Instantaneous VSI.
I\ Vsn Initial voice-switched network (NATO).
I\ VIR Instantaneous vertical velocity.
I\ W 1 Individual weapon.
I\ WR 2 Inminent warning (UK, WW2).

I/W

I\ Wa 1 Information warfare [also InfoWar], D adds defense [UK = defence], O offensive, or officer.
I\ Wg Integrated Wing, ATVP adds advanced-technology verification programme (UK 2004+).
I\ Wr Moment of inertia of rotating wheel or disc.
I\ Waa Initial wide-area augmentation system.
I\ Wac Integrated weapon-aiming computer.
I\ Wasm InternationaL Women’s Air and Space Museum (Cleveland, OH).
I\ Wb Independent wide-band repeater.
I\ WC Integrated weapon complex.
I\ We 1 Information warfare and electronic warfare.
I\ Wf Inhibited white fuming nitric; A adds acid.
I\ Wh Internet Working Group.
I\ Wg Industry Working Group on Business Aircraft Operations (DoT).
I\ Wi Interceptor weapons instructor.
I\ Was Integrated weather information display system.
I\ Wiu Integrated weapons interface unit.
I\ Wm 1 Imperial War Museum (London, UK).
I\ Wm 2 Institution of Works Managers (UK).
I\ Wm Index of warnings and malfunctions.
I\ Wr Instrument weather rating, proposed by JAA to replace UK’s IMC.
I\ Ws Integrated weapons system.
I\ Wr Moment of inertia about the X-axis.
I\ Wy Moment of inertia about the Y-axis.
I\ Yqs International Years of the Quiet Sun.
I\ Zl Moment of inertia about the Z-axis.
I\ Zd Helicopter blade moment of inertia about the lagging hinge.
I\ Zld IR zoom laser illuminator/designator.
I\ Zod Standard test for impact strength of notched specimen subjected to transverse blow[s] of known energy.
I\ Zs Satellite (R).
Joint air attack team tactics (outcome of Jaws JAATT JAAA Hoofddorp, Netherlands] (EAAC, Int.).

JAB 1 Turbojet (US military engine designation).
2 Jet route in Class-A airspace (civil airways).
3 Joule[s].
4 General EM signal power.
5 RPV [direction aircraft (DoD aircraft designation prefix).
6 Special test, temporary (DoD aircraft designation prefix).
7 Polar moment of inertia; also inertia matrix.
9 Life jackets.
10 Current density.
11 Propeller advance/diameter ratio.
12 Torsion constant units = length².
13 Cost function [or italic J].
14 Bessel function of first kind.
J 1 Mass flux (gaseous diffusion).
2 Square root of minus 1.
3 Usually as subscript, fully expanded jet.
4 Operator, 90° (electrical).
J2 Diesel fuel (G, WW2).
J3E Single-sideband suppressed-carrier mode, ie HF SSB.
J9 Joint Experimental Directorate (USA).
J-curves Atmospheric post-stall manoeuvres by thrust-vectoring aircraft [X-31].
J-dinghy Circular, for crew of 6 (RAF, WW2).
J-display Time base is ring near edge of display, echo blip position varies with range; main use radar altimeters.
J-noose Fixed leading-edge structure.
J-turn Cobra followed immediately by rapid [30°–40°/s] yaw to reverse direction of flight.
JA Judge-advocate.
JAA 1 Japan Aeronautic Association.
2 Joint Aviation Authorities [2000–, office at 2130 KA Hoofddorp, Netherlands] (EAAC, Int.).
JAAA Japan Ag-Aviation Association.
JAATT Joint air attack team tactics (outcome of Jaws [3]); hence JAAT.
Jabo Fighter-bomber (G).
Jabof Fighter-bomber wing (NATO, Luftwaffe).
JAC 1 Joint airworthiness code (AICMA).
2 Junta de Aeronautica Civil (Chile).
3 Joint Air Component [HQ adds headquarters] (UK).
JACIS 1 Japan Association of Air Cargo Information Systems.
2 Joint applications command information system (multiservice, UK).
Jack 1 Pivoted linear actuator.
2 Jack box.
Jack box Socket for plugging in communications headset. Except in light aircraft, probably enables any crew member or ground crew to access intercom.
Jackpad Tuning plate, usually square, distributing support of lifting jack into surrounding airframe.
Jackscrew Screwthread converting rotary power to linear (jack) output, usually irreversible (see ball *).

jack stall Aerodynamic load on the surface overcomes force applied by powered flight-control unit.
jackstay Hinged strut for bracing cowl or other large panel when in open position.

JACMAS Joint Approach Control Meteorological Advisory Service.
Jacobs-Relf Original equations for calculation of M crit and related Cpixy.
Jacola Joint Airports Committee Of Local Authorities (UK).
JACTS Joint Air Combat Training Squadron (USAF/USN).
JAF Judge Advocate-General Executive Office (USAF, Pentagon).
JAAF Japan Aerospace Exploration Agency.
JAF Royal Jordanian air force [UK usage].
JAFC Joint advanced fighter engine (US).
Jafu Jagdfüh rer, fighter leader (G, WW2).
JAG Judge-Advocate-General.
Jagd Hunt (G), hence Jagdliefer [fighter pilot], Jagdflugzeug [fighter], Jagdgeschwader [fighter group (US = wing)], Jagdgruppe [fighter wing (US = group)].
Jago, JAGO Joint air/ground operations [G adds Group, S School, at Nellis] (USAF).
Jaguar Joint air/ground operations unified adaptive replanning [or preplanning] (USAF).
JALS JAA-ATPL integrated learning system.
Jam Obliterates hostile EM transmission (esp. radar) by powerful emission on same wavelength(s).
Jamac Joint aeronautical materials activity (USAF).
James Air-damped pendulum driving deceleration (g) pointer carried in braked truck to give friction measure on runway (see JBD, JBI).
Jammer High-power emitter to jam specific wavelengths.
Jammer support receiver Automatically scans through programmed range of frequencies of interest.
Jamming 1 Noise * obliterates by sheer power.
2 Deception * attempts to mislead enemy by causing false indications on his equipment.
Jam nut Thin lock-nut.
JAMSCE Joint Advanced Materials and Structures Center of Excellence (FAA).
Janet flights Contractor flights bringing staff to classified Nellis/Tonopah sites.
Janis, jans Joint Army/Navy intelligence studies (US).
Jankers Punishment, confined to camp (RAF, colloq.).
JANTX Joint Army-Navy technical documentation (US).
Janus system Doppler radar technique in which frequency shift is measured as difference between beams to front and rear.
JAOC Joint Aerospace Operations Center (USAF).
JAOPA

JAOPA Jamaica Aviators, Operators and Pilots' Association.

japanning Coating with enamel.

JAPCC Joint Airpower Competence Centre [D-47546 Germany] (NATO).

JAPHR, Japhar Joint airbreathing propulsion for hypersonic applications research.

JANPS Jits air-platform network management system (RAF). 

JAR Joint Aviation Requirement[s] [eg Pt 23 light aircraft, 25 based on FAR-25 + national variants, 66 training for maintenance engineers, 145 approval for maintenance organizations; – AWO adds all-weather training for maintenance engineers, 145 approval for aircraft, 25 based on FAR-25 + national variants, 66 JAR system (RAF). 

JARE Joint Air Reconnaisance [US] Intelligence Centre [now part of DGHIA, at RAF Brampton] (UK).

JARS Joint assessment and ranking team.

JAS 1 Joint Airmiss Section, now Airprox (UK, civil/military).

JASA Joint airborne, or avionics, Sigint architecture.

JASC Joint Airmiss Steering Committee (ECAC).

JASDF Japanese Air Self-Defence Force = air force.

JASI Joint airborne signal intelligence family.

JASM Joint air-to-surface missile.

Jasmad Joint Air-to-Surface Missile and Deflection System.

JASMR Joint Aircraft Survivability Program Office (US).

JAST Joint aircraft survivability to Manpads.

JASO Joint Air-Support Organization (UK).

Jaspo Joint Aircraft-Survivability Program Office (US).

JASS 1 Joint Anti-Submarine School (UK).

JASW Joint to Air-to-Surface Standoff missile (US).

JASU Jet aircraft start[ing] unit (US).

JAT Joint affordability team (DoD).

JATCC Joint air traffic control centre (UK).

JATCRU Joint Air Traffic Control Radar Unit (UK).

JATE Joint Air Transport Establishment (UK).

JATEU Joint Air Traffic Evaluation Unit (RAF Brize Norton).

Jato Jet (ie, rocket) assisted takeoff.

Jats, JATS 1 Jamming analysis and transmission selection (ECM).

2 Joint Air Traffic Services.

Jaumann absorber Multilayer RAM (2) absorber consisting of sandwich of Salisbury screens graded from high resistivity at front to low resistivity at back.


Jaws 1 Joint attack weapon systems (fixed and rotary- wing against armour hostile to USA).

2 Jamming and warning system (ECM).

3 Joint airport weather studies.


SAX Rock Joint Survival Systems/Regional Operational Control Center (Adcom).

JB 1 Jet-propelled bomb category (USAFF, WW2).

2 Jet barrier.
JEFTS
JEFTS Joint Elementary Flying Training School (RAF Barkston Heath, since 2003 called DEFTS).
JEM 1 Jet-effects model.
  2 JTRS enhanced MBITR.
jempers JEMPRS (colloq.).
JEMPRS Joint en-route mission planning rehearsal system [typically 10 laptops, Ethernet network and palletized EMS terminal] (US DoD).
Jemtos Jet-engine maintenance task-oriented system.
JENA Jet engine neural analyser.
Jengo Junior engineering officer (RAF).
Jenisys Joint-effects network-integrated system solution.
JEPEX Joint engineer planning and execution system.
Jeppesen Widely used commercially-sold database of airway and airport charts and electronic information, named for Ebroy Jeppesen, whose 1926–40 notes formed basis.
jerk Rate of change of acceleration, V (esp. in ECM target or input motion).
jerk offload Extraction of large unit load from airlifter by sudden pull through ramp door (by parachute, ground extraction system etc).
Jesus nut Holds main rotor to rotor shaft on helicopter or, especially, light autogyro.
JET 1 Joint estimate team.
  2 Joint experimental toolkit.
  3 Turbojet engine (loosely, turbofan).
  4 Calibrated orifices (in carburettor).
  5 To travel by 3.
JET A-Turbine kerosene similar to JP-5; freezes about -40°C; available US only.
JET-A1 Turbine kerosene; freezes below -50°C, flash above 37.8°C; standard commercial fuel.
jet advisory area Specific regions along jet routes extending 14 nm each side of route segment from FL240–410 (radar) or FL270–310 + FL370–410 (non-radar).
jet advisory service That offered to certain civil jets in jet advisory areas; IFR separation or (in radar areas) other jet advisory service (radar).
Jet A-1 wide-range distillate fuel similar to JP-4; freezes below -60°C; vapour pressure 2–3 lb/sq in.
Jet B Disturbance caused by ground running jet engine, hence need for blast fence.
JetCat Joint electronics type designation system (NATO).
jet-edge shear Rate of change of velocity per unit radial distance at outer boundary of jet (1), including on large scale the velocity profile at edge of atmospheric jetstream.
jet engine Any propulsion system whose reaction is generated by a jet (1), thus a turbofan, turbojet or ramjet. Generally used to mean air-breathing, esp. turbofan/turbojet, and thus arguably not a rocket, and certainly not applied to space thrusters of ES, ion, plasma and similar types.
JFCOM
jet elevator Small power-actuated flap, spoiler or ring on skirt or nozzle exit or rocket for TVC.
jet flap Flap through which passes high-energy gas or air flow, discharged along trailing edge.
jet-fuel starter Main-engine starter burning main-engine fuel.
Jetheo Proprietary refractory sheet metal (high-nickel).
Jeti Jet-engine test instrumentation.
  2 Joint European Technology Initiative (Int.).
jet-impingement stagnation pressure That which would be achieved if a high-velocity jet were to be brought precisely to rest on a fixed surface.
jet lag Mild temporary symptoms produced in human beings by fast travel through large meridian difference, ie through five or more time zones.
jet lift Using jet-engine thrust to support V/STOL aircraft.
jet noise To a first approximation, the noise caused by interaction at the edge of a propulsive jet (from a jet engine or propeller) is proportional to the eighth power of the relative velocity. See noise.
jetpipe Pipe carrying hot gas from engine core [in a turbojet, turboshift or turboprop, from whole engine] to propulsive nozzle.
jet propulsion Aircraft propulsion by jet engine(s).
jet route High-altitude route system for aircraft with high-altitude navaids, normally extending from 18,000 ft AMSL to FL450 (FAA).
JETS Joint effects targeting system.
jet sheet High-velocity fluid flow of essentially two-dimensional nature.
jet shoes Astronaut shoes for weightless walking.
jetstream Quasi-horizontal wind exceeding 80 kt (148 km/hr) in warm air at sharp boundary with cold, high troposphere or stratosphere, mid latitudes, predominantly westerly.
jet tab See jet elevator.
jettab Discard fuel, canopy, external stores or other mass to reduce weight or remove a hazard; hence * pipe(s), * pump(s), * handle or switch.
Jets, JETTS Joint effects tactical targeting system, a software-driven C2 tool for managing defensive systems and sensor platforms (UK).
jet vane See jet elevator.
jet velocity In turbojet or turbofan core, proportional to square root of absolute temperature. In rocket, proportional to square root of absolute temperature divided by mean molecular weight of jet.
jetway See bridge.
JEWC Joint Electronic Warfare Center (US).
Jezebel Passive acoustic ASW search system (see Julie) (US).
JFAC Joint Force(s) Air Component; C adds Commander (US).
JFACC JFACC plus space (US).
JFC 1 Jet fuel control.
  2 Joint Force, or Field, Commander.
JFCC Joint Functional Component Command[s] (Stratcom).
JFCOM Joint Forces Command (US).
JFDP

JFDP Joint force development process, broad initiative at inter-service co-operation (US).

JFET Junction field-effect transistor.

JFHQ Joint Forces HQ.

JFI Joint Fires Initiative.

JFIT Joint fires integration and interoperability team (US).

JFL Joint Futures Laboratory (JFC2).

JFN Joint Fires Network.

J-FOCSS, J-fox Joint-force command support system.

JFS Jet-fuel starter.

JFTO Joint flight-test organization.

JFTC Joint Force Training Center (NATO).

JFTL Joint Future Theater Lift [USA–USAF].

JG 1 Jagdgeschwader, fighter unit equivalent to UK group or US wing (G).

2 Junior Grade (USN).

JGr Jagdgruppe, equivalent to UK wing or US group (G).

JCSDF Japanese Ground Self-Defence Force (= army).

JHC Joint Helicopter Command [multi-service, 1999–] (UK).

JHCU Jamming-head control unit; P adds processor.

JHL Joint Heavy Lift, proposed multiservice logistics aircraft (US).

JHNAC Joint helmet-mounted cueing system.

J-HPSSL Joint high-power solid-state laser (US multi-service).

JIF Joint inter-service co-operation (US).

JII Joint integrated air-defense system.

JIGI Joint industrial company, prime contractor interface or services (US).

JIPS Joint Interface Program, between different systems or services (US).

JIR Joint initial, or interim, requirements document.

JIST Joint, or JSF, integrated subsystems technology.

JIT Production Just in time.

JITS Joint Integrated Technical Support (MoD/RAF).

Jitter Transmission of DME pulses with random spacing, to avoid locking-on to another aircraft interrogating same beacon.

2 ECCM technique in which p.r.f. is made to vary unpredictably.

Jitterbug Hand-held rotary buffer/polisher.

Jitters JTRS.

Jiva, JVA Joint intelligence virtual architecture.

JJPTP Joint jet-pilot training programme.

J-Lars, JLARS Joint-liaison advanced radio system (US civil government).

JLD Jet-lag diet.

J-Lens, JLENS Joint-liaison advanced radio system.

Joint attack missile/cruise missile defense elevated netted sensor system.

JM JTIDS module[s].

JMC Johnson Missile Control Center (NASA JSC).

JMCIS Joint Maritime Command information system (US).

JMD Joint manufacturing demonstration.

JMEM Joint munitions effectiveness manual (US armed forces).

JMG Joint Meteorological Group.

JMIG Joint Meteorological Group.


JMSNS Justification of major-system new start.

JMSPO Joint Meteorological System Program Office (DoD).

JMTSS Joint multifunctional trunking and switching system.

JNC Jet navigation chart.

JNI Java native interface.

JNLWDE Joint Non-Lethal Weapons Directorate (DoD).

JNR Jamming-to-noise ratio.

JNT Joint.

JNWPU Joint Numerical Weather Prediction Unit (US 1954–).

JOAC Junior Officers Air Course (RN).

Jonna Joint airborne night navigation and attack.

JOAP Joint oil analysis program (USAF).

Job Card Actual piece of card traditionally used to record in handwriting details of maintenance task, part number and other information required in order to provide authority to draw item[s] from stores. Now becoming obsolete.

Jo-bolt Patented internally threaded three-part rivet.

Joint Operations Centre.
jock, jockey

Jet orientation course.

Jock Combat aircraft pilot (colloq.).

JOCS Joint Operations, or operational, command [and control] system.

joggle Small vertical offset along edge of sheet or strip to allow it to overlap adjacent component.

joggling Local squeezing of sheet-metal parts to improve abutment of mating surfaces.

Johannsen block Super-accurate metal block for reference of various dimensions and surface finishes.

Johnson noise RF thermal noise.

joined wing(s) Diamond wing.

Joint Aerospace Operations Center Carried in MC2A-X to control global task force (USAF).

Joint Aviation Authorities Regulations adopted by Austria, Belgium, Cyprus, Czech Rep., Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Monaco, Netherlands, Norway, Poland, Portugal, Slovenia, Spain, Sweden, Switzerland and UK.

jointery Willing co-operation between armed forces (UK colloq.).

jointship Vague buzzword meaning air/land/sea [space?] is all one conflict.

Joint-Stars One conflict.

joint-use restricted area Restricted area in which, when not in use by using agency (eg USAF), FR or VFR clearance can be given for FAA traffic.

Joint Weather Impact System Automatic database supporting MAAP.

joint-wing Diamond wing.

Joker Fuel planning level selected to warn of imminent approach of Bingo.

JONA Joint Office of Noise Abatement (DoT/NASA).

JOP Junior officer pilot (RAF).


JORD Joint Operational Requirements Document.

JORN Jindalee OTH radar network (Australia).

Josephson junction Formed by weakly linking superconductors at below 4°K, offering immense possibilities 0–1,000 GHz.

JOSS Joint overseas switchboard (DoD).

jostle Powerful RAF active jammer, 1942–45.

JOTS Joint operational tactical system.

JOTT Junior officer tactics team (USN).

joule SI unit of energy [potential, heat or kinetic], $J = Nm = Ws = 10^7erg; MJ = 0.37251 hp-h$.

Joule constant Mechanical equivalent of heat, $= 4.1858 J/15°C$ calorie, used in definition of 15° calorie.

Joule/Kelvin effect Expansion of gas from high pressure through throttling orifice or porous plug; also called Joule-Thomson effect, see next.

Joule/Thomson coefficient Rate of change $\frac{dT}{dP}$ H

where $T = \text{temp}, P = \text{fluid pressure and } H = \text{enthalpy in reversible flow through porous plug}$.

Joule/Thomson cooling Achieved by passing compressed gas through porous plug or small aperture.

Jovial A real-time language for embedded computers [replaced by Ada].

joy Success, satisfaction; thus “no *” = it failed to work (RAF).

joystick Control column (suggest archaic).

JP Jamming pulse.

2 Jet propulsion/propelled/propellant.

JP-1 Original kerosene, Avtur (Jet Propulsion -1) fuel, replaced by Jet A-1, NATO F35.

JP-2 Improved kerosene, soon obsolete.

JP-3 Original wide-cut, including gasolines, kerosene and gas oil fractions.

JP-4 Wide-range distillate, Avtag, FS II, NATO F40, commonly available but reduces pump life and increases fire hazard; equivalent is Jet B fuel.

JP-5 Avcat, NATO F44, denser high-flash kerosene.

JP-6 ‘Heart-cut distillate’, close control, good thermal stability, experimental use only.

JP-7 Special fuel for Mach 3 extreme-altitude aircraft (SR-71).

JP-8 Narrow-cut distillate, Jet A-1, F34, Avtur FS II.

JP-9 Starter fuel for cruise missiles [start at high altitude].

JP-10 High-density fuel developed to extend range of cruise missiles.

J-Pads Joint precision airdrop system.

J-Pals, JPALS Joint precision approach and landing system (USAF/USN, replaced ACLS).

J-Pass, PASS Joint precision advance strike system.

J-Pats, PATS Joint primary-aircraft training system (USAF/USN).

JPC J-tids portable capability (RAF).

JPDO Joint Planning and Development Office [also often called Joint Program Development Office and Joint Planning and Development Organization], charged with developing Ngets (FAA, DoC, DoD, DHS, NASA, White House).

JPF Joint programmable fuze; PO adds Program Office.

JPFI Joint precision interdiction (NATO).

JPTIL Joint prioritized integrated target list.

JPL Jet Propulsion Laboratory, a major facility of NASA, operated by Caltech [Pasadena, CA91109] (US).


JP-10 Joint programme office or organization.

2 Joint planning and development office for the transformation of the US aviation system (White House).

JPS Journal processing system.

JPSD Joint precision strike demonstration [PO adds project office] (USA).

J.P.T. Jet-pipe temperature.

JPTIL Joint prioritized target list.

JPTS Jet propulsion, thermally stable, fuel for ultra-high altitude aircraft [originally for the U-2].


JRB Joint Reserve Base (US).

JRBA Joint Review Board Advisory Committee.

JRC Joint Research Centre (Euratom Belgium/Germany/Italy/Netherlands).

2 Joint Resources Council (FAA).

JRC Co-ordinating Centre (UK).

2 Joint Requirements Oversight Council (DoD).

JRDF Joint Rapid Deployment Force (UK).
**JRDOD**

JRDOD Joint research and development objective document.

**JRFL** Joint [services] restricted frequency list (US military).

**JKIA** Japan Rocket Industry Association.

**JRMIB** Joint Requirements and Management Board (Office of JCS, US).

**JOR** Joint Repair Organization [RAF Cottesmore] (MoD, UK).

**JROC** Joint Requirements Oversight Council (DoD, US) or Committee (UK).

**JRP** Joint Robotics Program (DoD).

2 Joint reconnaissance pod (RAF).

**JRPG** Joint Radar Planning Group (USAF/CAAF, from 1996).

**JRRF** Joint Rapid Reaction Force (NATO).

**JRS** Japan Rocket Society.

**JRSCE** Jam-resistant secure communications programme.

**JRT** Joint Review Team [CAA/industry] (UK).

**JRTC** Joint Readiness Training Center (USA, USAF).

**JS** Job sheet.

**JSA** Jet standard atmosphere.

2 Joint security area.

**JSAF** 1 Joint Sigint airborne family.

2 Joint Sigint avionics facility; LBSS adds low-band subsystem.

**JSAM** Joint Service aircrew mask.

**JSAS** Japanese institute of Space and Astronomical Sciences.

**JSAT** 1 Joint safety analysis team.

2 Joint system acceptance test.

**JSC** 1 Lyndon B. Johnson Spaceflight Center [Houston, TX77058] (NASA).

2 Joint Security Commission (DoD).

3 Joint Steering Committee (ECAC-JAA and JARs).

4 Joint stock company.

**JSCM** Joint supersonic cruise missile (USN).

**JSCMO** Joint-Service Cruise-Missile Program Office (USAF/USN).

**Jscope** Joint synchronized common operational planning environment [provides COP from CAOC] (USAF).

**JSD** 1 Jackson system development (Ada).

2 Joint-Service[s] Designation.

**JSDC** Joint Service Defence College (Greenwich, UK).

**JSDF** Japan Self-Defence Force [=army; A adds Agency].

**J-Sea** Joint second-echelon interdiction (USA/USAF).

**JSESPO** Joint Surface-Effect Ship Program Office (US).

**JSEW** Joint-Service EW; S adds School.

**JSF** Joint Strike Fighter [40+ possible suffixes].

**JSG** Jump-strut [landing] gear.

**J-Ship, JSHIP** Joint shipboard helicopter integration process.

**JSIAF** Joint signal intelligence avionics program.

**JSIC** 1 Joint Security Industry Council.

2 Joint Systems Integration Command (US).

**JSIES** Joint-Services imagery exploitation system (UK).

**JSims** Joint simulation system.

**JSIPS, J-sips** Joint-Services imagery processing[ing] system (US).

**JSLO** Joint-Services Liaison Organization (GJ).

**JSME** The Japan Society of Mechanical Engineers.

**JSMRC** Joint Service Medical Rehabilitation Centre (UK).

**JSOA** Joint Special-Operations Agency (US).

**JSOR** Joint Strategic-Objective Plan (US).

2 Joint Services Operational Requirement (UK).

**JSOW** Joint-service stand-off weapon (US).

**JSP** Joint Services Publication, notably *318, Military Flying Regulations, esp. instrument, approach and departure procedures (UK).

**JSPI** Joint School of Photo Interpretation.

**JSR** Joint Staff Requirement.

2 Jammer saturation range.

3 Jammer support receiver.

4 Jamming-to-signal ratio.

**JSRC** Joint Service Rescue Centre (UK).

**JSRR** Jam/signal ratio required.

**JSS** Joint Surveillance System (replaced Sage/BUIC).

**JSSC** Joint Services Staff College, or Course (UK).

**JSSEE** Joint-Service software engineering environment[s].

**J-Stars** Joint-Stars.

**JSTPS** Joint strategic target planning staff.

**JSTU** Joint Service Trials Unit (UK).

**JSWDL** Joint-service weapon data/links.

**JSWS** Joint-Stars workstation.

**JTA** Joint technical architecture.

**JTAC** 1 Joint Tactical Air Controller.

2 Joint terminal attack control[ler] (US).

**JTACMS** Joint tactical missile system (USA/USAF).

**JTAG** Joint Test Action Group.

**JTAGG** Joint turbine advanced gas-generator (USA).

**JTAGS, j-tags** Joint tactical air/ground station, using IR data from DSP sensors to provide missile defence (USA).

**JTAMD** Joint theater air and missile defense; O adds organisation or office (USA).

**JT&E** Joint test and evaluation.

**JTAO** Joint tactical air order[s].

**JTAV** Joint total-asset visibility.

**JTC** Joint targeting cycle.

**JTC1A** Joint Tactical Command, Control and Communications Agency (US).

**JTCGAS** Joint Technical Coordinating Group for Aircraft Survivability (USN, industry).

**JTCTRS** Joint terminal control training and rehearsal system (USA).

**JTDE** Joint technology-demonstrator engine (APSI).

**JTE** Joint targeting effects.

**JTEG** Joint Test and Evaluation Group[s].

**JTEGG, j-tegg** Joint turbine-engine gas-generator.

**JTF** 1 Joint task force.

2 Joint tactical fusion; P adds program (US).

3 Joint test facility.

**JTGS** Joint Tactical Ground Station (US).

**JTI** Joint Technology Initiative (Acare).

**JTIDS, j-tids** Joint tactical information distribution system (all US Services, most of NATO).

**JTR** Joint transport rotorcraft.

**JTRS** Joint tactical radio system[s]; SCA adds software communications architecture.

**JTRU** Joint Tropical Research Unit.

**JTSO** Joint technical standing order.
JTSTR

JTSTR  Jetstream.
JTT  Joint tactical terminal.
 JTTR  Joint Trials Team.
JTTE Joint Tropical Trials and Research Establishment (Australia).
JTUAV Joint [service] tactical UAV.
JTUW Joint targeting workstation.
JTWG Joint Targeting Working Group (NATO).
JU Joint undertaking.
J-Ucas Joint unmanned combat air system(s) (USAF/USN).
Judy 1 Interceptor has contact and is assuming control of engagement (US).
2 Target in practice interception: I have been hit (UK).
JUEP Joint UAV experimental programme (UK).
JUG Joint Users Group.
jug 1 Piston-engine cylinder.
2 Drop tank (both meanings colloq.).
JUKL ATC association (Yugoslavia, Serbia).
Julie/Jezebel ASW system based on Julie plotting target position from echoes from ≤60 explosive charges detected by Jezebel.
Jumbo, jumbo jet Boeing 747.
Jump Joint upgrade [and] maintenance programme (RAF).
jumper Cable temporarily attached to terminals to bypass part of electric power circuit.
jump jet Jet VTOL aircraft (colloq.).
jumpliner STOL transport (colloq.).
jumpmaster Person in command of stick of parachutists.
jump seat, jumpseat Extra seat in cockpit or on flight deck not required by flight crew, but possibly occupied by authorized member of aircraft crew such as loadmaster.
jumpseat 1 Person occupying jump seat, eg passenger invited to flight deck (rare after ‘9-11’).
jump strut gear Main or (usually) nose landing gear capable of forcible extension to reduce TO ground roll of STOL aircraft.
jump takeoff 1 Autogyro takeoff using stored rotor energy to achieve initial lift at zero airspeed.
2 Jet VTO.

JWTC

JWTC 3 Launch of anti-tank missile with initial jump to operating height.
junction Mating surface between different types (eg p and n) of semiconductor material.
jungle penetrator SAR device lowered into dense jungle by helicopter.
Jungly Assault-transport helicopter, especially crew-member thereof (UK).
Junkers double wing Plain flap mounted entirely aft of wing trailing edge.
junkhead Head of sleeve-valve cylinder.
junkhead ring Gas sealing ring between head and sleeve.
JUP Joint university program.
JURA Joint-use restricted area.
jury strut 1 Additional or temporary strut for particular short-term purpose.
2 Short strut joining mid-point of main wing strut to wing.
juste retour Division of workshares according to a partner-nation’s investment, or commitment to purchase. The Eurofighter programme is the first in which this philosophy is no longer being applied.
Juxco Joint unexploded ordnance co-ordinating office.
JV 1 Joint venture.
2 Jettison vehicle [missile test].
JVATF Joint Vertical Airlift Task Force (DoD, August 2003–).
JV C Jet-vane control.
JVMF Joint variable message format.
J VX Joint-services advanced vertical lift aircraft (US).
JWA Jointed-wing aircraft (microlight).
J-Warn Joint warning and reporting network.
JWC 1 Joint Warfighting Center (JFCOM, Suffolk, VA).
2 Joint warfare capabilities.
JWE Joint Warfare Establishment, Old Sarum [closed].
JWI Joint Warrior, or warfare, interoperability, D adds demonstration.
JWIS Joint Weather Impact[s] System (USAF).
JWTC Joint Warfare Training Centre (Northwood, UK).
K

K 1 Kelvin, used without degree symbol.
2 Telemetry, computing (JETDS).
3 Prefix (non-SI or metric) = 1,000, thus K-bit or K-byte, 32K, K-lb or Kp (kilopounds).
4 Factor of wing planform efficiency, or gain.
5 Tanker (UK and US aircraft category, US being a role prefix).
6 Airfield subgrade 300 lb/cu ft, ie dense concrete.
7 See Knudsen number.
8 Various ratios, eg surface area of solid grain to nozzle throat; or ratio of propeller pitch to diameter at any chosen radius.
9 Circulation round aerofoil.
10 Potassium.
11 Km/h (flight plan).
12 Thermocouple of chrome/alumel type.
13 Invitation to transmit.
14 Knots (depreciated).
15 Smoke, obstruction to vision.
16 Bulk modulus.
17 Vehicle record category: spacecraft (FAI).
18 Diagonal tension factor in web-stiffened sheet; from this is derived the shear-buckling constant \( K_s \).
19 Helicopter rotor reduced frequency \( f_c/2V \).

**K**

K-bit 1,000 bits.
K-chart List of multipliers for calculating setback for bends other than 90\(^\circ\) in metal or other elastic sheet.
K-dinghy For one man (RAF, WW2).
K-display Horizontal timebase shows two blips from target which vary in height if aerial azimuth direction is incorrect.
K-index, K-number Combined measure of moisture content and lapse rate over a range of pressure altitudes.
K-ration Standard field rations (USA, WW2, Korea).
K-loader Standard US military cargo aircraft loader elevating to side-door sill.
K-site Dummy airfield (UK, WW2).
K-wing Usually combination of canard plus slender delta.
K-words Kilo-words.
KAB Message prefix (Morse).
KAB Guided bomb (R).
KADS, Kads Knowledge acquisition data system.
KAF Kenya Air Force.
Kagohl Heavy-bomber unit (G, WW1).
KAI Kaizan Aviation Institute (USSR, R).
Kai Kaizo (modification) suffix (J Army 1932-45).
Kaizen Meetings at which all concerned plan and then implement work flow [clean manufacturing].
Kalman filter Powerful software routine for combining multiple inputs (eg INS output and Doppler radar) to give most accurate single answer.
Kampf Battle, hence * geschwader = battle group [US wing] = bomber group; * Zerstörer = battle destroyer = heavy fighter (G).
Kamsin Hot, dry, southerly wind [Egypt and SE Mediterranean].
kanat Underground aqueduct with surface breather tubes (NATO).
Kan-ban Use of coloured balls, cards or similar symbols to identify exact location of production-line hold-up (J).
Kapitán Commander of a Staffel (G).
Kapse Kernel APSE (software).
Kaption Polyimide materials, esp. age-resistant plastic sheet used as substrate for solar arrays or with gold coating as thermal insulation for spacecraft (DuPont).
Kapustin Yar Soviet ICBM/space ‘cosmodrome’ on flat territory near Caspian.
Karboner Steel D-ring on harness for clipping to ‘dog lead’ to prevent photographer, despatcher or other aviator from falling out of aircraft.
KARI [South] Korea Aerospace Research Institute [1989-].
Karldap Administration centre for Karlsruhe ATC area.
Kármán-Moore Classic (1932) theory for aerodynamics of slender body of revolution travelling nose-first in supersonic gas flow.
Kármán street Endless succession of vortices, alternate left/right and clockwise/counterclockwise rotation, behind vibrating wire or strut in airflow.
Kármán-Tsien Classic (1939 and 1941) theory for compressibility effects on aerofoils, especially variation of \( C_p \) with \( M \); most useful form is
\[
C_p = \frac{(1 - M^2)^3}{2(1 - M^3)} + \frac{1}{2}C_p(1 - \frac{1 - M^3}{M^2})
\]
KAS Killed on active service.
katabatic wind Cold air flowing down mountain slope at night (keeps airfield on slope fog-free).
katie Killer alert threat identification and evasion.
Kaus SE/E winds in Persian Gulf heralding winter depression.
KAZ Air-refuelling unit (R).
KB 1 Construction (design) bureau (USSR).
2 Kite balloon (WW1).
Kb Kilobase.[s]
KBAC Royal Belgian aero club [Flemish language].
KBAS Design bureau for automatic systems (R).
KBF Kalman-Bucy filter.
kb 10\(^3\) bits.
KBO 1 Weapon-system officer (G).
2 Kuiper-belt objects.
kb/s, KBPS Kilobytes per second.
KBS Knowledge-based systems.
The most-used part of runway, along is 273.16K, units same as °C. Thus tk = tc + 273.16, = 5/9 not used; absolute zero is 0K, triple point of water [0°C]

Absolute (SI) temperature scale, degree symbol ° Kelvin

KEK Kinetic-energy kill; V adds vehicle.
KEI Kinetic-energy interceptor.
KEK-49 is called aramid fibre from resemblance to spider web (trade name, DuPont).
KEV/49 is US, Can, A, NZ”, also preferred by Rolls-Royce; former UK name paraffin. Wide range of petroleum-derived fuels, primarily used for aviation turbine engines. Homologous hydrocarbon series with general formula CnH2n+2; first of this series (methane/ethane/propane/butane) are gases at STP, but next 11 are liquids (BPt 150-310°C) and form basis of jet fuels. Over 90 national designations, thus Jet A-1 is (among other things) DEngRD.2494 in UK, DEF(Aust)

240A, AIR 3405C (Fr), VTL 9130 (G), Gost-1027-67 and T-1 (R), FSD-M0754 (Sweden), 3-GP-23h (Canada), BA-PF-3 (Belgium), D1655-70/A-1 (ASTM), F-34 (NATO) and Avtur/FSII (International Service designation). For this fuel, density 0.796 kg/l (c9.6 lb/Imp gal, 8.0 lb/US gal). Other major fuels include Acket narrow-BPt fuel with high flash point (originally for carrier aircraft), Avtur (turbine kerosene, DEngRD 2482, JP-1) and Avtag (turbine aviation gasoline, arguably not a kerosene), originally called JP-4 and in civil use JET B. See flame front.

Kerr cell Extremely fast electro-optical shutter based on glass container of nitrobenzene in electric field.

KET Krypton evaluation technique.
Kettle Section of three fighter aircraft (G, WW2).
Kevalar Fibre-reinforced composite materials with fibre properties superior to those of most glasses. Kevalar-49 is called aramid fibre from resemblance to spider web (trade name, DuPont).
KEW Kinetic-energy weapon[s], especially for SDI.

Key 1 Position at start of letdown to landing, usually hi-

keyed emission CW signal interrupted to convey intelligence.

Keying Interrupting current or signal by make/break switch, eg Morse key.

Keying solution Applied to give strong surface bond prior to application of dope, adhesive, corrosion protection or other coating.

Keys 1 Piano keys.

2 On electronic display, edge keys.

Keystroke 1 Input from an edge key.

2 Basic element in electronic-display writing.

KF Kinetic fires.
KFD Key-fill device.
KFI Krüger flaps indicator.
KIR Kommission für Raumfahrttechnik (G).
KFS Kerosene first stage.

KG Kampfgeschwader, bomber wing (G, WW2).

K/G Kevalar/graphite [IPH adds inter-ply hybrid];
kg Kilogramme[s];
kgf Kilogrammes force or thrust (non-SI);
kgp Kilogrammes force or thrust (poids, pond, puis-
sance).

KGS Japanese Aeronautical Council.
KGV Kryptographic variable (panel).
kGW, KGW

kGW, KGW  Thousands of pounds gross weight (highly ambiguous).

KH  Key Hole series of covert spy satellites (CIA/USAF).

K  Western rendition of Russian X, one of use of which is to designate ASMs.

k, k  Factor for effect of forward speed on suckdown (jet lift).

KhAI  Kharkov Aviation Institute (USSR, Ukraine).

Kharif  Severe dust storm (Somalia).

Khe Sanh  Extremely steep approach and departure (colloq., noun or verb).

KHTT  Know-how transfer and training.

kHz  Kilohertz, thousands of cycles per second.

Ki  Kita (airframe type) number (J Army 1932–45).

Kg  Radius of gyration.

KIA  Killed in action.

KIAS  Knots indicated airspeed.

Kic  Fracture toughness.

kick  Final impulse given by small upper-stage motor to space payload to achieve exact trajectory. Hence * motor, * stage, apogee * motor.

kickback  Brife offered in large-scale contracting.

kicker  Direction needle [SBA, ILS, colloq.].

kick-off drift  In autolanding, separate control signal inserted before touchdown to yaw aircraft parallel to runway (but too late for crosswind to move aircraft laterally from centreline).

Kif  Killed in flying accident.

Kif  Kilometre.

Kifis  Instantaneous vertical speed indicator.

Ki-Gas  Piston-engine hand-priming system drawing fuel from main tanks.

Kifrost  British liquid and paste deicer materials including propylene and other glycols.

kill  1 Confirmed victory in air combat.

2 Destruction of missile or RV in flight.

kill box  Predesignated volume of sky, usually rectilinear, in which air or ground targets are sought.

kill chain  Process linking discovery of target by sensor to lock-on by shooter, also called S2S and TCT.

kill/fuel ratio  Actual or claimed ratio of kills confirmed to losses suffered by a particular unit in a specified period; see kill ratio.

kill probability  Mathematical likelihood, based on experience, that a particular missile or attack will destroy its target.

kill ratio  1 For a particular type of aircraft, total of its air victories divided by its own losses in air combat.

2 Confirmed victories divided by number of hostile AAMs or SAMs launched.

kilo  Prefix, multiplied by 1,000; symbol k. Confusingly, often loosely used to mean kilogramme[s] or even kilometre[s].

kilobyte  Not 1,000 but 1,024 bytes, abb. kb.

kilocalorie  Non-SI unit of energy, often defined as 1/860 kWh, but see calorie.

kilogramme  SI unit of mass, = 1,000 grammes, in US kilogram, abb. kg, = 2.20462 lb. See IPK.

kilogramme-metre  Unit of work in the gravitational system, = 9.80665 Nm or 98,066.500 ergs.

kilohertz  SI unit of frequency, = 1,000 Hz, abb. kHz.

kilowatt  Unit of energy, = 1.000 V, abb. kW.

kilovolt-ampere  Measure of power of a.c. electrical machines, abb. kVA, numerically usually loosely = kW.

kilowatt-hour  Non-SI unit of electrical energy, kWh = 3.6 MJ.

kiloword  Unit of memory storage holding 1,024 words.

kinematic  Rapid conversion in roll of high α [AOA] to sideslip.

kinematic  Aiming ahead of target correct lead angle to allow for target relative motion.

kinematic viscosity  Fluid viscosity divided by density, µ/ρ symbol v. unit m² s⁻¹ (no name) = 10⁻² Stokes = 10⁻⁶ ft² s⁻¹.

kinematic kill  Space interception technique using weapon whose kinetic energy alone provides its direct-impact destructive effect.

kinetic energy  That due to motion: for linear motion \( E=\frac{1}{2}mV^2 \); for rotary \( E=\frac{1}{2}I\omega^2 \) where \( I \) is moment of inertia and \( \omega \) is angular velocity. Unit = joule. Note: symbols T and W are also used.

kinetic heating  Heating of boundary layer and surface beneath due to passage of body through gas, closely proportional to square of airspeed or Mach. For practical purposes synonymous with aerodynamic heating.

kinetic kill  Space interception technique using weapon whose kinetic energy alone provides its direct-impact destructive effect.

kinetic pressure  See dynamic pressure.

kinetic valve  Gas-turbine fuel-system valve in which two jets, one pump delivery pressure, the other pump servo pressure, point directly at each other with a variable interrupter blade where they meet.

kinetic weapons  All forms of projectile including bombs.

kingpost  One or more strong vertical struts above (and sometimes below) aircraft centreline providing attachment for primary flying and landing wires or struts, rare post-1916.

kink point  Any sharp corners on a graphical plot, e.g. of payload/range.

kip  Kilopound, 1,000 lbf (half a short ton), = 4,448.221615N. Not to be confused with kilopond.

kipper kite  Aircraft of Coastal Command [colloq. 1939–45] (RAF).

kips  Confusingly, in view of above, thousands of impulses, or instructions, per second.

KIR, KIR  Kinematic infra-red (flare).

Kirksite  Zinc alloy used for large airframe dies.

Kiruna  Swedish space launch and communications stations.

KIS  Kick-in step.

kiss landing  Touch at near-zero rate of descent.
kitbuilt

kitbuilt  Constructed by customer from factory-supplied kit.

kite  Aerodyne without propulsion tethered to semi-fixed point and sustained by wind.

kite balloon  Balloon tethered to Earth or vehicle and shaped to derive stability (sometimes lift) from relative wind.

kitplane  Aeroplane assembled by customer from factory-built kit.

kitting  One of many aerospace meanings is to furnish item (engine, surface power unit, etc) with fresh consumables (filter elements, harnesses, circlips, gaskets) before reinstallation.

kJ  Kilojoule, joules × 10³.

KJT  Japan Air Self-Defence Force.

kJt  Kinetic kill weapon.

KKV  Kinetic kill vehicle.

KKV  Air traffic controllers assoc. (J).

KJM  Japan Air Self-Defence Force.

KJT  Kinetic kill vehicle.

Kn  Lift slope factor.

Kb  Kilobits.  Kibits.  Pounds (lb) × 10³ [suggest not used without explanation].

KLD  Killed in line of duty, but not in action (US usage).

Klebgel  GRP/foam low-density sandwich materials (Klüber-Colombes).

klg(s)  Kilometre(s) (colloq.).

Kilometre(s) (colloq.).

KLM  Amsterdam airport authority.

KLP  Smoke layer aloft.

KLV  Copenhagen airport authority.

KLT  Smoke layer aloft.

klgs  Velocity-modulated electron-tube UHF oscillator.

Kn  Rare prefix, kiloega (giga).

Kn, K/N  KeVlar/Nomex.

Kn  One-of many aerospace meanings is to furnish item (engine, surface power unit, etc) with fresh consumables (filter elements, harnesses, circlips, gaskets) before reinstallation.

KNA  Kinetic kill weapon.

Knout panel  Portion of skin near pilot or other crew-member, often a window, which can be forced open from inside for emergency escape [esp. after belly landing].

Knot  Standard scale of resistance to knock (detonation) of piston-engine fuels, measured relative to iso-octane (100) (see fuel grade).

Knot  Speed of 1 nautical mile per hour, International and in US = 6,076.12 ft/h = 1.15078 mph = 1.852 km/h = 1.853184 km/h = 1.6878 ft/s = 0.5144 ms⁻¹; in UK = 6,080 ft/h = 1.151 mph = 1.853184 km/h = 1.68 ft/s = 0.51477 ms⁻¹.

KOA  Knocked Original adjective for levered-suspension landing gear.

Knuckle pin  See wrist pin.

KOD  Kick-off drift.

KOH  Potassium hydroxide, used as standard in determining acidity and saponification of fuels, lubricants and hydraulic oils.

KOKY  Smoke over city.

KOLP  Smoke over city.

KOMO  Steel latches over wearer’s chest connecting g-suit and harness to ejection seat and parachute.

KOPS  Smoke over city.

Koncentra  Seasonal variation.

Koru Pakistan.

Korea  Family of aramid/phenolic honeycombs.

Korona-F  Family of aramid/phenolic honeycombs.

Koros-F  Solar observatory launched 2001 (R-Ukraine plus others).

Kosmos  Department of experimental aeroplane construction (US, obs.).

Kourov  CSG.

Kniebein  Navaid derived from Lorenz beam approach (G, WW2).

Knife  Airshow flypast with angle of bank held close to 90°, with top or underside facing audience.

Knife  Close combat, usually one-on-one, (US term).

KNI  Royal Netherlands Meteorological Institute.

Knock-down factor  Arithmetical factor reducing allowable stresses imposed by certifying authority on uncertain structure [e.g. casting with porosity].

Knockdown Kit  Complete aircraft packaged for shipment in component parts for assembly by foreign customer (usually also a licensee).

Knockdown path  The route followed by fire-fighters to a crashed aircraft, esp. the final few metres in which a path is blown through flames.

Knocking  Detonation (1).

Knockout panel  Path the followed by fire-fighters to a crashed aircraft, esp. the final few metres in which a path is blown through flames.

Kneeling  Through front of pilot’s knees.

Knee line  An A5 panel with maximum information for G.A. pilot.

Kneeboard  Historically, a notepad, stopwatch and other items strapped as unit to test pilot’s leg above knee. Today Kneeboard  Instrument or control panel at knee level, below side console.

Knee window  Low side of cockpit [rare except helicopters].
Kovar

Kovar Fe/Ni/Co alloy whose coefficient of thermal expansion is close to that of glass.

Kp Kilopound, also called kip.

kp Kilopond, 1 kgf.

kPa Kilopascal[s], 1,000 N/m², SI unit of pressure.

KPP Key performance parameter[s].

KPS 1 Kilobytes per second.

2 Kills per sortie.

3 Knowledge-processing system.

KPU Keyboard printer unit.

kQ Torque coefficient.

Kraken Knowledge-rich acquisition of knowledge from experts who are non-logicians (USAF).

Kriegsmarine Navy (G, 1933-45).

KRL Khan Research Laboratories (Pakistan).

KPs & ACIs King’s Regulations and Air Council Instructions (RAF ‘bible’ to 1952).

Krueger Not Krüger, leading-edge flap normally flush with undersurface, hinged down and forward to give bluff leading edge on high-speed profile.

Krypton Kr, inert gas, density 3.7x10⁻³, BPt -52°C.

Ks Factor of takeoff distance.

Ksu Spin-up factor on wheel hitting runway, = f (t su/tn), spin-up time and natural period of gear in fore/aft vibration.

KTT Geometric stress-concentration factor.

Kuttasimmons The strength of the circulatory vortex on the underside of the wing is equal and opposite to that on the upper surface, \( \Gamma_l/\Gamma_u \) = 0

Kutta-Zhukovsky Formula giving lift per unit span as

\[
K = \frac{\rho}{\rho_u} V (circulation/\text{span})
\]

for two-dimensional irrotational inviscid flow.

KVA Kilovolt-ampere[s].

KVAR kVA-reactive, measure of reactive power.

KV Keyboard visual display terminal.

KW 1 Kinetic warhead.

2 Key word; IC and OC add in, or out of context.

kW Kilowatt[s].

kVA Kilovolt-ampere[s].

kVAR kVA-reactive, measure of reactive power.

KVD Keyboard visual display terminal.

KW / Kinetic warhead.

kW Kilowatt[s].

kWh Kilowatt-hour[s].

KWS Kampfwerterhöhung (G).

Kx, Ky ‘Engineering’ drag and lift coefficients.

kx, ky Respectively, helicopter rotor longitudinal and lateral inflow gradients.

Kymograph See barograph.


Kyoun Combination kite + balloon or kite-shaped balloon.

kZ Vertical component of VSI (1).

kZB Drop tank (G).

KZO Mini-RPV for target detection and location (G).

kxk 1,000 x 1,000 pixels.

kΩ Kilohm.
L 1 Characteristic length of body; also used for linear spacing of frames, alternative to b.
  2 Total lift, or section lift of helicopter rotor.
  3 Sound pressure level, see Noise.
  4 Inductance; unit, henry.
  5 Luminance, brightness.
  6 Distance to applied load.
  7 Low (naval category), under 18,000 ft and En Route Low-altitude chart (FAA).
  8 Low (synoptic chart).
  9 Rolling moment.
 10 Countermeasures (JETDS).
 11 Lighted (airfield).
 12 Code: IFR aircraft has DME and transponder.
 13 Fighter designation prefix, low-altitude (UK, WW2).
 14 Aircraft category, glider (prefix, USN, 1941–45), liaison (USAF from 1942, USN from 1962).
 16 Left (ident of parallel runway).
 17 Lower wing.
 18 Angular momentum.
 19 In-line (piston engine).
 20 Drizzle (ICAO).
 21 Latitude.
 22 Light (turbulence).
 23 Locator.
 24 Licensed airport.
 25 Cleared to land.
 26 Local.
 27 Launch time of mission.
 28 Low-intensity [airfield lighting].
 29 Level [fluid].

L 1 Litre[s].
 2 Aerofoil section lift.
 3 Length of beam, or aircraft overall length, or length of influencing vortex filament.
 4 Distance from c.g. of aeroplane to c.p. of horizontal tail.
 5 Stagnation line.
 6 Terrestrial longitude.
 7 Subscript, lower surface.

L Average peak sound pressure level.

L Section lift of 2-D aerofoil [lift per unit span, normal to freestream].

(L) Lower-airspace radar service, preceded by frequency.
L.1 L-band carrier 1,575.42 MHz (GPS).
L.2 L-band carrier, 1,227.6 MHz (GPS).
L.2CS Two GPS codes, one with navigation data, for improved accuracy for civil users.
L.3TV, L.7TV Low-light-level TV.
L.5 Third civil GPS frequency at 1,176 MHz, to be introduced 2005.
L.lasson Sound pressure level for octave band 300/600 Hz, see noise.

L-band See Appendix 2.

L-display Central diametral timebase (usually vertical) on which appear transmitter and target blips at position giving range and offset according to pointing error.

LA 1 Lighter than air.
  2 Launch azimuth.
  3 Loiter altitude.
  4 Limited authority.
  5 Limited operation.
  6 Latvijas Aeroklubs (Latvia).

LAA 1 Light anti-aircraft gun or gunfire.
  2 Low-altitude airspace.
  3 Local-airport advisory.
  4 Lowest acceptable altitude.
  5 Low-altitude alert [S adds system].
  6 Laboratory of Applied Anthropology.
  7 Laser altimeter.
  8 Light Aircraft Association [Turweston Aerodrome, Brackley, NN13 5YD] (UK).

LAAAS, LA’S Low-altitude airfield-attack system.

LAAD Low-altitude air defence; S adds system.

LAADR Low-altitude airway departure route.

LAAC Local Authorities Aircraft Noise Council (UK).

LAAT Laser-augmented airborne TOW.

LAAS Laboratoire d’Automatique et d’Analyse des Systèmes (F).

LAAS Laboratoire d’Automatique et d’Analyse des Systèmes (F).

LAAP Low-altitude autopilot.

LAAS Laboratoire d’Automatique et d’Analyse des Systèmes (F).

LAASH Litef analytical air-data system for helicopters.

LAAT Laser-augmented airborne TOW.

LAAS Laboratoire d’Automatique et d’Analyse des Systèmes (F).

LABV Large advanced ballistic re-entry vehicle.

Labs Low-altitude bombing system (guidance for upward toss of NW).

labyrinth seal Gas seal between fixed and moving parts comprising series of chambers which, though their sides do not quite touch, reduce gas escape close to zero.

LAC Leading Aircraftman (RAF, obs.).

LACAC Latin American Civil Aviation Commission [from 1969].

LACC London Air Control Centre.

Lace 1 Laser airborne communications experiment.
  2 Liquid air cycle engine.
  3 Low-power atmospheric compensation experiment.

Lacie Large-area crop inventory experiment.

Lacing Process of intermittent wrapping to join wire bundle into tight loom.

Lacking moral fibre Condition, often unfairly diagnosed, which resulted in aircrew being instantly removed from
Cascade of electrical sub-circuits each ladder network LADD

LACW Leading Aircraftwoman (WRAF).

LACM Land-attack cruise missile.

LACM Land Attack Cruise Missile.

LACM Land Attack Cruise Missile.

LAD Local Authorities Co-ordinators of Regulatory Services (UK).

Ladar See lidar.

LADD Low-altitude (or angle) drogue delivery.

Ladder network Cascade of electrical sub-circuits each controlled by its predecessor (central to test equipment).

LADF Lift augmented ducted fan.

LADGPS Local-area differential GPS.

Lading Placing load on aircraft, including bar stocks and food trolleys, excluding passengers and fuel.

Lado, LADO Launch, anomaly and disposal operations (Navstar).

LADS, Lads Lightweight air-defence systems.

LAE Low-altitude extraction (para-drop cargo).

LAEO Low-altitude electro-optics, or optical.

LAES Landing Aids Experiment Station (Arcata, CA, from 1946).

LAF Load-alleviation function.

LAFT Light-aircraft flying task (RAF).

LAFTS Laser and FLIR test set.

lag Angular crankshaft movement between a reference position (TDC, BDC) and open/closure of a valve.

Δlag Angular movement of electrical vector between reference position and current vector or other waveform.

Lag-plane damping Damping of fundamental mode of rotor system; critical for suppression of various instabilities, esp. ground and air resonance; expressed as % critical damping in non-rotating condition.

Lagrangian co-ordinates Identify fluid parcels by assigning each a series of time-invariant co-ordinates such as transient spatial position. Constant-pressure meteorological balloon observations are Lagrangian.

Lagrangian points Five positions in space where free body could maintain station with respect to satellite in existing two-body (eg Earth/Moon) system.

LAH Light attack helicopter.

Lahaw, LAHAWS Laser homing anti-tank.

LAHC Lincolnshire Aviation Heritage Centre.
land

land Return to Earth or planetary surface of land-based vehicle; marine touchdown, preferred word is ‘alight’. land and hold short Instruction by controller to landing aircraft to stop before first intersection or designated hold-short point to avoid conflict; recipient must tell ATC immediately if this clearance cannot be accepted. land arm Display signifying system is functioning in autoland mode. land breeze Offshore wind, towards sea. L&D Lateral and directional stability test. lander Spacecraft designed for soft landing on Moon or planet. landing The act of bringing an aerodyne under full control back to land surface landing angle Usually means angle between OX axis and ground at moment of touchdown. landing area Area of unpaved airfield reserved for landing and takeoff. landing beacon or beam Not recognized terms. landing charge Tax levied as part of airport charge. landing circuit Term used by Royal Navy in carrier operation. landing compass Precision magnetic compass on bubble-levelled tripod used as master when swinging aircraft. landing crew Large team(s) of handlers used in airship operations to hold ropes and manoeuvre ship to mast or walk it into hangar. landing direction indicator Visual device [eg tee, tetrahedron] at uncontrolled airfield. landing distance, LD Distance from runway threshold to aircraft stopping point. landing distance available That declared to be available by airfield authority. landing flare Released by aircraft over unlit airfield immediately before landing. landing forecast Met. forecast for destination at ETA, or nearest equivalent. landing fuel allowance, LDG, ldg, LFA Fuel mass required for theoretical circuit (go-around), landing and taxi at destination. landing gear Any portions of aircraft or spacecraft whose function is to enable a landing to be made; this includes wheels/skis/floats and attachments, and hook, but not flaps or lift-dumpers. Maximum speeds are usually prescribed for flight with * extended, as well as a lower maximum for cycling [act of retraction or extension], also called LGOS. landing gross weight Total weight of aircraft at point of touchdown in a particular landing, normally less than MLW. landing ground See airfield. landing light Forward-facing aircraft headlight, usually retractable or on nose or in leading edge, formerly to illuminate airfield and now used mainly as anti-collision or anti-bird beacon and for illuminating surface taxed over. landing loads Loads acting through structure of aircraft or spacecraft in design ultimate severe landing (or arrested landing). landing long Landing to touch down far down the runway. landing mat Various definitions, including flexible mat to reduce erosion or ingested debris in jet VTOL over unpaved surface. landing minima Worst weather, especially in terms of visibility, for legal landing; see weather minima. Traditionally involves DH and MDH. landing on, landing-on Recovery of aircraft on carrier, or helicopter on deck, by normal landing. landing party Landing crew (UK). landing point Intended or achieved point of MLG touchdown. landing radar Radio altimeter used by soft-landing spacecraft (rarely, by aircraft). landing run Actual achieved distance from touchdown point to stopping point. Also called roll or rollout. landing runway Runway assigned to arrivals. landing site Target for soft-landing spacecraft. landing speed Generally, TAS (sometimes defined as minimum TAS) at touchdown; plays no part in normal operation, which is based on VMCT and VAT. landing surface Those areas declared by airfield authority to be available for landings. landing tee Large T-shaped sign in signals area of simple lightplane field, rotated to show wind direction. landing weight Predicted total mass of aircraft at landing. landing wires Bracing wires used to bear landing loads (eg sag of wings); also known as anti-lift wires. landing zone Area surrounding airfield where allowable heights of obstructions are limited (arch.). land mine In 1940 Germany discovered magnetic mines could be countered, so existing stocks were fitted with direct-impact fuzes and dropped (retaining the parachute) on British cities, receiving this name by recipients. land on To land an aircraft on ship, especially carrier. landplane Aircraft designed to operate from land or aircraft carrier, including ice or snow on skis. Landsat Earth-resources satellite. LANE, Lane Low-altitude navigation equipment. lane 2 One conductor wire of a fly-by-wire or autopilot channel; in most modern flight-control systems there are three channels, each having three lanes. 2 One hyperbolic track in early Gee or Decca navigation. 3 One passenger guideway down escape slide. 4 Queues at check-in or departure security. lanes Furrows on sea surface indicative of wind direction. Langley NASA research centre near Hampton, VA. abbr. LaRC. Langmuir-Blodgett Film one molecule thick deposited on substrate in manufacture of very-high-speed devices. LANL Los Alamos National Laboratory (New Mexico, US), see LASL. Lannion French space communications ground station. Lans, Lans Land navigation system. Lansu Local air-navigation service unit (ATC). lanthanum La, soft silver metal, density 6.1, Mpt 921°C. Lantirn Lo-altitude navigation[al] targeting IR for night (autonomous pod-mounted fire-control linked to HUD). LAP 1 Large-scale advanced propeller or propfan. 2 Load, assemble and pack. lap 1 To fit two mating metal surfaces by rubbing together with fine abrasive. 2 Crankshaft angular movement with inlet and exhaust valves open. 3 Overlap (air reconnaissance). 4 See laps.
Lapads
Lapads Lightweight acoustic processing and display system.
Lapam Low-altitude penetrating attack missile.
Lapan National Institute for Aeronautics and Space (Indonesia).
LAPB Link access protocol, balanced.
LAPCB Live Animals and Perishable Cargo Board (IATA).
Lapels Large automated production of expendable launch structures.
Lapes Low-altitude parachute extraction system.
lap joint One sheet edge overlapping its neighbour.
LAPL Light Aircraft Pilot Licence
Laplace Name given to chief class of integral transforms, to elliptic partial differential equation and basic theorem on probabilities.
lap pack Parachute pack carried on seated wearer’s lap.
laps Local analysis and prediction system.
laps Flaws in surface of steel castings.
lapse rate Rate of reduction of temperature with height in atmosphere (see dry adiabatic **, wet adiabatic **).
LAPSS Laser airborne photographic scanning system.
lap strap Primitive seat harness with single belt across lap, almost universal in civil transport aircraft.
LAR Live-animals requirements (IATA).
LARA Light armed reconnaissance aircraft.
LARC Low-altitude radar altimeter.
LARC Low-altitude ride control (Softride); system for reducing vertical acceleration on crew compartment in high-speed flight through gusts.
LaRC Langley Research Center, [Hampton, VA, from 1920] (NASA).
large aircraft Over 12,500 lb (5,670 kg) MTOW (US).
large bird Mass 4 lb, 1.8 kg.
large-scale integration Typically c1,000 circuits, gates or logic functions on each chip; accepted upper limit is 16 kbit, above which is VLSI.
large space structure Assembly of beams and girders having overall dimensions in range of hundreds of metres, posing unique problems of vibration and attitude control.
Larmor precession Motion of charged particle attracted to fixed point in overall weak magnetic field.
LARS Lower-airspace radar advisory service (UK NATS).
Lassie, LASSIE Low airspeed sensing and indicating equipment (helicopter and VSTOL).
lasers and space optical systems Large-aperture space surveillance (optical) (Darpa).
lasers Laser/flight performances 
Lasers and space optical systems.
laser shock peening Rapidly repeated firing of high-power laser to cover surface of metal part to increase resistance to crack propagation [the laser fires through a film of water which sends a shockwave into the material].
laser ranging Radar technique but using laser to illuminate target, range being function of time of return journey to target.
laser reference system Gives attitude/heading, more precise than AHRS.
laser shock peening Rapidly repeated firing of high-power laser to cover surface of metal part to increase resistance to crack propagation [the laser fires through a film of water which sends a shockwave into the material].
laser shock peening Rapidly repeated firing of high-power laser to cover surface of metal part to increase resistance to crack propagation [the laser fires through a film of water which sends a shockwave into the material].
LATCC London Air Traffic Control Centre (West Drayton, UK).
latching indicator

**latching indicator** Instrument giving visual indication of security of door locks and pressure seals.

**late-arming switch** Sub-circuit in aircraft weapon-control system, enabling arming of weapons or firing circuits to be left until moment of firing.

**latency** 1 Delay in response of flight-simulator motion platform.

2 Delay between gathering intelligence and using it.

3 Time lag between satcom transmission and reception.

**latent heat** Absorbed or emitted when material changes physical state.

**lateral axis** Transverse OY axis, axis of pitch rotation.

**lateral clinometer** See cross-level.

**lateral-control criterion** Helix angle, described by wingtip in max-rate aileron roll: $p/b2V$ where $p$ is roll rate, $b$ span and $V$ airspeed.

**lateral-control departure parameter** One method of studying loss or reversal of control in roll, for adverse yaw or other reason.

**lateral datum** The transverse line passing through c.g. = lateral axis.

**lateral deviation** Error in radio D/F caused by refractions or refractions.

**lateral divergence** Traditionally, a combination of roll, yaw and sideslip which precedes a spin, or accelerating spiral descent.

**lateral force** Forces acting parallel to line joining wingtips.

**lateral gain** Width of fresh ground covered by each photo-reconnaissance run over area.

**lateral qualities** Behaviour in roll.

**lateral oscillation** One involving periodic roll, invariably with yaw and sideslip.

**lateral-rotor helicopter** Main lifting rotors side-by-side.

**lateral separation** Distance between parallel tracks of aircraft at same FL.

**lateral stability** Stability in roll (secondarily, yaw and sideslip), measured by studying phugoid oscillation (stick free or fixed) following roll disturbance.

**lateral translation** Manoeuvre possible with direct-force-control aircraft in which lateral velocity is commanded without change in heading.

**lateral velocity** Speed component, usually relative to surrounding air, along line parallel to OY axis.

**lateral tell** Communication of air surveillance and air target data sideways to other units along front.

**late turn** One initiated at or after fix passage at waypoint.

**LATEX** Laser assoocié à une tourelle experimentale (F).

**Latis** Lightweight airborne thermal imaging system.

**Latisha** Laser analysis and testing for intelligence, surveillance and hybrid applications (USAF).

**latitude band** Between two parallels of latitude around Earth.

**latitude nut** Screwed in or out on directional gyro (DI) to correct drift due to Earth rotation N or S of Equator.

**LATN** Low-altitude tactical navigation area.

**latr** Compass locator.

**LATS** 1 Launcher automatic test set (Varo).

2 Large-aperture tracking system.

**lattice fin** A misnomer, not a fin but a powered control surface featuring a rectilinear criss-cross of flat surfaces. Also called trellis control.

layered defence

**launch** In addition to obvious, also take-off of manned combat mission.

**launch bar** Towing link between catapult and nose leg.

**launch complex** Entire ground facilities for launch of large space vehicle, probably including facilities for integration.

**launch control centre** Manned room in launch complex from which countdown and launch, and possibly whole mission, are monitored and controlled.

**launch cost** 1 Sum charged for placing customer’s payload in desired orbit.

2 Nominal sum estimated, but not necessarily available, for design, development, construction and test of new major aircraft or engine; usually to certification in country of origin.

**launch cycle** Typically 105 min, average time between launch and recovery for carrier aircraft; AEW/ASW can be launched for a double cycle.

**launcher** 1 Interface unit between aircraft and externally or internally carried store, not necessarily with propulsion.

2 Container of tubes for firing unguided rockets, carried as external store or as retractable box.

3 Pad or other structure for land- or ship-based missile, space vehicle, RPV or unmanned free-flight device.

**launch escape** Ability of human crew to escape from slow-acceleration ballistic vehicle during countdown or in first seconds of flight, thus ** tower, ** motors, ** signal.

**launch opportunity** Period in which all factors, including launch window, local weather and serviceability of all participating systems, is favourable.

**launch pad** Platform with GSE for launch of ballistic vehicle, normally a fixed installation.

**launch reliability** Percentage of planned missions on which combat aircraft took off on time.

**launch time** Actual time for start of mission, esp. for large vehicle or ICBM, or strategic bomber already on runway with NW on board.

**launch vehicle** Vehicle providing propulsion for space payload or, rarely, atmospheric free-flight device; may be winged or ballistic but must lift off from Earth and impart nearly all impulse required.

**launch window** Exactly defined period during which relative positions and velocities of Earth and other bodies are such that a particular interplanetary mission can be launched, may last minutes to days, and may be a unique opportunity or repeated at intervals.

**LAV** Least absolute value.

**LAW** Light anti-tank (or anti-armour) weapon.

**LAWM** Lashenden Air Warfare Museum (UK).

**LAWRS** Limited aviation weather reporting station.

**LAWS** 1 Light aircraft warning system (UK Met. Office).

2 Lightweight aerial warning system (US).

**LAX** 1 Limited-area automatic extraction.

2 Single noise event; more precisely L$_{AC}$, see noise.

3 Lay Adjust aim of weapon in azimuth, elevation, or both (obs.).

2 Spread aerial smoke screen.

3 Laydown Release free-fall bombs in level flight at low altitude.

**layer** Either of two ionised shells around Earth, called E and F, which see.

**layered defence** 1 System for protecting fixed-base...
ICBMs by providing separate sensor/weapon systems for interception of hostile RVs at different altitudes.

2 More generally, any air defence system designed to assign different types of weapon to threats approaching in different height bands.

lay off  To redraw engineering part to full scale (has other meanings concerned with aiming).

layoff  Off-loading temporarily surplus employees (US).

layout 1 Gross spatial arrangement of parts of aircraft (see configuration [2]).

2 Arrangement of above-floor payload accommodation, eg one-class *.

3 Arrangement of drawings on sheet of paper; hence * draughtsman.

lay-up 1 Basic assembly of parts for FRC structure before bonding under pressure and possibly heat.

2 To withdraw aircraft from service for modification or rebuild.

lazy eight  Flight manoeuvre in which nose describes figure 8, upper half above horizon and lower half below.

LB 1 Light bomber.

2 Glider, bomb-carrying (USN, 1941–45).

3 Light bombardment aircraft category, USAAC 1924–32.

4 Laser beam.

5 Free balloon.

lb 1 Pound[s] mass, from Latin libra; as the plural is librae

2 Pounds force.


LB film 1 Layer (FAA).

2 Lifting condensation level.

LBA 1 Luftfahrt Bundestamt [office of civil aviation; D-38020 Braunschweig] (G).

2 Local boarding application, host boarding gate control.

LBC 1 Linear block (digital) code.

2 Locator back-course marker.

LBF 1 Pounds force.

2 Pound(s) force, static thrust.

LBF 1 Basic assembly of parts for FRC structure.

LBG 1 Low-cost ballast.

2 Liquid methane.

LBG 1 Leadless ceramic chip-carrier.

3 Load-carrying composite.

LBI 1 Launch-control-centre computer.

2 Launch-control center.

3 Launch-control facility.

LBJ 1 Local call, or control (FAA).

LBJ 1 Low-band jammer; A adds antenna, T transmitter.

2 Low-bit rate.

3 See next.

LBRG, lbrg  Laser beam-riding guidance.

LSA 1 Low-band structural array.

LBSAD 1 Land-based strategic deterrent, to replace existing ICBMs by 2018 (USAF).

2 Laser-based strategic deterrent [concept].

LBS 1 Low-band subsystem.

LBS 1 Load-carrying composite.

2 Low-cost inertial.

LBS 1 Laser countermeasures.

LCM 1 Cargo aircraft, cold-weather operation (USAF, USN).

2 Local call, or control (FAA).

3 Inductance/capacitance.

4 Letter contract.

5 Least-cost.

6 Liquid crystal.

7 Light-case.

8 Load centre.

LCA 1 Light combat aircraft.

2 Large civil aircraft.

3 Layered component architecture.

LCAAS 1 Low-cost autonomous attack system.

LCAC 1 Landing craft, air-cushion.

LCAS 1 Light close air support.

LCAV 1 Line of constant bearing.

2 Liquid-cooled brake.

3 Lowest compliant bidder (NATO).

LCC 1 Life-cycle cost.

2 Launch-control centre.

3 Launch-control facility.

LCC 1 Low-cost inertial.

2 Load-carrying composite.

3 Load-carrying composite.

LCL 1 Low cost.

2 Liquid-cooled brake.

3 Liquid-cooled brake.

4 Low-cost cruise-missile defense (Darpa).

LCCP 1 Launch-control [SAM] computer program.

LCD 1 Liquid-crystal display.

LCDB 1 Low collateral damage bomb.

LCP 1 Lateral-control departure parameter.

LCS 1 Limited-capability Earth station.

LCF 1 Low-cycle fatigue; C adds counter, D damage, M meter.

2 Launch-control facility.

3 Link control field.

LCG 1 Launch-control centre.

2 CBW measure, lethal concentration in atmosphere required to kill 50% of exposed population.

3 Lateral-control central actuator[s].

LCM 1 CBW measure, lethal concentration in atmosphere required to kill 50% of exposed population.

2 Local base rescue.

3 Local base rescue.

LCN 1 CBW measure, lethal concentration in atmosphere required to kill 50% of exposed population.

2 Liquid-cooled blood.

3 Liquid-cooled blood.

4 Local command centre.

5 Lowest compliant bidder (NATO).

6 Local command centre.

LCR 1 Liquid-crystal light valve.

7 Line of constant bearing.

LCR 1 Launch-control facility.

2 Local command centre.

3 Local command centre.

LCR 1 Launch-control facility.

2 Local command centre.

3 Local command centre.

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3 Local command centre.

LCR 1 Launch-control facility.
LCMS

2 Landing craft, medium.
3 Late change message.
4 Linear chirp modulation.
5 Lance-cartouches modulaire.
6 Logic control module.
7 Lithium/carbon monofluoride.
LCMS 7 Low-cost missile system.
2 Local control and monitoring system.
3 Learning content management system.
LCN 1 Load classification number; scale of values for paved surfaces indicating ability to support loads without cracking or permanent deformation.
2 Logistics control numbers.
3 Local communications network.
LCO 1 Life-cycle-oriented.
2 Launch control officer.
3 Limit-cycle oscillation.
4 Low-cost operation[s].
LCOS Lead-computing optical sight; S adds system.
LCS Liquid crystal on silicon.
LCP 1 Leachable chromate primer.
2 Launch control, or command, post.
3 Landing craft personnel.
4 Lighting control panel.
5 Last clicked position.
LCPT Laboratory for civil engineers (F).
LCTR 1 Laboratory for civil engineers (R).
LCTD Located.
LCU Location (FAA).
LCTR, Lctr Locator, suffixes M, O = middle or outer marker.
LCTSB Low-cost simulation testbed.
LCT 1 Longitudinal cyclic trim.
2 Local civil time.
3 Landing craft, tank (WW2).
LCTD Located.
LCVR Location (FAA).
LD 2 Landing distance
3 Load device, prefix for designations of standard family of cargo containers and pallets, each of particular dimensions and with certificated permissible load.
4 Loading dock.
5 Low-drag.
6 Lower deck.
LDa D (daytime) weighted sound pressure level.
LD D Lift/drag ratio.
LDa CBW measure of lethal dose; that which kills 50% of exposed population.
LDA Localizer-type directional aid only.

LDU

LDA, LDa Landing distance available [H adds helicopter].
LDB Launch data-bus.
LDC 1 Less-developed countries (ICAO).
2 Lower-deck container.
3 Landsat data continuity [M adds mission].
LDCC 1 Leaded chip carrier.
2 Lower-deck cargo compartment.
LDCM Landsat data continuity mission.
LDCS Local-departure control system, complete passenger-handling for non-hosted carriers.
LDDC London Docklands Development Corporation (Stolport).
LDDI Less-developed defence industries.
LDEF Long-duration exposure facility (Shuttle).
LDG Lift due to deflection (aeroelastic or surface rotation), thus L_{DG} = lift of tail due to deflection.
LDI Noise level density, noise from all sources summed through each 24h (EC proposal).
LDFL Lower DFL.
LDG, Ldg 1 Landing gear.
2 Landing.
LDGP Low-drag general-purpose (bomb).
LDP Low data-rate.
LDPS Local-area differential GPS.
LDHD Low-density high demand.
LDI Landing direction indicator.
LDIN Lead-in (light system).
LDL Lower-deck lavatory.
LDM 1 Linear delta modulation.
2 Lift/drag meter.
LDMax Maximum attainable L/D.
LDMCRC Lower-deck mobile crew-rest container.
LDMX Local digital message exchange (secure terminals).
LDDI Limited-duty officer (USN).
3 Landing decision point (helicopter operations from small platforms).
LDPU Link and display processing unit (ATC).
LDuu Link and display processing unit; SCAM adds strike camera.
LDR Landing distance required.
LD L/D for maximum range.
LDRF Laser designator rangefinder.
LDRI Laser dynamic range imager.
LDRU Light-duty release unit.
LDS 1 Layered-defence system.
2 Lithium-doped silicon.
3 Laser detecting set.
4 Laser dazzle sight.
LDSD Look down, shoot down.
LD-SVR Landing slant-visibility meter.
LDT Local daylight time.
LDU 1 Lamp driver unit.
2 Launcher decoder unit.
LEAD

LEAD 1 Limiting descent velocity.
2 Laser Doppler velocimeter.
3 Local Defence Volunteers [1940, in 1941 became Home Guard] (UK).
Ld  Landing weight.
LE 1 Leading edge; now has confusing additional meaning arising from expression ‘* of technology’, signifying the very latest advances into unknown fields.
2 Life extension.
3 Link established.
Le  Lewis number.
LEA Leurre [lure] electromagnétique actif (F).
LEAA Law-Enforcement Assistance Administration (US).
lead 1 Angular measurement of many variables (eg crankshaft motion between opening of exhaust value and TDC, or AC vectors related to zero-lead reference).
2 Angular distance between sightline to moving target and direction of aim to hit it.
3 First aircraft in element, or first element in large formation.
4 Dominant member of formation aerobatic display duo or team; role is to fly sequence precisely, without looking at No 2.
5 Different pronunciation, Pb, soft ductile metal, density 11.4, MP 334°C.
lead aircraft 1 Aircraft with greater flight time than any other of similar type or using similar airframe.
2 Obviously, that leading a formation or group; see leadplane.
lead angle See lead (2).
lead azide Explosive triggered by mechanical deformation, used in detonators.
lead-computing sight Gyro or other sight sensitive to flight manoeuvres and providing a direct aiming mark to be superimposed over the target.
lead fuel Containing small percentage TEL as anti-knock additive.
leader cable Electrically conductive cable buried along centreline of runway and taxiway to provide ground guidance in zero visibility.
lead-in 1 Formerly ground facilities and features between outer marker and threshold.
2 Tube through which aerial or towed MAD bird cable enters aircraft.
lead-in fighter Advanced jet trainer with which pupil can practise fighter missions, with sensors and weapons.
leading Angular displacement ahead of normal rest position of main-rotor blade of rotary-wing aircraft.
leading edge 1 Front edge of wing, rotor, tail or other aerfoil. Not precisely defined and, especially when made as detachable unit, extends to rear of 0% chord.
2 Rising slope of electronic pulse, esp. one on precise timebase, as in CRT, IFF, video etc.
3 Frontier of knowledge (see comment under LE).
leading-edge flap Any hinged high-lift surface attached to the leading edge but not forming the leading edge itself (ie, not a droop).
leading-edge radiator Piston-engine radiator incorporated into wing ahead of front spar.
leading-edge root extension Sharp increase of wing chord at LE root, often almost flat and projecting ahead of wing profile proper, to cause strong vortex at high AOA and enhance lift, control and manoeuvrability. In extreme (long-chord form) becomes a large strake.
leading-edge sweep Angle between local (or, sometimes, mean) leading edge and OY axis.
leading panel The FSW in an oblique [slew] wing aircraft.
leading sweep Curvature of propeller blade towards leading edge [rare-after 1914].
lead/lag axis The quasi-vertical axis at or near the root of a helicopter rotor blade about which the blade can pivot forward or lag to the rear.
leadplane That guiding fire tankers to the retardant drop zone, orders sequence and approach path, watches for conflicts and relays altimeter setting (USFS).
lead pole Connects cable to tow banner.
lead-pursuit Traditional air-to-air attack using fixed guns, approach from rear and aiming ahead of crossing target.
lead-replacement petrol UK term for piston engine gasoline in which lead is replaced by VSR additives; in 2002 not yet approved for aviation.
LEADS, Leads Law-enforcement agencies data system (airport com. systems).
lead ship Prominently marked aircraft on which large day bomber formations formed up before setting course.
lead time Time between (a) placing order for bought-out item, or (b) starting fabrication of major airframe part or even (c) receiving heavy plate or other raw material, and emergence of finished aircraft. Expression also, incorrectly, used for time between ordering aircraft and its delivery.
leaf brake Power tool for making radiused straight bends in sheet.
leaf seal Air or gas seal comprising a dense ring of thin foil blades, sloping in the direction of rotation, surrounding a shaft.
leakage Loss of aerostat gas.
leakage drag That due to local flows between fixed [eg, wing, tailplane] and movable parts of aircraft.
leaky turbojet Turbofan of very low BPR (under 0.5).
lean 1 Of fuel/air mixture, below stoichiometric, lacking fuel.
2 Linear distance at tip between position of backwards-leaning rotor blade (usually of gas-turbine compressor or helicopter) and position it would occupy if truly radial; the lean is sometimes along the tip-path line and sometimes along chord line at tip.
Lean Aerospace Initiative Programme by the SBAC and six UK universities to adopt the best practices in lean tools and processes (Toyota) to the aerospace industry. A major difference is that, unlike the motor industry, aerospace involves a great deal of non-recurring activity.
lean manufacturing Keeping production line flowing with smallest possible inventory of components and work in progress, and elimination of muda [waste], pioneered by Toyota).
lean mixture octane At present this means fuel with TEL giving octane rating of 100. Essential for supercharged piston engine engines, replacements for TEL are being sought.
Leans (the) Vertigo.
LEAP 1 Vertigo.
2 Lightweight exo-atmospheric projectile.
**leapfrog**

**To delay one ranging pulse train from radar to avoid two targets being superimposed.**

**LEAPP** Land environment air-picture provision.

**learner cost** Extra element of direct-labour cost when work is unfamiliar.

**learning curve** Fundamental curve portraying fall in manufacturing time or cost with increasing familiarity; abscissa is number of aircraft completed (often log scale) and ordinate is total direct labour cost, or total manufacturing man-hours or total manufacturing cost including raw materials and bought-out parts; usually an idealised curve not allowing for inflation.

**Leasat** Leased satellite, or space bus hired out for different payloads.

**leasing** Possession without title.

**least material condition** That in which the quantity of material in a part is minimised, e.g. maximum allowable hole diameter.

**Lecos** Light [ie optical] electronic control system.

**LEC** Locally employed civilian.

**LECP** Life-extension and capabilities program (US and ARRC).

**2 Low-energy charged particle.**

**LED** 1 Light-emitting diode. - RHA adds recording-head assembly.

**2 Leading-edge down (surface angular movement).**

**3 Leading-edge device(s).**

**4 Low endoatmospheric defence [I adds intercepter].**

**LEDDM** LED (1) dot matrix.

**LEED** Low-energy electron diffraction.

**see wave** See rotor cloud.

**LEF** 1 Leading-edge flap.

**2 Light-emitting film.**

**left-hand circuit** Rectilinear circuit (1) with turns to left, anti-clockwise seen from above. Almost universal.

**left-hand rotation** Anti-clockwise, viewed from rear.

**left/right needle** Needle pivoted at top or bottom of panel instrument giving steering indication; pilot steers to keep needle vertical.

**left seat** That of captain of aircraft; thus, **time.**

**left-seater** Pilot in command, usually.

**leg** 1 Main strut of landing gear.

**2 Part of flight at constant heading between two waypoints.**

**3 Beam of radio range station, identified by particular flight as inbound * or outbound *.**

**4 The two parts of a control cable running over a pulley at each end.**

**legacy carrier** US term for a long-established airline.

**legacy systems** Those which a nation cannot afford to replace.

**2 In general, those we use today, as distinct from the much better ones we can envisage. In the course of time everything becomes a *.”**

**3 Specifically, the previous version.**

**legend** 2 Any fixed printed or electronic warning notice in cockpit.

**2 Explanatory written matter on engineering drawing.**

**leg restraint** Strong belt automatically tightened round occupant’s legs as ejection seat fires.

**Lehár** Long-endurance high-altitude rotocraft (USA).

**LET** Lean Enterprise Institute (US).

**Leigh light** Powerful searchlight [RAF ASW aircraft 1941–45].
lethal envelope

mainly with controlled adoption of successively lower flight levels rather than with the landing; thus * procedure.

lethal envelope Volume, often spherical, within which parameters can be met for successful employment of particular munition.

letter boxing Becoming squeezed between cloud layer and rising ground.

letter-box inlet Large semi-rectangular air inlet along part of wing (or other) leading edge.

letter-box slot Fixed slot at about 8% chord, usually ahead of aileron; further aft than slot formed by open slat.

letter of intent Formal letter serving as notice by customer of intention to purchase, before negotiation of contract.

LEU Leading edge up (surface angular movement).

leurre Tip chord of vertical tail.

lever Strong easterly wind [straits of Gibraltar].

Leveche Pronounced. 'levetchay', hot, dry S wind [Spain].

level Air intercept code: “Contact is at your angels”.

level bust Failure by dangerous margin [usually ± 300 ft] to fly at assigned FL.

level landing Tail-up landing by tailwheel aeroplane; also known as a wheeler.

levelling circuit AC filter circuit used to smooth out variation in bias voltage.

level of escape Base of exosphere at which upward-moving particle has probability 1/e of colliding with another on way out of atmosphere.

level off To pull out of dive or gentle let-down and hold height constant.

levels of similarity Quantified lists of differences in aerodynamics and systems between early prototypes.

leverage 1 Ratio between variables (eg, if Δ sfc is 8 times the cost of engines and spares to achieve Δ sfc then * of improved sfc is 8).

2 Ratio of effect of destroying target to its own intrinsic value.

leveraged lease Lease of aircraft on any of several forms of sliding scale.

levered suspension Landing gear wheel(s) carried on arm pivoted to bottom of leg such that vertical travel of wheel is greater than that of shock strut.

LEV1 Leading-edge vortex lift.

LEW Large eye/wheel distance, ie pilot must allow for his height above wheels at touchdown.

Lewis NASA research centre for aeronautics, Cleveland, Ohio, Abb. LeRC.

Lewis aerial Laser gyro.

Lewis number Le = Pr (Prandtl)/Sc (Schmidt), used in hypersonics.

LEWK Loitering electronic-warfare killer (UAV).

LEWP Line echo wave pattern.

LEX Leading-edge extension (US terminology).

Lexan Commercially produced polycarbonate plastic, usually transparent.

LF 1 Load factor (structural).

2 Load factor (traffic).

3 Local forces, or landing force.

4 Launch facility.

LFR 1 Local flight regulations.

2 Low-medium-frequency radio range.

LFRED Liquid-fuelled ramjet engine development.

LFRJ Liquid-fuelled ramjet (in solid rocket case).

LFRR Low-frequency radio range.

LFS Low-flying system (UK military).

LFSMS Logistic force-structure management system(s).

LFT Live-fire testing.

LFL Lower flammability limit.

LFS 1 Low-powered fan marker.

2 Laminate, or limited, fine mesh [weather model].

3 Low-powered frequency modulator.

LFP Loaded flank pitch (fir-tree blade root).

LFR 1 Local flight regulations.

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LFT Live-fire testing.

LFL Lower flammability limit.
LGM

LGM  US weapon category, silo-launched missile.
LGS  Landing gear operating speed.
LGR  Laser guidance receiver.
LGS  Laser gun fire simulator.
LGD  Landing guidance system.
LGS  Linear glide-slope capture.
LGT  Light ground-station module.
LHG  Landing-gear tread.
Lgt  Laser guided.
LGR  Laser-guided training round.
LGW  Landing gross weight.
LGWB  Landing gear wheelbase.
LH  Left-hand.
LH  Light helicopter.
LH  Local horizontal.
LHA  US Navy ship category, large helicopter assault carrier.
LHA  Local hour angle.
LHC  Light helicopter cycle (standard cycle for US turboshaft engine testing).
LHC  Left-hand circuit.
LHi  Lower-hold cargo.
LHe  Liquid helium.
LHF  Liquid-cooled heavy fuel.
LHM  Laser hardened materials.
LHN  Long haul network.
LHOX  Low and high-pressure oxygen.
LHP  Lightning HIRP protection.
LHS  Left-hand side.
LHP  Latin hyperscale sampling [alternative to Monte Carlo].
LHi  Liquid hydrogen.
LHV  Fuel lower heating value, L/kgK, formerly measured in BTU/lb.
LHG  Hang gliding (Liechtenstein).
LHW  Laser homing weapon.
LHW  Lightning hazard warning radar.
LHX  Light helicopter, experimental.
LH  Lane identification (early Decca).
LH  Laser interrogator (or interrogation).
LH  Lithium iron [LiFe preferred].
L  Letter of intent.
L  Lift index; numerically positive, negative or zero if atmosphere stable, unstable or neutral.
L  Low-intensity lights.
L  Maximum weighted noise level over series of i noise events.
L  Lift.
L  Loudspeaker intercom box.
L  Large period oscillation, esp. that of Moon’s aspect from Earth.
LIC  Low intensity conflict [A adds aircraft, S system, hence Licas].
L  Licence.
LID  Lift-improvement device (jet VSTOL).
L  Luftfahrt Information Dienst (DDR).
L  Large integrated display.
L  Laser irradiation detector.
L  Liquid interface diffusion (bonding).
L  Laser detection and ranging, laser counterpart of radar.

**Lift-improvement device**

Lids, LDS  Low impact docking system.
LIF  Lead-in fighter.
LiFe  Lithium-iron.
life  Allowable total period of operation of a hardware item.
life  To assign such a period; hence, a life part.
lifeboat  Transport vehicle for rescuing crew from spacecraft, usually parafoil Earth landing.
life cycle  Essentially self-explanatory, the sequence of phases through which a product may be expected to pass. The most common * comprises: concept – definition – design – build – test – operate [sometimes refurbish] – scrap or retire. Also called product *.
liferaft  Correct term for inflatable emergency ‘dinghy’.
life-support system  Provides environment to sustain human life in space, including during EVA.
lifemf  Linear instantaneous frequency measurement.
lifemf  Linear frequency-modulated pulse.
life  Last in, first out.
lifemf  Low inertia flat plate (antenna).
lifemf  Low altitude instrument flight rules.
lifemf  Lead-in fighter training, or team.
lift  Total lifting force from a wing (component of resultant force along lift axis), aerostat envelope or other source excluding engine thrust. Normally, force supporting aircraft. Traditionally L = C\textsubscript{l}\frac{1}{2}\rho V^2S, where C\textsubscript{l} is lift coefficient, \rho density, V velocity and S area.
lift  Any element of such lift, acting through particular point.
lift  Whole or part of an airborne operation, thus second * means second force to be airlifted.
lift  Aircraft-carrier elevator (British terminology).
lift  Total traffic capability of fleet of transport aircraft [esp. military].
lift axis  Line through e.g. perpendicular to relative wind in plane of symmetry.
lift coefficient  C\textsubscript{l}, dimensionless measure of lift of surface; actual lift divided by free-stream dynamic pressure \frac{1}{2}\rho V^2 and surface’s area S.
lift cruise engine  Turbofan or turbojet with vectoring to give jet lift or thrust.
lift curve  Plot of lift coefficient against angle of attack (C\textsubscript{l}/\alpha), theoretically = 2\pi/\alpha per radian at low subsonic Mach numbers.
lift curve slope  Inclination of lift curve at any point, rate of change dC\textsubscript{l}/d\alpha.
lift-dependent drag  See lift-induced drag.
lift/drag ratio, L/D  Ratio of total lift to total drag, fundamental measure of efficiency of aircraft; L is normally constant and equal to weight but drag varies approx as square of airspeed; thus L/D plot is curve with peak at one particular airspeed for each aircraft, L/D\textsubscript{max}.
lift damper  Flat plate, usually long span and short chord, raised by powered system (rendered operative by weight on MLG) from upper surface of wing (usually inboard and at about 60% chord) after landing to destroy lift and improve wheel-brake traction. Usually synonymous with ground spoiler.
lift fan  Turbofan of HBPR installed only for lift thrust.
lift  Free running fan driven by tip turbine from external gas supply installed only for lift (note: 1 and 2 may have exit vanes to give a diagonal lift/thrust component).
lift-improvement device  Any aerodynamic strake, dam,
lift index

flap or other fixed or movable surface to assist jet VTO by reducing hot-gas reingestion, suckdown or other undesirable effects.

lift index  Air stability expressed as positive number if stable, zero neutral and negative unstable.

lift-induced drag  For all practical purposes, the same as lift-dependent drag or drag due to lift, the rearwards component of the total [resultant] force vector on a wing. Purists could say lift-dependent drag is the difference between drag at a given C_L and that at a datum C_L. They could also argue * is not synonymous with trailing-vortex drag, because the latter can exist in an inviscid flow.

lifting body  Aircraft whose chief or sole lift is generated by its body; usually hypersonic aircraft or spacecraft.

lifting re-entry  One in which aerodynamic lift forces play a significant role.

lift jet  Ultra-lightweight turbojet or turbofan installed only for upward thrust.

lift-lift/cruise  Equipped with both lift jet(s) and vectored-thrust engine.

lift motor  Engine driving vertical-axis prop/rotor on airship.

lift off  Separation of any aircraft or other flight or space vehicle from ground or (eg Space Shuttle atmospherics tests) a parent vehicle. Hence * speed, Vxoro. For aircraft, synonymous with unstick.

2 Undesirable gap between an eddy-current crack tester and the inspected surface.

lift slope  See lift-curve slope.

lift strut  Bears tensile (rarely compression) load due to wing lift.

LIFTT  Leaders in flight-test training, includes [2002] ETPS, Epner, CCA, DUT and IAS.

lift/thrust  Ratio of lift to thrust of vectored-thrust engine, usually varies from unity to zero over range of nozzle movement; also see L/T.

lift vector  Vector drawn through point at which lift force acts, with angle showing direction (usually normal to chord or OX axis, irrespective of aircraft attitude) and length showing magnitude.

lift wire  Bears tensile load due to lift of wing.

LIG  1 Laser image generator.

2 Lithium/iron gel.

light  Visible * extends from about 0.4 µ [red] to 0.75 µ [violet]. Velocity in vacuum = 299,792,456 ms⁻¹ [983,571,907 ft/s].

light aircraft  1 Traditionally one having MTOW less than 12,500 lb (5,670 kg).

2 Pre-1957, ‘aeroplane having a.u.w. less than 1,200 lb’.

3 Since 2006 LAPL has meant maximum weight 2,000 kg (4,409 lb).

light alloy  One whose principal constituent is aluminium; some authorities add ‘or magnesium’ but these are usually described as magnesium alloys.

light anti-aircraft  Guns ≤ 40 mm.

light bomber  Today meaningless, and never universally defined.

light-case  Bomb encased in thin sheet steel for use against cities and other soft targets.

light-emitting bar  Vertical bar of three (rarely, more) Si LEDs.

light-emitting diode  Solid-state diode emitting visible light when stimulated by electronic input, giving quick-reacting shaped light source.

light-emitting strip  Horizontal rectangular strip display made up of number of light-emitting bars, often used to give analog lateral-position readout.

lightening hole  Cut-out in relatively unstressed region of structural sheet part to save weight.

lighter than air  Buoyant in atmosphere (see aerostat).

light fighter  Unusually small fighter intended chiefly for close air-combat role.

light flight control  Easy to move, esp. when adjacent flight controls are heavy.

light gun  Alkis lamp or other projector of visible pencil beam, usually selectable white, red or green.

light ice  Traditionally, can be ignored for up to 1 h.

light machine gun  Not greater than rifle calibre.

light-microsecond  Almost exactly 300 m, 984 ft.

lightning  Any natural electrical discharge between clouds or between cloud and ground.

Lightning Bolt  Procedures enabling existing procurement to be streamlined, and commercially available items to be bought when appropriate (USAF).

lightoff, light off  1 Ignition followed by acceleration of gas turbine during starting cycle.

2 Ignition of afterburner.

light pen  Fibre-optic device for interfacing and accessing computer via visual display.

light pipe  Single or bundle of optical fibres.

lightplane  See light aircraft.

light propeller aircraft  ≤5,700 kg MTOW.

light-round  Progression of the combustion flame from one fuel burner to the next during gas-turbine starting cycle.

Light Series  Carrier for four 20-lb practice bombs (UK, 1922-c60).

Light Sport Aircraft  Defined by the FAA as: 1 or 2 seats, single engine, GTOW <1,320 lb [land] or 1,430 lb [seaplane], Vmax 120 kt, V, 45 kt, fixed or ground-adjust propeller.

light stick  Transparent container of two fluids which, when brought into contact, give off useful illumination.

light turboprop  Aircraft category MTOW 7 t (15,432 lb).

light valve  Photocoductive layer controlling areas of liquid crystal illuminated in large display.

light water  1 Water, as distinct from heavy water.

2 Trade name for AFFF.

lightweight fighter, LWF  Despite USAF competition 1972-75, never defined.

LIHI/LII/LIM  Light intensity high/low/medium.

LII  1 Light image intensifier.

2 Gromov flight research institute, at Zhukovskii (USSR, R).

LIL  Lithium iodide.

Li-ion  Lithium-ion.

LIIPS  Leningrad institute for sail and communications engineers (USSR).

like on like  Liquid rocket with streams of fuel impinging on each other from some injectors and streams of oxidant on oxidant from others.

Lilo  Last in, last out.

lily pad  Forward operating base (USAF, esp. PACAF).

LIM  1 Low-inclination mission.

2 Locator inner marker.

3 Light intensity medium.

4 Limit.

Lima  Laser ionisation mass analyser.
Limaçon
Limaçon Quartic curve, \( r = a \cos \theta + b \).

Limar Laser imaging and ranging.

limb Visible edge of heavenly body, esp. the Sun.

limit altitudes Angles of pitch or bank which FCS prevents being exceeded.

limit-cycle oscillation Sustained vibration at a fixed frequency and limited amplitude.

limited nav aids This usually means sextant only; electronic aids unavailable.

limited panel Pilot instruction with key flight instruments obliterated and external cues absent (originally meant gyro instruments obliterated, and always horizon; today depends on panel).

limited remote communications outlet Unmanned satel-

limited-route concept Operator, captain or whoever else prepares flight-plan, is offered very limited choice of routes through a controlled airspace.

limiter One meaning is control device attached to trans-

limiting meaning Maximum permitted for type of aircraft, usually before onset of buffet.

limiting runway One whose length, altitude or temperature necessitates take-off below MTOW.

limiting speed / Maximum IAS permitted in particular aircraft configuration, eg landing gear down.

limiting velocity Terminal velocity at specified angle to horizontal [not normal term].

limit load Greatest anticipated stress on structural member, unaffected, from authorized ground and flight operation.

limit of proportionality Tensile (rarely, other) stress at which material begins to suffer plastic deformation, acquiring permanent set.

limen / Weather minima permitted for particular pilot or flight.

limiter 1 Weather minima permitted for particular pilot or flight.

2 Boundaries of flight regimes, eg IAS or g in particular configurations.

limit switch Subsystem, which, normally automatically, varies the authority of a control, eg. changing the range of elevator movement available according to IAS or other parameter.

Linnstran Limited North Atlantic regional air naviga-

LiMnO₂ Lithium manganese dioxide electric battery.

LIMSS Logistics information management support system [hence LIMS, management system].

Linac Linear accelerator for X-radiography.

Linas Laser-inertial nav/attack system.

Lincs / Leased-products interfacility national air space communications system: digital net connecting remote radar and Wx sites to ATC centres (FAA).

2 Long-haul interfacility com. system.

Lindberg detector Fire detector with sealed network of stainless-steel tubing containing material which above set temperature emits gas, raising pressure.

Lindholme gear Air/sea rescue equipment dropped to survivors; the original form (1942) was packaged in 10 buoyant containers.

1 Single pipe in fluid system.

2 Single cable in electrical system.

3 Horizontal scan on raster display.

4 Cable or rope anchored to aerostat with other end free.

5 Flight-line.

6 Adjective, in revenue service with air carrier.

7 Future path of target.

8 Personal boast, from ‘shooting a *’ (RAF).

linear accelerometer In theory, any assisted-takeoff device. In practice, restricted to an “unrolled” electric motor.

linear array Yagi or other array of dipoles on straight axis.

linear building One in which operations take place in sequence from one end to other.

linear configuration Vehicle assembled from separable stages arranged end to end in one line.

linear friction welding Workpieces are rubbed together to reach welding temperature, giving a perfect bond by a solid-state process not involving melting.

linear hold Usually, to delay landing by intercepting extended runway centrel ine far from airport, advising when 1,000 m from threshold.

linear motion See heave, surge, sway.

linear optical sensor Transducer in fibre-optic sensor system which, by splitting and reflecting laser pulses whose phase-displacement is then measured, translates mechanical movement (eg. of aileron) into a decodable output.

linear-scale instrument Vertical or horizontal straight-

line replaceable Capable of being removed from aircraft.
linescan

parked on flight-line and replaced by different example of same item.
linescan IR graphics using raster display to generate picture.
line search 1 To examine one strip of film from straight reconnaissance run.
2 In sea reconnaissance, to search on constant heading at maximum height at which target is identifiable.
line service In revenue operation with constant heading.
Linesman British attempt at combined air defence and ATC system (see Mediator).
line speed Predicted take-off ASIR.
line squall Violent cold front characterised by sudden drop in temperature, rise in pressure, thunderstorms and, especially, severe vertical and other gusts.
lineup To position aircraft on downwind end of runway, pointing along centreline.
line vortex One in which vorticity is concentrated in a line.
lheavy Apron marshallers (RAF, collaq.).
linkbelt Ammunition feed using rigid inter-round links.
link chute Discharges used ammunition links overboard.
Link 11 Tactical datalink (NATO navies).
link route Authorised sector joining airways but not itself an airway.
Link 16 The datalink on which JTIDS is based (NATO).
Link's turbulence factor See turbulence factor.
Link trainer Traditional primitive electropneumatic flight (pilot training) simulator, esp. in instrument flight, not representative of aircraft type.
Link translator Provides translation and forwarding between Tadil, Link 11, NATO Link 1 and other friendly communications.
LINS, Lins Laser/inertial navigation system.
LION, Lion Link interoperability network (UK MoD).
LIP 1 Laboratory identification prototype.
2 Limited-installation program.
3 Lithium/iron polymer; E adds electrolyte.
4 Peripheral identification line (F).
lip 1 Leading edge of air inlet (other than a bodyside splitter plate).
lip microphone For use, pivoted to be almost touching the mouth.
Lips, LIPS Logical inferences per second (A12).
lithium-cooled Loosely, any engine cooled by liquid, including water, but preferably restricted to cooling by water/alcohol or glycol mix.
lithium crystal Organic liquids with elongated molecules which in electric fields arrange themselves to give controllable appearances.
liquid-film technique Traditional method of coating surface with volatile oil to show demarcation between laminar/turbulent boundary layer and some details of flow direction.
liquid-fuel starter Burning one or more liquids unlike that for main engine.
lithium thionyl chloride.
lifesaving equipment for modulating lasers.
lithometer Finely divided solid particles suspended in atmosphere.
lithosphere Earth land mass, as distinct from atmosphere, hydrosphere.
litre Metric unit of volume [in SI strictly called dm3], abbr. 1 [without full point] = 10-3 m3, 10-6 cm3 = 0.219969 Imp. gal. = 0.264172 US gal. = 61.02361 in3.
litres per kilometre Measure of fuel burn = 0.3541 Imp. gal., 0.4252 US gal./statute mile; reciprocals respectively 2.82406, 2.3518.
littoral warfare Coastal, shallow water.
LITVC Liquid-injection thrust-vector control.

liquid-fuel starter

liquid inertia vibration eliminator Heavy liquid, damps helicopter rotor vibration.
liquid injection TVC Use of volatile fluid pumped into one side of rocket nozzle to create shockwave and deflect jet.
liquid oxygen See oxygen.

Liquid hydrogen See cryogenic fuels.

Liquid petroleum gas Butane, heptane and similar gaseous hydrocarbon fuels stored as liquids under high pressure. See cryogenic fuels.

Liquid propellant Liquid fuel, monofuel or oxidant used in rocket.

Liquid rocket Rocket burning one or more liquid propellants.

Liquid Spring Dowty shockstrut filled with liquid with deformable large molecules absorbing energy internally.

LIR 1 Laser intercept receiver.
2 Life-improved rotor.
LIRA, Lira Low-intensity (ie limited war) reconnaissance, with simple optical/IR suite.
LIRCM Large-aircraft RCRM.
LIRL Low-intensity runway light(s).
LIRS Laser inertial reference system.
LIRU Laser inertial reference unit.
LJS / Localizer inertial smoother.
2 Lightning image shelter (NASA).
3 Laser interferometer space antenna.
4 Limited instruction-set architecture.
LISA, Lisa Logistics Information Systems Agency.
LISB Low-intensity [or less-intense] sonic boom.
LISE, Lise Laser integrated space experiment (SDI).
LISN Line-impedance stabilization network.
LISO Cl2 Lithium thiocyan chloride.
listening out Ready to receive broadcast transmissions on wavelength in use (US = listening watch, and predictably the latter is becoming standard).
listening post 1 Installation under landing or takeoff climbout paths of airport for measuring and recording noise of all traffic.
2 Installation, with or without sound-locator, giving warning of approach of possibly hostile aircraft (1917–45).

LIT 1 Lead-in training (US).
2 Light intratheatre transport.
lit Litres (SI unit).
litral Medium- and high-strength Al-Li alloys (Akan).
litias, LITAS Low-intensity two-colour approach slope system.
LITDL Link-16 interoperable tactical data link.
Lite Laser illuminator targeting equipment.

Lithium Extremely light (density 0.534) white metal, Mpt 186°C, used in Al-Li alloys and as isotopic Li-6 in NW.
lithium-drift detector Ionising-radiation detector using semiconductor doped with lithium as n-type ions.
lithium tantalate LiTaO3 for modulating lasers.
lithotope Finely divided solid particles suspended in atmosphere.
lithosphere Earth land mass, as distinct from atmosphere, hydrosphere.

liveliness

LISN Line-impedance stabilization network.
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LIU
LAN interface unit.
LIU LIU Left interconnect valve.
ln Root chord of vertical tail.
LIVE Live Liquid inertial vibration eliminator.
live drop Release from aircraft of operative device, eg missile with propulsion and guidance and possibly warhead, as distinct from inert equivalent.
live engine Operative engine(s) in aircraft with one or more real or simulated failures.
live flight deck Subject to motion at sea, rather than in port (aircraft carrier).
live mail Real air mail, as distinct from dummy loads.
live nut Driven by rotary power unit along thread to give live flight deck more real or simulated failures.
live engine Live engine of aircraft, as distinct from inert equivalent.
warhead, as distinct from inert equivalent.
missile with propulsion and guidance and possibly missile warhead, as distinct from inert equivalent.
LJDAM Laser joint direct attack munition.
LJAO London Joint Area Organization.
LJAD Laser joint direct attack munition.
LJS Laser jamming system.
Lk Product support (G).
LkLY Laser joint direct attack munition.
LKN Last known position [rarely, LKP].
LKRM Low-kiloton range.
LKS Lakes.
LKV LuchtvaartKundige Vereeniging (SA).
LL Line to line (AC voltage).
LLL Line maintenance.
LLF 1 Flying laboratory, i.e. research aircraft (USSR, R), 2 Low-level load, 3 Flying laboratory, i.e. research aircraft (USSR, R), 4 Low-level fuel, 5 Long load [time].
LLL 1 Low-level, 2 Limit load, 3 Flying laboratory, i.e. research aircraft (USSR, R), 4 Low-level load, 5 Long load [time].
LLL 1 Low-level, 2 Limit load, 3 Flying laboratory, i.e. research aircraft (USSR, R), 4 Low-level load, 5 Long load [time].
LLA Liquid inertial vibration eliminator.
LLA Low-level air defence; S adds system.
LLAP Airfield on Welsh coast serving Aberporth with targets (RAE, now Qinetiq).
LLAPI Low-level air-picture, or air-defence picture, interface.
LLC 1 Lift-lift/cruise, 2 Logic link control.
LLDF Low-level discomfort factor.
LLDIN Low-level air defence, can cross major city.
LLF 1 Low-level fan of reconnaissance cameras, 2 Long-lead funding.
LLGB Launch-and-leave guided bomb.
LLH Light liaison helicopter.
LLHK Low-level height keeper.
LLGB Low-level laser-guided bomb.
LLTV Low-light-level television.
LLM 1 Long-lead [time] material, 2 Launcher loading module.
LLMS Liquid-level measurement system.
LLNL Lawrence Livermore National Laboratory, California.
LLP 1 Low-level parachute, 2 Left lower plug [all similar entries = avionics boxes], 3 Limited-liability partnership, 4 Life-limited, or limited-life, part[s].
LLS Lightning location system.
LLT 1 Long load time.
LLTOW Landing limiting (or limited) takeoff weight.
LLTV Low-light television.
LIV Lower limit of video (HUD).
LLW Less-lethal weapon[s].
LLWAS Low-level windshear alert system (sometimes LLWSAS).
LLWD Low-level weapons delivery.
LLWS Low-level windshear.
LLZ Localizer.
LM 1 Lunar, or landing, module.
2 Last-minute (cargo), 3 Laser machining.
4 Little movement.
5 Locator, middle.
6 Laser module.
7 Line maintenance.
8 Linear motor.
9 Loitering munition[s].
L/M 1 Ratio of direct labour to material cost.
2 List of materials.
lm Lumen.
LMAE Lunar module ascent engine.
LMAR Lightweight multiband airborne radar, or radio.
LMARS London Military Area Radar Service.
Lmax Peak [maximum A-weighted] sound level.
LMC 1 A last-minute check-in.
2 Life-monitoring computer.
3 Least material condition.
LMC 1 Laboratoire Météorologique Dynamique (F).
2 Lithium manganese dioxide.
LMDE Lunar module descent engine.
LME 1 Line maintenance engineer.
2 Link management entity.
LMF 1 Liquid methane (or methanol) fuel.
2 Lacking moral fibre (RAF, 1939–45).
LMF Low/medium frequency.
LMG 1 Liquid methane gas.
2 Light machine gun.
LMI 1 Logical management interface.
2 Logistics management information.
LMIT Laser materials interaction testing.
LML Lightweight multiple launcher.
LMLF Limit manoeuvre load factor.
LMLO Liquid methane, liquid oxygen.
LMM 1 Compass locator at middle marker.
2 Linear multistep method.
LMN Local Mach number.
LMO Lean-mixture octane [rating].
LMP 1 Lunar module pilot.
2 Left middle plug.
3 Linear-motor profiler [machine tool].
4 Load maintenance panel.
LMRS London Military Radar Services.
LMS 1 Least mean square.
2 Land mobile service.
3 Local maintenance system (navaid).
4 Light monitor and switch.
5 Learning management system [on-line].
6 Line-maintenance service[s].
LMSS 1 Lightweight modular support jammer.
2 Land mobile satellite service.
Lunar near horizon.

LNG

LNDG

Landing.

LNC

LNP, LNP

LNAV, L-Nav

Lateral navigation.

LNA

Low-noise amplifier [DPL adds diplexer].

LN2

Liquid nitrogen.

LNA

Low-noise amplifier [DPL adds diplexer].

LNAV, L-Nav

Lateral navigation.

LNC

Loran [not necessarily Loran-C] chart.

LN-G

Landing.

NG

1 Liquefied natural gas.

1

LNA

Low-noise amplifier [DPL adds diplexer].

LNAV, L-Nav

Lateral navigation.

LNC

Loran [not necessarily Loran-C] chart.

LNG

Landing.

1 Liquefied natural gas.

LNR

Line to neutral (AC volts).

LNO

1 Limited nuclear option.

2 Liaison officer.

LNP, LNP

Noise pollution level, equal to $L_{eq} + 2.56 \text{ dB}$ standard deviation.

LNSF

Light Night Striking Force.

LNTF

Langley National Transonic Facility (US).

LNTWA

Low-noise travelling-wave amplifier.

LO

1 Low observables.

2 Local oscillator.

3 Compass locator at outer marker, also LOM.

4 Longitude.

5 Low band.

6 See next.

Lo

1 Low level, variously interpreted as 60 m and 200 ft; minimum practical safe height for transonic attack.

2 Minimum safe height to avoid obstructions, generally proportional to speed.

L/O

1 Lift-off.

2 Light off.

Lo

Local oscillator.

LOA

1 Letter of offer and acceptance; sometimes rendered as ‘letter of agreement’.

2 Launch on assessment.

3 Letter of authorization.

4 Line of attack.

LOAD, Load

Low-altitude defence [of ICBMs].

load cell

1 Fluid-filled device for generating large forces accurately, eg in weighing large aircraft.

2 Capsule containing strain gauge or other force transducer used, eg, in weighing aircraft.

Load classification number

LCN.

loadeo

Loading of explosive ordnance, structured procedures also used as basis for inter-unit competition (USAF).

loader

Loads computer main memory, esp. from transit tape.

load factor

1 Vertical acceleration in g.

2 Stress applied to structural part as multiple of that in 1 g flight (not necessarily same definition as 1).

3 Ratio of failing load to assumed 1 g load in component.

4 Number of passenger seats occupied as percentage of those available.

5 Revenue ton-miles (or tonne-km) performed as percentage of RTM available.

6 Percentage of engine’s maximum power needed for aircraft to fly (pre-1914).

load history

Crucially, a record of the number of times a particular load [stress, or vertical acceleration] has been exceeded by particular part.

loading

1 Total aircraft mass divided by wing area (wing *), span (span *), or total installed power (power *).

2 Volume fraction of composite (FRC) material occupied by strong fibres.

load bridge

See jetway.

loading chart

Permanent guidance chart or diagram displaying correct locations for airborne loads in transport aircraft, esp. cargo.

loading coil

Inserted inductance, eg to increase electrical length of aerial [antenna] system.

loading diagram

1 Standard graphical plot of forces in structural part or assembly.

2 Document with detailed plan of cargo floor and underfloor holds on which responsible official marks positions and masses of all cargo and final eg position.

loading loop

Graphical plot of transport aircraft weights against % SMC or MAC or distance from datum with fuel and payload forming closed figures.

loading up

Rich extinction of idling piston engine.

load manifest

Detailed inventory of cargo on commercial or military flight. See load sheet.

loadmaster

Member of military transport flight crew in charge of loading and unloading, and para-dropping etc if undertaken (but not of paratroops).

loadmeter

Ammeter, especially on light helicopter.

loadout

Total mission load (US).

loadpath

Sequence of structural elements carrying a load. Thus in F-22 * with missile-bay doors open is different from normal.

load programmer

Person in charge of structural fatigue test.

load ring

Rigid hoop to which balloon net and basket suspension are attached.

LOADS, Loads

Low-altitude air defence system.

load sheet

Load manifest prepared for each flight by transport aircraft, also showing distribution of fuel load and e.g. position.

load spreader

Rigid pallet for distributing dense loads over larger floor area.

load threshold

Notional maximum movements per hour ATC can accept.

load waterline

Waterline of marine aircraft at MTO weight.

LOAD

Lock-on after launch.

LOAS

Line operations assessment support.

LO-AxI

Low observable axisymmetric [N adds nozzle].

LOB

1 Left outboard.

2 Launch operations building.

3 Line of bearing.

lobe

1 One of two, four or more sub-beams that form directional radar beam from aerial [antenna] with reflector.

2 One of the (usually symmetrical) plan systems of regions of most intense noise from jet engine.

3 Eccentric profile of cam.
lobe nozzle

lobe nozzle  Jet-engine nozzle with mixing promoted by long multi-lobe periphery, resembling petals.
LOBL  Lock-on before launch.
Lobstar  Low-band structural array, principally for [radar] foliage penetration (AFRL).
LOC  1 Line of communication.
  3 Logistics operations centre.
  4 Limited operational capability.
  5 Level of capability.
  6 Location, locator (ICAO).
  7 Local-operations console.
  8 Limiting oxygen content, minimum to sustain combustion.
  9 Loss of control; IF adds in-flight.
  10 See next.
loc  Localizer.
LOCAAS, Locaas  1 Lo-observable comprehensive autonomous attack system.
  2 Low-cost anti-armor submunition (USA).
  3 Low-cost autonomous attack system (USN).
local-area augmentation  System, also called scheme, for use of GPS guidance as principal blind landing aid, replacing ILS (FAC).
local area network  Bus, ring, PABX (telecommunications) or other transmission links for communication and EDP within an office, factory or other establishment.
local camber  Distance measured perpendicular to chord line from chord line to camber line.
local elastic instability  Small region of buckling in otherwise almost undistorted structure.
local hour angle, LHA  Hour angle of observed body measured relative to observer’s meridian.
lcomizer  ILS [Antenna] and beam giving directional [azimuth] guidance.
lcomizer course  Locus of points in any horizontal plane at which DDM is zero.
lcomizer nozzle  Directional steering needle on ILS display.
lcomizer protected area  No aircraft or vehicles permitted to enter.
lcom Mach number  Actual Mach number at a point just outside boundary layer of aircraft or other vehicle. See local-surface airspeed.
lcom magnetic effects  Those peculiar to a region (eg ore deposits) which distort terrestrial field.
lcom mean time, LMT  Angle at celestial pole between local meridian and that of mean Sun; time elapsed since mean Sun’s transit of observer’s anti-meridian.
lcom meridian  That passing through a particular place.
lcom oscillator  Radio circuit generating RF with which received waves are combined.
lcom stress concentration  Intensification caused by shape of stressed part (eg at end of a crack).
lcom-surface airspeed  TAS+V, where V is increment. [usually positive] induced by body’s shape.
lcom thickness  In an aerofoil, distance between lower and upper surface measured perpendicular to camber line [some authorities insist to chord line].
lcom traffic  Visible from tower.
lcom velocity  Relative speed of fluid flow over small area of body, essentially = local-surface airspeed.

lockwiring

local vertical  Line from centre of Earth through a particular place.
locap  Lo combat air patrol.
locat  Low-cost aerial target, or trainer.
locate  Loranz/Omega course and tracking equipment.
location bearings  Ball or tapered-roller bearings which determine the axial position of a shaft.
location indicator  Identification code [usually four letters] of aeronautical fixed station (ICAO).
lcomator  J/LMF NDB used as fix for final approach.
2 Portable radio beacon 121.5/243 MHz, carried on person or in parachute harness, sometimes with voice facility.
LOC-BC, loc-BC  Localizer backcourse.
LOCC  Launch, or lander, operations control centre.
LOCD  Low-cost dispenser.
LOCE  1 Limited operational capability [for] Europe, see next.
  2 Linked operations and intelligence centres, Europe
locid  Location identifier.
LOCIF  Loss of control in flight [also LOC-I].
LOC inertia smoothing  Extra AFCS function, usually customer option, added in FCCs to alleviate effect of ILS localizer noise. Typically Setting 1 smoothes approach and provides survival after LOC failure below 100 ft/30 m; Setting 2 reduces minima on Cat II or III ILS.
Lockclad  Conventional 7 × 7 control cable covered with swaged aluminium envelope.
locked  I Gun bolt or breech block mechanically locked to barrel at moment of firing.
  2 Flight controls mechanically locked to prevent damage by wind when parked; must be unlocked for flight.
  3 Overbalanced flight-control surface driven to limit of deflection and not (or not readily) recoverable.
  4 Carrier flight deck is for any reason not usable for flying.
locked-in-condition  Aircraft in dangerous flight condition (eg super stall) with airflow over controls inadequate for recovery to be possible.
locking pin  Various, especially inserted in MLG/NLG to prevent retraction on ground.
locking wire  Fatigue-resistant wire pulled through ad loc holes in series of nuts or other rotary fasteners and finally tightened and twisted off with inspector’s stamp on soft metal seal at free ends.
Lock number  Value [usually about $] for ratio of inertia to aerodynamic forces in helicopter rotor, symbol γ.
lock nut  One that cannot loosen once tightened.
lock-on  1 Operating mode of many radars and other sensor systems in which pencil beam, having searched and found a target, thereafter remains pointing at that target.
  2 When DME receives replies to 50+ per cent of interrogations.
lock time  Time from release of gun sear to firing of primer or detonator.
lock up  Lock on. Used esp. in airborne self-test of radar against other member of formation.
lock washer  Tightened under nut, prevents nut working loose (by biting into nut or by a tab manually turned up beside a flat on the nut).
loclad
threading fatigue-free wire through their heads to apply torque opposing movement.

loclad Low-cost low-altitude dispenser.

Locom Low-cost manufacturing [AMS adds of advanced metal structures].

LOC1 First level of capability (ACCS).

locpod Low-cost powered off-boresight dispenser.

LOCR Low-observables combat readiness (USAF).

Locus Laser obstacle-cable unmasking system (helo).

locus Path traced out by moving object, esp. one rotating in complex repeated orbit, eg tip of helicopter rotor blade.

Locusp Low-cost uncooled sensor prototype.

LOD Light-off detector.

LODA Letter of deviation authority (FAA).

Logads Long Odals.

LODE Large optics demo experiment.

LOE 1 Level of effort.
2 Loft- and line-oriented evaluation.

LOEC, LO ExCom Low-observables Executive Committee; decides release of knowledge to partners/customers (US).

Lo-Erode Concrete with surface reinforced with Meltex 19-11 stainless-steel fibres.

LOF 1 Lift-off.
2 Line of flight.

Lofaads Lo-altitude forward-area air defense system (USA).

Lofar Low-frequency omnidirectional acoustic frequency analysis and recording (ASW).

Lo-Flyte Low-observable flight-test experimental.

LOFT Line-oriented flight training.

loft bombing Low-level bomb delivery, also called toss bombing, etc (see low-angle *).

loft floor Floor on which lofting is carried out.

lofting Plotting full-size exact shapes of airframe, from which master templates, jigs, tooling, forging and stamping dies and other large parts can be constructed and NC tapes prepared.

LOG Liquid oxygen/gasoline.

Log log Logarithm[ic].

log Large ground-burning target marker (RAF, WW2).

LOGAIR Air Logistics Command (USAF).

Logair Logistics air network.

logarithmic decrement Natural log of ratio of two successive amplitudes in damped harmonic or other oscillatory response.

logbook Master history of member of aircrew, aircraft or other important functioning system in which are recorded times, events and occurrences.

Logholds Air logistics message (NATO).

logic Electronic circuits and subcircuits constructed to obey mathematical laws.

Logmars Logistics applications of [bar code] marking and reading symbols.

Logo Limitation of government obligation.

Logspark Logistic(al) park, housing 7 days’ fuel, weapons and maintenance supplies, serving several STOVL hides.

LOH Light observation helicopter.

Lohmannising Metal dipped in amalgamating salt, pickled and then plated with two or more protective alloy coatings.

LOI 1 Lunar orbit insertion.

long lead time
2 Letter of intent to purchase.

loiter 1 To fly for maximum endurance.
2 To fly a standing patrol.

loiter plate Place where helicopters can practise hovering down to ground level (RAF).

loitering missile Missile which, after launch, can stand off in the proximity of targets for several hours before either being guided to a target or self-destroyed by programmed default.

Lola Low-level [windshear] alert.

Lolex Low-level extraction of parachute-retarded cargo.

LO/LO Log-on/log-off.

LOM 1 Compass locator at outer marker.
2 Localizer outer marker.

Lomads Low-altitude missile air-defence system.


Lomcovak Unlimited flight manoeuvre in which aircraft tumbles about transverse axis whilst travelling sideways at near-zero airspeed [often mis-spelt Lomcevak].

LOMEZ Low-altitude missile engagement zone.

LOMS Line operations management, or monitoring, system.

LON Longitude (FAA).

Lone Ranger Detachments by single aircraft throughout non-Communist world (RAF 1959–). long, Long Longitude.

long-dated Long lead time, ie must be ordered months to years in advance of aircraft completion.

longeron Principal longitudinal structural members in fuselage, nacelle, airship, etc.

longitudinal axis OX axis, from nose to tail; roll axis.

longitudinal bulkhead Major full-depth web in plane of OX axis.

longitudinal dihedral Angular difference between incidence of wing and of horizontal tail (latter normally being less).

longitudinal divergence Oscillation in pitch of increasing magnitude, leading to dive or stall.

longitudinal force coefficient Component of resultant wing force resolved along chord; Cx = C2cos< - C1 sin<.

longitudinal oscillation Vibration along longitudinal axis (chiefly in ballistic rocket vehicles); also known as pogo effect.

longitudinal plane Any plane of which OX axis is a part.

longitudinal separation Minimum distance or time between aircraft cleared to same track at same FL.

longitudinal short-period One of the five classic modes of aeroplane motion: near-constant airspeed, heavily damped by wing and tailplane/canard.

longitudinal stability Ability to recover automatically to level flight after sharp dive or climb command; generally, all stabilities in plane of symmetry. Static * is defined as tendency to return to trimmed airspeed and AOA following any mild disturbance, throttle fixed throughout.

longitudinal velocity “The component velocity along the longitudinal axis relative to the air”, (B.S., 1940). This need not be synonymous with true airspeed.

longitudinal wave One devoil of lateral components (eg sound).

long lead time Must be ordered months to years before aircraft completion; sum of contractual delays for item,
long-range delays in delivery (heavy forging may be years), processing time at sub-contractor or in plant, and time from when finished part joins aircraft to completion of aircraft. long-range No valid modern definition except DoD * bomber operational radius over 2,500 nm. long-range operations Philosophy possible with modern aircraft, where reliability is near-perfect. It ignores number of engines, and aims to achieve autonomous operation, with crew [two pilots] able to correct any fault or mishap. long-wave In the case of radio/radar, usually means wavelength over 1 km, but not a normal aerospace term.  2 In the case of IR, wavelength 8–14 μ. Lons, LONS Local on-line network system. look angle Angular limits of vision of EO or IR seeker. look-down angle Limiting inclination of main beam in AWACS-type aircraft, strongly dependent on aerial [antenna] geometry. look-down shoot-down Ability to destroy low-level hostile aircraft from high altitude against land or clutter background. loom Tightly laced bundle of electric cables, instrumentation leads or other flexible wires. loop Flight manoeuvre in which aircraft rotates nose-up through 360° whilst keeping lateral axis horizontal; many variations but normal loop restores level flight on original heading but at slightly higher altitude. See inverted *, outside *, bunt. loop aerial Conductive coil in vertical plane rotating about vertical axis to give bearing to ground radio station; a D/F loop [US = loop antenna]. loop detector Conductive loop buried in runway or taxiway to sense passage of aircraft and activate a display or airfield lights. loop heat pipe In spacecraft, keeps vapour and cooled liquid separate by circulation through porous wick. Loose Deuce Pair of tactical aircraft in varying loose formation c300 m (1,000 ft) apart. LOP 1 Line of position [or positioning]. 2 Loss of power. LOPC 1 Lander operations planning center. 2 Loss-of-power control. lopro Low probe; military aircraft mission. LOR 1 Lunar orbital rendezvous. 2 Launch off RWR target data. Lora, LORA 1 Level of repair analysis. 2 Low-frequency radar. Loraas Long-range airborne ASW system. Lorac Long-range accuracy, also called Loran-C or Cytac, Lorac derivative. Lorads Long-range radar and display system [now Lorads II]. Lorag Loads research advisory group. Loran Long-range navigation, early [1941] but much developed hyperbolic navaid, using various onboard systems to translate time difference of reception of pulse-type transmissions from two or more fixed ground stations. In 1980 Loran-A [1,850/1,900/1,950 kHz] was replaced by Loran-C [100–110 kHz]. LORAS, Loras Linear omnidirectional resolving airspeed system. Lord, LORD Laser obstacle ranging and display, for helicopters. low approach Lord mount Large family of patented anti-vibration mounts, usually metal/rubber. Lorentz force, Fi That on charged particle moving in magnetic field, = q(VB) where q is particle charge, V velocity and B magnetic induction (flux density). Lorentz system Pioneer beam-approach landing system. Lores, LORES Low-resolution. LORO Lobe-on receive only. Loroc 1 Long-range optical camera. 2 Long-range offboard chaff. Lorop Long-range oblique [or optical] photography [S adds system]. Lorv Low-observable re-entry vehicle, characterized by reduced radar cross-section. LOS 1 Line of sight; I adds indicator. 2 Loss of signal. 3 Linear optical sensor. 4 Line-oriented simulation. 5 Level of service. LOSA Line Oriented, or Operations, Safety Audit (U. of Texas). losas Low-cost Scout acoustic system. Losat Line of sight, anti-tank. LOSC Launch operations support contract. Losschmidt number Number of molecules of ideal gas per unit volume, = 2.687 × 1019 per cm³. Loss Large-object salvage system. lost-wax Technique for casting intricate precision shapes, derived from Benvenuto Cellini c1550 but modified for modern refractory alloys. See investment casting. LOT Life of type [E adds extension]. lot A particular meaning is one batch of production missiles. LOTA Low-level training area. LOTAWS Laser obstacle terrain-avoidance warning system. LOTC Loss-of-thrust control. LOTE, LOTEX Life-of-type extension. LO₂ Liquid oxygen. lounges Waiting area at airport for departure passengers between processing and gates. louvre Fixed or controllable aperture for cooling or ventilating airflow. LOV Loss of vision due to opaque frames and other obstructions. Low Low-vulnerability ammunition. LOW Launch on warning. low Geographical region of low atmospheric pressure. low airburst Fallout safe height of NW burst for maximum effect on surface target. low altitude US military traditional, 5002,000 ft; today see lo (1). low-altitude <18,000 ft [5,486 m] (see low route) (FAA). low-altitude airway departure route Provides operators with method to access under-utilized LAA (1) when upper airspace constrained, asking www.fly.faa.gov for procedures. low-altitude bomb system Early weapon-aiming electronics for tossing nuclear weapons in low attack, the high bomb trajectory giving aircraft time to escape explosion. low-angle loft bombing Free-fall loft bombing where release angle is within 35° of horizontal. low approach Premeditated overshoot.
low bidder

low bidder Manufacturer offering lowest price in industry competition.

low blower See low supercharger gear.

low blown Piston engine supercharged for maximum powers at low altitudes at expense of poor performance at height.

low boss VSV inner bearing.

low cloud Cumulus, cumulonimbus, stratocumulus, stratus and nimbostratus; base generally below 1,800 m, 5,900 ft.

low-cycle fatigue Fatigue caused by changes in material stress resulting from changes in speed of rotating machines; from idling to take-off power and back to cruise rpm could represent single completed cycle.

low density, high demand Assets [e.g. aircraft] available only in small numbers but needed in all theatres.

low Earth orbit Below 2,000 km (1,243 miles), see low orbits.

low area space No single definition; FAA usually below 14,500 ft AMSL, but see next.

low airspace radar advisory service Provided on request to local (say, within 50 km, 30 miles) uncontrolled traffic from 3,000 ft up to FL95 (CAA, UK).

low-deck container ULD shaped to fit underfloor space, either full- or half-width.

Lower DFL Lowest divisional flight level, expected to be FL100.

lower heating value Net calorific value of fuel.

lower-level gearbox In a turbofan, this transmits the drive from the angled input shaft to the accessory gearbox.

lower rotating ventral door Chief pivoted member forming underside of D (or 2-D) nozzle.

lower sideband Difference in frequency between modulation signal and AM carrier.

Lower transient Low gate

low-frequency flying is authorized for training.

low flying Flight at minimum safe (sometimes unsafe) altitude for training or sport.

low-flying area Geographical region within which low flying is authorized for training.

low frequency Generally defined as 30-300 kHz.

low gate Mechanical stop on piston-engine throttle box beyond which further opening inadvisable below rated height or other altitude limit.

low inclination mission Satellite inclination less than 30° to Equator (eg 28.6°).

low-lead Petrol [US, gasoline] containing typically 2 ml/gal, 1.66 ml/US gal, of TEL.

low-level parachute Rapid automatic opening for precision delivery of fragile loads.

low-level TV Videotube with multiplier tubes giving useful picture in near-darkness.

low-light TV Generally used for same EO devices as preceding entry.

low loader Ground vehicle designed for attaching load, e.g., cruise missile or NW, under carrier aircraft.

low/mid wing Mounted about one-third way up body.

low oblique Photography from lo altitude at oblique angles to either side, not vertical or ahead.

low observables Stealth.

low orbit Nominally, period 90 min or less.

low-pass filter Designed to cut off all signals above given frequency.

low pitch See coarse pitch.

low-pressure compressor The first compressor down-stream of the inlet [or fan, if fitted] in an engine with two or more shafts.

low-pressure fuel pump That mounted in or on the fuel tank.

low route Area-navigation routes not dependent on nav-aid-based airways, for low-level traffic, MAA (3) 4,000 ft AMSL (FAA).

low rudder In tight turn, or other occasion with wings near-vertical, depressing pedal nearest ground to lower nose.

low silhouette Squat aircraft, esp. in frontal aspect, easy to hide on battlefield (usually anti-tank helicopter).

low situational awareness Criticism of combat pilot, failure to correlate several kinds of simultaneous input.

low-speed aerodynamics Not defined; below 100 ft/s has been suggested.

low-speed aircraft Several attempted definitions; UK CAA and FAR.91 do not define.

low-speed stall Normal 1 g stall.

low supercharger gear Lower of two gears in two-speed supercharger drive.

low tow Towing a glider, especially over a long distance, at an altitude lower than the tug.

low vacuum Pressure below 101.247 kPa (760 torr) and above some lower level usually agreed as 3.33 kPa (26 torr).

low velocity drop Parachutist to escape with velocity below 30 ft/s (DoD, NATO).

low visibility procedures Adopted by airport controllers in visual control room [vary according to airport and RVR].

low wing Mounted low on body, usually so that undersurfaces approximately coincide.

lox Liquid oxygen.

loz Liquid oxygen (arch.).

LOx Liquid oxygen (arch.).

LP I Low pressure; in an axial compressor or turbine a suffix number indicates the stage, thus: LP4.

LP 1 Low pressure; in an axial compressor or turbine a suffix number indicates the stage, thus: LP4.

LPB I Potential impact on tiredness, fatigue, and performance, particularly if low vacuum or low altitude.

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LPD Low pressure; in an axial compressor or turbine a suffix number indicates the stage, thus: LP4.

LPD Low pressure; in an axial compressor or turbine a suffix number indicates the stage, thus: LP4.

LPF Low pressure; in an axial compressor or turbine a suffix number indicates the stage, thus: LP4.

LPF Low pressure; in an axial compressor or turbine a suffix number indicates the stage, thus: LP4.

LPG Low pressure; in an axial compressor or turbine a suffix number indicates the stage, thus: LP4.

LPG Low pressure; in an axial compressor or turbine a suffix number indicates the stage, thus: LP4.

LPN Low pressure; in an axial compressor or turbine a suffix number indicates the stage, thus: LP4.

LPN Low pressure; in an axial compressor or turbine a suffix number indicates the stage, thus: LP4.

LP 1 Low pressure; in an axial compressor or turbine a suffix number indicates the stage, thus: LP4.
LPBA


LPC 1 Luftfahrt Presse-Club (G).

LP compressor; a suffix number indicates a particular stage, thus: LP1.5.

LP Linear predictive coding.

LP Paper in the cockpit.

LPCA LP compressor bleed actuator.

LPCR Low-power colour radar.

LFD 1 Labelled plan display.

2 Low-prf pulse Doppler.

3 Log periodic dipole antenna, or array.

4 Low probability of detection.

LPDA Light propeller-driven aircraft.

LPDS Landing platform docking ship (USN).

LPDT Low-power distress transmitter.

LPDU Link-protocol data unit.

LPET Low-pressure elevated temperature glasscloth.

LPFI Logiky perspektive frontovy istrebitel (light-fighter) [R].

LPFT Low-pressure fuel turbopump.

LPG Liquid, or liquefied, petroleum gas.

LPH Landing platform, helicopter ship (USN).

LPHUD Low-profile HUD.

LPI 1 Low probability of interception.

2 Liquid-penetrant inspection.

LPDr LPI radar, multi-beam broadband coded waveform with very small sidelobes.

LPL Linear polarized laser.

LPLC, LPL/CL Lift plus lift/cruise.

LPM 1 Looks per minute.

2 Landing path monitor.

Lp.m. Litres per minute.

LPM L–P maximum value.

LPR Perceived noise level.

3 Average peak outdoor LPN at individual’s residence.

LPNPSG Long-profile night-vision goggles.

LPO 1 Lunar parking orbit.

2 Lithium phospho-olivine.

3 Launch-panel operator.

LPOT Low-pressure oxygen available.

LPPO 1 Launch-point prediction.

2 Lean premixed/prevaporized.

LPPO-L Long-period pitch oscillation.

LPFS Low-pressure plasma spray.

LPR Low pulse-repetition frequency.

LPRP Lunar precursor and robotic program (MSFC).

LPS Launch processing system.

LPSF Liquid Propulsion Systems Centre (Mahendra Pratap Singh, ISRO).

LPT LP turbine; a suffix number indicates a particular stage, thus: LPT4.

LPTS Linearly polarized transverse wave[s].

LPTV Low-profile transfer vehicle [for pas].

LPU 1 Logical program unit.

2 Line processor, or processing, unit.

LPX Extraction of shaft power from LP spool/Shaft.

LQA Link quality analysis.

LQG Linear quadratic Gaussian.

LQR Linear quadratic regulator.

LQT Linear quadratic tracker.

LR 1 Long range.

2 Launch reliability of aircraft.

3 Line-replaceable.

4 Lead radial (VOR).

5 Prefix: the last message I received was . . .

6 Glider transport (USN, 1941–45).

L/R Launch, retrieve.

1 Roll moment coefficient due to yaw.

LRA 1 Line-replaceable assembly.

2 Landing-rights airport.

3 Laser retroreflector array.

4 Low-range radar altimeter.

LRAACA Long-range air anti-submarine capability aircraft.

LRAAS Long-range airborne ASW system.

LRAD Long-range atmospheric defense [MDA6]

LRALT Long-range air-launch[ed] target.

LRAM Long-range aviation missile (USA, USAF).

LRAS Long-range airspeed system; ASI for V/STOL, helicopters.

1 Large radar array technology.

LRB Liquid-rocket booster (J).

LRBA Laboratoire des Recherches Balistiques et Aérodynamiques, Vernon (F).

LRBL Least-risk bomb location.

LRBM Long-range ballistic missile (2,500 nm, 2,880 miles).

1 Long-range cruise.

2 Logistics Readiness Center (USAF).

3 Light reflective capacitor.

4 Line-replaceable component[s].

LRCO Long-range combat aircraft.

LRCO-L Limited remote communications outlet.

1 Lead range control officer.

LRCOSW Long-range conventional stand-off weapon.

LRCU Landing rollout control unit.

LRD 1 Labelled radar display.

2 Laser ranger/designator.

3 Liquid runway deicer, usually glycol or PAF.

LRE 1 Launch and recovery element (UAV).

2 List of radioactive and hazardous elements.

1 Laser rangefinder; D adds designator.

1 Long-range glide bomb.

2 Laser rate gyro.

LRGMB Long-range glide bomb.

1 Long-range interceptor.

2 Air-traffic and airport administration (Hungary).

3 Line-replaceable item.

4 Liquid-resin injection.

LRINF Long-range intermediate nuclear force(s).

LRIP Low-rate initial production.

LRLST Long-range IR search and track.

LRL 1 Lunar receiving Laboratory.

2 Lightweight rocket launcher.

LRLS Long-range, long-endurance [MoD] (UK).

LRLS Long-range radar landing system.

1 Long-range air-to-air missile.

2 Launching/reeving machine (towed MAD).

3 Line-replaceable module.

LRMP Long-range maritime patrol.

LRMR Laser ranger and marked-target receiver.

LRMTS Laser ranger and marked-target seeker.

LRN Long-range navigation.

LRNLS Long-range navigation.

LRNS Long-range navigation system.
LRO

LRO Lunar reconnaissance orbiter; C adds camera (NASA).
LROPS, L-Rops Long-range operations.
LRP Lead-replacement petrol.
LRPA Long-range patrol aircraft.
LRR 1 Long-range [surveillance] radar.
LRRR Laser ranging retro-reflector.
LRS 1 Load relief system.
LRTS Long-range tactical surveillance.
LSF Load-sheet fuel.
LSG Less-stealthy export version.
LSH Light-support helicopter.
LSI 1 Large-scale integration (microelectronics).
LSK Line-select key.
LSLS Long-range surveillance radar.
LSM Linear synchronous motor.
LSMU Laser-communications space measurement unit.
LSN Local sub-network.
LSO 1 Landing safety officer (manages aircraft-carrier projector sight).
LSR Loose snow on runway.
LSRH Long-range high-altitude radar horizon.
LSRS Loose snow on runway.
LSRU Long-range radio unit.
LSST Lightweight satcom system.
LSU 1 Lavatory servicing unit.
LSSS Lightweight SHF satcom system.
LSV 1 Laser spot seeker/tracker.
LSW 1 Line-select key.
LSX 1 Line-select key.
LT 1 Low tension (electrical).
LTS Linear synchronous motor.
LTV Line-of-sight target acquisition vehicle.
LTVS Long-term target vetting system.
LSW 1 Laser spot seeker/tracker.
LSX 1 Line-select key.
LSY 1 Linear token.
LSZ 1 Laser spot seeker/tracker.
LTA 1 Longitudinal short-period.
LTC Linear synchronous motor.
LTS Large space structure.
LTA 1 Longitudinal short-period.
LTS Line-of-sight target acquisition vehicle.
LTS Long-term target vetting system.
LTV Line-of-sight target acquisition vehicle.
LTVS Long-term target vetting system.
LSM Linear synchronous motor.
LRV Line-replaceable unit.
LRW Line-of-sight weapon system.
LRT Long-range tactical surveillance.
LRLR Line-replaceable unit.
LSLR Line-of-sight weapon system.
LSA 1 Logistics support analysis [R adds records].
LSB 1 Lower sideband.
LSED 1 Large-screen display.
LSS 1 Local speed of sound.
LSM 1 Lethal Strike Joint Systems Project Office (DoD).
LST 1 Local scientific survey module.
LSV 1 Laser spot seeker/tracker.
LSW 1 Line-select key.
LSX 1 Line-select key.
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LTA

LTA* 1 Lighter than air.
  3 Light transport aircraft.
  4 Light tactical aircraft.
  5 Long-term agreement.
  6 Limited, or Lunar Module, test article.
LTC 1 Light tactical aircraft capability.
LTT&E 1 Logistics testing and evaluation.
LTAS 1 See The LTAS.
LTF 1 Aircraft maintenance facility (G).
LTFB 1 Limited Test-Ban Treaty.
LTC 1 1 Long-term costing, or contract.
  2 Lithium thionyl chloride (electric battery).
  3 Limited Type Certificate.
  4 Lowest two-way channel.
LTCC 1 Low-temperature co-fired ceramic.
LTD 1 Laser target designator.
Ltd 1 Limited company (UK).
LDTP 1 Long-term defence plan (NATO).
LTDIR 1 Laser target designator/ranger.
LTD 1 Laser target designator set.
LTE 1 Loss of tail-rotor effectiveness.
  2 Landline telephony.
3 Laser-target equipment, of aircraft in checking ILS.
LTF 1 Learning[] to fly.
LTFRS 1 Lanthanum TFR system.
LTG 1 Lightning [CA adds cloud-to-air, CC cloud-to-cloud, CCG cloud/cloud/ground, CG cloud-to-ground, CW cloud-to-water, IC in clouds].
Lt Ho 1 Lighthouse.
LTI 1 Linear and time-invariant.
LTIT 1 Low [-pressure] turbine inlet temperature.
LTKh 1 Flying qualities (ICAO).
LTL, lit 1 Little.
  2 Lateral.
LTM 1 Load ton-mile.
  2 Laser target marker.
  3 Landsat thematic mapper.
  4 Livestock transportation manual.
LTMA 1 London terminal control area.
LTMP 1 Low-temperature microgravity physics; F adds facility (ISS4).
LTMR 1 Laser target marker and receiver.
LTO 1 Landing and takeoff, especially a standard cycle (ICAO).
  2 See LTOs.
LTOF 1 Low-temperature optical facility.
LTOs 1 Letters to owners/operators (CAA).
LTP 1 Laboratorio de Tecnología de la Propulsión (Spain).
LTPR 1 Landline teletypewriter.
LTPB 1 Linear-token passing bus.
LTPG 1 Long-term planning guidelines (NATO).
LTPR 1 Loop transfer recovery (EDP methodology).
LTPS 1 Loop, or LTR.
LTPS 1 Loop, or LTR.
LTPR 1 Linear-token ring.
LTRS 1 Improper abbrev. litre[s].
LTS 1 Load and trim sheet.
  2 Landing threshold speed.
  3 Lantirn targeting system.
  4 Lights.
  5 Link translator system.
  6 See Litas.
LTSA 1 Long-term service agreement.
LTTSS 1 Long-term software support [P adds programme].
LTW 1 Lineal, or linearized, travelling-wave tube amplifier.
LTS 1 Logic(al) unit.
LUA 1 Launch under attack.
Lubber line Reference index, usually parallel to aircraft longitudinal axis, eg on compass, denoting aircraft heading.
Lubbock burner Pioneer [1940] atomising burner for turbojets, devised by Isaac Lubbock; featured a sliding piston which controlled inlet ports to a swirl chamber.
lube 1 Lubricating oil (US, colloq.).
lubricating oil 1 In general, piston engines still use mainly mineral oils and gas turbines ester-based “synthetics”, over 1,000 national and international [e.g., NATO] specifications are in current use.
Lucero 1 Ground beacon keyed to 1.5 m Al or ASV radars, 1942-57.
Lucid 1 Software package for processing image data from all forms of visual sensor.
Lucite 1 Resin produced from methyl methacrylate, widely used for transparent plastics.
LUF 1 Lowest usable frequency.
Lufbery circle 1 Military ring formation in which all aircraft fly gentle turn following that in front.
Luftsverket 1 CAA (Norway), met. services (Sweden).
LUH 1 Light utility helicopter.
lufh 1 Lowest usable high frequency.
lumen 1 SI unit of luminous flux; lm = cd.sr (candela-steradian).
luminance 1 Brightness; intrinsic luminous intensity; illumination on unit surface normal to radiation divided by subtended solid angle L = cd m².
luminescence 1 Non-thermal emission of light, ie not incandescence but electro-*, phosphorescence, chemi-* and photo-* (fluorescence).
luminous flux 1 Light emitted in solid angle of 1 steradian by point source of luminous intensity 1 cd, symbol Φ, unit lumen; thus Φ = cd sr.
luminous intensity 1 Luminous energy per unit solid angle per second; unit candela, cd. A basic SI unit.
lunar boot 1 Astronaut footwear tailored to surface of Moon.
lunar orbit 1 Orbit round the Moon.
lunar orbital rendezvous 1 Lunar exploration by descent stage detached from larger spacecraft left in lunar orbit and which is rejoined for return to Earth.
Luneberg lens 1 Device, often spherical, designed for maximum reflectivity of radar energy back along incident
lusec

path, tailored to wavelength; an enhancing corner reflector.

lusec  Lumen-second, quantity of luminous energy.

LUT  / Local-user-terminal [SAR satellites].

LV  / Local vertical.

lux  SI unit of illuminance; lx = lm/m².

LV  / Local vertical.

LV  / Launch[er] umbilical tower.

LV  / Low volume (crop spraying).

LV  / Light and variable.

LV  / Launch vehicle.

LV  / Moment arm of vertical tail, usually measured from 25% MAC.

LV  / Local vertical.

LV  / Long-wave.

LV  / Sound power level; usually measured in 1/3-octave bands and can be measured in dB or W.

LV  / Long wave.

LV  / Longitudinal distance between aeroplane centre of gravity and centre of lift.

LWA  / Laser warning analyser.

LWABTJ  / Lightweight afterburning turbojet.

LWAD  / Littoral warfare advanced development.

LWBT  / Total lift of wing/body/tail.

LWC  / Light-water (firefighting foam).

LWC  / Liquid-water content.

LWCCU  / Lightweight common control unit.

LWD  / Lowered.

LWF  / Light-velocity fighter.

LWIR  / Long-wavelength IR.

LWL  / Load waterline.

LWLD  / Lightweight laser designator.

LWMNT  / Low water mark mean tides.

LWP  / Light window pintle.

LWR  / Luftwaffenring eV (G).

LWS  / Laser warning system.

LWSS  / Lightweight sound system [helo sonar].

LWTR  / Licence with type rating.

lx  / See lux.

Lyapunov equations  Linear quadratic equations containing solutions to LQR, typically including $g = A^TP + PA^T$.

Lychgate  Multimedia data system linking RAF, MoD and other services (UK).

Lyman-Alpha  Radiation emitted by hydrogen at 12.16 pm (1,216 Å), penetrates Earth atmosphere to base of D-region (90 km, 55 miles).

LYR  / Layer.

LYRD  / Layered.

LYRS  / Layers.

LZ  / Landing zone (assault in land battle).

LZE  / Luminous-zone emissivity (flare, IRCM).

LZS  / Aeronautical association (Slovenia).
M

M Prefix mega, \( \times 10^6 \).
2 Mass, except BS decrees m.
3 Magnetic heading/course/bearing.
4 Mach number [also \( M_\infty \)].
5 Prefixed minus (wind component).
6 Maxwell.
7 Dynamics, moment, esp. in pitch, with numerous suffixes.
8 Meteorological (JETDS).
9 Mutual inductance; unit henry.
10 Molecular weight.
11 Structural bending moment, and generalized symbol for moment.
12 Mandatory (NASA).
14 Telecommunication code: ‘IFR aircraft has Tacan and transponder with no code capability’ (FAA and others).
15 Mean anomaly of orbit.
16 Most ambiguously, thousand (ASA).
17 Prefix maximum.
18 Main.
19 Maintain.
20 Maritime air.
21 Measured.
22 Moderate.
23 Multi-mission (US role prefix).
24 MATZ penetration service (or (M)).
25 Missing.
26 Master station (Loran).
27 Magnetization intensity; magnetic polarization.
28 Medium-intensity [airfield lighting].
29 Aircraft category: tilting-wing/engine aircraft (FAI).

\( M^* \) Critical Mach number.

\( M_a \) Free-stream Mach number.

\( M \) Torque, turning moment, also T.

2 See 2/ above.

m 1 Metre(s).
2 Prefix milli, \( \times 10^{-3} \).
3 Superplasticity.
4 Modular ratio.
5 Bypass ratio (US, R).
6 Mass, esp. of electron.
7 Minute(s).
8 Overlap fraction of helicopter tandem or side-by-side rotors.
9 Maximum camber of helicopter rotor blade.
10 Mach-number factor.
11 Confusingly, now being used for moment, especially in pitch.
\( \dot{m} \) Mass flow rate; also \( \dot{m} = \text{kg s}^{-1} \). Sometimes written \( \dot{n} \).

\( m/ \) Internet-based modules providing toolbox for: airborne, techlog and jobcard.
\( \dot{m} \) 2-D section moment [pitching moment per unit span, nose-up positive].

MAB Cargo container half width of wide-body main deck.
M2° Multi-mode fire and forget.
M2M Machine to machine [architecture].
M3P Mini-mutes modification program.
M3R Mobile multifunctional modular radar.
M-band EM radiation, 3–3 mm, 60–100 GHz.
M-carcinotron Backward-wave oscillator in which high power is possible by electron beam travelling between slow-wave structure and negative sole plate.
M-day Day on which mobilization is to begin.
M-display Has horizontal timebase along which target blip moves; operator moves second blip to line up on target by control graduated to indicate target range.
M-generator Main generator (Gripen).
M-marker Middle marker.
2 Low power NDB.
M-staff Methanol (G).
M-wave EM millimetric wavelengths.
M-wing Wing studied for low supersonic speeds with inner portions swept forward, outers swept back.
MA Mission abort.
2 Naval aviation (US, R).
3 Mobilization augmentee (US).
4 Minor airfield(s).
5 Meteorological authority (ICAO).
6 Missed approach.
7 Marker analysis.
Mx Generalised term for a resultant aerodynamic moment.
M/A Mach/airspeed.
mA Milliampere(s).
ma Mass flow (airflow); eg that passing through engine.

MAA Maximum authorized IFR altitude.
2 Monitoring angle of attack.
3 Missed-approach action.
4 Mission-area analysis.
5 Manufacturers’ Aircraft Association [initially provided aircraft from a pool, 1917]; [office, New York] (US).
6 Midlands Aerospace Alliance [trade assoc.; office, Thirk, Yorks.].
7 Museo de Aeronáutica y Astronáutica (Spain).
8 MidEast Aviation Academy, Amman (Jordan).

MAAC Medical Air Ambulance Company (USA).
MAAF Mediterranean Allied Air Force (1942–45).
MAAG Military Assistance Advisory Group (US).
MAAH Minimum asymmetric approach height.

MAAM Mid-Atlantic Air Museum (Reading, PA).
MAAP Master air attack plan; TK adds tool kit.
MAAS Military air accident summary.
2 Mobile aircraft arresting system.

MAATS Military automated air-traffic system (Canada).

MAAWLR Miniature autonomous attack weapon, long-range.

MAB Modular-array basing (ICBM).
2 Malaysia Airports Behr (37 airports).
MABCC Military Airspace Booking and Co-ordination Centre [Swanwick] (UK).
MABES

MABES Manufacturing agent-based emulation system.
MAC 1 Mean aerodynamic chord, c. 2 Military Airlift Command (USAF). 3 Maintenance Analysis Center (FAA). 4 Maintenance allocation chart. 5 Master air control (UK, CAA). 6 Medium-access controller. 7 Multi-activity contract. 8 Air defence command (Spain). 9 Message act cancelled, or cancellation. 10 Multiple all-up round canister, converts SSBN to fire cruise missiles. 11 Mid-air collision. 12 Mediterranean Air Command (US/UK, WW2). 13 Metal augmented charge (warhead). 14 Media access control [protocol].

Mac Pitching moment of aircraft about aerodynamic centre.
MACA Military assistance to civil authorities (US).
Macas Mid-air collision-avoidance system.
MACC 1 Military area control centre. 2 Multi-application control computer. 3 Modified Air Control Center. 4 Modular air command and control.
MACCS Marine air command and control system (DoD).
Mace, MACE 1 Minimum-area crutchless ejector. 2 Multinational alliance for criminal emergencies. 3 Multiple adaptive combat environment [for BVR training]. 4 Multistatic ASW capability enhancement.
MACF Missed-approach control failure.
Mach Mach number.
Mach angle Angle between weak (ie point-source) shockwave and freestream flow; theoretically 90° at Mach 1, thereafter \( \alpha = \sin^{-1} \frac{1}{M} \).
Mach-buster Anyone who has flown faster than sound, esp. in pre-Concorde era when accomplishment had element of exclusivity.
Mach cone Conical shock front from point source moving at supersonic speed relative to surrounding fluid; locus of Mach lines. Semi-vertex angle \( \theta \) is given by cosec \( \theta = \frac{1}{M} \), where \( M \) is free-stream Mach number.
Mach disc Visible disc at point of minimum diameter between jet shock and tail shock in supersonic jet, ie between adjacent shock diamonds.
Mach front Mach stem.
Mach hold Autopilot of AFCS mode holding Mach number at preset value.
machine Flying machine, normally aeroplane (colloq., arch.). machine gun Magazine-fed automatic weapon using rifle ammunition.
language Normally compatible with particular computer but unintelligible to humans.
machine screw For pre-threaded holes and/or nuts, loosely = bolt.

to machine Basis of future tactical air operations for netcentric warfare, supported by MAAP [machine means those that provide information and take decisions] (USAF).
machining centre Major group of (usually NC) machine tools performing large number of operations on workpiece held either stationary or under positive control throughout.
Mach intersection Junction of two or more shockwaves.
Mach-limited Boundaries of flight performance set by restriction on permissible Mach number, not by thrust or other limitation, esp. * ceiling.
Mach line 1 Weak (infinitesimal amplitude) shockwave. 2 Line on surface of body (ignoring boundary layer) at which accelerating free-stream flow reaches relative Mach 1. 3 Some authorities are confusingly using this term to mean weak shockwaves in supersonic flight.
Mach lock See Mach hold.
machmeter Instrument giving near-instantaneous readout of Mach number.
Mach NO/YES Air-intercept code: ‘I have reached maximum speed and am not/am closing on target’. Mach number Ratio of true airspeed to speed of sound in surrounding fluid (which varies as square root of absolute temperature). Symbol \( M=V/S \).
Mach-number factor \( 1-M^2 \); in supersonic flight \( M^2<1 \).
Mach reflection Attenuated shockwave reflected from solid surface, eg walls of tunnel or Earth’s surface. Reflection and some other effects approximate laws of optics.
Mach stem Shock front (Mach front) formed by fusion of incident and ground-reflected blast waves from explosion, esp. from NW.
Mach trim coupler Electronic subsystem of Mach trim system, which through analog (to 1970) or digital computational chain controls aircraft pitch-trim servo as function of Mach number; also contains switching, logic, monitoring and Bite.
Mach trimmer Electronic/mechanical system for relieving pilot of task of correcting progressive deficiency in aircraft pitch trim and longitudinal stability at high Mach numbers; sensitive to Mach number and vertical acceleration and automatically feeds primary pitch-trim demand to keep aircraft level or in desired attitude while leaving pilot authority to feed manual trim. In US called pitch trim compensator.
MAC 1 Model Aeronautics Council of Ireland. 2 Multiple all-up round canister, converts SSBN to fire cruise missiles. 3 Maintenance allocation chart. 4 Modular air command and control. 5 Master air control (UK, CAA). 6 Modular air command and control system (DoD).
MACC 1 Military area control centre. 2 Multi-application control computer. 3 Modified Air Control Center. 4 Modular air command and control. 5 Master air control (UK, CAA). 6 Modular air command and control system (DoD).
MACS System for meshing, aligning and connecting system (DoD).
Mafis 1 Modular airborne, or aerial, firefighting systems.

Modular airborne computer system (Gripen).

Military Aeronautical Communications Service.

Mac-ship 2 Multiple-applications control system.

3 Mobile approach control system.

4 Modular airborne computer system (Gripen).

5 Military Aeronautical Communications Service.

MAD 1 Magnetic-anomaly detection, or detector.

2 Magnetic-azimuth detector.

3 Mutual, or massive, assured destruction.

4 Maintenance access door.

5 Mass air delivery (attack weapons).

6 Multiairwave anomalous diffraction.

Madap 1 Maastricht automatic data-processing (Eurocontrol).

madapolam Fabric woven from long-staple cotton, originally from Madapolam (single 1 originally erroneous).

Madar Maintenance [or malfunction] analysis, detection and recording.

MADC Miniature, or micro, air-data computer.

Maddis Mirror-assisted dummy deck landings.

MADF Missile assembly/disassembly facility.

Madge 1 Microwave aircraft digital guidance equipment.

2 Malaysian air-defence ground environment.

3 Mascot design generator, enables software tools to be integrated.

MADL Multifunction advanced data-link.

MADLS Mobile air-defence launching system.

MADM Modified atmosphere density model.

MADME, Madmel Management and distribution system for more electric aircraft.

M-ADS, Mads 1 Modified automatic dependent surveillance.

2 Modified air-defense system.

MAE 1 Mean area of effectiveness.

2 Medium-altitude endurance (UAV).

3 Modular avionics emulator.

MAEO 1 Master air electronics officer (RAF).

2 Medium-altitude electro-optics, or optical.

Maestro 1 Modular avionics enhancement system targeted for retrofit operations.

2 Strong NW wind [Adriatic].

Mae West Inflatable aircrew lifejacket tied round upper torso (WW2).

MAG 1 Magnetic chip detector.

2 Marine air group.

3 Mobile arresting gear.

4 Machine gun.

5 Micromachined accelerometer gyro.

mag 1 Magnetic (FAA), or Mag (CAA).

2 Magneto (eg * drop).

3 Magazine (camera) (NASA).

mag-amp Magnetic amplifier.

Magat Military assistance grant-aid training.

Mag Brg Magnetic bearing [heading].

Magcom Guidance technique similar to Tercom but using variations in terrestrial magnetic field.

mag drop Reduction in rpm when either ignition source of dual-ignition piston engine is switched off; always checked before take-off to confirm both sources operative (from magneto rpm-drop).

Magerd MRCA AGE Requirement Document.

Maget Magnetic Mosfet.

Maggs Modular advanced-graphics generation system, for simulator external visuals.

Magic 1 Microprocessor application of graphics with interactive communications (USAF).

2 Multiple-action global interactive control (Thomson-CSF).

3 Multiple-aircraft GPS integrated command and control (Herley-Vega).

magic eye Tuning system using miniature CRT with radial illumination around sector whose size varies with strength of received signal; important in pre-crystal tuning era; also called magic-T.

Magics Modular architecture for graphics and image console, or control, system.

Magie Pronounced magic, Mobile Army Ground Imagery Interpretation Center (USA).

Magis Marine (or mobile) air/ground intelligence system.

magnet Magnetic levitation.

Magnafux Non-destructive test for magnetic material using magnetic field and fluorescent ink; trade name.

Maganate Family of CFRP composites (Hercules Inc.).

magnesium Mg, low-density (1.74) white metal, MPt 649°C, used pure and as alloy (Elektron, Dowmetal etc) for structural parts and incendiary bombs.

Magnesyn Patented remote-indicating system using induction between permanent-magnet rotor and saturable coil.

Magnet Multi-modal approach for GNSS 1 in European transport, implemented in two (A, B) concurrent forms (Euret).

Maget Mobile arresting gear using fast-erecting net to catch aircraft lacking serviceable tailhook.

magnetically anchored rate damper One in which gyro spin axis is restrained magnetically.

magnetic amplifier Various arrangements of saturable reactors such that small control current governs large output load/power/voltage.

magnetic anomaly Local irregularity in terrestrial magnetic field caused by presence of magnetic material such as submerged submarine or ore deposit.

magnetic azimuth detector Essentially, a compass.

magnetic bearing Direction of a fixed object measured clockwise from magnetic north.

magnetic chip detector See chip detector.
magnetic compass

magnetic compass Traditional compass indicating local horizontal direction of Earth’s magnetic field.
magnetic core Doughnut-shaped ferrite ring storing either 1 or 0 in either of two stable magnetic states.
magnetic course Course (heading) indicated by simple magnetic compass after correction for deviation.
magnetic crack detection Magnetic particle.
magnetic crotchet Sudden change in numerical values of magnetic crotchet.
magnetic declination Horizontal angle between terrestrial field and true N, ie between magnetic and geographic meridians; also known as variation.
magnetic deviation Errors in magnetic compass indication caused by local disturbance to field, esp. by ‘iron’ in aircraft.
magnetic dip Angle between local terrestrial field and local horizontal.
magnetic disc Computer storage in magnetic-oxide coating on surface of high-speed rotating disc.
magnetic drag cup Aluminium or copper cup surrounding rotating core in simple tachometer, rotated by generated eddy current.
magnetic equator Line joining points where angle of dip is zero.
magnetic field intensity Magnetizing force exerted on unit pole; also called field strength, symbol H, units Atm⁻¹ [ampere-turns per metre].
magnetic flux Product of area and of field intensity perpendicular to it (in effect number of lines of force); kg m²s⁻² = V m⁻¹; symbol Φ, unit is weber Wb.
magnetic flux density Measure of magnetic induction; kg m⁻² = V m⁻¹; symbol B, unit is tesla T = Wb/m².
magnetic induction Induced magnetism in magnetic material, see previous entry.
magnetic inspection Many NDT methods which attempt to detect imperfections in magnetic-metal parts by the anomalies they cause in strong fields.
magnetic meridian Direction of horizontal component of terrestrial field near surface.
magnetic north North as indicated by the magnetic meridian.
magnetic orange pipe Brightly painted magnetized iron pipe filled with Styrofoam for aerial sweeping of magnetic influence mines in shallow water.
magnetic particle inspection NDT for ferrous parts which when magnetized form N/S poles across cracks rendered visible by iron oxide powder viewed under UV.
magnetic permeability See permeability.
magnetic plug Removable chip detector.
magnetic RAM Any variety of RAM (2) which relies on magnetic materials such as very finely divided sintered nickel zinc ferrite, applied in layers on outside of aircraft skin; see iron ball.
magnetic refrigerator Cryogenic cooler (eg for IR materials) operating by magneto-caloric repeated magnetization and demagnetization of suitable materials.
magnetic storm Transient major disturbance in Earth’s field.
magnetic surface wave Travels across substrate, esp. ferromagnetic garnet.
magnetic tachometer Most common speed-measuring system in aero engines measures frequency signal from magnetic and electrical interaction between toothed wheel and fixed sensor.
magnetic tape Storage system in which information is recorded on and read off long strip coated with magnetic oxide.
magnetic track Angle between track and magnetic N.
magnetic turning error Northerly turning error.
magnetic variation Angle between magnetic meridian and true north, varies throughout globe and with time; thus used as ± correction to “M” to give °T.
magnetizing force Field strength, symbol H.
mageto-aerodynamics Aerodynamics at high supersonic speed and near-vacuum conditions, where magnetic and aerodynamic forces are similar.
mageto drop See mag drop.
magnetohydrodynamics, MHD Science of interaction between magnetic fields and electrically conductive fluids, especially plasmas.
magnetometer Instrument for measuring magnetic field intensity and direction.
magnetometer navaid Precision position-fixing system based upon measurement of local terrestrial field, eg MAHRS.
magnetomotive force Product of flux and reluctance (resistance), work needed to move unit pole against field; symbols F or M but unit ampere A.
magnetopause Outer boundary of geomagnetic cavity.
magneto sphere Region around Earth, from T-layer at 350 km to about 15 Earth radii, where magnetic field and ionised gas are dominant.
magnetostriiction Change in dimensions when magnetic material is magnetized; most pronounced in nickel.
magnetron Pioneer resonant-cavity generator of high-power microwaves, with spinning electron beam deflected by transverse field.
magnitude Apparent brightness of stars, planets, on scale of relative luminosity where × 100 brightness reduces magnitude by 5; hence brightest bodies have negative *.

Maica

Maica Modelling and analysis of the impact of changes in ATM (7).
maintenance access terminal  Major connection through which engineers can interrogate systems and perform Bite checks.

maintenance burden  Usually total maintenance cost, calculated as 1.8 times total maintenance labour cost.

maintenance data panel  Electroluminescent or liquid-crystal display which collates, logs and displays any faults detected on avionics data bus.

maintenance dock  Large structure fixed inside hangar with hinged or separable sections which can be closed tightly around large aircraft undergoing maintenance, providing staircases to platforms at different levels equipped with electric power and, usually, hydraulic and pneumatic power and water supply. Some are configured for particular type of aircraft.

maintenance lift  Maintenance platform.

maintenance platform  Mobile platform with scissors elevation to maximum height up to c10 m (c33 ft); some provide electric and other supplies.

maintenance recorder  Wire or tape recorder for flight time, engine operation and variable number of other parameters.

maintenance reserve  Money set aside by a lessee to pay the lessor a regular amount, usually per month, calculated from hours flown [and other factors] in the previous month. The intention is to cover deterioration and overhaul costs during a long lease.

Maintenance Review Board  Establishes maintenance schedule for Transport Category aircraft.

maintenance schedule  Prearranged plan for all maintenance required through life of item [but subject to revision].

maintenance status  Non-operating condition deliberately imposed.

Maintenance Steering Group  Globally defined analysis of minimum standard of scheduled maintenance required by engines and systems [ATA] (Int.).

maintenance unit  Military formation at fixed airbase able to store, modify, overhaul, flight-test and scrap aircraft.

main transverse  Major frame of rigid airship joining all longitudinals.

main undercarriage  Main landing gear.

mainwheel  Wheel of main landing gear.

Mair  Maritime air (NATO).

MAISO  Military Aeronautical Information Services Office[r] (NATS AIS).

MAJCOM  Major command (USAF).

Majic  Multi-sensor aerospace ground joint ISR interoperability [or intelligence] coalition.

major  Large [especially international-route] airline, to which passengers are brought by regions (US).

major aircraft review  Search for items that can be cancelled (UK).

major axis  Principal axis through solid body, usually along largest dimension or chief moment of inertia; where possible, axis of symmetry.

majority rule  Philosophy whereby two or more operative channels (eg AFCS) always ‘out-vote’ single failed channel.

majority voting system  Redundant system wherein outputs of three or more active channels are summed and output is fed back to each channel. When failure of one channel occurs, feedback causes all unfailed channels to
major join

act to offset failure; hence immediate shut-off of failure is not necessary.

major join

Erection of aircraft, esp. mating fuselage to wing.

MAK

1 Interstate aviation committee (R, CIS).

2 Maximal Arbeitsplatz Konzentration, standard for air pollution (Int.).

Malch, MALCH

Multiple-access laser communications head (LEO satellite)

Mald, MALD

Miniature air-launched decoy; - J adds jammer.

MALDT

Mean administrative and logistics delay time.

MALE

Medium-altitude long-endurance.

MALF

Mostly aloft, precipitation not reaching ground.

M-Allens

Messaging automated low-flying flight planning enquiry and notification system [now MFIMS].

MALJ

Miniature air-launched jammer.

Mallory

See mercury battery.

MALS

Medium-intensity approach light system; F adds sequenced flashing, R adds with runway-alignment lights.

Malta

Microprocessor aircraft landing training aid.

MAM

Mission adapter module.

Mamba

Mobile artillery-monitoring battlefield radar.

 Mamis

Mandatory aircraft modifications and inspections summary (FAA).

Manicus

Cumuliform cloud with pendulous bulged undersurface.

Mannmut

Luftwaffe surveillance radar, 1944.

MAMS

Mobile air movements squadron (RAF).

MAMT

Multi-axial, -axis, materials technology.

MAN

Military Aviation Notice.

manacle

Mounting in form of calipers surrounding and gripping circular section hardware, eg generator.

Manchester coding

See blip plane coding.

Manclos

Manual command to line of sight.

M&A

Mergers and acquisitions.

mandatory

To be complied with, often as AOG modification.

Mandatory Permit Directive

Grounds the aircraft (CAA).

M&S

Magnetic and electromagnetic silencing.

M&A

1 Maintenance and overhaul.

2 Maintenance and Operations.

M&R

Maintenance and repair.

Mandrel

High-power radar jammer (RAF, 1943).

mandrel

Centrebody, usually circular section, around which tubular or female part is hand-forged, extruded or formed.

M&S

1 Marred and scarred (US category).

2 Modelling and simulation.

maneton

Pinch-fit coupling for female part tightened by bolt around (usually smooth-surface) pin, eg crankshaft web or big end.

manganese

Mn, hard silver-white metal, density 7.3, Mpt 1,244°C, important as alloying element in tough corrosion-resistant steels and with light alloys, brasses and bronzes.

manganese bronze

Golden alloy, resistant to marine corrosion, sometimes used for compressor blading (DTD.197).

Manicom

Manned information and communication facility.

manicured

Manicured. Manned information and communication facility.

manifest

List of all passengers and cargo for one flight.

manifold

Fluid pipe system distributing from single input to multiple outputs or vice versa (thus piston engine inlet *, exhaust *).

manifold pressure

Pressure in inlet manifold of piston engine, normally local atmospheric plus boost (US traditionally inches Hg).

manipulator

1 Mechanical device resembling enlarged and more powerful human arm for positioning items in space.

2 Flat-plate aerofoil projections through aircraft boundary layer to cause major re-energization.

manning the rail

Crew of warship, esp. carrier, line main-deck periphery on entering/leaving harbour.

manoeuvrability

Mean administrative and logistic delay time.

manoeuvring envelope

Basic design envelope in which vehicle.

manoeuvring area

Area of airfield used for takeoffs, landings and associated manoeuvres (NATO).

manoeuvring ballistic re-entry vehicle

For practical purposes synonymous with manoeuvrable re-entry vehicle.

manoeuvring control force

Stick force per g.

manoeuvring envelope

Basic design envelope in which permissible speed (EAS) is plotted against load factor.
manoeuvring factor

From the origin the positive stall line extends to design limit load factor, thence to $V_{st}$, back to limit negative load factor at $V_{n}$. thence horizontally to intersect the negative stall line.

manoeuvring factor See load factor (1).

manoeuvring speed True airspeed at which the $V-n$ diagram changes from the positive stall line to the positive load-factor limit [i.e. top left corner, $V_{st} = \sqrt{V_{n}n_{st}}$].

manometer Linked twin or single vertical fluid tubes giving indication of pressure piped from remote source.

manometer bank Large array of manometers side-by-side.

manometric lock Autopilot function for capturing and holding constant pressure-based flight parameters, esp. IAS, altitude, vertical speed, M.

Manot Missing-aircraft notice.

manpack General term for astronaut/cosmonaut load carriers, designed according to local (e.g. lunar) gravity.

Manpads Man-portable air-defense system (USA).

manprint Manpower personnel integration.

man-rated Sufficiently reliable to form part of manned spacecraft or launcher.

MANS, Mans Missile and nuet surveillance.

man space Assumed to include individual equipment and currently defined as 250 lb/13.5 cu ft (DoD).

Mantra 1 Multi-axis no-tail aircraft.

2 Manpads threat avoidance.

Manteca Management of surface traffic at European airports (Euret).

Mantech Manufacturing technology (AFSC).

man-tended free-flier Autonomous space laboratory accessible to astronauts but not normally manned.

manual Performed by hands, thus * control, * flying = hand-flying aircraft fitted with autopilot or AFCS.

manual D/F Obtaining bearing by hand-rotation of loop and visual or aural judgement of signal.

manual feedback Force experienced at pilot from manual FCS, or (rarely) other system.

manual override Condition in which pilot physically overcomes AFCS through cable and/or linkage connections and exerts flight control in excess of AFCS authority or in opposition to AFCS command.

manual reversion Ability to switch from autopilot or AFCS to hand-flying (can be automatic in event of AFCS failure) wherein pilot’s forces are transmitted to control surfaces.

manufactured head Rivet head preformed when rivet made.

Manvis Map and aviator’s night-vision system (helicopters).

man - Air intercept code: more than eight (DoD).

MAO Mature aircraft objective.

MAOCB Multicore air operation[s] co-ordination centre.

MAOT Mobile air operations team (British Army).

MAP 1 Ministry of Aircraft Production (UK, 1940–April 1946).

2 Military Assistance Program (DoD).

3 Machine assembly program.

4 Missed-approach point, or procedure.

5 Ministry of Aviation Industry (USSR, R).

6 Manufacturing automation protocol.

7 Manifold absolute (or air) pressure.

8 Multiple aim point (USA).

9 Municipal airport (US).

10 Maximum a priori probability.

11 Modular airborne processor.

12 Military Airport Program (FAA).

13 Mode-annunciation panel.

map Two-dimensional plot of two [sometimes several] parameters, usually based on X and Y axes, generally = graphical plot.

MAPA Malaysian Airlines’ Pilots’ Association.

Maple Flag Canadian Red Flag.

map-matching Navigation (usually of RPV or missile) by auto-correlation of terrain with stored strip of film; based on appearance, unlike Tercom.

Mapp Methyl acetylene-propadiene/propane (FAE).

M/Map Missed-approach procedure.

mapping radar Producing pictorial display showing Earth’s surface in detail (usually in sector ahead, sometimes PPI 360° all round aircraft).

map reading Navigating by comparing terrain with map, generally called contact flying.

MAPS, Maps Mobile aerial port squadron (MAC).

2 Measurement of air pollution sensor (Shuttle), also rendered as measurement of atmospheric pollution from satellites.

3 Mission analysis and planning system, several models (USAF).

4 Military-aircraft planning system.

5 Meteorological and aeronautical presentation system (1976).

Mapse Minimal APSE (Ada programming support environment).

MAPSS Modular airborne patrol surveillance system.

MAPt Missed-approach point.

MAPTH Mission aborts per thousand flight hours.

MAR 1 March (ICAO).

2 At sea (ICAO).

3 Multiple- (or multi-function) array radar.

4 Mission abort rate.

5 Minimally attended radar.

6 Military Aircraft Release (UK).

7 Major aircraft review.

8 Multi-access receiver.

9 Multiple-access recorder.

10 Mobile access router [satcoms].

MARA, Mara Modular architecture for real-time applications.

maraging steel High-alloy (Ni, Co, Mo) steels aged in martensitic condition for maximum tensile strength.

MARAIMED Maritime Air Forces, Mediterranean (NATO).

Maras, MARAS Middle airspace radar advisory service.

MARC Multi-access remote-control.

MARCS, Marcs Military Airlift [Command] reaction communication system.

MARE Miniature analog recording avionics.

Marendax flap Split flap hinged under wing entirely forward of TE.

Mareng tank Flexible fuel cell (from Martin Engineering, US).

mare’s tail sky Cirrus.

marginal performance Barely able to comply with airworthiness requirements, or to fly safely.

marginal weather Only just good enough for safe or legal flight, actual conditions depending on whether flight is
margin of lift

IFR or VFR. DoD definition: ‘Sufficiently adverse to military operation so [sic] as to require imposition of procedural limitation’.  

margin of lift 1 Aerostat buoyancy (gross lift) minus mass.  

2 Various meaningless definitions for aerodynes.  

margin of safety 1 Percentage of ratio by which ultimate failing load of component exceeds design limit load.  

maria 1 Flat areas on Moon once thought to be seas.  

Marie Martian radiation environment experiment.  

marine aircraft 1 Designed to operate from water. Hence, marine aerodrome or airport.  

maritime distress signal Pyrotechnic fired after unpremeditated alighting.  

maritime aircraft Designed to operate over sea areas.  

maritime PDNES PDNES having extremely short pulses to reduce sea-clutter.  

maritime SAR Region within which USCG exercises SAR co-ordination function (FAA).  

MARK Material accountability and robotic kitting system (DoD).  

Mark Air-control agency code for commanded point of weapon release, usually preceded by word ‘Standby’ (DoD).  

mark 1 Abb. Mk, British word meaning version or subtype to distinguish each variant of a basic aircraft design, whether produced in series or not. See * number.  

2 Verb, to illuminate a target by flares, TLs, markers or laser.  

marked target One illuminated by (2) above to enable it to be attacked visually or by laser-homing weapons.  

marker 1 Distinctive visual (usually pyrotechnic), electronic or other device dropped on surface location.  

2 Visual or electronic navigation aid indicating a fixed position, see * beacon.  

3 Aircraft detailed to mark a target by air-dropped stores or to designate it by laser.  

marker beacon Any beacon (course-indicating, fan, outer, middle, inner) giving substantially vertical radiation, usually at 75 MHz, which gives aural and visual signal in cockpit (see outer *, middle * etc).  

marker template One having profile of common stringer or similar standard section, for marking end-cuts and cut-outs.  

market 1 The world total of available potential customers.  

marketable range or radius Maximum sector distance sold to customers by air carrier; eg Dash-7 * 400 miles, while ‘operational range’ is 700 miles.  

marking panel Sheet of material displayed by ground troops for signalling to friendly aircraft.  

marking team Troops dropped into tactical area to establish navaids and possibly other electronic facilities.  

marking up Putting bright paint line round each airframe crack or blemish.  

mark number Suffix numeral identifying each mark; Roman to 1946, Arabic subsequently (UK).  

Markov analysis A logical and rigorous technique to ascertain the airworthiness of systems having multi-channel architecture with numerous inter-related functioning parts and monitors.  

Marmon clamp Patented ring joint for pipe sections, with wedge action.  

MARRES Manual radar-reconnaissance exploitation system.  

marrying up Offering up major airframe or other large items in erection of aircraft or space launcher, esp. when likelihood of imperfect fit.  

Mars 1 Mid-air recovery (USN), or retrieval (USAF) system.  

2 Military affiliate radio system (DoD).  

3 Multi-access retrieval system.  

4 Modular airborne recorder series, or system.  

5 Minimally attended radar station.  

6 Meteorological and AIS (1) retrieval system.  

7 Multi-applications recording, or reproducer, system.  

# Military Archive and Research Services (UK).  

9 Mobile automatic reporting station.  

10 Modular adaptable radar simulator.  

11 Medium-altitude reconnaissance system.  

12 Mission-assessment recording system.  

13 Multimission airborne reconnaissance and surveillance.  

Marsa Military accepts responsibility for separation of aircraft (DoD/FAA).  

marshal 1 Person giving visual and/or aural signals to sporting aircraft or sailplanes to ensure line-up in correct take-off sequence.  

2 See Air Marshal, Sky marshal.  

marshaller Person on apron or flightline giving visual signals or radio guidance to aircraft on ground, eg directions where to park; hence, * frequency, * van.  

marshalling point Place on airfield where aircraft come under control of a marshal (sporting, out-bound) or marshaller (inbound).  

marshalling wand Combined black flag and illuminated wand normally used one in each hand by marshaller.  

MARSS 1 Microwave airborne radiometer and scanning system.  

2 Multi-mission airborne reconnaissance and surveillance system (USA).  

MarSTC Maritime Strike Carrier [capability or mission] (UK).  

MART, Mart 1 Modular air/ground remote terminal.  

2 Mini-avion de Reconnaissance Télécommandé = RPV (F).  

3 Mean active repair time.  

Martacs Maritime tactics.  

martensite Family of rapidly quenched [hence hard but brittle] steels.  

Martha Maillage anti-aérien des radars tactiques contre hélicoptères et avions.  

Martlesham Martlesham Heath, pre-1939 centre of military aircraft test and evaluation in UK, hence * figures (= indisputable).  

MARY, Marv manoeuvrable, or manoeuvring [manoeuvring], re-entry vehicle.  

MAS 1 Military Agency for Standardization (NATO).  

2 Military area services.  

3 Military assistance sales (DoD).  

4 Middle airspace service.  

5 Micro autonomous system.  

6 Morphing aircraft structure.  

MASA Multi-arm spiral array.  

MASC Maritime airborne surveillance and control; also rendered as maritime air surveillance capability.
mascon

mascon One of the mass concentrations scattered over lunar surface which distort orbits near the Moon.

MASDC Military Aircraft Storage and Disposition Center (USAF Davis-Monthan AFB).

MASE Multi-axis seat ejection.

maser Microwave amplification by stimulated emission of radiation, devices which pump electrons to higher energies and build up amplification of EM signals at microwave frequencies (see laser).

MASF Mobile aeromedical staging flight(s).

2 Military assistance service fund (DoD).

MASH, Mash Mobile Army Surgical Hospital (USA).

2 Mobile avionics screening handler.

MASI, Masi Mach/ASI.

Masint Measuring [or measurements] and signals [or signatures] intelligence.

masking 1 Layer protecting substrate against applied process, eg metal foil or special paper when painting aircraft, or hi-resist, surface pattern when doping or etching microelectronic chip.

2 Deliberate use of additional emitters to hide or conceal true purpose of particular EM radiation.

master Hiding battlefield helicopter behind natural cover.

1 Time taken for (3), typically ≤2 s.

mask Face mask for (a) protecting skin in open cockpit, (b) supplying oxygen, and/or (c) incorporating microphone.

Masonite Commercial formulation of compressed fibreboard, moulded to shape with accurate glossy finish on at least one surface.

MASP Minimum aviation systems performance, A adds avionics, S standards or specification.

MASR Multiple antenna surveillance radar.

MASS, Mass Marine air support squadron (DoD).

1 Mission avionics sensor synergism (data fusion).

3 Military approach and surveillance system.

2 Maritime air surveillance sortie.

5 Magnetic-array sensor system.

6 Multi-ammunition soft-kill system.

Military airborne surveillance system.

mass Applied force on body divided by resulting acceleration; in practice gravitational attraction of body related to standard kilogramme.

mass axis Line joining c.g. of all elements of part, esp. wing.

mass balance Mass attached to flight-control surface, typically ahead of hinge axis, to reduce or eliminate inertial coupling with airflow flutter modes.

mass flow Quantity of fluid passing through closed system per unit time.

1 Specifically, mass of air passing through an engine or any of its components per second. Generally W V T/P = pAV. One conversion is: 1 lb/h = 1.25998 × 10⁻⁴ kg s⁻¹; reciprocals, 7.93663 × 10⁴.

mass fraction See mass ratio (1).

mass injected pre-compressor cooled Propulsion for initial part of Rascal turbojet[s] with injection of water plus liquid air or LO₂.

massive ordnance Conventional warhead weighing 9,072 kg (20,000 lb) or more (DoD).

massive ordnance penetrator Giant bomb, designed to defeat deeply buried structures.

mass law Transmission of sound through a solid wall is very approximately inversely proportional to both frequency and mass per unit area.

mass parameter Ratio of aircraft density [mass divided by wing area and mean chord] to air density multiplied by 2 and divided by lift slope; if necessary corrected for Mach number.

mass per unit area 1 kg m⁻² = 3.27705 oz ft⁻²; 1 lb ft⁻² = 4.88243 kg m⁻².

mass per unit length 1 kg m⁻¹ = 0.05600 lb in⁻¹; 1 lb in⁻¹ = 17.8580 kg m⁻¹.

mass-properties engineering Discipline dealing with weight, balance, moment of inertia, centre of gravity, stability and mission dynamics.

mass ratio Mass of vehicle, normally ballistic rocket, at liftoff divided by mass at all-burnt or other later condition.

2 Rarely and ambiguously, mass of propellants as fraction of total liftoff.

mass spectrograph Instrument for converting molecules to ions and then separating these to determine exact isotopic weights.

mass taper Rate of, or graphical plot of, reduction of cross-section-percentage material density from root to tip of blade (eg helicopter rotor), latter usually being externally untapered.

mass values For average passengers [except charters]: male 88 kg, female 70, child 35.

MASE Marine airborne surveillance system.

Military aircraft satcom[s] terminal.

Military assistance to safety and traffic.

3 Married airmen sharing together (USAF).

4 Multimission airborne surveillance technology (USAF).

5 Multiple aircraft simulation terminal.

6 Maintenance, analysis, safety and training.

mast 1 Tube projecting from underside of aircraft so that liquid can drain well away from airframe.

2 Rigid pillar for avionics antenna (aerial).

3 Rigid mooring structure for airship.

4 Pillar above centre of helicopter rotor for MMS (2).

Mastacs Manoeuvrability-augmentation system for tactical air combat simulation (USN).

Master Military aircraftsatcom[s] terminal.

Master air attack plan Basis of netcentric warfare, automatically supported to eliminate human error or oversight (USAF).

Master Bomber Experienced crew-member tasked with staying over target throughout attack issuing instructions on [eg] which markers to use and which to avoid (RAF, WW2).

master caption panel Flight-deck panel giving initial warning information and/or indication of AFCS mode, navigation mode etc.

master caution signal Indication that at least one caution signal has been activated.

master connecting rod See master rod.

master contour template Full-size flat template showing all mould-line contours, rib contours or other related shapes to common reference.

master diversion airfield Large and well-equipped airfield able to handle all kinds of aircraft whose home
master engine
bases are shut by weather or enemy action, and promul-
gated as such.
master engine  When all engines of a multi-engined
aircraft are synchronized, that to which the other engines
are slaved.
master oscillator  That defining timebase and waveform
for radio or radar.
Master Pilot  1 Formerly, highest grade of commercial
B-licence [5 + years and other requirements] (UK).
  2 Highest rank in unpopular ‘aircrew’ system [1947–53]
          (RAF).
master rating  In certain air forces, highest level of
aircrew proficiency in each trade.
master rod  Connecting rod with big end and with
attachments for all other rods in same plane.
master router template  Flat template, usually same size
as metal sheet or slab, used to locate pilot and pin holes
and set up sheet for routing or skin-milling by non-NC
control.
master station  Various meanings, esp. that housing
timebase and emitting original signals in R-Nav hyper-
bolic systems, other stations being slaves keyed to it.
master switch  Makes or breaks generator main line,
must be ON to start engine[s].
Master systems bench  Ground installation duplicating
complete avionics and flight-display systems.
master template  Reference for any form, usually two-
dimensional, in manufacture; used to make jigs and
tooling.
Mastiff  Multiple-axis spin-test inertia facility.
Mastiff  Modular automated system to IFF.
mast-mounted sight  Group of sensors, typically optical,
FLIR, laser, mounted on anti-vibration mast above heli-
copter rotor hub to allow crew to see targets without
exposing helicopter.
MASU  1 Multiple acceleration sensor unit.
  2 Military Aircraft Storage Unit (DARA Fleetlands,
          UK).
  3 Mobile Aircraft Support Unit (RN).
MAT  1 Modification aprobal test.
  2 Moscow aviation technical high school.
  3 Modular advanced test (Raytheon).
  4 Maintenance-access terminal.
mat  Flexible membrane laid on unprepared ground
for limited number of V/STOL operations.
  2 Area paved with quick-assembled metal mesh or
planking.
  3 Floating support towed by ship for recovery of
marine aircraft.
Matac, MATAC  Tactical air command (Spanish air
force, EdeA).
MATC  Mobile Aircraft Traffic Control (1).
Matcals  Marine (or Mobile) air-traffic control and all-
weather landing system (USMC).
Match  Männer [per medium] anti-submarine troop- [or
torpedo]-carrying helicopter.
matched pole-zero  For approximate conversion of a
continuous transfer function into a discrete one by
mapping both poles and finite zeros into the z-plane.
matching  Any prolonged process of developing
dynamic parts to work properly together; eg inlet/
Mauve AIC

J Modular avionics unit(s).

Mauve AIC Gives details of temporary airspace restrictions caused by special activity.

MAUW Maximum all-up weight (tantalological).

MAY 1 Micro air vehicle.

2 Mars ascent vehicle.

J Multrole autonomous vehicle.

MAVA TCD Micro air-vehicle advanced concept technology demonstration.

Mavar Parametric amplifier (from mixed amplification by variable reactivity).

Mavus Maritime VTOL UAV system.

MAW J Mission-adaptive wing.

2 Missile approach warning, defensive system linked to RWR giving definite warning of a locked-on missile’s approach.

J Military Airlift Wing (USAF).

2 Marine Air Wing (USMC).

MAWP Missed-approach waypoint.

MAWS J Modular automated weather system.

2 Missile approach, or attack, or advance, or warning, warning system.

MAWTs Marine Aviation Weapons and Tactics Squadron.

MAX Maximum; CLB, CRZ add climb, cruise.

Maxaret Pioneer (Dunlop) anti-skid system for wheel brakes.

max chat Maximum power (colloq.).

max-des Maximum rate of descent mode.

maxed out Total overload of brain of jet pilot in combat.

2 Electronic processor with no available capacity.

J Nation unable to commit any more armed force to trouble spot.

maxi Top RPV class, on basis of weight, altitude and speed; all are high-altitude jets.

Maxi decoy ECM payload, originally bronze model aircraft with radar cross-section identical to attack aircraft.

maximum authorized altitude Highest altitude on airway jet route or any other direct route for which MEA (1) is designated in FAR.95 at which navaid reception is assured (FAA).

maximum boom-free speed Mach limit at high altitude to avoid shock reaching ground, variable with atmosphere in region of M 1.12.

maximum chamber pressure Peak pressure in complete firing cycle of solid-propellant motor, symbol Pc max.

maximum Cl Value at peak of curve where dCp/dx=0, hence “angle of attack.”

maximum climb thrust For most jet engines, achieved by advancing throttle to obtain a predetermined EPR.

maximum cold thrust Highest thrust without using (available) afterburner.

maximum contingency Highest output turboshaft (rarely, other type of engine) can deliver or is authorized to deliver, usually for 2½ min. following failure of other engine of multi-engine aircraft; usually requires subsequent inspection.

maximum continuous Thrust or rpm limit available for unlimited period, usually using rich mixture if piston engine and all augmentation for gas turbine, often available for certification or emergency only.

maximum cruise rating Highest power without augmentation or [piston engine] rich mixture; often this is highest available for normal continuous operation.

maximum cruise thrust Same as max climb procedure.

maximum cruising speed Highest speed permitted (usually in flight manual) for sustained operation; normally expressed as EAS or CAS, occasionally only as Mach.

maximum demonstrated Precise limit [of whatever parameter] available to test pilot when aircraft is being certificated.

maximum diving speed Highest speed demonstrated in certification (see V∞).

maximum effort Using every aircraft that can be made serviceable, though usually without addition to list of allowable deficiencies.

maximum elevation figure Published height AMSL [in US in ft] of highest point in local area or other prescribed region.

maximum except takeoff Highest available piston engine power other than takeoff rating.

maximum expected operating pressure Peak (or 1.1 times peak) of pressure throughout burn of solid motor.

maximum gross weight US term = MTOW.

maximum landing weight MLW, certified value above which fuel must be jettisoned or burned off if landing becomes urgently necessary and possible structural damage is to be avoided.

maximum likelihood A standard method of deriving stability and control plus cost function [difference between measured and estimated response, summed over time].

maximum loaded weight To avoid confusion, now generally replaced by MRW.

maximum material condition That in which a feature of size contains the maximum permissible amount of material, e.g. a hole on the minimum permitted diameter.

maximum mean camber Maximum camber of median line of wing sections from root to tip.

maximum net weight Allowable payload of baggage trolley or other surface vehicle = maximum gross minus tare.

maximum on ground Overall size of ‘spot’ on ground needed for landing, unloading and take-off of airlifter, probably in haste (under enemy fire). Most studies demand so many MOG Spots that STOVL capability is essential.

maximum operating Mach number Self-explanatory, but still less than Mrne.

maximum payload Limit for transport as defined in certification. For cargo aircraft usually same as maximum structural payload; for all-pax configuration, usually established by seat configuration at much lower value.

maximum performance takeoff That in which energy transfer is at highest possible rate, usually limited by sliding of locked tyres and avoidance of striking tail on runway or exceeding gear-down EAS.

maximum power For propulsion engine, power under ISA/SL conditions with engine operating at authorized limits of rpm, pressures and temperatures. See previous ‘maximum’ entries.

maximum power altitude Lowest altitude at which full throttle is permissible (some definitions add: at maximum rpm for level flight); for supercharged piston engine,
maximum q

highest altitude at which maximum boost pressure can be maintained.

maximum q Highest dynamic pressure attainable; for given aircraft, function of dive limits, atmospheric pressure and structural strength.

maximum ramp weight The highest of all certified weight, = MTOW/MTWA plus fuel allowance for start-up and taxi.

maximum reading accelerometer Records maximum reached.

maximum rpm In shaft-drive engines, invariably a transient overspeed condition permitted by lag in propeller or engine-speed control system.

maximum speed Highest TAS attainable in level flight, at best altitude.

maximum structural payload Combined weight [or capacity] of pax, baggage and cargo certificated to be carried on main deck and in belly holds.

maximum takeoff rating In jet engine, achieved by selecting water [if available] and advancing throttle to give TO EPR.

maximum takeoff weight See MTOW.

maximum turn rate That giving maximum number of deg/rate of change of heading, ie rotation of longitudinal axis; unrelated to change in trajectory.

maximum undistorted output Peak signal strength consistent with intelligible speech in early radio.

maximum usable frequency Highest for shortwave communications between fixed points using ionospheric reflection (time-variant).

maximum usable speed Consistent with intelligible speech in early radio.

MB 

Multi-beam acquisition radar.

MBAT Multibeam array transmitter.

MBC 1 Main-beam clutter.

MBDOE Million barrels per day oil equivalent.

MBE 1 Molecular-beam epitaxy.

MBEC Maximum best-economy, or economical, cruise, or cruising; P adds power [piston engines].

MBF Multi-body freighter.

MBFR Mutual and balanced force reductions.

MBFS Maximum boom-free speed.

MBIL Multi-beam illuminator [BC/FC].

MBITR Multi-band inter/intra team radio.

MBK Missing, believed killed.

MBM Magnetic bubble memory.

MBMMR Multi-band multi-mode radio.

MBR Management by objectives.

MBOH Minimum break-off height.

MBP Maximum takeoff regime (USSR, Cyrillic characters actually represent MVR).

MBR 1 Minimum burner pressure; V adds valve.

MBPS, MBps, MB/s Megabits/second.

MBps Megabytes/second.

MBR Marker-beacon receiver.

MBRGW MBRW (adds redundant ‘gross’).

MBRV Manoeuvrable ballistic re-entry vehicle.

MBRW Maximum brake-release weight, at start of takeoff run.

MBS 1 Millibars (on alphanumeric readout).

MBsat Multimedia broadband satellite(s).

MBSU Main-bus switching unit.

MBTH Military Budget Committee.

MBX Management by exception.

MBs, mb/sec Megabits per second.

MBX Material by the hour.

MBX Management by exception.

MBY Megabytes, = 220 = 1,048,576 bytes.

MBZ Mandatory broadcast zone.

MC 1 Marine Corps (USMC).

MC 2 Medium-case, or capacity (bomb).

MC 3 Magnetic course.

MC 4 Multi-combiner (HUD).

MC 5 Maximum certificated (altitude).

MC 6 Manufacturing cost.

MC 7 Mission-capable.

MC 8 Motion cueing.

MC 9 Master change.

MC 10 Military characteristics (of NW).

MC 11 Materials consortium.

MC 12 Main, or mission, or monitoring, or multifunction, computer.

MC 13 Megacycles (incorrect usage).

MC 14 Design cruise Mach number.

MC 15 Couple causing bending.

m/c 1 Mached.
m.c. 2 Machine, colloquial = aeroplane.
m.c. Moving-coil.
im. Mass flow through core of turbofan.
MCA 1 Ministry of Civil Aviation.
  2 Minimum crossing altitude.
  3 Military/civil action.
  4 ISA in Cyrillic (R) characters, actually reading MSA.
  5 Military C. of A.
  6 Minimum controllable airspeed.
  7 Maritime and Coastguard Agency (UK).
  8 Maintenance-centre analyser (a HUMS).
  9 Major component assembly [hall].
MCAD Mechanical computer-aided design.
MCAGC Marine Corps Air/Ground Combat Center.
MC&G Mapping, Charting and Geodesy (USAF).
MCAP M-Cap Manned/unmanned common architecture program (UAV) (USA).
MCAS Marine Corps Air Station (USMC).
MCASD Marine Corps aviation simulator master plan (USMC).
MCC Multi-colour display.
MCC 1 Mission control center (NASA).
  2 Midcourse correction.
  3 Meteorological communications centre.
  4 Mobile command centre.
  5 Main combustion chamber.
  6 Mission-control console.
  7 Mission crew commander.
  8 Manual control centre.
  9 Multi-crew co-operation.
 10 Mission computer cluster.
 11 Maintenance control computer, or centre.
 12 Management command and control.
 13 Main communications control; P adds panel.
 14 Manual control and counter.
 15 Maritime command and control.
 16 Mobile computer core.
 17 Military command corridor.
MC3A, MC3 Multi-sensor command and control [aircraft] (USAF).
MC3C, MC3C Multi-sensor command and control constellation (USAF).
MCC-H Mission Control Center – Houston (NASA).
MCCIS Maritime command and control information system (NATO).
MCSS Multi-function command and control system.
MCX 1 Marine C. of A.
  2 Marine Craft Detachment (RAF).
  3 Multi-colour display.
MCDD Mini common datalink.
MCDE Maintenance control and display panel.
MCDF Critical drag-rise Mach number.
MCDFU Multi-function, or multipurpose, controller / display [or control and display] unit; in cockpit, enables line maintenance to identify faulty LRUs and replace without documentation.
MCDFW Minimum-collateral-damage weapon.
MCE 1 Mission, or modular, control element, or module control equipment.
  2 Microcircut engineering; P adds program (NASA).
MCS 1 Military communications electronics; B adds board, WG working Group (US).
MCCE Maneuver-criteria evaluation program (US).
MCF 1 Manoeuvring control force.
  2 Military computer family.
  3 Millied carbon fibre.
MEC 1 Minimum-collateral-damage weapon.
  2 Maintenance-cost guarantee; P adds plan.
  3 Pitching moment about c.g.
McGg tube High-speed photo image tube, samples 'sausage' of electrons slice by slice.
MCG Modular crew operations panel (ISS4).
MCID 1 Mine countermeasures [F adds Force].
  2,100 circular mls.
  3 Multi-chip module.
  4 Pitching moment about centre of mass [c.g.].
MCMP Modular countermeasures pod.
MCN Manufacturing contract, or control, number.
MCNDC Missile capture network defense command (US).
MCOP Multi-channel operation panel (ISS4).
MCO 1 Confusingly used to mean maximum continuous thrust.
  2 Mars climate orbiter.
  3 Mode-coupled oscillation.
MICO Methane/castor oil.
MCOP Multi-crew Operations Panel (ISS crews).
MCOPS Millions of computer operations per second.
MCOS Multicomputing operating system.
MCP 1 Maximum continuous power.
  2 Maximum climb power.
  3 Multi- or micro-channel plate (image intensifier).
  4 Mode [or maintenance] control panel.
  5 Military construction program (USAF).
  6 Missile control panel.
  7 Modular countermeasures pod.
MCPH Maintenance cost per hour.
MCPL Multi-crew pilot license [the correct abbreviation is MPL].
MCR 1 Maximum cruising rate.
  2 Maximum control range.
  3 Mission capable [or completion] rate.
  4 Modular-cabin crew rest.
MCR 1 Mine countermeasures [F adds Force].
  2 Maximum control range.
MCRI Critical Mach number.
MERI Critical Mach number.
MERI D Merit at which subsonic C0 rises by 0.002 at constant angle of attack.
MCRC Mobile control and reporting centre.
MCSS 1 Military control speed.
  2 Miniature control system (ATC).
Mc w
3 Missile control system, on fighter.
4 Mixed-class seating.
5 Material [or material] certification statement (FAA).
6 Modular cooling system.
7 Main-computer, or mission-control, software.
8 Manoeuvre[s] control system.
9 Multifunctional control surface.
10 Mission communications system.
11 Mixture control system.
12 Mobility completion success rate.
13 Mission control station, or segment.
14 Monte Carlo simulation.

Mc/s MDLRS
6 Missile Defense Agency (US, formed 2002 to manage GMD).
7 Multidisciplinary analysis.
MDAP Mutual Defense Assistance Program (US, NATO, June 1952).
2 Major defense-acquisition program (US).
MDAS Multifunction defense avionics system.
MDAU Modular data analysis unit.
MDR Multiplex data bus.
MDBR Missile defense/battle-integration center (USA).
MDBR Multifunction dextrous boro-robot.
MDC Minimum-displacement [i.e., force-sensing] control[er].
2 Main display console.
3 Maintenance Data Centre (RAF).
4 Miniature [also micro, which is smaller] detonating, or detonation, chord [previously cord].
5 Motor-driven compressor.
6 Multiple drone control.
7 Main-deck cargo (V adds volume).
8 Maintenance diagnostic computer.

MD-Cad Multidisciplinary concept assessment and design.
MDCRS Meteorological data collection and reporting system, or service.
MDD Meteorological data distribution.
2 Mission data brief.
3 Master dimension definition.
MDD See drag-divergence Mach number.
MDDS MDD(2) software.
MDDU Multipurpose disk-drive unit [-O adds on-board, for BITE, CMC etc].
MDE Manual, or mission, data entry.
2 Major defense equipment; AEA adds airborne electronic attack.
3 Mission data edit [display].
MDFN Maximum demonstrated diving flight Mach number.
MDEF Mach number at which shockwave is just detached.
MDEWS Modular digital EW suite.
MDF XMF D/F station (ICAO).
2 Mission degradation factor (USAF).
3 Mission data file.
MDFR Multiple disblocated flight-data recorder; S adds system.
MDFN Molybdenum-disulphide-filled nylon.
MDFY Modify.
MDG Map display generator.
MDGT Pronounced midget, mission data [or mission debriefing] ground terminal.
MDH Minimum descent height.
MDI Miss-distance indicator; hence MDIS = * system.
2 Multifunction display indicator.
MDIV MDIV Drag-divergence Mach number, which see
MDL Mission data-loader.
2 Multipurpose data-link.
3 Minimum description length.
MDLC Manoeuvring direct-lift control.
MDLRs Mission-data loading and recording system.
MDLT
Mobile data-link terminal.

MDM
Multiplexer-demultiplexer.

MDNS
Managed data network services.

MDNT
Missile Defense National Team (US).

MDO
Multidisciplinary design organization, or optimization.

MDOF
Multiple degrees of freedom.

MDP
1 Motor-driven pump.
   1 Maintenance data panel (1553B data-bus).
   1 Maximum dry power.
   4 Modular display processor.
   5 Multi-designation protocol.
   6 Material deficiency report.

MDPC
Mission and display processing computer.

MDPS
Metric data-processing system.

MDPU
Modular data-processing unit.

MDR
1 Mandatory defect reporting.
   2 Magnetic-field dependent resistor.
   3 Medium data-rate.
   5 Micro-data recorder, linking surveillance radars with computers.
   5 Mission data recorder.
   6 Material deficiency report.

M0D
Drag-rise Mach number.

MDRC
Material Development and Readiness Command (USA).

MDRI
Multipurpose display repeater indicator.

MD/RWW
Map display and report-writing workstation, part of GIES.

MDS
1 Minimum discernible, or detectable, signal.
   3 Matériels de servitude, ie GSE (F).
   4 Mission/design/series, basic system of designators of military aircraft (US).
   5 Multilevel database system.
   6 Measurement and debriefing station, or system [Tacts].
   7 Manned destructive suppression.
   8 Miss-distance sensor.
   9 Medium-distance [EO] sensor.
   10 Maintenance data station.
   11 Mission distribution system.
   12 Meteorological data system.
   13 Modular dispenser system.
   14 Mid-course defense segment [see GMDS].
   15 Mobile data service.
   16 Multi-static dependent surveillance, synonymous with multilateration.
   17 Master dimension surface.

MDT
1 Maintenance display terminal.
   2 Mission-data tools, or terminal.
   3 Mountain daylight time (US).
   4 Moderate.

MDTCP/M
Mega-data-transfer cartridge, with processor.

MDTS
1 Mission data-transfer system.
   2 Megabit digital troposcatter subsystem.

MDU
1 Microwave distribution unit.
   2 Mine distributing unit.

MDV
Minimum detection velocity.

MDWP
Mutual Defense Weapons Program.

MDWT
Marine division/wing team (DoD).

ME
1 Maneuvre enhancement mode.
   2 Multi-engine, or main engine.
   3 Mission-essential.

Mearts, M-EARTS

4 Maintenance error.

M€
Millions of Euros.

M€
Merkel number.

mE
Maritime equatorial air.

m0
electron rest-mass.

MEA
1 Minimum en-route IFR altitude.
   2 Maintenance engineering analysis.
   3 More-electric aircraft.

meacon
To mislead enemy by receiving and instantly rebroadcasting radio-beacon signals from false positions.

Meads
1 MEA (2) data system.

2 Medium extended air-defense system (USA, G, I).

mean aerodynamic chord
Chord of imaginary wing of constant section having same force vectors under all conditions as those of actual wing, symbol c (in practice usually very close to mean chord c).

mean blade width ratio
Ratio of mean blade (width) of propeller blade to diameter.

mean chord
Gross wing area divided by span, symbol c.

mean day
Time between successive transits of mean Sun.

mean effective pressure
Pressure acting on piston during power stroke in Otto, diesel, two-stroke, Stirling and most other reciprocating IC engines.

mean fleet performance
Mean (sometimes average) flight performance (sometimes other parameters, eg engine IFSD rate) of entire airline fleet of one aircraft type.

mean free path
Mean distance point could move in straight line without collision with surrounding fluid molecule; greater than mean distance between fluid molecules.

2 Mean distance a sound wave travels in an enclosed space before being reflected.

mean geometric pitch
Mean of geometric pitches of all elements from root to tip of propeller blade, symbol Pg.

mean square value
Arithmetic mean of squares of all values; * error equals sum of squares of errors divided by their number.

MEAP
Mean time to repair
during power stroke in Otto, diesel, two-stroke, Stirling and most other reciprocating IC engines.

mean time between failures
For specified time interval, total operating time of population of material divided by total number of failures within population (USAF).

mean time to repair
For specified time interval, summation of active repair times divided by total number of malfunctions (USAF).

MEAP
More-electric aircraft project (DSB).

Mearts, M-EARTS
Micro en-route automated radar tracking system.
MEARW

MEARW Multi-engined advanced rotary-wing (school, RAF Shawbury).
MEAS Mechanical engineering aircraft squadron (RAF).

measured performance That measured on one occasion under specified conditions; usually slightly higher than gross performance.
measured thrust That measured on one occasion under specified conditions, usually by force transducers on testbed (see installed/net/gross thrust).
measured thrust coefficient For solid-propellant rocket, thrust-versus-time integral over action-time interval divided by product of average throat area and integral of chamber pressure versus time over action-time interval; symbol Cf.

meatball 1 Colloquial American for any guidance reference: thus, on the * to hack the *.
2 Accurately flown final approach.
# Fresnel lens.
$ Main electronics box.
% Marine Expeditionary Brigade.
& Modular expendable block (countermeasures).
Mebul, MEBUL Multiple engine build-up list.
MEC Main, or mechanical, engine control.
$ Main equipment centre.
$ Modular electronics concept.
$ Master Executive Council (ALPA).
$5 Modular exploitation capability [to achieve interoperability for all ISTAR] (MoD, UK).
MECA Missile electronics and computer assembly.
Mecaplex Registered acrylic plastic sheet similar to Plexiglas.

mechanical See * horsepower.
mechanical de-icing Using distortion (eg rubber boot), centrifugal force or other physical method to dislodge ice.

mechanical efficiency Work delivered by a machine as percentage of work put in, difference being mainly frictional losses.

mechanical equivalent of heat See joule.
mechanical horsepower Shaft horsepower.
Meco Main-engine cutoff (large rocket vehicle).
MECU Main-engine control unit.
MECV Mobile explosive containment vessel.
MED 1 Multifunction electronic display [S adds system, or subsystem].
2 Maximum-entropy discrimination.
$ Maximum.
$5 Medical.
$ Mediterranean regional area.
Med Medium.
MEDA 1 Military emergency diversion airfield.
2 Maintenance error decision aid.
Medcat Medium-altitude CAT.
Medevac Military airlift of sick or wounded.
median lethal dose That over whole body which would be fatal to 50% of subjects.

median line Line through aerofoil profile at all places equidistant from nearest points on upper and lower surfaces, = mean line.
median selection Automatic choice of mean and rejection of extreme values; can also mean majority voting.

MEHT

Mediator Unsuccessful grand design for UK ATC (1) system embracing all air traffic.
medium aircraft Meaningless, but in 1998 the 737 was cited as an example. An ICAO document once said, 7,000–136,000 kg MTOW.
medium altitude Between 2,000 ft and 35,000 ft (DoD).
medium-altitude level bombing Release between 8,000 ft and 15,000 ft (DoD).
medium-angle loft bombing Release at 35° to 75° from horizontal.
medium bird For impact or ingestion certification, one weighing 1.5 lb, 0.68 kg.
medium bomber Former category defined quite differently by different air forces, either by bomb load or range, and so developed 1920–50 as to make numerical values meaningless.

medium cloud, CM Cloud types prefixed by alto-; according to BSI with average height 8,000 ft to 20,000 ft (2,438–6,096 m).

medium Earth orbit Between LEO and synchronous.
medium frequency EM radiation with superimposed carrier at 300 kHz–3 MHz.
medium-range ballistic missile Operational range 600 to 1,500 nm (1.112–2.780 km); see mid-range (** DoD).
medium-range transport Full-payload range 1,500 to 3,500 nm (2,780–6,486 km).
medium-scale integration Normally taken to mean 50–500 circuits or gates per chip.
medium-scale map From 1:75,000 to 1:600,000 (DoD, IADB).

medium turn Most authorities define as bank angle 25° to 45°.
medium-wave Rare in modern radio/radar; in IR means wavelength 3–5 μ.

Medusa Multifunction electro-optics for defense of US aircraft (AFRL).
MEE More electric engine.
MEECN Minimum essential emergency communications network.

MEF 1 Minimum essential facilities.
2 Marine Expeditionary Force.
3 Maximum elevation figure[s].
MEFC Manual emergency fuel control.
MEG Motionless electromagnetic generator.
mega 1 Prefix, ×106; symbol M, thus MW = megawatts[s]; a omitted in megohms[s].
2 In EDP = 2^6 = 1,048,576.

megacycles Megahertz.
megafloat Technology for floating offshore airports.
megahertz 10^6 cycles per second, MHz.
megajet Jet aeroplane of over 10^6 lb MTOW.
megawatt 10^6 maxwells, = 10^6 Wb.
megaton, MT Explosive power equivalent to nominal 1,000,000 short tons of TNT.
M/EGB Metal and end-grain balsa.
MEGG Merging.
megger Universal electrical continuity and resistance tester (collorq., arch.).
megohm Ohm × 10^6, symbol MQ.

MEHT 1 Minimum, or mean, eye-height over threshold.
2 Multiple-event hard target.
MEHTF

MEHTF Multiple-event hard-target fuze.
MEI 1 Multi-engine instrument rating.
   2 Minimum-equipment item.
   3 Maintenance engineering inspection.
   4 Maintenance-error investigation.
   5 Missile ECM improvement.
   6 More-Electric Initiative.
MEIS Modular engine instrument system.
MEISR Minimum essential improvement in system reliability.

Meissner effect Use of powerful superconducting electric fields to levitate hardware, such as a rotating shaft, without physical contact.
MEIT Multi-element integrated test.
MEK Methyl ethyl ketone solvent.
MEL 1 Multi-engine licence, or landplane.
   2 Minimum equipment list, list of ME (3) items.
   3 Missile ejector launcher.
MELC Main electrical load center (centre).
mezée Confused close combat by numerous aircraft, opposite of one-on-one.
MELHS Mobile electroluminescent helipad [lighting] system.
Melin Multi-engine lead-in [training] (RAF).
Melios Minimum eyesafe laser IR observation.
MEM 1 Module exchange magazine.
   2 Multiple evaluation method.
   3 Maintenance engineering management.
MEMS 1 Maintenance-error management system (CAA, 2000–).
   2 Module-exchange mechanism system.
MEMS Microelectromechanical systems, now with such prefixes as bio-, fluidic, optical, refractory and RF.
MENS Mission element need statement (DoD).
menu Range of variable inputs from human operator to EDP, fire-control system, display or other electronic system; files, codes, information, modes, formats, etc.
MEO 1 Mass in Earth orbit.
   2 Medium Earth orbit.
   3 Mission equipment operator.
MEOP Maximum expected operating pressure (solid motors).
MEOTBF Mean engine operating time between failures.
MEP 1 Multi-engine pilot.
   2 Mission equipment package, or package.
   3 Marine environmental protection.
   4 Management engineering program(me).
   5 Member of European Parliament.
   6 Mean effective pressure.
   7 Mars exploration program(me).
   8 Manufacturing Extension Partnership.
Mephu Multiple-effect penetrator high [or hard] sophisticated target optimized.
MEPT Multi-engine pilot trainer.
Mepu, MEPU Monofuel emergency power unit.
MER 1 Multiple ejector rack.
   2 Mission evaluation room.
   3 Minor equipment requirement [(A) adds Air] (UK).
   4 True height above MSL.
   5 Mars exploration rover.
   6 Minimum experience requirement.
Mera 1 Molecular-electronics radar.
   2 See MER (3).
Mercator 1 Map projection: light at Earth centre projects map on to cylinder wrapped round Equator.
   2 Map electronic remote colour autonomous television output reader.
Mercier French aerodynamicist with patents for close-fitting cowlings for radial engines and low-drag ailerons hinged diagonally across wingtip.
memory Hg, the only metal liquid at NTP, MPt –39°C, BPT 357°C, density 13.5, used (rarely) as vapour in closed-circuit space power and as ion beam (thrusters).
memory battery Dry cell. 1.2V, KOH electrolyte between mercuric oxide/graphite cathode and zinc anode.
Meredith effect Making a heat-rejection system, such as a radiator or oil cooler, give positive thrust.
merge 1 The coming together of two fighters about to engage in close combat.
   2 To fly close beside unknown aircraft in order to identify it visually.
meridian Great circle through any place on Earth and the poles.
meridian altitude Altitude of celestial body when on celestial meridian of observer (000° or 180° true).
meridian passage Time at which celestial body crosses observer’s celestial meridian.
Merris Medium-resolution IR spectrometer.
Merkel number Heat transfer equation \( Me = b S' V / md \) where \( b \) is mass-transfer coefficient, \( S' \) transport surface per unit volume, \( V \) volume and \( md \) mass flow of dry gas.
Merlin 1 Multi-service extended-range low-cost interceptor (Darpa).
   2 Modular ejection-rated low-profile imaging for night.
Merzouo effort Collaboration, led by Airbus/Boeing, on improvement of global ATC (Int. 2003–).
Merod Message entry and readout device.
Merritt Island Site of largest KSC launch complexes (Saturn V vehicle).
Merto Maximum-energy rejected takeoff.
MES 1 Major equipment supplier (large projects).
   2 Main engine start(ing).
   3 Medium-energy source (laser).
   4 Multi-engine seaplane.
   5 Mobile Earth station.
   6 Multi-energy spectrum.
Mesal 1 Modular equipment storage area (NASA).
   2 Multirelo electronically scanned array [radar].
   3 Minimum emergency safe altitude.
mesa Raised portion[s] of microcircuit.
Mesar, MESAR Multifunction electronically-scanned adaptive radar.
Mesas Multirelo electronically scanned aircraft, or airborne, system.
MESF Mechanical Engineering Support Flight (RAF).
Meset Metal semiconductor field-effect transistor.
MESH 1 Micro-electrostatically suspended gyro.
   2 Main-engine starter/generator.
Mesh Measuring engineering safety and health.
mesh wiring

mesh wiring Network inserted to prevent gasbags chafing against structure of rigid airship.

mesosphere Lower layer of mesosphere (1) where temperature rises to about 10°C at 60 km.

meson Family of elementary particles with energy 135–550 MeV and zero spin (possibly nine types, and corresponding anti-particles, but some may be resonances).

mesopause Boundary between top of mesosphere (1) and thermosphere, 80–85 km.

mesoscale 1 Thermodynamic region of atmosphere between stratopause (30 km) and mesopause (Chapman gives lower limit as 32 km).

methane Simplest hydrocarbon fuel CH₄; gas at NTP but cryogenic liquid.

metabolic See liquid crystal.

metallic 1 Various blends of high-energy (so-called “zip”) turbine fuel incorporated boranes and metallic compounds.

metallic fuel additive 1 Various blends of high-energy (so-called “zip”) turbine fuel incorporated boranes and metallic compounds.

metallic matrix composite Various structural or refractory composites consist of a metal matrix, the most common being aluminium, magnesium, titanium and copper, reinforced by continuous fibres or whiskers of silicon carbide or graphite.

metallics See metal matrix composite.

metamorphic states See liquid crystal.

metamorphic transition 2p₁₀ and 5d₅ of Kr-86 atom.

metamorphism 2 Phase change, esp. catalytic effect of copper on fuel oxidation.

metastable Pseudo-equilibrium [e.g. supersaturated solution or supercooled liquid] needing small external disturbance to trigger violent change.

meteor burst communication OTH radio technique in which short-burst signals are scattered by ionised trails left by meteors.

meteorological 1 Meteorology on scale between macro and micro.

2 Meteorology of mesosphere (1).

mesometeorology 1 Meteorology on scale between macro and micro.

metacentre Intersection of line of buoyancy (of marine aircraft) and axis of symmetry.

metacentric height Vertical distance from metacentre to c.g.

metal Slang for [usually historic] aircraft, especially airtliner or warbird.

Metalcast Patented family of metal/rubber bonded devices, mainly anti-vibration.

metal deactivator Hydrocarbon fuel additive to reduce possibility of electrochemical action in tank or system, esp. catalytic effect of copper on fuel oxidation.

metal injection moulding Working material is mix of metal and plastic binder.

metals See metal matrix composite.

microgravity Microgravity; often in reference to near-Earth orbit.

metrology Science of Earth’s atmosphere (abbrev. met.).

metering Control of flow, e.g. of air traffic entering terminal airspace.

metering orifice Calibrated nozzle or tube passing exactly known flow at given pressure difference.

metavanadium Various structural or refractory composites consist of a metal matrix, the most common
Metro, metro

health measures normally falling under three headings: cost, quality and schedule-adherence.

Metro, metro Increasingly popular word meaning urban; applied to ‘downtown’ air services, commuter routes and aircraft.

2 Pilot-to-∗ voice call.

metreology Science of precise measurement, esp. of linear dimensions.

metropolex routes Selected recommended high-altitude IFR inner-city (US).

METS Mobile engine test stand.

2 Multi-Engine Training Squadron (RAF).

MetWEB Internet-based aviation weather service (UK Met. Office).

MEU Maritime Expeditionary Unit [SOC adds Special Operations Capable].

MeV Mega-electron-volts, ev×10⁶.

MEW Manufactured empty weight.

2 Microwave early warning.

3 Ministry of Economic Warfare (UK, WW2).

4 Mean equivalent wind.

MEWS Modular EW simulator.

2 Microwave EW system.

3 Missile early-warning station.

MEWSG Multiservice [or mobile] EW Support Group (NATO).

MEX Microelectronics.

MEXE Military Engineering Experimental Establishment (UK).

Mexepad Air-portable ground cover for sustained jet-Store operations.

MEZ Missile (esp. AAM) engagement zone.

MF Main frame.

2 Main force.

3 Major field.

4 Multifunction.

5 Mandatory frequency.

m.l., MF Medium frequency (see Appendix 2).

MFT Multimode fire and forget.

Mf Fuel mass flow.

MFA Minimum flight altitude.

2 Multi-furnace assembly.

3 Military flying area.

MFA Multifunction array radar.

MFA Multifunction active sensor.

MFBB Multifunction bomb fuze.

MFC Main fuel control, or controller.

2 Maximum fuel capacity.

3 Multi-frequency code, or coding.

4 Miniature flight computer.

5 Minimum Mach number for satisfactory flight control and stability.

MFCF Modular flare/chaff dispenser.

2 Multifunction colour [or control] display [P adds panel].

MFCU Multifunction control or control unit.

MFU Multifunction display [S adds system, U unit].

MFU Microfarad.

MFESAR Multifunction electronically-scanned adaptive radar.

MFF Mixed fighter force, such as all-weather look-

down BVR mixed with simple visual day aircraft [O adds operations].

2 Mixed-fleet flying [common pool of pilots for airline’s aircraft].

3 Multirole fighter force concept (eg, Phantoms/Hawks, RAf).

MFFO Mixed-fleet flight operations.

MFG Miniature flex gyro.

2 Manufacturing.

3 Master-frequency generator.

MFHBF Mean flight-hours between failures.

MFHDD Multifunction head-down display.

MFI Multirole tactical fighter (R).

MFIT Mean fault isolation time.

MK Multifunction keyboard.

MFL Minimum field length, TO distance to clear standard (35 or 50 ft) screen.

2 Minimum flight level.

MFLI Magnetic fluid-level indicator.

MFLOPS Million of flops, floating-point operations per second.

MFM Maintenance-fault memory.

2 Multisensor fusion module.

MFMJA Military flying management information system [2004–] (UK MoD).

MFMIS Military flying operations quality assurance.

MFP Medium field of view.

FPM Free path.

2 Main fuel pump.

2 Million of flops.

MFPO Multimode-flightpath propulsion demonstrator (scramjet).

2 Maintenance-free operating period.

MFQA Military flight operations quality assurance.

MFQV Medium field of view.

2 Military flight operations.

MFOP Maintenance-free operating period.

2 Manufacturing.

2 Manufacturer.

2 Manned flight simulator.

2 Media file server.

2 Master gauge.

MFSG Free-stream Mach number.

MFSSK Multiple-frequency shift-keying.

MFSP Multifunction signal payload.

MFSSPP Mediterranean forecasting system pilot project.

2 Multi-radar fusion tracking.

2 Multifunction trainer, or training.

3 Meter fix time (US usage).

MFST Multifunctional touch display.

MFST Maintenance/flight training device.

MFTS Military Flying Training System, or Service (UK MoD).

MFU Main fuel valve.

2 Minimum forward visibility.

2 Machine gun.
Mg 

Motor glider.

Mg 1 Magnesium.

2 Megagramme, ie 1,000 kg or 1 tonne.

mg 1 Milligram[mg].

2 Machine gun.

MGA 1 Middle gimbal angle.

2 Ministry of civil aviation (R).

MGARJS Mobile ground/air radar jamming system.

MGCS 1 Missile guidance and control system.

2 Mobile ground control station.

3 Meteosat ground computer system.

MGD Magnetogasdynamics.

MGDA Maintenance Group Defence Agency (UK, now part of DARA).

MGF Metallized glass-fibre (chaff).

MGF2 Magnesium fluoride (IR seeker domes).

MGGB Modular guided glide bomb.

MGIR Motor glider instrument, or instructor, rating.

MGM Former US code, mobile-launcher surface-attack guided missile.

MGOS Metal glass oxide silicon.

MGR Minimum GPS receiver.

MGRS Military grid-reference system.

MGS 1 Mobile ground station (RPV).

2 Minimum groundspeed system.

3 Mars global surveyor.

*M Main-gear steering [CU adds control unit].

5 Microgravity science.

6 MoD guard services.

MGSM Medium ground station module.

MGSS Maintenance and ground-support system.

MGT 1 Motor gas temperature (solid rocket).

2 Module ground terminal.

MGTOW See MTOW.

MGTP Main-gear touchdown point.

MGTR Minimum ground turning radius.

MG2D MGaero two-dimensional.

MGU Midcourse guidance unit.

MGVF Ministry of Civil Aviation (USSR, R).

MGW Maximum gross weight (MTOW and MRW are more explicit).

MH 1 NDB, less than 50 W.

2 Magnetic heading.


mH Millihenry.

MHA 1 Minimum holding altitude.

2 Maintenance hazard analysis.

MHD 1 Magnetohydrodynamic(s).

2 Magnetic hard drive.

MHDD Multifunction head-down display.

MHDF Co-located MF and HF D/F (ICAO).

M/HFE Maintainability and human factors engineering.

MHH Musée Historique de l’Hydraulisation [F-40600 Biscarosse](F).

MHI Missile [or manual] hit indicator.

mho Unit of conductance, reciprocal ohm, symbol Ωs, SI unit siemens.

MHP Main hydraulic pump.

mhp Muzzle horsepower, measure of automatic weapon.

MHR Monopropellant hydrazine rocket.

MHS 1 Message-handling system.

2 Masint hyperspectral study.

3 Microwave humidity sounder

MHV Miniature homing vehicle.

MHVDF Co-located MF, HF and VHF/DF (ICAO).

MHWS Mean high water spring tides.

MHz Megahertz [106 Hz].

MI 1 Model improvement.

2 Medium intensity.

3 Miles (not recommended).

4 Military intelligence.

5 Shallow (ICAO).

6 Maritime interdiction.

mi Statute mile[s].

M.I. Minimum impulse.

MIA 1 Missing in action.

2 Minimum IFR altitude.

Miaes Multisensor integrated airborne command system.

MIAG Modular integrated avionics group (UAV).

Miais Medium-intensity approach-light system.

Miami Microwave ice-accretion measurement instrument.

MIAT Malayan Institute of Aviation Technology [1997-].

MIATS Memory interrogation and test system.

MIB 1 Minimum-impulse bit (rocket).

2 Management information base.

3 Mishap Investigation Board (NASA).

4 Military Intelligence Battalion; (AE) adds aerial exploitation (USA).

MIC 1 Mineral insulated cable.

2 Microwave integrated circuit.

3 Multinational Interoperability Council (Int.).

Mig Pitching moment due to inertial coupling.

mig microphone.

Mica 1 Missile d’interception et de combat aérien (F).

2 Met [meteorological] improvements for controller aids (Euret).

Micad Multipurpose integrated chemical-agent alarm device.

Micap Mission-capable.

Micarta Trade name for phenolic insulator and small-part material made from resin-impregnated cloth.

Micas Miniature integrated camera spectrometer, or spectroscopy.

Mice Microwave integrated checkout equipment.

mice Small inserts fitted by hand to tailor cross-section area of fluid flow path, esp. gas-turbine jetpipe nozzle.

Michigan height That at which an air-dropped store, esp. nuclear, is activated by its radar altimeter.

Mickey HX (colloq.).

Mickey Finn Major exercises involving numerous NW-carrying bombers from dispersed bases (RAF, 1960s).

MICNS Modular integrated communications and navigation subsystem (Sotas).

MICON, Micon Missile Command (USA).

Micos Multifunctional IR coherent optical scanner.

micrad Microwave radiometer.

micro 1 Prefix one-millionth, × 10⁻⁶, symbol μ.

2 Abb., microlight.

micro-adaptive flow control High-frequency alternate blowing and sucking generated electromagnetically to preserve attachment of airflow to surface.

Mg micro-adaptive flow control
micro-adjuster

**micro-adjuster** Small permanent magnets arranged to correct magnetic compass for coefficients P, Q, Cz, Fz.

**Micro-aids** Micro-aircraft integrated data system.

**micro air vehicle** Rapidly growing species of aerodyne, using lift from jets, rotating wings or fans, or fixed wing[s], capable of being carried by a human and of carrying various payloads. No quantified definition.

**microballons** Microscopic hollow spheres used to increase bulk of fillers and potting compounds.

**microbarograph** Records very small transient changes in atmospheric pressure at ground station.

**microbiological corrosion** Eating away by micro-organisms living at fuel/air interfaces and on surface of virtually all aeronautical materials.

**microballoons** Bolometer able to measure microscopic regions (no numerical definition).

**microburst** Most lethal form of vertical gust, in which core up to 2.5 km (1.5 miles) diameter forms vertical jet below convective cloud with downward velocity up to 20 m/s (4,000 ft/min), an almost instantaneous velocity difference of 80 kt, down to very low levels.

**microchannel plate** Multiplies $\times 10^{10}$ electrons passing through and routes them to phosphor screen which converts to green light.

**microcircuit** Basic element of microelectronics, with numerous * fabricated on each epistaxial chip.

**Micro-Earts** Micro on route automated radar tracking system.

**microelectronics** Electronics based on solid-state devices of microscopic [down to nanometre] dimensions.

**microfabrication** Manufacture of microscopic [to nanometre] devices.

**microfarad** Farad $\times 10^{-6}$, symbol $\mu$F.

**microfiche** Common system of storing written or visual information with 24 to 288 microfilmed pages on each 100 mm $\times$ 150 mm (or 4 in $\times$ 6 in) sheet of film.

**microfilm** Microfluidic molecular system.

**microgravity** Gravitational acceleration in the region of 6 in (152.4 mm), TOW 4 oz (113.4 g).

**microheater** Heats to a temperature of 25°C.

**microinch** One-millionth of an inch.

**microjet** Not defined, but commonly a bizjet with six or fewer total seats. It is confusing to use * for sporting 1- or 2-seaters.

**microkernel** Core of software.

**micro level** Critical final design of software.

**microlight** Originally aeroplane with OWE $\leq$ 150 kg (330.7 lb), next definition was MTOW $\leq$390 kg, $\leq$50 litres fuel; latest definition: $V_{\text{eo}} \leq 65$ km/h, MTOW, 1-seat $\leq$300 kg [land], 330 kg [sea/amph]; 2-seat $\leq$450 kg [land], 495 kg [sea/amph]. (JAA, FAA). See ultralight.

**micrometer** Micrometric molecular system.

**microprobes** Microscopic solid particle, many species throughout explored space.

**micrometer** Instrument for precise dimensional measurement, usually mechanical but sometimes based on fluid escape through small clearance.

**micron** One-millionth of metre, 10$^{-6}$m, symbol $\mu$.

**micromirror** Microscopic multilayer reflective device, usually comprising an array of CMOS memory cells. Each mirror can tilt slightly, pointing a beam at an on or an off pixel.

**micron** Previous name for micrometre, still common in US to avoid confusion with micrometer.

**micronavigation** Guidance of aircraft or missile in relation to nearby target (usually air/ground).

**micronic** Concerned with micron dimensions, hence * filler.

**micronitre** Quantity of gas: 1 litre at pressure 1 $\mu$Hg.

**microprobe** Instrument for investigating regions of micron size, hence laser-pulse * analyser.

**microprogram** Small sub-program for defining computer instructions in terms of other basic elemental operations.

**microsatellite** Mass 10–100 kg.

**microsecond** $10^{-6}$s.

**micronshaving** Micronic Multifunction IR distributed-aperture system.

**microstrip** Microwave guide comprising conductor supported above ground plane, generally fabricated by printed circuitry.

**microswitch** Microcircuit switch governs the system(s) according to external movement such as compression of MLG.

**microwave** Current microwave tagging system.

**microwave background** Found throughout universe, corresponding to temperature of 2.7K.

**microwave landing system** Post-1995 successor to ILS, TRSB (US) being political choice. Guides over $\pm 40^\circ$ sector landing or overshoot.

**microwaves** Electromagnetic radiation between RF and far-IR, normally 1–300 GHz.

**MICS** Manned interactive control station.

**mic-tel socket** Connector for headset.

**MID** 1 Multifunction information distribution.

**midair** Midair collision.

**midcourse** Space trajectory linking departure from neighbourhood of Earth and arrival near destination, corresponding to atmospheric flight cruise; hence * guidance.

**midcourse** Post-1995 successor to ILS, TRSB (US) being political choice. Guides over $\pm 40^\circ$ sector landing or overshoot.

**midcourse** Mission-definition alarm system (USA, USAF).

**Midas** Message interchange distributed application.

**MIDAS, Midash** Modular integrated display and sight helmet.

**midcourse** Multifunction information distribution and acquisition system.

**MiDASH, Midash** Modular integrated display and sight helmet.
midcourse guidance

2 From missile boost burnout to start of terminal homing.

midcourse guidance Applies to midcourse (1), sometimes to (2).

midcourse weight Gross weight at midpoint of mission.

mid-course airspace Several national definitions, eg FL 180–290, FL 145–250.

Middleman Air-interop code: VHF or UHF radio relay (DoD).

middle marker ILS marker on extended runway centre-line at ILS Point B, usually 1,386 m (3,500 ft) from threshold.

Mids Meteorology and oceanography integrated data-display system.

mid-flap Intermediate portion of triple-slotted flap.

mid-high wing Set about three-quarters way up fuselage.

midi Intermediate RPV class, on basis of weight, altitude and speed.

Midis Multifunction integrated defensive information system.

MIDIZ Mid-Canada identification zone.

Midl Modular inter-operable data-link.

Mid-life update Major refurbishment of costly military [rarely, large commercial] aircraft which in bygone days would have been replaced by a new design.

MIDN Midnight.

Midnight Air-interop code: 'Change from close to broadcast control' (DoD).

MIDR Maintenance (or mandatory) incident and defect report.

mid-range ballistic missile One having range of 500–3,000 nm (927–5,560 km); see medium-range * (DoD).

MIDS, Mids 1 Management information and decision support.

2 Multifunction[al] or multiuser or multiple, information distribution system [FDL adds fighter data link, LVT low-volume terminal] (NATO).

3 Multi-information display system (weather).

4 Mission-data acquisition system.

mid-size Important bizjet category, 8–12 seats.

Midst Multiple interferometer determination of trajectories.

MiDSTEP Microsatellite demonstration science and technology experiment program (Darpa).

mild tank Usually, the centre tank in a wing, between the inner and outer.

MIDU 1 Missile-ignition delay unit.

2 Multipurpose interactive display unit.

mid-upper Dorado turret.

mid-value logic Redundant system having odd number of active channels wherein system output is always that of intermediate-value channel, thus eliminating wild values.

mid-wave IR This usually means medium-wave, wavelength 3–5 µ.

mid-wing aircraft This usually means a monoplane with its wing[s] in the so-called mid position, half-way down the fuselage, but see next.

mid-wing pylon The centre pylon, or hardpoint, of three under each wing, between the inner- and outer-wing pylons; by itself confusing and in any case should be mid-wing pylon.

MIE 1 Maneuvre-induced error.

2 Managing (or management) in inflationary economy.

3 Minimum ignition energy.

Mie region Resonating between reflected and creeping waves around radar target.

MIES Multi- [or modernised] imagery exploitation system.

MIF Make it fly.

Mifass Marine integrated fire and air support system.

MIFF Anti-tank mine dispensed from MW-1 system (GI).

MIFG Shallow fog (ICAO).

Mifir, MIFIR Microwave instantaneous-frequency indication receiver (ECM).

MIG Metal inert gas [welding].

Mig, MIG Miniature integrating gyro.

MiG/ML Combatt air patrol directed specifically against MiG aircraft, hence MiG screen.

Might, MIGHT Malaysian Industry/Government Group for High Technology.

Migts Miniature integrated GPS/INS tactical system.

Mig magnet Photoflash (US, colloq.).

3 Migration Movement at molecular level of one solid into another, eg of vinyl plasticiser into polyethylene core of electrical cable.

2 Movement of secondhand aircraft causing significant variation in demand for new aircraft.

3 Transferring internal equipment, such as a navigation or attack system, to another aircraft.

Migrator Microwave guidance radar beacon interrogator.

MIIRS Modular imagery interpretation and reporting system.

MIITE Multi-intelligence and information technology exploitation.

Mike mike Millimetres.

MIL 1 Military (ICAO, US); hence * specifications, common to all US armed services; * rating, high-power engine ratings, usually close to max. cold or Meto.

2 Combined USAF/USN specifications, eg MIL-F-8785 covering basic flying qualities of aeroplanes.

3 Merritt Island.

mil 1 One-thousandth of an inch, 10⁻³ in, = 0.0254 mm; hence circular * = area of 1 mil circle = 506.7µ².

2 Angular measure, 1/40 of circle = 3.737°.

3 Military (UK, CAA).

3 Milcon Magnetic-intrusion line detector.

Milds, MILDS Missile [originally meant ICBM] launch detection system.

mile Imperial unit of length 1,609.344 m; aviation more commonly uses nautical mile, 1,853.184 m [US 1,852 exactly], except when reporting visibility.

* mile-high club Notional clique of those who have sex at high altitude.

Miles Multiple integrated laser engagement system (USA).

Miles in trail Longitudinal spacing of en-route military aircraft in loose procession.

Miles per hour Statute mph = 1.609344 km/h, 0.886842 kt, 88 ft/min, 0.44704 ft/s; reciprocals 0.621371, 1.15152, 0.011364, 2.2369.

Milestones Usually I programme launch, II full development, III production.


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Milestones Usually I programme launch, II full development, III production.

miligraphic display

Large (19 in, 483 mm) software-driven colour display of radar overlaid on map.

military aerodrome traffic zone

Protected airspace typically extending 5 km (9.26 km) round airfield periphery and from surface to 3,000 ft (914 m) AAL. Approach to main runway may be protected by an extended stub. In UK MATZ recognition by civil traffic is not mandatory.

military aircraft

Any operated by armed service, legal or insurrectionary, no matter what aircraft type; combat aircraft retired and privately owned is not military (see paramilitary).

Military Aircraft Release

Statement of operating envelope, build standard, limitations and procedures within which airworthiness has been established, which, if accepted, transfers responsibility to the Procurement Executive. This would apply were there to be a new British military aircraft.

military emergency diversion airfield

Available 24-h, 365 days, to aircraft in distress, offering radar vectoring (UK).

military power

Normally maximum cold (unaugmented) thrust; for piston engine METO.

military productivity

Several forms, including flying rate per squadron or wing, aircraft utilization, ordnance work rates, etc.

military qualification test, MQT

Final hurdle hardware must pass before entering US military service; schedule varies depending on item.

military spaceplane

MSP, family of systems providing multiple independent levels of security.

mine countermeasures

All methods of reducing damage or danger from land or sea mines.

mineral oil

Lubricating oil of mineral (normally North American crude) base, thus not a synthetic turbine oil nor vegetable oil such as castor oil used in rotary engines; dyed red.

mineral wool

Fibrous heat insulator made by blowing steam through molten slag with additives.

Miner’s hypothesis

If alternating stresses $S_1, S_2, \ldots$ are applied for $n_1, n_2, \ldots$ cycles, and $N_1, N_2, \ldots$ are the cycles to failure at constant $S_1, S_2, \ldots$, fatigue damage will begin when $S_n^{1/n} = 1$.

minfap

Minimum facilities project; Eurocontrol, Maastricht.

Mings

Micro-interneted unattended ground sensor(s).

mini

Smallest RPV class, on basis of weight, altitude and speed; resembles large model aircraft.

miniature flex gyro

DTG is mounted on flex shaft with opposing strut producing destabilizing force in proportion to rotor angular displacement. At tuned speed $[\pi/2]N'[\pi]$ spring force and torques cancel.

Miniun

GE multi-barrel belt-fed weapons of rifle calibre, usually 7.62 mm or 5.56 mm.

mini-M

Single-channel voice, fax or data [small GA aircraft].

minima

Lower limit of weather [esp. visibility] for particular aircraft and type of flight operation, esp. landing.

minimal flight path

That for shortest time en route (ASCC).

minimally manned

Airplane available for flight as RPV but sometimes flown with safety pilot.

minimum airplane

Concept, most active in US, of smallest/lightest/simplest aeroplane. By 1985 being accepted as MTOW not exceeding 100 kg, or 120 kg for two-seater.

minimum altitude

Normally undefined except in same terms as low.

minimum-altitude bombing

Horizontal or glide bombing (ie not toss) with release height below 900 ft (274 m) (DoD, IADB).
**minimum break-off height**

**minimum break-off height**  For practical purposes, minimum descent height.

**minimum burner pressure**  That below which combustion in idling engine may be extinguished, maintained by * valve. *v.

**minimum-control speed Vmc**  Lowest IAS at which aeroplane can always be flown safely (eg after sudden worst-case engine failure); specified as such in flight manual. See Vmc, Vmcg, Vmcc.

**minimum crossing altitude**  Lowest altitudes at certain radio fixes at which aircraft may cross en route to higher IFR MEA (FAA).

**minimum decision altitude**  Minimum descent altitude (NESN, NFSN).

**minimum descent altitude**  J MDA, lowest altitude, expressed in feet above MSL, without sight of runway to which descent is authorized on final approach or during circle-to-land manoeuvre in execution of standard instrument approach where no electronic glideslope is provided such as ILS, PAR (FAA). See MD height.

**2 Decision height (UK and others).**

**minimum descent height, MDH**  Height above touchdown, at which pilot making a non-precision instrument approach must either see to land or initiate overshoot, based entirely on topography and characteristics (including sink) of aircraft. Not used in US.

**minimum design weight**  Not normally used: existing definitions are generally similar to operating weight.

**minimum-energy orbit**  See Hohmann orbit.

**minimum en route altitude**  That between radio fixes which meets obstruction clearances and assures good radio reception or navaid signal coverage; MEAs apply to entire width of all airways or other direct routes (FAA).

**minimum equipment item**  Device whose failure does not delay departure, also called allowable deficiency, despach deviation.

**minimum flying speed**  Lowest TAS at which aeroplane or autogyro can maintain height; often well below Vmca or angle of attack at which operative stall-warning system would trigger.

**minimum fuel**  1 Smallest quantity of fuel with which aircraft may be authorized to fly.

2 Smallest quantity of fuel with which c.g. can fall within permitted range, normally sufficient for 30 min at maximum continuous power.

**minimum glide path**  This has appeared in print but is surely meaningless. There is only one glideslope angle at each ILS.

**minimum gliding speed**  Lowest TAS at which aircraft can fly without propulsion; below Vmc, or best-range gliding speed.

**minimum groundspeed system**  Subsystem in AFCS which continuously calculates correct approach speed using TAS, GS and W/V (entered into FMS by pilot) to protect against windshear.

**minimum holding altitude**  Lowest altitude prescribed for holding pattern which complies with obstruction clearance and assures good radio/navaid signal reception.

**minimum human force**  At least three sets of measures in use as basis for aircraft/spacecraft design, factored to allow for injury, fatigue, g, anoxia and other influences.

**minimum IFR altitude**  As published in FAR-95 and 97, 1,000 ft above highest obstruction [2,000 ft in designated mountainous areas] within 5 statute miles of track [FAR word is “course”], or as otherwise authorized by ATC.

**minimum line of interception**  Arbitrary line at which hostile aircraft should be intercepted by aircraft if friendly AAA and SAMs are to destroy all objects not thus intercepted.

**minimum military requirement**  Specification or description of infrastructure designed to meet immediate or obvious future need and no more, on ‘no frills’ basis (NATO).

**minimum navigation performance specification, MNPS**  Effective from October 1978 over ocean areas FL275–400, calling for certain standards of navigation and close adherence to flightplan, and permitting major reductions in separation.

**minimum normal burst altitude**  Height AGL below which air-defense nuclear warheads are not normally detonated (DoD).

**minimum obstruction clearance altitude**  Specified altitude between ratio fixes on VOR/LF airways, off-airway routes or segments, which meets obstruction clearances and ensures acceptable signal coverage only with 22 nm of each VOR (FAA).

**minimum off-route altitude**  MORA charts published by Jeppesen show details of terrain and obstruction clearance within 10 nm of track.

**minimum operating strip**  All-weather runway devoid of non-portable facilities, see BOP (USMC).

**minimum reception altitude**  Lowest altitude required to receive adequate signals to determine VOR/Tacan/Vortac fixes (FAA).

**minimum rpm**  Engine rotational speed normally governed; with throttle on rearmost stop the speed depends on a governor, IAS and possibly other factors, such as MLG microswitch allowing a ground condition with superfine propeller pitch.

**minimum runway**  Not defined, other than a limiting runway for particular aircraft or mission, with regard to weather, aids and surrounding terrain.

**minimums**  Minimums.

**minimumsafe altitude warning, MSAW**  Included in ARTS, monitors all controlled aircraft and alerts controller of potentially unsafe situations, usually 100 ft below MDA.

**minimum safe distance**  Sum of radius of safety and buffer distance.

**minimum sector altitude**  That which in emergency will provide 300 m (984.2 ft) clearance within specified sector within 25 nm radius of radio aid.

**minimum-sink speed**  Of glider, self-explanatory, but note that MSS is not the same as speed for best L/D or glide ratio.

**minimum speed**  See minimum flying speed.

**minimum TAS**  Corresponds to IAS for minimum flying speed, and below MSL or on cold day can be lower.

**minimum vectoring altitude**  Lowest altitude, expressed in feet AMSL, to which aircraft may be vectored by radar controller.
minimum warning time

minimum warning time  Sum of personnel and system reaction times.

mini-NW Commonly called a mini-nuke, or mininuke, weapon with yield ≤5KT.

minisat Satellite launch mass 100–500 kg.

Minitat Family of helicopter armament systems, from minimum tactical aircraft turret.

Minited Mini trailing-edge device.

Minitrack See Stanford.

minor equipments Simple hardware items such as fasteners and clips, bought out by major supplier but not shared in collaborative programme.

MINS Minimums (ICAO).

Mins Minutes.

Mint 1 Multi-intelligence.

2 Mutual interference.

MIRs Ministry of Technology (UK, obs.).

minute 1 One-sixtieth [1.667 × 10⁻²] of hour; abb. min.

2 One-sixtieth [1.667 × 10⁻²] of degree of angular measure.

MIO Multiple input/output control system.

Mio Million (G).

MIP 1 Missile impact predictor [S adds set].

2 Multilateral interoperability program (NATO).

3 Multinational interoperability protocol (G).

Mipax Michelson interferometer for passive atmospheric sounding.

MIPB Mono-isopropyl biphenyl.

MIPCC Mass-injected [or injection] pre-compressor cooled [or cooling].

MIPi Material in process inventory.

MIPR Military interdepartmental purchase request (US).

MIPS, Mips 1 Million instructions per second.

2 Maintenance information planning system.

3 Midlife improvement project study.

4 Dualband imaging photometer for SRTF.

5 See MIP.

MIR 1 Multiple-target instrumentation radar.

2 Modular integrated rack, or racking.

3 Micropower impulse radar.

4 MLS inspection receiver.

5 Manipulated information rate.

Mira 1 Miniature IR alarm.

2 Medium [wavelength] IR array.

Miracle Mid-IR advanced chemical laser.

Miradcon Missile R&D Command (USA).

Mirage Microelectronic indicator for radar ground equipment.

Miran Missile ranging system interrogating at 600 MHz with beacon reply at 580 MHz.

Miras, MIRAS Multicolour infra-red [missile] approach [or alerting] sensor.

Mirc, MIRC Missile in-range computer.

MIRFS Multifunction integrated RF system.

MIRL Medium-intensity runway-edge lights.

Mirls Miniature IR linescan[ner].

mirror Aerobatic manoeuvres by two aircraft in tight formation [usually one above the other], roll attitude of one 180º from that of partner.

mirror sight Optical device to assist fixed-wing recovery on aircraft carrier, giving pitch-stabilized light indications to approaching pilot.

mission-capability rate

MIRTS Modularized infra-red transmitting set, protects against IR-seeking missiles.

Mivr Multiple independently targeted re-entry vehicle[s], hence to * an existing missile, mirved warheads, * Salt limits.

MIS 1 Management information system.

2 Missing (ICAO).

3 Micro-inertial sensor[s].

4 Modular insertion stage.

5 Man in space.

6 Meteorological impact statement.

MISDS Multiple instruction, single data stream.

mismatch 1 Inability of gas-turbine (invariably supersonic) inlet system to supply engine with correct airflow in yawed flight or other disturbed conditions.

2 Upper and lower dies not perfectly aligned in closed die forging.

MISR Multiangle imaging spectroradiometer.

Misrep Message report.

misriggering Incorrect angular setting of neutral position of control surface or other aerodynamic surface [less often, of wing(s)].

MISS, Miss 1 Model integrated suspension system.

2 Missile-intercept scoring system.

miss-distance scorer Indicates minimum passing distance between munition and target but does not give any co-ordinate values (ASCC).

missed approach 1 One aborted for any reason, followed by a go-around (overshoot).

2 Standard flight procedure to be followed in (1).

Captain or pilot flying elects to overshoot upon reaching DH and not seeing runway, or upon command to do so from approach controller.

missed-approach point Point on published ILS approach, expressed as distance or time from FAF or missed-approach point from approach controller.

DH and not seeing runway, or upon command to do so Captain or pilot flying elects to overshoot upon reaching DH and not seeing runway, or upon command to do so from approach controller.

missile free Usually voice command, authority to launch AAM unless target is identified as friendly.

missile range Ambiguous, can mean range (1) or (2).

Missle Technology Control Regime Prohibits transfer to rogue state of hardware or technology with range over 300 km, 165 nm.

missilry Technology of (assumed guided) missiles (colloq.).

missing-man flyby Restrainted flypast by formation team configured to leave one obvious gap in formation, symbolism (variable) being known to audience.

mission 1 Single military operation flown by assigned force of aircraft.

2 Sortie, ie military operation flown by one aircraft.

3 Rarely (incorrectly) special flight of non-military nature.

4 Basic function or capability of missile or rocket, as shown by MDS designator (DoD).

mission-adaptive wing One whose section profile varies automatically to suit the requirements of each flight condition.

mission-capability rate Time out of each 24h period that
mission control [center]

aircraft is available to perform its mission, expressed as percentage.

mission control [center] Term usually means control of spacecraft.

mission degradation factor Variables affecting mission, eg abort, navigation error, misidentification of target, etc.

mission equipment See role equipment.

mission-oriented items Those required following numerical assessment of enemy capabilities or targets.

mission profile Graphical or written plot of flight level from start to finish of mission, usually a succession of lo and/or hi.

mission radius Practical radius of action for aircraft equipped and loaded for mission on given profile, with allowances varying in peace or war; invariably less than half range with same load.

mission review report Intelligence report containing information on all targets covered by one reconnaissance sortie.

mission specialist Engineer or mathematician responsible for planning spaceflight, assigning payloads and assisting integration.

Mist 1 Miniature spaceplane technology.

2 Meteorological-information self-briefing terminal.

3 Modular interoperable satellite terminal.

4 Mosaic IR sensor technology.

mist Visibility reduced by water droplets to 1–10 km.

2 Mixture of gas (invariably air) and finely divided liquid (usually an oil).

3 Definition ‘popular expression for drizzle’ is erroneous.

Mistel Code name for explosive-filled pilotless aircraft guided to target by a pilot in a fighter initially linked to it (G, WW2).

misting Obscuration of transparency caused by condensed water droplets.

2 Tendency of fuel to form easily ignited dispersion in crash.

Mistral Cold, dry wind from N/NW [French S coast].

Mists Modular (ized) IR transmitting set.

mistuning Introducing microscopic variation into the thickness of gas-turbine rotor blades (alternate blades, pairs or quadrants) to reduce stress due to flutter.

MIT Massachusetts Institute of Technology.

2 Moscow Institute for Thermotechnology.

3 Miles in trail.

4 Military integrated team.

MITAS, Mitsas Multi-sensor imaging technology for airborne surveillance.

Mite Micro tactically expendable.

MITEx Micro-satellite technology experiment (Darpa, NRL, USAF).

MITI Ministry of International Trade and Industry (J).

MITO Minimum-interval takeoff.

MITIS Multi-integrated TCPED systems.

MIU Missile interface unit.

mix See mixer.

mixed compression Mixing box (2), occasionally purely mechanical for translating flight-control input into required surface deflections on two axes.

mixed-exhaust nacelle Engine nacelle fitted with a mixer (3).

mixed-flow augmentation Turbofan whose core and bypass flows are mixed upstream of augmenter (afterburner, reheat jetpipe).

mixed-flow compressor Axial followed by centrifugal.

mixed-flow nozzle Single nozzle for fan and core. Not necessarily a mixer.

mixed-manneUCAV Fleet of UCAVs under integrated control, also called MSIC.

mixed mode 1 Combining two EM-wave propagation modes.

2 Takeoffs and landings on same runway; hence MM operations.

mixed power aircraft Equipped with more than one species of propulsion, notably turbojet and rocket.

mixed propellant See dual propellant.

mixed traffic Contrasting types of aircraft (eg jets and lightplanes) under control or otherwise in same airspace, esp. on approach.

mixed twin-spool turbofan Engine in which the fan rotates with an LP compressor which supercharges the core [the most common type].

mixer 1 In communications radio, first detector in superhet receiver, which combines received signal with locally generated oscillation to yield intermediate frequency.

2 In AFCS, pitch/roll proportioning device, either mechanical or electronic, for supplying required signals to different surface power units.

3 Annular array of chutes in turbofan jetpipe which causes rapid mixing of core and bypass [fan] flows.

mixer nozzle/ejector Proposed propulsion for SSBJ: low-BPR tubofan with con/di ejector nozzle mixing jet and bypass flows.

mixing box Mixer (2), occasionally purely mechanical for translating flight-control input into required surface deflections on two axes.

mixing length Most common meaning is linear distance for fuel droplet to be vapourised.

mixture Airfuel vapour suitable for piston engine, other than direct-injection types; hence * control, * ratio, etc.

mixture control Manual inceptor formerly included in carburettor to maintain desired mixture as piston engine gains altitude.

MJ Megajoule[s], 10^9 joules.

MJ Fully expanded jet exit Mach number.

MJ Millijoule[s] (10^-3 J).

MJP Magnetron jamming pod.

MJPO Missatcom Joint Project Office (USAF).

MJSJ mission Mars, Jupiter, Saturn mission; hence MJ; also includes Uranus.

MK Machine cannon (G).

Mk Mark (UK designations).

MKB Machine-construction [i.e., engine design] bureau (R).

MKC Multiple-kill capability.

MKR, Mkr Fan marker.

MKS 1 Metre/kilogramme/second [A adds ampere]; outmoded “engineering” system of metric units.
MKSA
2 International Space Station (R).
MKSA Metre/kilogramme/second/ampere.
MKU Translated: ‘multi-round catapult installation’, rotary missile launcher (R).
MKV 1 Miniature kill vehicle.
2 Multiple kill vehicle (MDA).
ML 1 Missile launcher.
2 Minelayer.
3 Middle locator.
M 1 Local Mach number.
m 1 Total mass on landing.
ml Millilitre = cm³.
MLA 1 Manoeuvre load alleviation.
2 Maneuver limited altitude.
MLA(A) Magic lantern adaptation.
MLB 1 Multi-layer board.
2 Main-lobe blanking (ECM).
MLBM Modern large ballistic missile.
MLC 1 Main-lobe clutter.
2 Main-line contractor.
MLCM Modular life-cycle cost model.
MLCM Microprocessor logic control module.
MLCS Mobile launching, or launcher, and control system.
MLD 1 Maintenance logic diagram.
2 Multi-layer defense (DoD).
MLDI Meter-list display interval (timed arrivals, US).
MLDS Missile-launch detection system; -F adds fighter.
MLE 1 Missile launch envelope.
2 Maximum likelihood estimation.
MLF Multilateral nuclear force [never activated].
MLFS Modular lightweight Flir system.
MLG Main landing gear; sometimes m.i.g.
MLI 1 Mid-life improvement; S adds study.
2 Magnetic level indicator.
MLM Multipurpose laboratory module (ISS4).
MLLV Medium-lift launch vehicle.
MLMS Multipurpose lightweight missile system.
MLND, Mlnd Maximum landing weight (usually MLWA).
MLP 1 Multi-layered, or multi-layered, missile.
2 Multi-link processor.
MLPRF 1 Modular low-power RF.
MLRR Mode-locked ring resonator.
MLRS Multiple launch rocket system.
MLS 1 Microwave landing system.
2 Multi-level secure (or security) computer operating system.
3 Mapping and localization system (UAV).
MLST Mars local solar time.
MLT 1 Munitions lift trailer.
2 Multi-line terminal.
MLTI, MLT/I Mesosphere and lower thermosphere/ ionosphere.
MLTLVL Melting level.
MLU, MLUD 1 Mid-life update, or upgrade.
2 Monitor and logic unit.
MLV 1 Mobile launch vehicle.
2 Medium launch vehicle (upgraded Delta).
MLV Memory loader/verifier.
MLW 1 Minimum certificated landing weight.
MLWA MLW authorized.
MLWS Missile launch warning system.

MLZ 1 MLS receiver.
MM 1 Rare prefix mega-mega (tera), 10²².
2 Middle marker (ICAO).
3 Missile prefix mer/mer (sea/sea) (F).
4 Mass memory.
5 Mission Manager.
6 Mission Module (CEV2).
mm Millimetre(s).
MM 1 Multimission aircraft.
2 Mono-methyl aniline.
3 Multimission, or multirole, maritime aircraft.
MMACS Multimission aft crew station; cockpit occupied by either crew member or avionics.
MMkT Manufacturing methods and technology.
M-marker Beacon with Morse-coded emission (obs.).
MMARS Military Mobile Airspace Radar Service, available to all aircraft FL100–245 (UK).
MMB International bank in Moscow.
MMC 1 Metallic-, or metal-, matrix composite.
2 Monitor Mach computer.
3 Monopolies & Mergers Commission (UK).
4 Miniaturized munitions capability.
5 Modular mission [or mission management] computer.
6 Multimedia controller.
7 Mission Management Center (USA, SWC, USSC, 2001).
8 Maximum material condition.
MMCCC Multi-mission command and control constellation [abb. MC³C].
MMCM Multi-mission common modular.
MMD Master monitor [or mission-management, moving-map or multi-mode] display.
MMDL Multi-mode data-link.
MMDP Modular mission display processor; drives HUD and MFDs.
MDDR Multi-mode Doppler radar.
MMDT Master-model design tool.
MME 1 Maritime-mission electronics.
2 Miscellaneous military equipment [R adds requirement] (UK).
3 Modular mounting enclosure.
MMEL Master minimum equipment list.
MMF, mmm 1 Magnetomotive force.
2 Model-management framework(s).
MMFC Monomethyl fuel cell.
mmf Micro-microfarad = picofarad, pf.
MMFF Multimode fire and forget.
MMH 1 Monomethyl hydrazine.
2 Maintenance man-hour.
MMI 1 Mandatory modification and inspection.
2 Man/machine interface, or integration.
3 Marine Militare Italia.
MMIC 1 Millimetre-wave integrated circuit.
2 Monolithic microwave integrated circuit.
3 Marina Militare Italia.
MMLS 1 Modular MLS.
2 Mobile MLS.
MLLSA Military MLS avionics.
MKV Multiple MKV.
MMMA Multi-mission maritime aircraft.
MMMIEM Multimission minimum equipment list.
MMMMEM Sudden-change special weather report (ICAO).
MMMP

MMMP Multimission mobile processor.
M-MMS Military-mission management system.
MMMS, M’S Multimission management system.
MMO Main meteorological office.
  1 Mixed-mode operations.
  2 Maximum operating Mach number.
MMOU Multinational memorandum of understanding.
MMP Metallic materials processor (company category).
  1 Modular mission payload.
  2 Maintenance monitoring panel.
  3 Material management program.[me].
MMPM MEECN message processing mode.
MMPP In English, machine-building production enterprise = factory (R).
MMR Machmeter reading.
  1 Minimum military requirement.
  2 Multi-mode receiver.
  3 Multi-mode [or multimission] radar [$ adds system].
MMRC Modular multi-role computer.
MMRH/FH Mean maintenance and repair hours per flight hour.
MMRPV Multi-mission RPV.
MMS Missile-management system.
  1 Multi-mission spacecraft.
  2 Metal measuring set.
  3 Magnetic minesweeping system.
  4 Moisture, or maintenance, management system.
  5 Magnetospheric multiscale mission (NASA).
  6 Mission-management system.
MMSA Multimission surveillance aircraft.
MMSI Minimum mean square error.
MMSSI Miniature munition[s] technology demonstration.
MMSS Mobile mass-storage system.
MMT Multiple-mirror telescope.
  1 Message/management terminal.
  2 Mission team.
MMTD Miniaturized, or miniature, munition[s] technology demonstration.
MMTS Multi-modal transport system (Airbus).
MMU Managed manoeuvring unit (gas-powered flight control system for Shuttle astronauts).
  1 Mobile meteorological unit (RAF).
  2 Mass memory unit.
MMU/UCAV Mixed manned UCAV.
MMVX Medium-speed support aircraft (project).
MMW Millimetre, or millimetric, wave; R adds radar.
MN 1 Meganewton[s].
  2 Number.
  3 Magnetic north.
Mach number.
MN Millinewton[s] = N×10⁻³.
Mn Neutron rest-mass, 1.6749286 × 10⁻²⁴g.
MNA Maritime Notification Area.
MNB Multiple narrow beam(s).
MNC Major NATO command.
MNCID Management of network category interaction diagram.
MND Mission need documents (NATO).

mobile quarantine facility

  2 Multi-National Division (SFOR).
  3 Minimum nuclear deterrent.
  4 Ministry of National Defence (Poland).
MNE 1 Mixer nozzle/jector.
  2 Multi-national experiment [followed by suffix number] (NATO, US, UK).
Mso Mach number never to be exceeded, and not even approached in normal flying, but demonstrated in civil certification.
mnemonic Easily remembered sequence to assist aircrew with their pre-flight and other checks. eg HTMPPFG = hood/harness, trim, mixture, pitch, fuel, flaps, gills/gyro (largely archaic except in general aviation).
MNFP Multinational fighter program (US).
MNIRS Moscow scientific-research institute of radio communication.
MNLC Multi-National Logistic Command.
MNLD Mainland.
Mmn, mmm Minimum (ICAO).
MNO Ministry of national defence (Czech).
MN P Normal operating Mach number, now generally replaced by Mso.
MNOS MOS with silicon nitride on oxide.
MNP Magnetic north pole.
MNPA Minimum navigation performance airspace, allowing 60 nm lateral separation at FL275–400.
MNPS Minimum navigation performance standards, or specification [A adds airspace].
MNR Minimum-noise route, or routeing.
MNS Mission-need[s] statement.
MNT Monitor[ing].
MNTN Maintain.
MND Monocular night-vision device.
MO 1 Meteorological Office.
  2 Magneto-optical.
  3 Ministry of defence (R).
  4 Massive ordnance.
M.O.A Master oscillator.
MOA Memorandum of agreement.
  1 Military operations area.
  2 Minimum operating altitude.
  3 Military operational approach[s].
  4 Maintenance organisation approval.
MoA Ministry of Aviation (defunct in UK).
MOAB 1 Missile optimised anti-ballistic.
  2 Massive ordnance aerial bomb.
  3 Massive ordnance air-burst, or [more often] air blast.
MoAS Ministry of Aviation Supply (UK defunct).
MOB Main operational base (USAF).
  1 Main operational base (USA).
  2 Main operating base (RAF).
  3 Mobile offshore base (ONR).
MOBA Mobility operations for built-up areas (USA).
Mobie Modular bird with dispensing container (MB/3/Aerospatiale).
mobile air movements team Air Force team trained for deployment on air-movement traffic duties.
mobile lounge Lounge which also conveys passengers between terminal and aircraft and vice versa (eg Washington Dulles Airport).
Mobile Packet Data service Internet Protocol service charged not on length of connection but on megabits sent or downloaded.
mobile quarantine facility Set up on vehicle, usually
mobile satellite system

helicopter-capable ship, for receiving special cargo, eg lunar rock.

**mobile satellite system** One designed to serve mobile (eg aeronautical) subscribers.

**MOBSS** Mobility support squadron.

**MOC** 1 Maintenance operational check.

2 Minimum operational characteristics.

3 Minimum obstacle clearance.

4 Mars orbiter [or orbital] camera.

5 Modular [or mission, or multifunction] operations centre [or console].

**MOCA** Minimum obstruction- [or obstacle-] clearance altitude.

**mock-up** Quickly built replica of aircraft or other product, usually full-scale, to solve various problems (see customer *, engineering *, exhibition *, furnishing *, hard *).

**MOCM** Multispectral ocean colour monitor.

**MOCN** NC machine tool (F).

**MOCVD** Metal organic chemical vapour deposition.

**MOD** 1 Magneto-optical drive.

2 Meteoroids and orbital debris.

MoD Ministry of Defence [London SW1A 2HB] (UK).

**mod** 1 Modification, or modified.

2 Modulation, or modulator.

3 Moderate.

**Modar** Modular aviation radar.

**Modas** Modular data-acquisition system.

2 Modular defensive-aids suite (UK, RAF).

**MOD-DIG, Mod-Dig** Modular digital image-generator.

**mode** 1 The five classical * of aeroplane motion; see motion.

2 Any of selectable methods of operation of device or system.

3 Number or letter referring to specific pulse spacing of signal transmitted by interrogator (IFF, SIR, SSR).

4 Each possible configuration of spatial variable, eg EM wave, flutter or aerodynamic phenomena.

**Mode A** Pulse format for interrogation of ATCRBS, displaying aircraft identity, range and bearing on SSR.

**Mode B** Optional for ATCRBS transponder.

**Mode C** Pulse format which also adds aircraft altitude.

**Modems** Automatic reporting of altitude.

**mode-coupled oscillation** PIOs, assumed linear, which interact with flexible modes of structure [in complex and usually unique ways].

**Mode D** Optional or unassigned transponder mode.

**model** Ambiguously used in aviation:

1 Small-scale replica for testing characteristics of full-size aircraft.

2 In general aviation, improved version marketed at (often annual) intervals.

3 To reproduce a functioning system synthetically, eg in EDP program.

**model atmosphere** Mathematically exact numerical values closely approximating to an idealized real atmosphere.

**model basin** See towing tank.

**model cart** Often large and elaborate wheeled truck on which are mounted a balance or sting and aircraft model, the whole then installed in tunnel working section with large number of electrical and manometric connections.

**modulated augmentation**

**model qualification test** US military clearance of new item, esp. engine, for production.

**model tank** 1 See towing tank.

2 Tank filled with fluid for flow exploration round model by electrical potential analogy.

**model tunnel** Ambiguous, term best reserved for any small-scale model of a future large wind tunnel.

**modem** Telecommunications or EDP (1) device: modulator + demodulator.

**moderator** In nuclear reactor, substance specifically present to slow down neutrons by collisions with nuclei.

**Mode S** Selective interrogation of SSR offering Mode C plus mode-select for discrete interrogation and data-link between nearby aircraft and ATC.

**modex** Three-numeral designator for quick identification of individual aircraft within CAG or other unit (USN).

**modification** Temporary or permanent change to either single aircraft (for particular purpose) or all aircraft of type (to rectify fault or shortcoming or offer improved capability); can be unique, to owner’s requirement, or one of planned and controlled series throughout life of aircraft.

**modified close control** Interceptor is told only target-position information (USAF).

**modified mission** MDS(4) letter added to left of basic mission letter to indicate a permanent alteration to basic mission (DoD).

**modified PAR** Precision approach guidance for high-performance aircraft to flare point instead of to touchdown point (USAF).

**Modals** Modular ILS.

**Modir** Modulated IR jammer.

**Modis** Moderate-resolution imaging spectroradiometer, or spectrometer.

**Modmor** Commercially produced (Morgan Crucible) family of carbon/graphite fibres.

**Modos** Mobile Doppler Sodar.

**ModPE** MoD Procurement Executive (UK).

**modular** Designed in discrete series of major components for ease of inspection, overhaul or repair by module replacement without greatly disturbing neighbours; engine may comprise fan, LP compressor, HP compressor, combustor, turbine and accessories modules, while major avionic system may be series of * boxes [see next].

**Modular Concept Unit** Standardised sizes for boxes [e.g., for avionics], developed in conjunction with Arinc 600 to replace ATR sizes. An MCU has a height of 7.64 in (194 mm) and depth of 12.76 in (324 mm). The width is equal to 1.3N–0.032in, where N is the MCU size number; thus an 8 MCU box has a width of 10.368 in.

**modular insertion stage** A low-cost expendable upper stage to the MSP that would be used to deploy mission payloads for rapid replenishment and other critical-time missions (USAF).

**modular licence** One obtained by studying and passing successive stages or chapters, common in obtaining CPL.

**modular lounge** Airport lounge built as unit capable of (1) being moved from place to place to add capacity where required or (2) being driven to/from aircraft (mobile lounge).

**modulated augmentation** Afterburner (retreat) with fuel
modulated waves

flow continuously variable to give smooth increase in thrust from max. cold to max. augmented.

**modulated waves** Electromagnetic waves on which is impressed information in form of variation in amplitude (AM) or frequency (FM).

**module** J One of assemblies of modular system, easily replaced but seldom itself torn down except at major base or by manufacturer; eg spacecraft command \( * \), engine fan \( * \).

J Any standard dimensions or standard size of container.

J Standard-capacity building block of computer memory.

**modulus of elasticity** Ratio of unit stress to unit deformation of structural material stressed below elastic limit (limit of proportionality), symbol \( K \).

**modulus of rigidity** Shearing modulus of elasticity, proportional to angle of distortion but measured in stress per unit area, symbol \( C \) or \( N \).

**modulus of rupture** In beam loaded in bending to failing point \( S_f = Mc/I \) \([M\; bending\; moment, \; c\; distance\; from\; neutral\; axis];\; in\; shaft\; or\; tube\; failing\; in\; torsion \( S_t = T/I \).

**MOE, MOE** J Measure of effectiveness.

J Maintenance organization exposition.

**MOET** More open electrical technologies (Hispano-Suiza).

Moffett Moffett Field, CA, home of NACA lab., now known as NASA Ames Research Center, and an NAS.

**Mole** Mid and outer fixed leading edge.

**Mog** Maximum on ground, areas suitable for large number of airlift transports in front-line LZ at time of MOG.

**Mogas** Motor gasoline, ie ordinary automotive petrol. Usually 91 or 93 octane.

**Mogr** Moderate or greater.

**MOG spots** Unloading spots for STOVL transports in battle area, typically along short length of highway.

**MOH** Major overhaul.

**Mohl** Mix of Mogas and alcohol.

**MoHS** Ministry of Home Security [against air attack, 1940–46], (UK).

**MOI** Mars orbit insertion.

**MOKA** Methodology of knowledge acquisition.

**MOL** Manned orbital laboratory.

**mol** See mole-(2).

**MOLA** Mars orbiter laser altimeter.

**mold** mould (US spelling).

**Mole** Molecular electronics, many suffixes, not listed.

**mole** J Self-contained intelligence sensor air-dropped over hostile territory.

J SI unit for amount of substance containing as many units [eg, atom, ion, molecule] as in 0.012 kg of C\( ^{12} \), Abb. mol.

**molecular sieve** Filter designed continuously to remove particles of a selected size from an airflow [water, or gases other than oxygen].

**mole dropper** Usually a UAV, see previous.

**mole skin strip** Soft strip around bonedome to eliminate scratching canopy.

**Molle** Modular lightweight load-lifting equipment.

**Mollier diagram** Plot of enthalpy (ordinate) against entropy.

**moment** Turning effect about an axis: force multiplied by perpendicular distance from axis to force; for conversion factors, see torque-.

**moment arm** Distance from axis to force, eg from c.g. to aerodynamic centre of tailplane.

**moment coefficient** J Any moment reduced to non-dimensional form, usually by dividing by dynamic pressure.

J Particular values such as \( C_m \) (section *), \( C_{m_0} \) (pitching *), \( C_{m_{ac}} \) (about aerodynamic centre) and \( C_{m_{cg}} \) (about c.g.).

**moment distribution** Analytical method for frameworks based on bending moments at rigidly attached joints between members.

**moment index** Divisor, typically \( 10 \), to reduce numerical values in balance calculations of heavy or large aircraft.

**moment of area** Not normally used, though term ‘second ***’ synonymous with moment of inertia.

**moment of inertia** Symbol \( I \), sum of all values of \( mr^2 \) where \( m \) is elementary particle and \( r \) its distance from axis about which \( I \) is measured, or \( Mk^2 \) where \( M \) is total mass and \( k \) is radius of gyration; SI unit usually kg-m\( ^2 \) = 23.73 lb-ft\( ^2 \).

**moment of momentum** See angular momentum.

**momentum** Mass multiplied by velocity, symbol \( p = mv \), units kg ms\(^{-1} \).

**momentum coefficient** For CC/BLC System in \( \frac{V_j}{qS} \), symbol \( C_p \).

**momentum drag** Drag due to change in momentum of air entering lateral or other non-ram inlet; major factor in design of ACVs and small high-power jet-lift V/STOLs = \( \frac{WV_j}{g} \) where \( W \) is mass flow and \( V_j \) vehicle speed.

**momentum separation** Flow separation from convex duct wall or other surface where Coanda effect is inadequate.

**momentum theory** Idealized Froude treatment for propellers and other driven rotors by calculating momentum ahead of and behind disc exerting uniform pressure on uniform flow through a stream tube exactly containing the propeller.

**momentum thickness** Measure of reduction in momentum of flow due to viscous forces in boundary layer.

**momentum thrust** Component of jet-engine thrust due to acceleration of jet = \( \frac{WV_j}{g} \) where \( W \) is mass flow and \( V_j \) jet velocity. See thrust.

**momentum transfer method** Drag measurement by pitot traverse of wake.

**momentum wheel** Flywheel, eg in attitude stabilization.
moment weight

Moms, MOMS Modular opto-electronic multi-spectral scanner.
Montel Range of corrosion-resistant Ni-Cu alloys.
monomer Substance consisting of single molecules, esp. one which one hydrogen atom is replaced by methyl group $\text{N}_2\text{H}_4\text{CH}_3$.
monoplane Aerodyne having single wing, or single wing each side of the axis of symmetry.
monopropellant Monofuel used in liquid rocket, eg HTP.
monopulse Radar technique using four overlapping pencil beams, two for azimuth, two for elevation, with circuitry so arranged that, when target is at centre, output voltage vanishes.
monorail Installed along ceiling of paratroop transport, to which static lines are hooked.
monostatic radar Radio whose transmitter and receiver are co-located.
Monte Carlo method Computation based on computerized random sampling.
Montgolfière Common term for early (pre-c1850) hot-air balloons.
Montreal Protocol Mandatory regulations for civil aircraft, especially safety and environment (ICAO).
MOOTW Military operations other than war.
MOR

MOR 1 Mandatory occurrence reporting, or report (CAA).
  2 MF omni-range (365–415 kHz).
  3 Military operational requirement(s).
  4 Meteorological optical range.
MORA 1 Minimum off-route altitude.
  2 Memorandum of reallocation agreement.
Morag MOR (1) advisory group.
Morass Modern ramjet systems synthesis.
More-Electric Initiative Major effort to use electric power for secondary power [such as HEL] and propulsion (DoD, NASA, industry).
morph A morphable aircraft.
morphing To change shape of aircraft in flight [in gross and significant manner, not just by lowering flaps, for example]. Effort at present mainly on UAVs.
Morrison shelter Mild-steel ‘table shelter’, able to support collapsed house; issued to British civilians 1942–44.
MORS MOR (1) scheme.
Morse Code for transmitting messages by succession of dots and dashes.
Morse key Hand-operated switch for sending short and long signals [dots and dashes].
Morsiaxputnik National signatory to Inmarsat (USSR).
motor Large-calibre low-velocity gun for projecting payloads, eg Shuttle drag chute.
motor signal Large signal flare fired vertically to c300m/1,000 ft, thereafter falling free or on parachute.
MOS 1 Metal oxide silicon, family of semiconductor devices.
  2 Maritime observation satellite.
  3 Minimum operating strip.
  4 Multiprocessor operating system(s).
MoS 1 Ministry of Supply (UK, April 1946, became MoA).
  2 Military occupational specialty (USA).
MoS2 Molybdenum disulphide.
MOSA, Mosasa Modular open-systems approach [architectures].
Mosaic Multifunction on the move secure adaptive integrated communications (USA).
mosaic Large assemblage of mating aerial photographs, from optical camera, vidicon, IR or other source, with adjacent boundaries accurately aligned, to cover whole area under surveillance (military reconnaissance or photogrammetric mapping and surveying).
Mosap MOS dynamic analysis program.
MOT Ad hoc AOPA group formed to resolve IRM4 problems [2006–7] (Int.).
MOSFET, Moset Metal oxide silicon, field-effect transistor.
MOSLK MOS (3) lighting kit (USMC).
MOSLS Minimum operating strip lighting system.
MOSP Multimission optronic stabilized payload.
Mosquito Light military [i.e., observation] aircraft used as FAC platform in Korea, Vietnam (US).
Most, Most Metal oxide silicon (or semiconductor) transistor.
MOS-VAO All-union association for experimental aircraft (USSR).
MOT Maximum overhaul time(s).
mounting

mounting, 1 Vague term acceptable for most objects hung on vehicle but not for landing gear or strut attachments. Includes all linkage of structural nature, and any ad hoc parts of airframe such as pylon, but not control or accessory systems.

2 Process of fitting a tire [tyre] to a landing-gear wheel.

mounting pad Circular attachment on engine or ADG for shaft-driven accessory.

mouse See mice.

moused Completely wrapped in soft copper wire [in mooring flying boat].

moustaches Small canard foreplanes, usually retractable and used only at high-alpha regimes by supersonic delta.

MOUT See Mount.

mouth 1 Inlet of circular parachute, esp. where this has diameter less than canopy opening.

2 Open bottom of hot-air-balloon envelope.

mouth lock Reef.

MOV 1 Metal-oxide varistor.

2 Main oxidiser valve.

mov Move, moving.

movables All flight-control, high-lift or high-drag surfaces on wing.

movement 1 One aircraft flight as recorded by particular ground location; for airport, transits overhead are not counted and a * is either an arrival or a departure.

2 Single military aircrfont operation by one or more aircraft.

movement area Region where aircraft may be found on ground proceeding under their own power.

move off blocks Start of an aeroplane flight from parked position, esp. commercial transport; time entered in ATC and flight logs. Where parked nose-on, time is from start of backward push.

MOVG Moving.

moving-base simulator One whose flight deck or cockpit can move linearly as well as rotate, usually in any direction.

moving-coil speaker Dynamic loudspeaker, driven by forces developed by interaction of currents in conductor and surrounding field.

moving flight deck In 1943–49 the advantages of making a carrier flight deck as a powered belt, with an axial motion similar to, or opposite to, that of landing aircraft, was shown to offer no advantage.

moving iron instrument Coil carrying current to be measured moves soft-iron armature connected to indicating pointer.

moving-map display One having topographical, radar, IR, target or other map projected optically on screen with aircraft position fixed (usually at centre).

moving-target indication Radar which incorporates circuits automatically eliminating fixed echoes so that display shows only those moving with respect to Earth. For airborne radar, eg AWACS, aircraft platform motion is automatically subtracted.

moving wings Wings whose incidence is varied in flight as primary means of trajectory control.

Movias Manually operated visual landing-aid system (carrier LSO).

MOVPE Metal organic vapour-phase epitaxy.

MOVVAS, Movtas Modified visual target-acquisition system.

MOX, Mox Mixed dioxides of Pu and U.

Mozaic Measurement of ozone by Airbus in-service aircraft.

MP 1 Midpoint between fixes or waypoints.

2 Manoeuvre programmer (RPV).

3 Manifold pressure.

4 Multiphase (or pulse).

5 Manual proportional (flight-control system).

6 Manpower and Personnel (USAF).

7 Maintenance period.

8 Middle plug.

9 Main, or maritime, processor.

10 Modification proposal.

11 Multipurpose.

12 Mission planner, or planning.

13 Maximum payload.

14 Multi-platform.

15 Montreal Protocol.

Mₚ Pitching moment due to propulsive thrust.

mₓ Maritime polar air.

Mₚ Proton-rest mass.

MPA 1 Man-powered aircraft.

2 Management problems analysis.

3 Maritime-patrol aircraft.

4 Million passengers [per annum].

5 Module performance analysis.

MPₐ Megapascal, SI unit for high pressures = 145.0376 lb/in².

MPAA Multi-beam (or multifunctional) phased-array antenna (or aerial).

MPAG Man-Powered Aircraft Group.

MPAR Multipurpose airport radar (FAA).

MPA/V Multi-purpose air vehicle.

MPB 1 Multiple pencil beam.

2 Mobility procedures branch.

MPBA Multiple practice bomb adapter.

MPBE Multiple-platform boresight equipment [helicopter].

MPBW Ministry of Public Buildings and Works (UK, defunct).

MPC 1 Multi-purpose console.

2 Military personnel centre.

3 Multilayer printed circuit.

4 Message-processing centre.

5 Missile practice camp.

MPCD Multipurpose colour, or CRT, or computer, or control and display.

MP-CDL Multi-platform common data-link (USAF).

MPCDU Multi-purpose control and display unit.

MPCF Million parts/particles per cubic foot.

MPCS 1 Mission planning and control station.

MCU 1 Multiport protocol converter unit.

2 Maintenance/power control system.

MPD 1 Medium-prf pulse Doppler.
MPDI

2 Maximum permitted dose (radiation).
3 Maintenance planning document.
4 Multi-purpose display.
5 Mobile packet data (Satcoms); S adds service.
6 Mandatory Permit Directive (CAA).
MPDI Multi-purpose display indicator (see MDRI).
MPDM Multi-purpose dextrous manipulator.
MPDR Monopulse Doppler radar.
MPDS 2 Missile-penetrating discarding sabot.
3 Multi-purpose display system.
4 Message processing and distribution system.
5 See MPD (5).
MPED Multi-purpose electronic display.
MPFL Multi-purpose fighter facility.
MPFG Metallized polyethylene terephthalate.
MPFR Modified, or medium, pulse-repetition frequency.
MPFPA Multi-platform Fury short-range attack missile.
MPFRP Multiple protective facility.
MPGR Mixed-propellant system.
MPGRS Mixed-propellant seeker.
MPGRU Mixed-propellant rocket unit.
MPGJ Mixed-propellant jet.
MPGK Mixed-propellant kamikaze.
MPGL Mixed-propellant glide.
MPGLK Mixed-propellant glide kamikaze.
MPGM Mixed-propellant glide missile.
MPGMR Mixed-propellant glide rocket.
MPGRS Mixed-propellant glide system.
MPGTH Mixed-propellant GRETA (ICBM).
MPGTV Mixed-propellant GRETA (ICBM) test vehicle.
MPGTVS Mixed-propellant GRETA (ICBM) test vehicle system.
MPGVE Mixed-propellant GRETA (ICBM) engine.
MPGWE Mixed-propellant GRETA (ICBM) weapon.
MPGVH Mixed-propellant GRETA (ICBM) hardware.
MPGW mixed-propellant GRETA (ICBM) weapon system.
MPGWV Mixed-propellant GRETA (ICBM) vehicle.
MPGV Mixed-propellant GRETA (ICBM) vehicle.
MPGZ Mixed-propellant GRETA (ICBM) zero range.
MPGR Mixed-propellant GRETA (ICBM) range.
MPGRS Mixed-propellant GRETA (ICBM) system.
MPGV Mixed-propellant GRETA (ICBM) vehicle.
MPGW mixed-propellant GRETA (ICBM) weapon.
MPGWV Mixed-propellant GRETA (ICBM) vehicle system.
MPGVH Mixed-propellant GRETA (ICBM) hardware.
MPGVZ Mixed-propellant GRETA (ICBM) zero range.
MPGR mixed-propellant GRETA (ICBM) range.
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MPGVH Mixed-propellant GRETA (ICBM) hardware.
MPGVZ Mixed-propellant GRETA (ICBM) zero range.
MPGR mixed-propellant GRETA (ICBM) range.
MPGRS Mixed-propellant GRETA (ICBM) system.
MR

  9 Magnetic resonance.
 10 Microwave receiver (Awacs).
 11 Morning report (US usage).
 12 Manual rectification.
 13 Main rotor.

M_{ad} Aerodynamic moment about the reference point, e.g. c.g. or wing c.p.

mR Milliroentgen[s]; also incorrectly used to mean milli-c.g., or wing c.p.

MRF Milliröntgen, thus mrem/h.

MRE Multi-radar data processing.

MRDL Main-rotor data link.

MRD Multi-role data processing.

MRE 1 Mean radial error (weapon delivery).

MREM Milliradian, = 36'6.25", just over 0.05°.

MRA Marshal of the Royal Air Force.

MRAAM Medium-range air/air missile.

mRad Milliradian, = 36.25°, just over 0.05°.

MRAF Materials Research Consultative Committee.

MRAM Magneto-rheo-tic random-access memory.

MRBC Mean rounds before failure.

MRBC(2) Report.

MRE 2 Materials, or Management, Review Board.

MRCLOS Medium-range air-to-surface missile.

MRC 1 Significant radar.

MRC 2 Main rotor blade.

MRC 3 Multiple-record data-acquisition unit.

MRC 4 Machine-readable document.

MRC 5 Missile round design agent.

MRC 6 Multi-role data link.

MRC 7 Magnetic/rubber inspection.

MRC 8 Main-rotor gearbox.

MRC 9 Meteorological reporting point.

MRC 10 Mission-rehearsal exercise.

MRC 11 Mission-ready management system, or service.

MRC 12 Magnetoresistive random-access memory.

MRC 13 Multi-role reusable vehicle.

MRC 14 Modular rugged flat display.

MRC 15 Multi-role survivable radar.

MRC 16 Mission-ready management system, or service.

MRC 17 Medium-range missile.

MRC 18 Minimum [rarely maximum] rate of climb.

MRC 19 Mission replay.

MRC 20 Meteorological reporting point.

MRCAS Multi-role combat aircraft.

MRCDS Multiple RPA control system.

MRCED Missile Research, Development and Engineering Center (USA).

MRF 1 Meteorological Research Flight.

MRF 2 Multi-role proximity fuze.

MRF 3 Medical red flag.

MRT 1 Maximum reheat thrust.

MRT 2 Military rated thrust.

MRFD Modular rugged flat display.

MRG 1 Master reference gyro.

MRH Maintain runway heading.

MRE 1 Mission-rehearsal exercise.

MRS 1 Medium-range (ICAO).

MRSI Multiple-round[s] simultaneous impact.

MRSR Multi-role survivable radar.

MRSU Maintenance repair and overhaul.

MRSU Mandatory radar service area.

MRV Multi-role vehicle.
MRTA

- Multi-role turret.
- Miniature receive terminal.
- Maintenance release tag.
- Mountain rescue team.
- Multi-radar tracker, or tracking.
- Multiple remote terminal.

MRTA Medium-range tactical aircraft.

MRTD 1 Minimum-resolvable temperature [rarely, time] difference.

MRTF Mean round to failure (gun).

MRTFB Major range and test-facility base (USAF).

MRTM Maritime.

MRTS Microwave repeater test set.

MRTT 1 Multi-role tanker/transport.

MRTU Multiple remote terminal unit.

MRU 1 Mountain rescue unit.

MRW Maximum ramp weight.

MRWS Manned remote work-station (for space-station construction).

MS 1 Minus (ICAO).

Military Sealift Command (US).

Military scan correlation.

Master server computer.

Microspark coating.

Military Satellite Communications [JPO adds Joint Program Office] [DoD/USAF] (US).

Microstandard CADC.

Mean spherical candlepower (non-SI).

Mass storage device.

Minimum separation distance.

Multisensor display.

Multimode silent digital (radar).

Most significant digit.

Multiple-site damage [airframe].

Mid-span damper.

Map storage display.

Mean square deviation.

Mission-system databus.

Manual spinning direction finding.

Military survey digital production system.

Mode-selector damping service.

Material safety data sheet (OSHA).

Minimum single-engine speed.

Manned spacecraft engineer.

Mean square error (signal processing).

Mission support element.

Millisecond.

Multiple stores ejector rack.

Multi-sensor exploitations testbed.

Military significantly significant fallout.

Multi-sensor fusion.

Mission support facility.

Mobile strike force.

George C Marshall Space Flight Center

[Huntsville, Alabama 35821] (NASA).

Manned Space Flight Network (NASA).

Mosaic-staring focal plane (early-warning sensors).

Manned spaceflight support group (USAF).

Merchant ship fighter unit (WW2).

Maintenance steering group [inter-airline; suffix number denotes edition, currently 3] (Int.).

Message (ICAO).

Microgravity science glovebox, for space experiments.

Minimum support helicopter; ATF adds aircrew training facility [RAF Benson] (UK).

Mission-systems integration.

Mission, or missile, store interface.

Multi-source integration or integrator.

Mission-systems integration.

Mean square deviation.

Mid-span damper.

Multiple-site damage [airframe].

Mean square error (signal processing).

Mission support element.

Mean square deviation.

Mobile server.

Military Satellite Communications [JPO adds Joint Program Office] [DoD/USAF] (US).

Mean spherical candlepower (non-SI).

Mass storage device.

Minimum separation distance.

Multisensor display.

Multimode silent digital (radar).

Most significant digit.

Multiple-site damage [airframe].

Mid-span damper.

Map storage display.

Mean square deviation.

Mission-system databus.

Manual spinning direction finding.

Military survey digital production system.

Mode-selector damping service.

Material safety data sheet (OSHA).

Minimum single-engine speed.

Manned spacecraft engineer.

Mean square error (signal processing).

Mission support element.

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Multiple stores ejector rack.

Multi-sensor exploitations testbed.

Military significantly significant fallout.
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>MSIS</td>
<td>Multisensor stabilized integrated system.</td>
</tr>
<tr>
<td>MSK</td>
<td>Modulation, or minimum, shift keying.</td>
</tr>
<tr>
<td>MSL</td>
<td>1 Mean sea level.</td>
</tr>
<tr>
<td></td>
<td>2 Mapping Sciences Laboratory (NASA).</td>
</tr>
<tr>
<td></td>
<td>3 Mars Science Laboratory (NASA).</td>
</tr>
<tr>
<td>Msld</td>
<td>Missile.</td>
</tr>
<tr>
<td>MSLC</td>
<td>Maintenance stock level case.</td>
</tr>
<tr>
<td>MSLT</td>
<td>Multiple sleep latency test.</td>
</tr>
<tr>
<td>MSLV</td>
<td>Microsatellite launch vehicle.</td>
</tr>
<tr>
<td>MSMA</td>
<td>Macro sensor management application.</td>
</tr>
<tr>
<td>MSMM</td>
<td>Multisensor, multimission.</td>
</tr>
<tr>
<td>MSMS, MSs</td>
<td>MS's Maritime-surveillance mission system.</td>
</tr>
<tr>
<td>MSN, MSn</td>
<td>Manufacturer's serial number.</td>
</tr>
<tr>
<td>MSO</td>
<td>1 Manager, shop operations.</td>
</tr>
<tr>
<td></td>
<td>2 Molecular-sieve oxygen [C adds concentrator, S adds system].</td>
</tr>
<tr>
<td>MSOGS</td>
<td>Molecular-sieve oxygen generation system.</td>
</tr>
<tr>
<td>MSOSA</td>
<td>Modelling and simulation operational support activity.</td>
</tr>
<tr>
<td>MSOV</td>
<td>1 Modular standoff vehicle.</td>
</tr>
<tr>
<td></td>
<td>2 Master, or modulating, shut-off valve.</td>
</tr>
<tr>
<td>MSOW</td>
<td>Modular standoff weapon.</td>
</tr>
<tr>
<td>MSP</td>
<td>1 Mach sweep programmer.</td>
</tr>
<tr>
<td></td>
<td>2 Maintenance service plan.</td>
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<tr>
<td></td>
<td>3 Magnetic speed probe.</td>
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<tr>
<td></td>
<td>4 Mosaic sensor program(me).</td>
</tr>
<tr>
<td></td>
<td>5 Maximum structural payload.</td>
</tr>
<tr>
<td></td>
<td>6 Military spaceplane, also military spaceplane program [no longer active] (USAF).</td>
</tr>
<tr>
<td>MSPPFE</td>
<td>Multi-sensor programmable feature extraction.</td>
</tr>
<tr>
<td>MSPS</td>
<td>Modular self-protection system.</td>
</tr>
<tr>
<td></td>
<td>2 Modern signal-processing system.</td>
</tr>
<tr>
<td>MSPT</td>
<td>Marine silent power-transmission system (ASW).</td>
</tr>
<tr>
<td>MSLR</td>
<td>Multisensor reconnaissance.</td>
</tr>
<tr>
<td></td>
<td>2 Missile-site radar.</td>
</tr>
<tr>
<td></td>
<td>3 Modular strain recorder.</td>
</tr>
<tr>
<td></td>
<td>4 Missile simulated round.</td>
</tr>
<tr>
<td></td>
<td>5 Main supply route.</td>
</tr>
<tr>
<td></td>
<td>6 Modular survivable radar.</td>
</tr>
<tr>
<td></td>
<td>7 Maximum-speed range.</td>
</tr>
<tr>
<td>MSRS</td>
<td>8 Missed.</td>
</tr>
<tr>
<td>MSRT</td>
<td>9 Mars sample return.</td>
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<tr>
<td>MSRF</td>
<td>10 Mission-system processor.</td>
</tr>
<tr>
<td></td>
<td>11 Multi-scan radar.</td>
</tr>
<tr>
<td>MSG</td>
<td>Microwave Space Research Facility (USN).</td>
</tr>
<tr>
<td>MSGS</td>
<td>Miniature-sonobuoy receiver system.</td>
</tr>
<tr>
<td>MSS</td>
<td>Multi-spectral scanner, or satellite.</td>
</tr>
<tr>
<td></td>
<td>2 Missile-sight subsystem.</td>
</tr>
<tr>
<td></td>
<td>3 Mobile satellite service, or system.</td>
</tr>
<tr>
<td></td>
<td>4 Model support strut.</td>
</tr>
<tr>
<td></td>
<td>5 Mission-support system[s].</td>
</tr>
<tr>
<td>MSSS</td>
<td>Multi-sensor system.</td>
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<tr>
<td>MSSS</td>
<td>Maritime-surveillance system.</td>
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<tr>
<td>MSSS</td>
<td>8 Minimum sinking speed.</td>
</tr>
<tr>
<td>MSSS</td>
<td>9 Master servicing schedule.</td>
</tr>
<tr>
<td>MSSC</td>
<td>Maritime surface-surveillance capability.</td>
</tr>
<tr>
<td>MSSL</td>
<td>Mullard Space Science Laboratory (UK).</td>
</tr>
<tr>
<td>MSSMP</td>
<td>Multipurpose security and surveillance monitoring platform.</td>
</tr>
<tr>
<td>MSSP</td>
<td>Mobile satellite service provider.</td>
</tr>
</tbody>
</table>

**MSIS**

**MTAT**

- 2 Mode-S specific protocol.
- MSISR 1 Monopulse SSR.
- 2 Mars surface-sample return.
- 3 Multi-spectral scanning radiometer.
- MSISS 1 Man/seat separation system.
- 2 Mode-S specific services.
- MSL 1 Multisensor tracking, or turret.
- 2 Moving surface target; E adds engagement.
- 3 Mountain Standard Time.
- 4 Microprocessor simulation technology.
- 5 Missile surveillance technology.
- 6 Microsystems technology.
- 7 Mobile service tower.
- 8 Mechanical-systems trainer.
- MT&E Multi-service test and evaluation.
- M-Start, MSTAR 1 Moving and stationary target acquisition and recognition.
- 2 Man-portable surveillance and target-acquisition radar.
- 3 MLRS Smart tactical rocket.
- MStart, M-Start Missile system to attack relocatable targets.
- MSTCS Multiservice target control system.
- MSTI Miniature sensor technology integration.
- MSTR Moisture.
- MSTRS Miniature-satellite threat-reporting system.
- MSTS Multiservice tactical system.
- MSTSAP Medium-speed tactical-support aircraft program.
- MSU 1 Mobile satcom unit.
- 2 Mode-selection unit.
- 3 Master switching unit.
- 4 Mass storage unit.
- 5 Maintenance station unit.
- MSV Mobile [explosion-] suppression vessel.
- MSV 1 Milli-solar volts.
- MSW 1 Maximum STOL weight.
- 2 Magnetic surface wave.
- MSWS Multisensor warning system.
- MSX 1 Medium-course space experiment.
- MSZ Magnesium-stabilized zirconia.
- MT 1 Megaton[s], usually means 10^6 short tons.
- 2 Metric tonne[s], confusing.
- 3 Motor [surface] transport.
- 4 Mean, or minimum, time.
- 5 Message, or mobile, terminal.
- 6 Multi-frequency transducer.
- 7 Maximum-top (weather).
- 8 Mountain (ICAO).
- mT 1 Magnetic field intensity.
- mT 2 Mean turn-around time.
- mTL Total mass on takeoff, not necessarily MTOW.
- mTone[s].
- MTA 1 Military training area.
- 2 Multithread architecture.
- 3 Maintenance-task analysis.
- MTACS, Mtas Marine tactical air control system.
- MTAD Multi-trace analysis display (EW).
- MTADS Modernized target-acquisition and designation sight.
- MTAE Multiple-time-around echoes (radar and EW).
- MTAPO Mine/torpedo aviation regiment (USSR, WW2).
- MTAS Millimeter, or modular, target-acquisition system.
- MTAT Mean turn-around time.

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MTBAA
MTBAA  Mean time between avionics anomalies.
MTBCF  Mean time between critical failures.
MTBCM  Mean time between corrective maintenance.
MTBE   Methyl tertiary butyl-ether.
MTBFb  Mean time between failures.
MTBFC  Mean time between component failure (also written MTBCF).
MTBFRO, MTBFro Mean time between failures requiring overhaul.
MTBI   Mean time between incidents.
MTBIE  Mean time between interruption, or instability, events.
MTBMA  1 Mean time between maintenance action(s).
        2 Mean time between mission aborts.
MTBO   Mean time between overhauls or outages.
MTBR   Mean time between repair, or removals, or replacement.
MTBSF  Mean time between significant failure.
MTBUEr Mean time between unscheduled engine removal.
MTBUm  Mean time between unscheduled maintenance.
MTBUr  Mean time between unscheduled, or unit, replacements, or repair.
MTC    1 Mach-trim compensator, or computer.
        2 Mission Training Center (DMT).
        3 Maintenance terminal cabinet.
        Military-Technical Co-operation (R).
        5 Measured-term contract (UK, MoD).
MTCA  1 Ministry of Transport and Civil Aviation (UK, Oct. 1951, became MCA).
        2 Minimum terrain-clearance altitude.
        3 Military terminal control area [MTMA more common].
MTCD  Medium-term conflict detection.
MTCR   Missile Technology Control Regime [=<250 km] (Int.).
MTD   1 Mounted.
        2 Maintenance terminal display.
        3 Maintenance training device.
        5 Moving-target detection, or detector (primary radar).
MTDA  Mean time to dispatch alert.
MTDAS  Mobile telemetry data-acquisition system.
MTDP   Mid-term defense program.
MTDS   1 Marine tactical data system (USMC).
        2 Mission, or military, training through distributed systems, or simulation.
MTE   1 Megatons equivalent, unit of area destruction.
        2 Modular threat emitter.
        3 Moving-target exploitation.
        5 Magnetic turning error.
MTEL   Methyl-triethyl lead.
MTF    1 Modulation transfer function.
        2 Mississippi Test Facility (NASA, now SSC 4).
        3 Mid-tandem fan.
        7 Maintenance terminal function.
MTFP   Man-tended free flyer.
MTG    Meeting.
MTGW   Maximum taxi gross weight.
MTHEL  Mobile tactical high-energy laser.
M4     Pitching moment due to elevator deflection.
M6     Torsional stiffness.
M6h    Pitching moment of tailless aircraft.
M8h    Monthly.
M3R    Multimission modular radar.

MTI
1 Moving target indication, or indicator.
2 Multiple-target interception.
3 Multispectral thermal imager.
# Marked temperature inversion.

MTIP  Maintenance training improvement program.
Mka  Tip Mach number of rotor of hovering helicopter.
MTRIA Machine Tool Industry Research Association (UK).
MTIS  Modular thermal-imaging sight.
MTIX  Moving-target information exploitation.
MTk   Maritime tropical air, colder than surface.
MTL   1 Mean (rarely maximum) transmitter level.
        2 Minimum triggering level [transponder].
        3 Magnetic-tape loader.
        4 Multiturn loop [ISS].
MTLA  Minimum takeoff and landing area.
MLLM  Major throttle-lever movement.
MTLO  Moscow Technical Liaison Office (NASA).
MTM   1 Mission and traffic model; co-ordinates Space Shuttle payloads and customer requirements.
        2 Maximum takeoff mass.
        3 Ministry of transport machine construction (USSR).
        4 Million ton-miles (short tons).
        5 Module test and maintenance [bus interface].
MTMA  Military terminal manoeuvring area.
MTMC  Military Traffic Management Command.
MTMD  Million ton-miles per day (short tons).
MTMIU  Module test and maintenance bus interface unit.
MTMP  Mid-term modification [or moderization] program (US; UK equivalent is MLU).
MTMT  Multiple target and missile tracker.
MTN   Mountain(s).
MTO   See MTOP.
MTOA  Maintenance training organisation approval.
MTOD  Mean (or maximum) time on deck.
MTOE  Mid-term operations estimate.
        2 Modified table of organization and equipment.
MTOW  Maximum takeoff weight [MTOGW adds gross], a certificated value exceeded only during certification flight testing.
MTP   1 Mandatory technical publications.
        2 Maintenance test panel.
MTPA  Mobile transponder performance analyser.
MTPS  Maintenance Test Pilots’ School (formerly RNAS Brawdy).
MTR  1 Missile tracking radar.
        2 Marked-target receiver.
        3 Military training route.
        5 Main and tail rotor (helicopter configuration).
MTIRA Megafloat Technological Research Association.
MTRE  Missile test and readiness equipment.
MTRIV  Mission-tape recorder interface unit.
MTS   1 Marked-target seeker.
        2 Mobile training set.
        3 Mobile test set.
        4 Motion/time survey.
        5 Maintenance training simulator.
        6 Multispectral, or multisensor, targeting system(s).
        7 Mobile telephone service.
        8 Mountains.
        9 Manned tactical simulator, or simulation.
        10 Movement tracking system (JBFSA).
MTSAT Multifunctional transport satellite.
MTT
 MT 1 Multiple-target tracking.
  2 Maintenance-training tutorial.
  3 Maximum turbine temperature.
MTDAD Mean time to dispatch alert.
MTDF Mean time to (next) failure [differs from MTBF in that no credit is given for items that have not failed].
MTDFSF Mean time to first system failure.
MTDM Mean time to maintenance [A adds alert].
MTDR 1 Mean time to repair.
  2 Multiple-target tracking radar.
MTDRS Mean time to restore service.
MTSIS Multi-task training system, versatile simulators which can be configured for particular aircraft types.
MTUR MTUR.
MTU 1 Use metric units (ICAO).
  2 Mobile training unit.
  3 Magnetic-tape unit.
MTUR Mean time to unscheduled removal, or replacement [differs from MTBUR in that no allowance is made for items not removed].
MTV Magnesium, Teflon, Viton [flame material].
MTVC 1 Motor thrust-vector control.
  2 Manual thrust-vector control.
MTW 1 Major theatre [of] war.
  2 Mountain wave[s].
MTw Maritime tropical air, warmer than surface.
MTWA Maximum takeoff [or total] weight authorized, = MTOW.
MTX Miniature transmitter.
M-type marker See M-marker.
MTZT Multiple time-zone travel.
MU 1 Maintenance unit.
  2 Management unit [usually Acars].
MUA Military utility assessment (DoD).
MUC Military upper-area control centre.
MUAS Multimission unmanned aerial system.
MUAV Micro, or maritime, UAV.
Mucels Multiple communications emitter location system.
MUCO Manned/unmanned convertible optronics.
MUD Maximum unambiguous Doppler.
mud Pilot of *-mover.
Mudcell Modular universal data-acquisition system.
mud-mover Low-level close-support or attack aircraft, or its pilot (colloq.).
MUE Modernized user equipment (GPS).
MUf, muf Maximum usable frequency.
muff Exhaust heat exchanger, usually for cabin heating.
muffler Silencer (US).
Mudfids Multi-user flight-information display system.
µFORS Mu (micro) fibre-optic rate sensor.
mufi Civilian dress worn by Serviceman off duty (UK usage, Hindustani origin).
MUGS, Mugs Multiple universal gunner system.
mule 1 Refuelling bowser (US term).
  2 Hydraulic test rig (colloq.).
  3 Modular universal laser equipment.
Multile Commercially produced ablation material.
mult Multiple, or multiplier.
Multack Multiple target attack program (software).
multibank engine Piston engine with several linear banks.

multi-mode radar
multi-body freighter Hypothetical aircraft with payload in detachable bodies all carried on one wing.
multi-bogey Air-combat situation in which there are many enemy aircraft.
multi-burn See multi-impulse.
multi-cell ACM engagement in which two or more DA cells participate.
multicellular foam Material of low density with air or gas-filled closed cells such as expanded polyurethane; term not used for honeycombs.
multichannel receiver Usual meaning is ability simultaneously to track several GPS signals.
multichannel selector Manual controller for preselected communications channels.
multicom Multiple communications.
multicombiner Optical system for projecting several sets of displays all focused at infinity on HUD screen.
multicomunications service Mobile private communications service on 122.9 MHz for such activities as ag-aviation and forest firefighting.
multicolour system Guidance, tracking or other target-oriented system which operates alternately or continuously on several EM wavelengths, not necessarily in visible range.
multicoupler Device for making single aerial (antenna) serve several receivers.
multi-energy spectrum Gives output in contrasting colours depending on average atomic number (baggage screening).
multi-foil wing Wing of extremely thick (up to t/c 30%) supercritical profile comprising a main fixed portion and upper/lower rear hinged foils (up to 35% chord), with or without blowing between the foils.
multifunctional control surface Flight-control system in which lateral and direct-lift control is effected by spoilers and full-span Fowler flaps and variable-camber tabs, one advantage being fast letdown and steeper approach.
multifunction display EFIS display offering selectable weather radar, navigation maps, checklists and other information other than that on PFD.
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multi-mode receiver

ating modes with quick switching between each, eg (for MMR for attack aircraft) ground map, ground map spoiled, etc, each mode requiring a different waveform.

multi-mode receiver Usually means compatible with VOR, ILS, MLS, DGPS.

multi-path effect Anomalies in radar target range and position, and many other optical/radar situations, caused by receipt of reflected radiation from land or sea surface and other reflectors as well as direct signal from target.

multiplane / Aeroplane with several sets of main wings, normally superimposed.

2 Adjective: tail unit or other assembly with several superimposed horizontal surfaces.

multiple-access receiver Lasercom to make uplink/downlink by sensing beacons to refine beam aiming.

multiple courses Narrow false courses heard on radio range, esp. among mountains.

multiple echoes[es] Reception of more than one transmission of a single signal because of refractions and reflections.

multiple ejection rack, MER Interface allowing several stores to be carried on single external-stores station, with positive ejector rams to ensure clean separation.

multiple independently targeted RV Delivery system containing several missile re-entry vehicles each having own guidance system to separate targets.

multiple independent RV Broader concept than above; system delivers several warheads which may free-fall or be independently targeted.

multiple kill capability Usual meaning is that platform has several types of armament, eg gun plus two types of missile.

multiple options Force employment alternatives depending on flexibility in tactical/strategic situations, retargeting and availability of conventional or nuclear weapons.

multiple RV Re-entry vehicle containing number of separate warheads which scatter slightly but fall on same area target.

multiple-time-around echoes Those from targets at exact multiples of the radar unambiguous range.

multiplexing 1 Act of combining signals from many sources into common channel, requiring frequency, phase and time-division.

2 In electrical wiring of whole vehicle, providing redundant pathways or alternative routes with auto switching triggered by battle damage or other discontinuity.

multiplexer, multiplexor Device, often stored-program computer, which handles I/O (input/output) functions of on-line EDP (1) system with multiple communications channels.

multi- ply Material, eg wood, fabric, metal or composite, assembled from several laminar layers.

multiplying valve, multiplier Device whose output is exact product of several inputs.

multiprocessor Multiprogrammed processor.

multiprogramming Technique allowing single computer to run several programs simultaneously.

multi-row engine Piston engine having more than two banks or radial rows of cylinders.

multi-sensor Using more than one type of signal to gather information; eg optical camera, radar, IR linescan, passive elint etc.

multiservice connector Personal coupling for suit pressure, electric heating, oxygen, radio and possibly other services.

Multisite fracture Main break was preceded by numerous micro-cracks.

multispectral Capable of responding usefully to wide range of EM wavelengths including all visible hues, IR and possibly UV.

multi-stage rocket Vehicle with several stages each fired and staged in succession.

multistatic dependent surveillance Fusion of airfield surface sensors and surface-movement radar to provide precision display for controllers.

multi-step See multi-stage rocket.

multithread architecture Simple parallel programming.

multitube launcher External store filled with parallel tubes for air-launched rockets.

multi-use thruster Rocket engine capable of being started and stopped repeatedly in the same mission.

multivibrator Oscillator having two cross-coupled valves or transistors operating alternately, each input coming from other stage’s output; can be bistable (flip/flop), monostable or astable.

MULTS, Mults Mobile universal Link-11 translator system.

Multimacs Multiple unmanned aircraft control system.

mu-metal High-permeability alloy used to screen equipment (eg CRT) from stray magnetic influences.

mu-meter Rolling truck with pair of toed-out tyres, measures side force and hence coefficient of friction. From $\mu$ (mu), coefficient of sliding friction.

Mumps Multi-user MEMS process.

MUN, MUNI, MUNL Municipal.

Munk factor Formula for performance of biplanes based on ratios of spans, lifts, gap and interference.

MuOS, Muos Mobile- or, confusingly, multiple-, user objective system (satcom system, USN/DoD).

Mupso Multi-purpose stand-off weapon.

Murlin Multiband research laser IR.

Muroc Dry California lake, site of USAF flight-test centre of same name (now Edwards AFB).

Murphy’s law If it is physically possible for an assemblage of parts to be connected incorrectly, sooner or later they will be thus connected.

MUS Minimum-use specification.

MUSA, Musa 1 Multiple-element steerable array.

2 Frag subdivision for semi-hard targets, dispensed by MW-1 system (G).

muscle pressure Pneumatic pressure for applying force on a shaft bearing.

MUSE, Muse 1 Multi-user system [and] environment [sometimes Musent], includes LBA, L-DCS, BVIS and other functions.

2 Monitor of UV solar energy.

3 Multiple unified simulated environment.

mush To increase angle of attack suddenly but without immediate corresponding vertical acceleration, resulting from momentum along original path.

mush-head See next.

mushroom rivet One having thin convex head with sharp edge, for thin sheet.

Music 1 Multiple signal classification.

2 Multi-spectral IRCM.

music EW emissions, esp. jamming (colloq.).

Musical Prefix to marking techniques denoting Oboe guidance (RAF 1943–45).
MUSPA

**MUSPA** Area-denial mine, dispersed by MW-1 system (G).

**Must** Multimission u.h.f. satcom terminal.

**Mustrs, MUSTRS** Multisensor target-recognition system.

**MUT** Multi-use thruster.

**Muta, MUTA** Military upper [-level] traffic control area.

**Mutes** Multiple-threat emitter system; simulates many hostile emissions simultaneously.

**Mute switch** Disconnects headset, microphone (term also often used for PA disconnect).

**Muting** See mute switch.

**Mutual inductance** The e.m.f. in a circuit caused by rapid change in surrounding magnetic field, unit = henry, symbol H, also = Wb per ampere.

**Mutual interception** By two friendly interceptors on each other.

**mux** Multiplexer.[r]

**muzzle brake** Any of variety of gun-muzzle gas deflector units to reduce recoil, or blast on surrounding structure.

**muzzle cap** Frangible closure on gun muzzle to reduce drag and ingestion of precipitation.

**muzzle energy** Kinetic energy of each projectile as it leaves gun, measured relative to gun.

**muzzle horsepower** Standard non-SI measure of gun power, esp. automatic weapons; muzzle energy multiplied by rate of fire (units being compatible).

**MV** 1 Muzzle velocity.

2 **Miniature vehicle.**

3 **Mass value.**

**mV** Millivolt[s].

**MVA** 1 **Minimum vectoring altitude.**

2 Multivariate analysis.

3 Megavolt-amperes, basic unit of large AC powers.

**MVAR** Magnetic variation.

**MVDF** MF and VHF D/F facilities co-located (ICAO).

**MVEE** Military Vehicles Experimental Establishment (UK).

**MVFR** Marginal VFR.

**MVG** Moving.

**MVIS** Microgravity vibration-isolating system.

**MVL, mvl** Mid-value logic.

**MM** 1 **Muzzle-velocity measurement.**

2 Mounted vertical manoeuvre.

**MMEM** Modular virtual memory environment.

**MMT** Movement.

**MPVA** Military variable-profile area (air-traffic management).

**MPS** Multiple vertical protective shelter (ICBM).

**MVS** 1 Minimum vector speed (light pen).

2 Multi-vendor system (distributed networks).

**MVSRF** Man/vehicle systems research facility (NASA, Ames).

**MVT** Multi-view tomography.

**MVU** Moscow higher technical school.

**MW** 1 Medium wave.

2 Methanol/water.

3 Megawatt[s].

4 Microwave.

5 Mine warfare.

**MW** 1 Bending moment at wing root.

2 Mine warfare.

**MW[A]** 1 Multiple weapons adaptor.

2 Moment-wheel assembly.

3 Mountain-wave activity.

**MWARA** Major world air-route area.

**MWCS** Multiple weapons carrier, or carriage, system.

**MWD** Military working dog.

**MWDB** Miscellaneous Weapons Development Branch (UK, 1942–45).

**MWDP** 1 Mutual weapons development program.

2 Master warning display panel.

**MWE** 1 Manufactured (or manufacturer’s) weight empty.

2 Maximum weight empty.

**MWE(E)** Megawatts electrical.

**MW50** Methanol 50%, water 49.5%, inhibitor 0.5%.

**MWG** Maintenance Working Group[s].

**MWIR** Mid-, or medium-, wave IR.

**MWL** 1 Minimum takeoff distance on water to clear standard (35 or 50 ft) obstacle.

2 Maintain wings level.

**MWLD** Man-worn laser detector.

**MWO** 1 Meteorological Watch Office (ICAO).

2 **Modification work order.**

**MWP** 1 Museum of Women Pilots (US).

2 Meteorologist weather processor (FAA).

3 Master warning panel.

**MWRI** Millimetre-wave radar.

**MWS** 1 Master warning system.

2 Missile Warning Squadron (USAF).

3 Multiple-warhead system[s].

4 Modular workstation.

5 **Missile warning system; –PE adds passive element.**

**MW(T)** Megawatts (thermal).

**MWVS** Mission weapon visions system.

**MX** Mixed types of icing, white and clear (ICAO).

**Mx** 1 Bending moment at any station x.

2 Helicopter-rotor rolling moment, positive to starboard.

3 Bending moment.

**Mx, Mzero** 1 Bend moment.

2 Bending moment at any station x.

3 Modelling work order.

**Mxh** Mixed (ICAO).

**MY** Multi-year [C adds contract(ing)].

**MYA** 1 Bending moment at any station x.

2 Bending moment.

3 Bending moment at any station x.

4 Modelling work order.

5 Mine warfare.

**Mylar** Tough transparent film, of terephthalate polyester family, usable down to extreme thinness (hence light weight per unit area).

**Mynapak** Integrated circuit with up to three ceramic substrates carrying devices connected by gold wires, the whole being N2-filled (BAe).

**Myopia** Short sight, near-parallel rays being focused in front of the retina.

**MYP** Multi-year procurement, or programme.

**myriametre** Non-SI term for 10⁴ metres, hence myriametric.

**Mz** 1 Zero-lift pitching moment.

2 Zero-lift pitching moment.

**MZFW** Maximum zero-fuel weight.
### N

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Newton[N]</td>
</tr>
<tr>
<td>2</td>
<td>Shaft rotation speed, with suffix number (N₁, N₂ etc) for each shaft (see gas-turbine numerology).</td>
</tr>
<tr>
<td>3</td>
<td>Yawing moment.</td>
</tr>
<tr>
<td>4</td>
<td>Code: operates by sound in air (JETDS).</td>
</tr>
<tr>
<td>5</td>
<td>Code: navaid (ICAO).</td>
</tr>
<tr>
<td>6</td>
<td>Prefix, amount of cloud.</td>
</tr>
<tr>
<td>7</td>
<td>Number of turns in a coil, or of load cycles, usually per second, or number of samples in statistics.</td>
</tr>
<tr>
<td>8</td>
<td>North (ICAO, or northern).</td>
</tr>
<tr>
<td>9</td>
<td>Synoptic chart code: air mass has had characteristics changed.</td>
</tr>
<tr>
<td>10</td>
<td>Telecom code: aircraft.</td>
</tr>
<tr>
<td>11</td>
<td>Avogadro’s number.</td>
</tr>
<tr>
<td>12</td>
<td>Nitrogen.</td>
</tr>
<tr>
<td>13</td>
<td>STOL aircraft (FAI).</td>
</tr>
<tr>
<td>14</td>
<td>Prefix, night, negative, nose, no.</td>
</tr>
<tr>
<td>15</td>
<td>Prefix, nuclear (USSR).</td>
</tr>
<tr>
<td>16</td>
<td>Knots [flight plan].</td>
</tr>
<tr>
<td>17</td>
<td>Nicrosil-nisil thermocouple.</td>
</tr>
<tr>
<td>18</td>
<td>IFR weather.</td>
</tr>
<tr>
<td>19</td>
<td>Non-scheduled civil transport flight.</td>
</tr>
<tr>
<td>20</td>
<td>Permanent special test (USAF/USN aircraft designation prefix).</td>
</tr>
<tr>
<td>21</td>
<td>Trainer (USN 1922–60).</td>
</tr>
<tr>
<td>22</td>
<td>Noise.</td>
</tr>
<tr>
<td>23</td>
<td>Modified mission suffix, night or all-weather (USN 1950–62).</td>
</tr>
<tr>
<td>24</td>
<td>Aircraft category STOL aeroplanes (FAI).</td>
</tr>
</tbody>
</table>

**n**

- 1 Prefix, nano (\(\times 10^{-9}\)).
- 2 Generalized symbol for an aircraft equipped with Tacan only and 6-digit transponder.
- 3 Normal acceleration in g, load factor.
- 4 Number in a sample, any integer.
- 5 Frequency, esp. of rotation.
- 6 Refractive index.
- 7 Negative, hence n-type semiconductor.
- 8 Number of frames or supports to a beam.
- 9 Subscript, normal, e.g., to leading edge.
- N Normal force on 2-D aerofoil [per unit span, normal to chord].
- N Normal acceleration factor [positive downwards].
- (N) Night.
- á Angular acceleration.
- N₁ Fan or LP compressor speed.
- N₂ Nitrogen.
- 2 IP compressor speed (CAA).
- 3 HP compressor speed (2-shaft engine).
- N₁, N₂ Rate of change of N(2) on spool-up or rundown.
- N Vector representing integrated noise energy.
- N-code ICAO code, amount of cloud.
- N-display Target forms two blips on horizontal time-base (as in K-display), lateral positions giving range and relative amplitudes bearing.
- N-layer N is set for any layer name [link, net, etc] or for the initial [open system architecture].
- N-sector Sector of radio range in which Morse N is heard.

**N-strut** Arrangement of interplane struts or cabane struts resembling N.

**n-type semiconductor** One in which charge carriers are nearly all electrons.

**N-wave** Shockwave remote from source; far-field boom signature, when profile of pressure/linear distance has settled down to N-like profile.

(N) Night.

**NA**

- 1 Noise abatement (procedure).
- 2 Numerical aperture.
- NIA Not applicable, not available, not authorized, not approved.
- 2 Navigation/attack.
- N1 Avogadro constant.
- Na Sodium.
- 2 National Aviation Academy [Clearwater FL33760] (US).
- 3 National Aviation Authorities (European countries).
- 4 National Airport Authority (India).
- NAAAC National Aviation Associations Coalition (US).
- 3 See sodium acetate.
- NAAFI Pronounced “naffy”, Navy, Army and Air Force Institutes [civilian organization in support of Other Rank(s)] (UK).
- NAAM National Agricultural Aviation Museum [Jackson, Mississippi] (US).
- NAAP Netherlands Agency for Aerospace Promotion (NIVR).
- NAAWS NATO anti-war warfare system.
- NAB Navy Air Base (USN).
- Nabs NATO air base Satcom.
- NAC 1 North Atlantic Council, of NATO ambassadors.
- 2 Noise Advisory Council (UK).
- 3 National Air Communications (UK, 1939–40).
- 5 Naval Air Command (UK).
- 6 Naval Avionics Center (USN).
- 7 Non-airline carrier.
- 8 Network access controller.
NACA

9 NASA Advisory Council.
NA
c  National Advisory Committee for Aeronautics (US, 1915–58, became NASA).


NACA cowling Drag-reducing annular cowling for radial engines with aerofoil-profile leading edge and cylindrical main section.

NACA section Any of numerous aerofoil sections designed by NACA.

NACA standard atmosphere Original idealized atmosphere, published in 1925; later superseded by ICAO, ARDC and others.

NACEL Naval air crew equipment laboratory.

nacelle Streamlined body sized according to what it contains, which may be an engine, landing gear, human occupants etc; when tail carried on separate booms * takes place of fuselage.

NACES, Naces Navy aircrew common ejection seat (USN).

Nacic, NACISA NATO Communications and Informations Systems Agency.

Nacma NATO Air Command and Control Management Agency.


Nacre New aircraft concepts research.

NACP Noise-abatement climb procedure.

nacreous cloud High layer cloud with iridescent appearance; also called mother-of-pearl cloud.

Nacsa NATO Advisory Committee on Signals Intelligence.

NAD National Armament Director[s] (NATO nations).

NAD AC US Naval Air Development Center.

NADC US Naval Air Development Board.

NAD C US Naval Air Development Center.

NAD E US Nuclear Affairs Defence Council (NATO).

NADF US Air-Defence Committee.

NADG Noise-abatement departure procedure.

Nadcap Widespread industry group, originally US when name meant National Aerospace and Defense Contractors Accreditation Program, now no longer an acronym, (Int.).

NADEC NATO Air Defence Electronic Environment Committee (NATO).


Nadep Naval Aviation [or Air] Depot (USN).

Nadge NATO aircrew common ejection seat (USN).

Nadge plan.

Nadgemo Nadge Management Office; formed within NATO to act as unified customer.

Nadin 1 National airspace data-interchange network (FAA).

Nadir 2 National data-interchange network.

Nadir Point on celestial sphere vertically below observer, ie 180° from zenith. Thus, through- * tracking = during overflight.

NAEL US Navy Avionics Development Laboratory.

NADS 1 US Naval Air Development Station (from 1947).

2 National Armaments Directors (NATO).

3 Next available delivery slot.

NAE 1 National Aeronautical Establishment (Canada).

2 National Academy of Engineering (US).


2 National Aerospace Education Council (US).

Naegi, NAEGIS NATO airborne early warning ground environment integration segment.

NAEIL SI Naval Air Engineering Laboratory (Ship Installations), from 1962.

NAES 1 Naval Aviation Engineering Services (US); plus U = unit.

2 US Naval Air Experimental Station (1943–57).

NAEW NATO airborne early warning; F adds force (base Geilenkirchen, G).

NADF 1 Norwegian Air Transportation Foreningen (Norway).

2 Non-appropriated fund(s).

3 Naval air facility (US).

Nafag NATO Air Force Armaments Group.

Nafdu Naval Air Fighting Development Unit.


NAFIN, Nafin Netherlands armed-forces integrated network.

NAF P National aeronautical facilities programme.


NaGr Short-range reconnaissance wing (G, WW2).

NAIGS, Nags NATO alliance ground surveillance.

NAGTE Non-aircraft gas-turbine engine.

Naheim NATO Helicopter Management Agency [Aix-en-Provence P-13082] (Int.).

NAHF National Aviation Hall of Fame [Dayton, OH 45402] (US).

NAHSI National Aviation Heritage Skills Initiative (BAPC).

NAI 1 Negro Airmen International [education and training; Oshkosh, WI54903] (US).

2 Netherlands Aerospace Industries [member AECMA, title in English].

3 National Aerospace Initiative (US).

NAIA National Aerospace Intelligence Agency (USAF).

Nails National airspace integrated logistics support (FAA).

NAIU Naval Accident Investigation Unit.

NACK 1 National Aero Klubb [N-0102 Oslo] (Norway).

2 Norsk Aero Klubbl [N-0102 Oslo] (Norway).

3 Negative acknowledgement.

Nak Generalised term for all mixtures of sodium and potassium; used eg as liquid-metal heat-transfer media.

Naka National aerospace agency (Kazakhstan).

naked See clean (1, 2).
NAL 1 National Aerospace Laboratories [Bangalore 560 017] (India).
2 National Aerospace Library [being established on site at Farnborough of former Royal Aircraft Establishment] (UK).

Nalidds Norwegian Army low-level air-defence system.

2 National Atomic Museum (Albuquerque, NM).
3 NATO Air Meet (annual).
4 North American region (ICAO).
5 National Aviation Museum [Ottawa, PQ] (Canada).
6 Newark Air Museum [Newark NG24 2NY] (UK).

Nam, n.m.n. Nautical miles; hence *lb of fuel.

NAMAS National Measurement and Accreditation Service (UK).

NAMCUS Naval Air Material Center (1943, in 1962 became NAEC).

Nameadsma NATO medium extended air-defence system management agency.

NAMFI, Namfi NATO Missile Firing Installation (Crete).

NAMI Scientific auto-motor institute (Sweden).

Namis NATO automated meteorological information system.

NAML Naval Aircraft Materials Laboratory (UK).

NAMMA NATO MRCA Management Agency.

NAMP Naval Air Maintenance Program (USN).

NAMRL Naval Aerospace Medical Research Laboratory (USN).

NAMS NATO Maintenance and Supply [A adds Agency, Luxembourg: O Organization].

NAMTD Naval Air Maintenance Training Detachment (USN).

NAMU US Naval Aircraft Modification Unit, (1943–47).

NAND 1 NOT + AND logic device, retains output until voltage at all inputs, then goes to 0.
2 Nested analysis and design.

nano air vehicle Smallest possible UAV, span ≤ 75mm, 3 in.

nanosatellite Mass 1≤10 kg.

NAO National Audit Office (US, UK).

NAOAL National Aviation Officer for Airworthiness and Logistics (US Fire Service).

NAOC National Airborne Operations Center (E-4B platform for NCA).

NAOMS National Aviation Operations Monitoring Service [Washington DC].

NAOS North Atlantic Ocean station.

NAOTS North Atlantic organised track system.

NAP 1 Noise-abatement procedure[s].
2 Normal acceleration point (SST).
3 National airport plan (US).

nap 1 Local profile of land surface; hence * of Earth, * of the Earth flying (as close to ground as possible).
2 Short fibre ends along edge of fabric.

napalm 1 Mixture of naphtha and palm oil (hence name), usually with additives, used as incendiary material.
2 Air-dropped ordnance filled with * designed to burst and distribute flame over large area.

NAPC Naval Air Projects Co-ordination office (USN).

NAPCA, Napca National Air-Pollution Control Association [now APCC] (US).

nape Use napalm against (colloq.).

Napgel Mix of ethylene/proplylene glycols [de-icing fluid tradename].

naphtha Generalized name for inflammable oils distilled from coal tar and other sources.

NAPI National Air Photo Library (Canada).

NAPMA NATO AEW&C Programme Management Agency.

Napoc No acceptable price, no contract.

Napo NASA Pasadenan Office.

Napon Norfolk Atlantic Policy (ECAC working group).


NAPR NATO armaments planning review.

NAPTF Naval Air Propulsion Test Center (USN).

NAR 1 National airspace review (US).

NARC 1 Nexcom Aviational Rulemaking Committee (FAA).
2 National Aerospace Resource Centre [RMIT] (Australia).


NARF 1 Naval Air Reserve Force (USN).
2 Naval Air Rework Facility; Pensacola (USN).

NARG Navais and area-navigation working group (ICAO).

NARIM NAS (2) research and investment model.

NARO Naval Aircraft Repair Organization [Gosport, now part of DARA] (UK).

narrow-body Commercial transport with fuselage width of approximately 10 ft (3 m) with single aisle between passenger seats.

narrow gate AAM operating mode permitting homing on target only within narrow limits of rate of closure.

NARS Navigation and attitude reference system.

Narsim NLR ATC research simulator.

NARTEL National air radio telecommunications (UK).

NARUC National Association of Regulatory Utility Commissioners (US).

NAS 1 Naval Air Station (USN).
2 National airspace system (FAA).
3 National Academy of Sciences (US).
4 Nozzle actuation system.
5 National aerospace standards (FAA, CAA, UK).
6 Numeric aerodynamic simulation.
7 Nav/attack system.
8 Naval Air Squadron [Fleet Air Arm] (UK).


NASAO

NASAO National Association of State Aviation Officials [office, Silver Spring, MD20910] (US).

NASC National Air Sea Command (USN).

NASO National Air Navigation Service (UK).

NASP National Association of Spotters’ Clubs (UK, 1941–46).

NASP National Aerospace Standards Committee.

NASP National Association of Aircraft Owners and Pilots (US).

NASQ National Aeronautics and Space Administration (NASA).

NASC Canadian Aeronautics and Space Agency (Canada, Denmark, Luxembourg, Norway, US).

Natar Yellowknife, NT (Canada).

NATA National Association of Airlines (US).

NATC National Air Transport Commission (US).

NATCC National Air Transport Co-ordinating Committee (US).

NATCS National Air Traffic Control Services (UK).

NATF US Naval Air Test Facility.

NATW American National Air Traffic Commission (Canada).

NATS National Air Traffic Services Ltd. [subsidiary of North Atlantic Capacity And Inclusive Tours (UK)].

NATS National Air Traffic Service [also known as NATS].

NATS Panel.

NATL Canadian National Air Transport Co-ordinating Committee (CAA).

NASAO National Association of State Aviation Officials (US).

NASP National Aerospace Standards Committee.

NASQ National Aeronautics and Space Administration (NASA).

NASC Canadian Aeronautics and Space Agency (Canada, Denmark, Luxembourg, Norway, US).

Natar Yellowknife, NT (Canada).

NATA National Association of Airlines (US).

NATC National Air Transport Commission (US).

NATCC National Air Transport Co-ordinating Committee (US).

NATCS National Air Traffic Control Services (UK, now NATS).

NATF US Naval Air Test Facility.

NATW American National Air Traffic Commission (Canada).

NATS National Air Traffic Services Ltd. [subsidiary of North Atlantic Capacity And Inclusive Tours (UK)].

NATS Panel.

NATL Canadian National Air Transport Co-ordinating Committee (CAA).

NATO National Atlantic Treaty Organization, formed 1949, always written thus yet spoken as Nato [Secretariat, B-1110 Brussels] (Int.).

NATO Natural language

Nata National Air Traffic Controllers Association (US).

Natcap North Atlantic Capacity And Inclusive Tours Panel.

NATCC National Air Transport Co-ordinating Committee (US).

NATCS National Air Traffic Control Services (UK, now NATS).

NATF US Naval Air Test Facility.

NATW American National Air Traffic Commission (Canada).

NATS National air-traffic management advisory committee (CAA).

NATO National Atlantic Treaty Organization, formed 1949, always written thus yet spoken as Nato [Secretariat, B-1110 Brussels] (Int.).

NAF African theatre of operations (WW2).

Nats National Aviation System Planning Group.

Natops National Air Traffic Control Services (UK).

Natcap National Aeronautics and Space Council (US).

NASC Canadian Aeronautics and Space Agency (Canada, Denmark, Luxembourg, Norway, US).

Natar Transatlantic advanced radar (Belgium, Canada, Denmark, Luxembourg, Norway, US).

NATC Naval Air Technical Training Command (US).

NATC National Air Training Command (US).

NATTC Naval Air Turbine Test Center (USN).

naturally aspirated

naturally aspirated  Not supercharged but left to draw in air at local atmospheric pressure.
natural satellite  Not man-made.
natural wavelength  That corresponding to natural frequency of tuned electronic circuit; that at which open aerial [antenna] will oscillate.
NAU  Network access unit.
nausea bag  Sickbag.
nautical mile  Standard unit of distance in air navigation, totally at variance with SI; aviation uses International *, 6,076.1 ft, 1,852 m; UK * 6,080 ft, 1,853.18 m. A common aviation approximation is 6,000 ft (1,828.80 m). Abb. n.m. See knot.
nautical twilight  Period when Sun’s upper limb is below visible horizon and Sun’s centre is not more than 12° below celestial horizon.
NAV  Air navigation services provider (Portugal).
N 2 Nano air vehicle.
nav  Navigation, navigator.
navaid  Navigation aid, esp. one of electronic nature located at fixed ground station.
Navy  US Naval Air Systems Command.
naval aircraft  1 Loosely, one used by a navy.
  2 One specially equipped for operation from aircraft carrier or other warship.
navattack system  One offering either pilot guidance or direct command of aircraft to ensure accurate navigation and weapon delivery against surface target.
nav/bomb  Crew-member combines functions of navigator and bomb aimer.
nav/com  Loosely, navigation and communications, or a single radio transceiver used for both functions.
Nahars  Navigation, heading and attitude reference system.
NAVCP  Naval inventory control point (USN).
Navier-Stokes  Basic set of equations for motion of body or flow parcel in viscous fluid.
navigation aid  Any facility intended to assist tokeoff, en route flight and landing.
navigation datacard  Portable holder of customized database.
navigation flare  Bright-burning pyrotechnic dropped over open country at night to provide fixed object for measurement of drift (obs.).
navigation flight test  A section of the practical examination for the PPL and IRT.
navigation float  Navigation aid in form of clearly visible float, with or without pyrotechnics, for drift measurement over sea; hence navigation flame-float, navigation smoke-float (obs.).
navigation lights  Regulation wingtip lights (red on left, blue-green on right)) visible from ahead through 110° to side, and white light at tail visible each side of rear centre-line.
navigation satellite  Artificial satellite whose purpose is to assist navigation [not only of aircraft].
navigation smoke bomb  See navigation flare.
navigation stars  Those used in astro-navigation.
Navsat  Navigation satellite.
Navsep  Specialist [semi-permanent] panel on navigation and separation of aircraft.
Navspasur  Naval space surveillance system (USN).
NCAR  National Center for Atmospheric Research (Boulder, Colorado).
NCAE  National Coalition for Aviation Education (US).
NCAD  Network-centric airborne defense element.
NCAT  National Committee for Atmospheric Research (US).
NCFS  Non-compulsory reporting point.
NCFA  Night combat air patrol, also called nightcap.
NCCT  Network-centric, or netcentric, precision strike.
NCDM  Navigation/communications operator.
NCF  Non-crimp fabric.
NCDS  Navigation/checklist display system.
NCDC  No date.
NCDO  Net control device.
NCER  National Committee for the Evaluation of Radar (US).
NCET  Navigation database, stored in FMC.
NCFT  Network control terminal.
NCGS  Nomex core, GRP skin.
NCGT  Navigation [control] system.
NCI  Network control center/centre.
NCIP  Navigation control indicator.
NCL  National Contract Management Association (US, now Int.).
NCN  Non-commissioned officer.
NCND  Networked communications/intelligence weapon data-link architecture program (USAF).
NCNC  National Contract Management Agency.
NCTR  Network-centric warfare.
NDAC  Northern Defence Affairs Committee (NATO).
NDI  Non-destructive inspection.
NDL  Navigation display.
NDM  No date.
NDN  Network control terminal.
NDR  Navigation display.
NDP  National designated pilot examiner registry (US).
NDQ  Non-disclosure agreement.
NRD  Navigation display.
NDP  National Defense Panel, or planning (US).
NDA  Northern Defence Industries (Canada).
NDE  No direction beacon.
NDF  National Defence Industries Council (UK).
NDEG  Nuclear directed-energy weapon.
NDQA  Northern Defence Industries [previously Aerospace; office Sunderland SR5 2TH] (UK).
NDRL  National Development Research Laboratory (UK).
NDT  Northern Defence Industries [previously Aerospace; office Sunderland SR5 2TH] (UK).
NDU  National Defense University (US).
NDX  Northern Defence Industries [previously Aerospace; office Sunderland SR5 2TH] (UK).
NDW  Northern Defence Industries [previously Aerospace; office Sunderland SR5 2TH] (UK).
NDX  Northern Defence Industries [previously Aerospace; office Sunderland SR5 2TH] (UK).
NDY  Northern Defence Industries [previously Aerospace; office Sunderland SR5 2TH] (UK).
ND point Nominal deceleration point (SST).
NDRC National Defense Research Committee (US, WW2).
NDS Nuclear detection system.
NDT Non-destructive testing.
NDTS Non-Destructive Testing Society (UK).
NDU Navigation display unit.
NDV Nuclear delivery vehicle.
NdYAG Nd-doped YAG.
NE No echo [radar weather].
NEB National Enterprise Board (UK).
NEC Network-enabled capability.
NEC I Noise exposure computer/integrator.
neck Lower tube-like portion of gas-balloon envelope.
necking Local reduction in cross-section of member due to plastic flow under tension.
necking down Reducing the diversity of types, e.g. on a carrier.
necklace vortex Formed at a junction between a quasi-flat surface, such as the local skin of a fuselage, and a bluff projection, such as the leading edge of the wing. Unable to penetrate the adverse pressure-gradient, the fuselage boundary layer separates and forms a *, coiling above and below the wing. In most applications the same as a horse-shoe vortex.
neck moment Bending moment on neck on entering slip-stream in ejection.
NED North/east/down co-ordinate system.
NEDO English rendition of New Energy and Industrial Technology Organization (Japan).
NEDS Narcotics eradication delivery system (US).
NEEC Noise-excluding ear capsule.
needle Rotary ‘hand’ of traditional dial-type instrument; but see plural.
needle and ball See turn and slip.
needle beam Extremely directional radio beam with suppressed sidelobes (difficult for enemy to detect).
needles Generalized term for instrument (esp. flight instrument) readings; thus ‘the * all dropped to zero’.
needle split Divergence between helicopter engine and rotor speed indications, with normally superimposed needles.
needle valve One offering fine adjustment of fluid flow by linear translation of tapering pointed rod centred in oriﬁce.
NEF Noise exposure forecast.
NFC NATO electronic-warfare fusion cell.
NEFD Noise equivalent ﬂux density.
NEFMA, NEFMA NATO European Fighter Management Agency (Int.).
NEG Negative.
“negative” Voice communications word meaning “no”.
negative altitude Angular distance below horizon; depression (ASCII).
negative area 1 Area on tephigram enclosed between path of rising particle at all times colder than environment and surrounding air.
  2 Generally, vague area (volume) surrounding colder air that happens to be rising.
negative camber Usually interpreted as concave on upper surface.
negative feedback 1 Signal either reversed in sense or otherwise out of phase and thus tending to increase departure from original condition.
  2 Transfer of part of amplifier output in reverse phase to input.
negative flow Through an axial compressor, flow from delivery to inlet.
negative g Subject to acceleration in the vertical plane in the opposite-to-normal sense, e.g. aircraft in sustained inverted flight or in pushover from steep climb to steep dive; wings are bent ‘downwards’ (relative to aircraft atti-
negative-g valve

tude) and pilot can experience 'red-out'. This condition is intermittently inevitable in severe turbulence but is normally prohibited for non-aerobatic aircraft.

negative-g valve Inverted-flight valve.

negative image Apart from photographic meaning, transposition of blacks and whites in TV, EO or IR picture.

negative pole Cathode, or S-seeking pole of magnet.

negative pressure relief valve Prevents dP in pressurized aircraft becoming negative.

negative rolling moment Tending to rotate aircraft anticlockwise, seen from rear.

negative stability See instability.

negative stagger Backwards stagger; lower plane in advance of upper.

negative stall Stall under negative g; this regime provides lower left boundary of basic manoeuvre envelope.

negative sweep See forward sweep.

negative terminal That from which electrons flow; thus towards which 'current' flows.

to signal Indication of fault characterized by driven member (eg propeller) tending to drive driving input (eg turboprop).

negative yaw Rotating aircraft anticlockwise about z-axis seen from above.

NEGL Negligible.

negotiation Commercial discussion preceding contract.

negotiation threshold Point in escalating conflict at which either participant is likely to draw back and initiate negotiation.

NEH Code: 'I am connecting you to a station accepting traffic for station you request' (ICAO).

N18 Powder metallurgy nickel alloy, MP; 1.225–1.323°C.

NEIA Net-enabled information access.

NEL National Engineering Laboratory (UK).

NEMA National Electrical Manufacturers Association (US).

nematic See liquid crystal.

NEMO, Nemo Navy [or Naval] Earth Map Observer.

NEMP Nuclear electromagnetic pulse.

Nems, NEMS Nano-electromechanical system[s].


NEO 1 National energy outlook (US).

2 Near-Earth object[s].

3 Non-combatant evacuation, or extraction, operation.

Network-enabled operations.

neodymium Nd, silver metal, density 7.0, MPT 1,021°C, used in lasers and in permanent magnets of highest known energy level [see next].

Neomax Magnetic material Nd15Fe77B8.

neon Ne, inert gas, density 0.9×10⁻³, BPT -246°C.

Neoprene Family of synthetic rubbers (polymerized chloroprene) resists).

NEP 1 Noise equivalent power.

2 Nuclear-electric propulsion.

3 Night enhancement program, or package.

4 Nuclear explosive package (ICBM).

Nepal drop Low-level airdrop of cargo, usually food, in which about 20 sacks are attached to strong plywood sheets by cords which break on impact.

neper Unit (Napier) expressing scalar ratio of two currents, N = nat log (I₁/I₂) nepers, = 8.686 dB. Applicable to all scalar ratios of like quantities.

nephelometer Measures light scattering by fine particles in suspension.

nepholoscope Measures temperature changes in gases rapidly compressed or expanded.

nepholometer Convex mirror divided into one central and five radial parts for estimating cloud cover.

nepholoscope Optical instrument for measuring direction and angular velocity of cloud motion.

NEPP Normal and emergency preflight procedures.

Nepto Process for manufacturing soft-skin composite in which main fibres are pultruded rods.

Nerc, NERC 1 New EnRoute Centre (Swanwick, NATS, UK).

2 Natural Environmental Research Council (UK).

National Environmental Research Council (UK).

NERO 1 National Energy Resources Organization (US).

2 Nederlanse Vereniging voor Raketonderzoek.

Nerva Nuclear energy, or engine, for rocket-vehicle applications; May 1961.


Nesacc North, east and southern area control centres (China).

NESC 1 Naval Electronics Systems Command (USN).

2 National Environmental Satellite Center (NOAA).

3 NASA Engineering & Safety Center (LaRC, 2003–).

NESDIS, Nesdis National environmental satellite data and information service or system (NOAA).


Net Non-expendable space transport [S adds system].

Nesterov loop Flying 360° circle in horizontal plane whilst rolling continuously (1913).

NET 1 Network entity title.

2 Network enabled technologies.

net 1 Tailored mesh forming structural link between traditional gas balloon envelope and useful load.

2 Electronic, optical or other telecommunications system(s) forming single service covering designated area accessible at any point.

net area 1 Traditional gross area (normally of wing) minus projected horizontal area of fuselages, booms, nacelles, pods, etc.

net dimensions Those of final shape, thus a * moulded core.

netcentricity Conduct of future warfare governed by an integrated ISR network using aircraft and UAVs; hence netcentric warfare, etc.

NETD Noise equivalent temperature difference, or differential.

net dry weight Basic weight of engine or other device calculated according to various rules but always excluding fluids (fuel, lubricant, coolant, etc) and usually all accessories, protective systems, instrumentation systems, etc, not essential for device to function.

net flightpath That followed by aircraft, esp. aeroplane, after application of factors (particularly for average-aircraft performance and average pilot skill); ie gross flightpath fully factored.

net height That at any point on net flightpath, esp. during takeoff and climb-out.
Netma

Netma NATO Eurofighter and Tornado Management Agency.

net performance Gross performance factored to take account of temporary variations (from whatever cause) and pilot handling skill.

net propulsive force See net thrust.

net radiation factor Percentage of radiant energy emitted by one surface or volume that is absorbed by another surface or volume.

net shape Finished shape [many refinements, depending on tolerances and which dimensions are chosen].

nettage decrement Percentage difference between gross and net performance.

net thrust $F_n$, effective thrust of jet engine numerically equal to change in momentum of fluids (air/gas and fuel) passing through engine (plus, in engine operating with choked nozzle, extra aerodynamic thrust generated in nozzle).

netting Electronically interlinking numerous related stations, such as SAM launchers or battlefield communications centres, which are dispersed randomly over a wide area and move relative to each other.

net weight Loosely empty weight, but usually excluded from aerospace usage.

net wing area Gross area minus projected plan area of fuselage, nacelles over wing and other non-aerofuel parts.

network System of communications linking computers and other management tools.

network carrier Large airline serving many cities or countries, opposite of hub/spoke.

network centric warfare Radical new command, control and communications systems, with every post, vehicle [including airborne] and sensor interconnected. A core objective is to find targets using multiple—possibly widely dispersed—sensors and provide near-instantaneous target data.

network enabled capability Local or global linkage of sensors, decision-makers and weapons in order to achieve rapid and correct overwhelming effect.

neutral networks Loosely follow architecture of human neurons and their dendritic connections; NNP is a pioneer multiple instruction/multiple data neural processor.

neutral-angle intake An inlet whose mouth is shaped to minimise variation of ram pressure with airspeed.

neutral area “A strip of ground of specified width adjoining the sides of a runway” (B.S., 1940).

neutral axis Locus of points within structural member at which bending imposes neither tension nor compression.

neutral burning Combustion of solid propellant grain in which exposed surface [and thus thrust] remains almost constant over burn-time.

neutral engine Main propulsion engine devoid of dressing peculiar to either particular aircraft type or to left or right installation in multi-engined aircraft, and thus available for quick completion for desired installation.

neutral equilibrium Normally means that system will tend to stay in most recently commanded attitude or condition, without oscillation, unstable divergence or recovery of previous condition.

neutral flame Neither oxidizing nor reducing.

neutral hole Aperture cut from sheet, esp. in wall of internally pressurized container (usually taken to be cylindrical) shaped so that peak stress around periphery is minimised and stress in surrounding material is as if hole did not exist. Credited to E.H. Mansfield, RAE. Normally approximates to ellipse, with minor axis parallel to cylinder longitudinal axis.

neutralized controls Usually taken to mean centralized.

neutralized track Air intercept code: target is ineffective or unusable.

neutral point 1 Location of aircraft, esp. aeroplane, c.g. at which longitudinal stability would be neutral $C_{ma} = 0$; rear extremity from which static margin is measured. More strictly, stick-fixed $**$ is e.g. position at which stick movement to trim a change in speed is zero; stick-free $**$ is e.g. position at which stick force to trim a change in speed is zero.

2 Lagrangian point. [] Any sky direction where polarization of diffuse (ie not from specific source) radiation is zero.

neutral stability See neutral equilibrium.

neutrino Elusive small particle, rest mass 0, spin ½.

neutron Particle of atomic nucleus having no charge and mass $1.6749286 \times 10^{-24}$ g (proton is $1.6726231 \times 10^{-24}$ g).

neutron bomb Enhanced-radiation weapon.

neutron radiography NDT method similar to X-ray inspection and ‘photography’ but using beam of neutrons.

neutronat Possible future gyro: magnetic field guides atoms at near-zero temperature round 20-mm ring.

NEW 1 NATO electronic warfare [AC adds advisory committee; TS training system].

2 Network-enabled warfare.

Newac NATO Electronic Warfare Advisory Committee.

new blue Recruit (USAF).

Newhaven Visual marking of ground target (RAF WW2).

new heading R/T for “that is my next routing”.

newton SI unit of force, $= 1 \text{ kg m s}^{-2} = 10^5 \text{ dyn} = 7.233 \text{ pdl}$ $= 0.224809 \text{ lb}$, written without initial capital, but symbol N.

Newtonian mechanics Those based on Newton’s laws of motion, in which mass and energy are unrelated.

Newtonian speed of sound Relation $a = \sqrt{\frac{\rho}{\mu}}$ where $\rho$ is pressure and $\mu$ density.

Newtonian stress Fundamental shear stress in fluid, $\frac{du}{dy}$ given by law $\tau = \mu \frac{du}{dy}$ where $\mu$ is fluid viscosity and $u$ is fluid velocity at distance $y$ from fixed surface.

Newton’s laws Briefly: (1) body at rest remains at rest unless acted upon by outside force, (2) change in motion (momentum) is proportional to applied force, and (3) to every action (force or change in momentum) there is equal and opposite reaction.

Newts Naval electronic-warfare training system (USN).

Nex, NEX Next-generation (prefix, DoD).

Nexcom Next-generation air/ground communications [P adds program] (FAA).

Nexrad Next-generation radar.

NEXST Next-generation supersonic transport.

Next NASA evolutionary xenon thruster.

Nextwave Next-generation weather-observing system (FAA, 1995).

NEZ No-escape zone.
NF

NF 1 French material specification prefix.

2 Night fighter.

3 Notched filter.

4 Norsk Flyverforbund [ALPA, office Oslo] (Norway).

Nf 1 Fan rpm.

2 Relationship between power-turbine speed and gear box governor.

nF Nanofarad.

NF 1 Noise factor (radio).

2 Negative feedback.

NFA Near-field atmospheres and aerodynamics.

NFAC National Full-scale Aerodynamics Complex (NASA Ames).

NFCS Nuclear forces communications satellite.

NFCT Non-Federal control tower (FAA).

NFED National flight data [C adds Center, D Digest, PS processing system] (FAA).

NFE Near-field effects.

NFER Near-field electromagnetic ranging.

NFF No fault found.

NFP National aeronautical research programme (Sweden).

NFG The Newfoundland Group, airline labour watchdog (US).

NFGH NATO frigate helicopter.

NFIP National foreign intelligence program (US).

N-fire , NFIRE Near-field IR experiment (KEI).

NFIS Navigational flight inspection system.

N5+ Refractory NiCo alloy used for monocrystal engine parts.

NFKK Women's aero association (J).

NFL No-fly list (TSA).

NFLC National Flying Laboratory Centre [Cranfield, UK].

n.f.m., NFM Narrow-band FM.

NFMS Navigation and flight-management system.

NFN 1 Near-field noise.

2 Naval fires network (USN).

NFO Naval flight officer (USN).

NFOV 1 Narrow field of view.

NP 1 Net flightpath.

2 No-feathering plane, in which an observer would see no variation in helicopter rotor cyclic pitch.

NFPA National Fire Protection Association [office, Boston, MA] (US); many annexes, eg * 417 specifies resis-
tance of ADB (2) to an external fire.

NFRL Naval Facilities Research Laboratories (USN).

NFS 1 Network file system.

2 National Fire Service (UK, WW2).

3 Near-field source.

NFSM NATO French-speaking nations.

NFT 1 Night-flying test.

2 Navigation flight test.

NFTC NATO flying training in Canada [office, Ottawa K1P 6L7].

NFTM Noise and flight-track monitoring.

NFU Non-formed unit (EAW).


NFZ No-fly zone.

NG 1 Natural gas, hence LNG = liquid natural gas.

2 Next generation.

NG, Ng Nitroglycerine.

Nget 1 Gas-generator rpm., or number of cycles.

NGA National Geospatial-intelligence Agency [until 2004 was NIMA/Nima] (US).

NGAGC See Nexcom.

NGATM New-generation air-traffic manager.

Ngats Next-Generation Air Transportation [or Traffic] System (JPDO).

NGAUS National Guard Association of the US.

NGB National Guard Bureau (US).

NGC Nylon/graphite composite.

NGCCS Next-generation command and control system.

NGDC National Geographic Data Center (NOAA).

NGDR Next-generation [broadband] digital receiver.

NE Non-ground effect.

NGEA Nouvelle génération école/appui [combat-aircraft trainer] (F).

NGFF New-generation IFF.

NGL Natural gas liquids.

NGLRS Next-generation long-range strike.

NGLS Next-generation launch system.

NGLT Next-generation launcher technology.

NGM Nested-grid model [weather computer program].

NGO Non-government organization (US).

NGPS Navstar global positioning system.

NGR 1 Night-goggle readable (ie at IR level).

2 Next-generation GPS receiver.

3 Nitrogen gas reduction.

NGS 1 Naval gunfire support.

2 National Geodetic Survey (NOAA).

3 Nitrogen generation system.


NGSA Next-generation single-aisle.

NGSP National geodetic-satellite program (NASA).

NGSST Next-generation SST.

NGST Next-generation space telescope, following Hubble.

NGT 1 New-generation trainer.

2 Night.

NGTA Next-generation twin-aisle.

NGTCS Next-generation target control system.

NGTE National Gas Turbine Establishment (formerly at Pyestock, UK).

NGTOS Next-generation theater observation system (USN).

NGV Nozzle guide vane.

NGW Nuclear gravity weapon.

NH 1 Nitrogen.

2 HP rpm, engine speed, also written NH or N2.

NHA Naval Helicopter Association [office, Coronado, CA92178–0578] (US).

NHC 1 Navigator’s hand controller.

2 National Hurricane Center (NWS).

NHCRC National Flying League (J).

NHE Notes and helps editor.

NHGA National Hang-Gliding Association (UK).

NHMF National Heritage Memorial Fund (UK).

NHP Non-handling pilot.

NHR National Flying Association (J).

NHSS National hypersonics strategy (US).

NI Noisiness Index (South Africa, Van Niekerk/Muller, 1969; see noise).

Ni Nickel.

Nt Number of stress reversals to fail specimen.
NIAC

2 Northern Ireland Aerospace Consortium.
3 Navigation interface and autopilot computer.

NIAG / NATO Industrial Advisory Group.
Nial Nickel/aluminate diffusion coating.

NIAR / National Institute for Aviation Research
[Wichita State University, Kansas 67260-0093] (US).
2 No inspection after rework.

NIAST / National Institute for Aeronautics and Systems Technology (South Africa).
NIAT / MAP-sponsored factory (USSR).
2 National institute for engineering research (R).

NiAu Nickel gold.

NIB / Neodymium, iron, boron, permanent-magnet material.

nih Any substantially axial fore or aft-pointing fairing, usually with concave surfaces.
2 Aft-pointing fairing between, and projecting behind, two closely spaced jetpipes.
3 Forward-pointing extension at inner end of fixed glove on VG aircraft.

nibbler Machine tool for eating away edge of sheet by repeated local vertical shearing, in some cases with ability to impart lateral compression or joggling.

nibble An approach to very limit of g-induced stall in air combat, also see next entry.

nibbles Stall testing of aircraft in which AOA is increased in small increments at 1 g, culminating in fully developed stalls.

NIBS / Neutral industry booking system [IG adds interest group].

NIC / Newly industrializing country.
2 New installation concept.

Nicad See nickel/cadmium.

Nicalloy Nickel-iron alloy, low initial but high maximum permeability for transformers, etc.

Nicalon Proprietary SiC alloys.

Nicap National Investigation Committee on Aerial Phenomena (US).

Nicasil Ni/Cd/Si.

NiCd, Nicad Nickel/cadmium electric battery.

NICE / Nice 1 NAT(2) implementation manager, or management, cost/effectiveness.
2 NATO internet cryptography equipment.
3 Network-integrated cabin equipment,

Nicerol Widely used protein foam compound for firefighting.

Nichols diagram Plots stability of rigid aeroplane showing open-loop frequency response in each axis following control-surface deflection.

Nichrome American heat-resisting alloys (c 85% Ni, 15% Cr), eg for resistance wire.

nickel Ni, silver-white magnetic metal important in corrosion-resistant alloys; density 8.9, MPt 1,453°C.

nickel/cadmium battery Cell having KOH (potassium hydroxide) electrolyte, positive plates of nickel hydroxide and negative plates of cadmium hydroxide.

Niemos Near-IR camera and multi-object spectrometer.

NICP / Navy inventory control point (USN).

Nieral Nickel/chromium/aluminium plasma spray.

Nicrosil Ni/Cr/Si.

NICS, Nics NATO integrated communications system;
O added “Organization”, MA added ‘Management Agency’; became NACISA.

NID National interest determination.

Nidjam Nav/ident deception jammer.

NIDTS / NATO integrated digital transmission system.

NIE / National Intelligence Estimate(s) (US).

NIF / National infrastructure forum (UK).
2 National Ignition Facility [laser research] (LLNL).

NIFA / National Intercollegiate Flying Association
[office, Cahokia, IL] (US).

NIFC / National Inter-Agency Fire Center (US).

NiFe, Nife Nickel/iron electric battery.

NIG / NATS Infringement Group (UK).

night airglow See airglow.

night and all-weather Strictly, interceptor can be used at night or in any weather, seldom true at time this term was in use; more accurately meant night and rain or snow but with acceptable landing minima.

Night cap, NCAP Night combat air patrol (DoD).

night effect Phenomenon most noticeable near sunrise and sunset when directional radio signals (D/F, radio range, VOR) give false readings thought to be due to variations in ionosphere.

night fighter Aircraft intended to intercept other aircraft at night; today implicit in term ‘fighter’ or ‘interceptor’.

night-flying chart Special editions of regional charts, usually 1:1,000,000, eliminating all detail unseen at night but emphasising lights, navails and fields with night facilities (US).

Night Owl Night ground-attack mission.

Night rating Enables holder of PPL to fly at night as PIC with passenger[s].

night vision Human seeing after eyes have had time fully to adapt to near-absence of light, with irises fully open.

NIH Not invented here, rejection of foreign developments.

NIHL Noise-induced hearing loss.

NiH₂ Nickel/hydrogen electric battery.

NII 1 Scientific test institute (USSR, R; many, each covering one subject).
2 National, or NATO, information infrastructure.

NID / Defence manufacturers association (Netherlands).

NIHR Radio engineering research institute (R).

NIIRS National imagery interpretability rating scale (US, runs 0 to 9).

NIL / 1 Code: ‘I have no message for you’ (ICAO).
2 National Information Library (NIMA).

NILE, Nile NATO improved link 11.

NIM / National Imagery & Mapping; A adds Agency, C college (DoD, Bethesda, MD).

Nima See previous; now NG4.

nimbostratus, Ns Thick dark blanket cloud in low/middle band (2,000–6,000 m), mainly ice crystals and supercooled water, large horizontal extent, usually rain.

nimbus Not normally used as cloud type but as adjective meaning rain-producing, as in Cb andNs.

Nimby Not in my back yard.

NIMCIS New integrated Marines communications and information system.

Nimocast British casting alloys, composition akin to Nimonic.

Nimonic Family of refractory and anticorrosive alloys based chiefly on nickel, originally Mond patents,
NIMS, Nims

important where creep-resistance essential; Inconel, Hastelloy, Udiment and Waspalloys related.

NIMS, Nims National airspace system Infrastructure Management System (FAA).

90-minute rule Certification requirement that twin-engined passenger aircraft may fly transoceanic sectors provided they are never more than 90 minutes from an emergency alternate.

The 99s US women in aviation educational charity [sometimes spelt out].

NINST Non-instrument [runway].

niobium Nb, shiny grey metal, density 8.6, MPt 2,468°C.

NIOSH National Institute for Occupational Safety and Health (US).

NIP Network interface processor.

nip 1 Local compression between adjacent components, esp. that used to secure a third part, eg compressor rotor between discs.

2 Local compression caused by deflection under operating conditions, eg axial movement at periphery of conical compressor or turbine disc.

NIPC National Infrastructure Protection Center (US).


Nipnet Non-classified information protocol router network (DoD).

NIR Near infra-red; S adds spectrometer.

2 Network interface router; V adds VHF data-link.

NIS NATO identification system.

2 Nose-in stand (airport ramp).

2 Not in service.

Nisac National Infrastructure Simulation and Analysis Center (LASL/Sanda, a response to 9-11).

NISC National IFF/SSR Committee (CAA).

Nisil NiSi.

NISR Non-traditional intelligence surveillance and reconnaissance.

NIST National Institute of Standards and Technology (US, previously NBS).

nit Name, not normally used, of SI unit of luminance, cd/m².

NITE Night imaging and threat evaluation.

Nitenol Alloys of Ni and Ti, variable properties.

Nite-Op Night imaging through electro-optics.

NITEworks Pronounced nightworks, network, integration, test and experimentation works (UK, MoD and US, previously NBS).

NIT Large aeroplane study group.

NITF British steels for nitrided parts with small amounts of Cr, Al, Mn, C, Si and possibly Ni and Mo.

nitrate dope Aircraft fabric dope comprising cellulose fibres dissolved in nitric acid, plus pigment, thinner, etc.

nitrating Surface hardening of steels by prolonged heating in nitrogen-rich atmosphere.

nitrogen Generally unreactive gas forming 78.03% by mass of sea-level air, symbol N₂, BPt −195.8°C, density 1.25 gl⁻¹, 0.07807 lb/ft³; dry gas important as inert purging medium, liquid LN₂ used as cryogenic heat-transfer fluid.

nitrogen desaturation Human condition caused by apparent reaction between tissue fats and nitrogen under pressure.

nitrogen tetroxide N₂O₄, most common storable liquid oxidant, often called NTO, BPt 21°C, Isp 285 with UDMH, 290 with hydrazine.

nitroglycerine Major constituent of many gun propellants, commercial name Picrite.

Nitrojet Versatile supersonic jet of LN₂ used for cutting and surface treatment.

nitromethane CH₃NO₂, oily liquid, monopropellant.

nitrous oxide N₂O 'laughing gas', used as source of oxygen in power-boosting piston engines in WW2.

NIU Nitrogen inerting unit.

2 Network, or navigation, interface unit.

NIVO, Nivo Dark green night-bomber paint, later RDM2 (RAF).

NIVR Netherlands Institute for Aerospace Development.

NIW Night and in-weather.

NJ Noise jamming.

NJE Nominal jet edge.

NJG Nachtjagdgeschwader, night-fighter group [US = wing] (G, WW2).

NJSK Private Pilots’ Association (J).

NKAP State commissariat for aviation industry (USSR).

NKF Non-kinetic fires.

NKK Nihon Koku Kyokai [Aeronautical Association; main office, Tokyo 105-0004] (J).

NKG Nihon Kakai Gakkai [Society of Mechanical Engineers; office, Tokyo] (J).

NKGGK Nihon Koku Gijutsu Kyokai [Society of Aeronautical and Space Sciences; office, Tokyo] (J).

NKKK Nihon Koku Gijutsu Kyokai [Society of Aeronautical Engineers; office Tokyo] (J).

NKOK State commissariat for defence (USSR).

NKRR Nihon Kikyu Remmei [Balloon Federation; office, Tokyo] (J).

NKSJ State commissariat for defence (USSR).

NKRK Nihon Kiku Komyo Kyokai [Society of Mechanical Engineers; office Tokyo] (J).

NKUGK Society of Aeronautical and Space Sciences (J).

NKVD State commissariat for internal affairs (now KGB).

NiKw Newtons per kilowatt, fundamental performance measure of Hall-thruster thrusters.

NL 1 Natural language.

2 Normenstelle Luftfahrt (G).

N₁ 1 LP rpm engine speed [N₁ preferred].

2 Normal load factor.

NLA 1 New large aeroplane study group.

2 Noise-level analyser.

NLD Next-generation light anti-armour weapon.

NLB Nose loader, or loading, bridge; see bridge.

NLC Noctilucent cloud.

NLCM Non-lethal countermeasures.

NLES Navigation land Earth satellite.

NLF 1 Natural laminar flow.

2 Normal load factor.

NLI 1 Nose landing gear.

2 Noise Liaison Group (UK).

3 Non-linear gearing.

NLL No load lubrication.

NLM Network-loadable module.

NLO No local, or live, operator, also called nulls.

NLOS Non-line-of-sight; CA adds combined arms.

NLP Network layer protocol.

NLRB

NLRB  National Labor Relations Board (US).
NLRGC  Aeromedical research centre (Netherlands).
NLS  New launch system (NASA/USAFA).
NLSIM  Non-linear simulation.
NLT  Not less than.
NLW  Non-lethal weapon.
NM, n.m., nm  S Nautical mile; nm preferred except by ICAO. Note confusion with nanometre.
Network management.
Nm  SI unit of torque or moment, Newton-metre = 0.73756 lbf-ft.

NN  Nanometre (10⁻⁹m).
2 Nautical mile[s], or n.m.
NMAC  Near mid-air collision.
NMB  National Mediation Board (US).
2 No mechanical backup.

NMC  Naval Missile Center (Pt Mugu, CA).
2 Not mission-capable.
3 Naval Material Command (USN).
4 Satellite network management centre.
5 National Meteorological Center (NWS).
6 Network[work] monitoring and control.

NMCC  National Military Command Center (US).
NMCCD  Network-management category class diagram.

NMI  Navy, Marine Corps intranet (US).
NMC  Navigator’s missile-control panel.

NMD  National Missile Defense System.
NED  National Environmental Defense Foundation.

NMCS  National military command system (US).

NMA  Nano-technology and information systems.
NMR  Nuclear magnetic resonance.

NMB  Near mid-air collision.

NMdB  Network-management data-processing.

NME  National Marine Environmental Laboratory (US).
NMECA  National Marine Engineering and Computer Association (J).
NMEC  National Marine Engineering Center.

NMO  Numerical master geometry.

NMH  Nickel-metal hydride.

NMA  National Mail Service (US).
NMIC  National Military Intelligence Center (US).

NMIS  Network management interface requirements specification.

NMK  Model Aeronautics Association (J).

NML  Normal.

NMN  National missile network (US).

NMO  National missile objectives (US).

NMOS  Negative (n-type) metal-oxide semiconductor, or silicon.

NMP  Navigation microfilm projector.
2 Network management plan.

NMPG  Nautical miles per gallon [gallon not specified].

NMR  Nuclear magnetic resonance.

NMRB  National Nuclear Regulatory Board.

NMRS  Numerous.

NMS  Navigation, or network, management system.
2 Noise monitoring system.

NMSB  Non-modification Service Bulletin.


NMT  Non-maneuvering target.
2 Not more than.
3 Noise-monitoring terminal.

NMR  Nuclear magnetic resonance.

NO  Nitric oxide, colourless gas.
2 Normally open.
3 Not available, not operative.
4 Notice to Airmen.
5 Night observation aircraft category (USA 1919–24).

No  Normal operating [e.g., point on graphical plot].

NOA  National Oceanic and Atmospheric Administration (US).

NOAA  National Oceanic and Atmospheric Administration (US).

NOAX, No-ax  Non-oxide adhesive experimental [repairs in space based on SiC powder].

Noball  Code name for German flying bombs and rockets, hence * targets were mainly launch sites.

no brains  Aircraft handling always predictable, pilot can relax.

no-break supply  One whose emergency standby system comes on-line instantaneously, in theory without losing one waveform or pulse in coded train.

NOC  Network operations centre.
2 Notice of change.

Nocar  North Atlantic oceanic concept and requirements.

Nocas  Night-operation[s]-capable avionics system.

Nocom  No communications (Aircar).

nocilicious cloud  Appearing self-luminous at twilight in high [50+°] latitudes, caused by particulate matter at height 75+ km.

Nocus  North continental US (Loran chain).

NOD  Night observation device [LR adds long-range].

nodalisation  Equipment of helicopter with antivibration couplings between rotor head and fuselage.

Noda-Matic  Patented vibration-isolation system in which helicopter fuselage is suspended from rotor via arrangement of tuned vibrating masses which cancel out rotor vibrations (Bell).
**noodling**

**noodling** Deflection under vertical acceleration of masses cantilevered ahead of or behind main structure, eg forward fuselage (in flight only) or engine on wing pylon well ahead of leading edge.

**noodling aerial** One oscillating only, or principally, in vertical plane, eg HFR.

**nobody cap** Protective cover for delicate (eg IR-homing) missile nose (RAF, colloq.).

**NODE** National operational [ATC] display equipment.

**node** 1 In structures, location of point where load variation causes only rotation but no linear deflection.

2 Point, line or surface in wave system where some major variable has zero amplitude.

3 In any network, terminal point or point where two channels branch.

4 Intersection of orbit of satellite with plane of orbit of primary.

5 Location in mobility system where movement is originated, processed or terminated (DoD).

**NODLOR** Night observation device, long-range.

**no-draft forging** One forged essentially to finish dimensions, thus needing little if any machining.

**NODS** 1 Night observation and detection system.

2 Near-object detection sensor.

**nodular cast iron** See SG cast iron.

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**no go** In AAM engagement with fast target, essentially straight line until landing gear hits ground.

**no-feathering** No feathering moment or first-harmonic variation of cyclic pitch.

**no-feathering axis** Axis of swashplate, about which there is no feathering moment or first-harmonic variation of cyclic pitch.

**no-feathering plane** That in which an observer sees no variation in cyclic pitch [helicopter rotor].

**no-flare landing** Aeroplane landing (rarely, other than by nodding) in which an observer sees no variation in cyclic pitch [helicopter rotor].

**no-fly list** Passengers who, for whatever reason, are permanently denied boarding (TSA).

**no-fly zone** Airspace prohibited to the aircraft of that country, and [usually] patrolled by aircraft of a hostile country to ensure compliance.

**NOFORN** No foreign [dissemination of information] (USN).

**Nogaps** Naval operational global atmospheric prediction system (USN).

**no go** One whose failure or absence from aircraft prohibits takeoff according to operating rules (though not necessarily rendering it unairworthy).

**NOGS, Nogs** Night observation gunship system.

**NOI** 1 Notice of intention.

2 Notice of Inquiry (US).

3 NCCT operations interface.

**NOISE** National Organization to Insure [sic] a Sound-controlled Environment (US).

**noise** 1 Noise in air. Basic unit is decibel, dB, 0.1 bel, measure of sound pressure above local atmosphere on logarithmic scale, usually related to starting reference pressure of $2 \times 10^{-5}$ N m$^{-2}$. Sound pressure level $L = 10 \log \frac{p^2}{p_0^2} = 20 \log \frac{p}{p_0}$ where $p_0$ is reference pressure and $p$ actual measured pressure. Alternative is to use source power level $L_w = 10 \log \left(\frac{W/W_0}\right)$ dB where $W_0$ is reference power commonly taken to be $10^{-12}$ W (Watts). Pressure levels are more common, and log scale allows for million-fold increase in human perceived pressures, each 6 dB increment representing doubling of pressure level. Study of aircraft noise from 1952 led to many new measures in attempts to quantify noise nuisance. In 1953 CNR (Community Noise Rating) gave single-number scale based on public response to six generally quantifiable factors, and in 1957 NC (Noise Criteria) curves attempted to portray equal-loudness contours taking into account discrete tones, impulsive nature of some sounds and other variables. By this time many workers had tried to quantify human aural response to different frequencies and tones with mixed frequencies, and curves drawn in 1959 were labelled $L_{eq}$ (Perceived Noise Level) in units of dBA(PN), sometimes written PNdB. Despite its complexity this gained major foothold, and virtually eliminated traditional measures (phon, relating sound pressure level to standard 1 kHz tone, and sone, loudness corresponding to 40 phons). Various weighted dB measures were introduced for the measures taken by meters with scales adjusted to equal-loudness contours for different overall pressure levels, these being called by various letters (thus, A-weighted = dBA = $L_{eq}$). In 1961 a series of surveys measured annoyance according to new measures, $L_{PN}$ or $L_{PNO}$ ($L_{PN}$ exceeded by 50 or 90 per cent of aircraft), $D_H$ or $D_S$ (10 log time in seconds when sound pressure exceeded 85 or 95 dB), and $N$ (number of aircraft ‘passing over’, latter criterion not being defined); result was single value for location called NNI (Noise and Number Index). Another 1961 unit was derived by splitting noise into one-third-octave bands and assigning each band a Noy rating by comparing with subjective noisiness of random noise centred on 1 kHz; individual Noy figures then added by method allowing for masking of one band by others and presented in PNdB. Further work allowing for particular features—such as intense pure tones, as from compressor blading, in otherwise broadband jet sound—led to use of $L_{PEN}$ (Effective Perceived Noise Level) measured in PNdB (Effective Perceived Noise dB) in first-draft legislation in 1996, which led to FAR Pt 36 and subsequently closely similar ICAO Annex 16. By that time at least 20 national or local authorities had published research, including Australia’s AI (Annoyance Index) = $L_{PN} + 10 \log N$; German Störindex Q based on dBA; French R-index = $L_{PN} + 10 \log N$; Swedish Total Noise Rating B based on log of summation of A-weighted pressure levels; American CNR (Community Noise Rating) based on many variables; California’s CNEL (Community Noise Equivalent Level) using WECPNs (Weighted Equivalent Continuous Perceived Noise Levels) varying with time of day and season; American NEF (Noise Exposure Forecast) = $L_{EPN} + 10 \log N-K$ where K is 88 by day and 76 by night; the European Community’s $L_{DEN}$ = noise from all sources [noise density] summed through each 24 h; South Africa’s NI (Noisiness Index) = $L > 10 \log N + 10 \log T_4/T$ where $T_4$ and $T$ are times; British TNI (Traffic Noise Index) and resulting $L_{EQ}$ (Equivalent Average Sound Pressure Level), which led to $L_{SP}$ (Noise Pollution Level) = $L_{EQ} + 2.56$ erwhere er is standard deviation of dB fluctuations. Further measures
**noise (electronic)**

Include LAX or L_{AX}, also called Senel (Single-Event Noise Exposure Level), SIL (Speech Interference Level), L_{TPN} (Tone-Corrected Perceived Noise Level), QC Quota Count established by London Heathrow, and various octave-band measures such as L_{300-600} (sound pressure level of band 300–600 Hz). Also see Approach *, jet *, sideline *, takeoff *.

2 Background noise, that present in electronic amplification, communication or recording system in absence of signal.

- Deliberate procedures whose objective is noise abatement, including those generated within the system.

- Noise abatement Deliberate procedures whose objective is minimization of noise perceived at ground. See next.

- Thermal or Johnson noise caused by thermal agitation of charge carriers.

- White (Gaussian) noise, constant energy per unit bandwidth.

- Shot noise, fluctuation in charge-carrier current.

- Random noise (eg white, shot), uniform energy versus frequency distribution.

**noise (electronic)** 1 Effects of unwanted signals, including those generated within the system.

- Unwanted signals themselves.

**noise abatement procedure** Maximum power from brakes-release to reach maximum attainable height AGL at point where ground track crosses boundary of built-up area, or location of listening post(s), there cutting back power to predetermined value just sufficient to maintain positive rate of climb or 2% gross gradient at V_2 + 15 kt, until either built-up area is passed (some operators add 1 nm margin) or height AGL exceeds FL 50, where all-engines en-route climb is started.

**noise-absorbing material** Wide range of materials, usually used as non-structural linings, containing precisely sized cells which convert impinging sound energy into heat. Most are honeycomb sandwiches whose facesheet is perforated.

**Noise and Number Index** See noise (1).

**noise attenuation** Design and/or constructional features whose purpose is to minimize externally perceived noise. Techniques include addition of sound-energy-absorbing linings, structural and aerodynamic features to change frequencies (eg of blades passing), mechanical design to reduce noise of bearings and gear teeth, and maximization of jet-nozzle periphery to increase rapidity of jet/atmosphere mixing.

**noise abatement** Area along aircraft track subjected to significant noise nuisance.

**noise certification** Certifying authorities in all but a few states require compliance with noise (and emissions in most cases) legislation for all new civil aircraft. Older aircraft have to comply at specified future dates.

**noise contour** Locus of points on ground at which specified aircraft traffic results in particular perceived noise level, NNI or other noise nuisance. Traffic may be an average of arrivals or departures, a weighted average, a ‘noisiest’ aircraft type or an NNI figure taking frequency of flights into account.

**noise exposure** Not defined but related to noise levels, number of events (though Senel [see noise (1)] is one event) and time of day. Hence ** forecast.

**noise factor** Ratio of audio to thermal noise at same frequency.

**noise floor** Hypothetical minimum background noise level.

**noise footprint** Outline – generally footprint-shaped – of enclosed region around runway bounded by particular noise contour (often 90 EPNL) resulting from one landing and one takeoff by particular aircraft type operating at MTOW in ISA with measures taken at standard reference points and other locations.

**noise-reduction rating** Quantified measure of effectiveness of ear-defenders and aircraft headsets, unit is dB (EPA).

**noise-reference points** In civil aircraft certification, three locations at which noise measures are taken. See approach noise, sideline noise and takeoff noise.

**noise-shield aircraft** One in which basic configuration, by design or as fortuitous bonus, places major portions of structure between main noise sources and ground.

**noise shielding** Portions of aircraft which, by design or fortuitously, are interposed between noise sources and distant observers.

**noise suppression** See noise attenuation.

**noise suppressor** Jet nozzle configured to reduce noise by increasing periphery of nozzle(s) and speeding mixing.

**no joy** Air intercept code: ‘I have been unsuccessful, or have no information’.

**NOK** Next of kin.

**NOIL** Naval Ordnance Laboratory (USN).

**no lift** Stencilled instruction to ground personnel prohibiting application of lifting forces in local area of airframe.

**no-lift angle** That between no-lift direction and chord.

**no-lift direction** Angle of attack of two-dimensional aerofoil section at which lift is zero at low airspeeds. In practical wing * varies from root to tip.

**no-lift wire** One bracing aerofoil from above; also called anti-lift wire.

**nolo, no live** No live, or local, operator, ie RPV is preprogrammed.

**NOM** National Operations Manager (ATC/CC).

**Nomad** Naval operations and maintenance aviation deck (USN).

**Nomex** Family of nylon/phenolic honeycomb structures, core resin-impregnated or coated paper.

**nominal acceleration point** That geographical location at which SST is to begin supersonic acceleration.

**nominal deceleration point** Location, varying with flight level and pitch attitude, at which SST is to begin deceleration to subsonic regime.

**nominal dimension** Various interpretations, typically that indicated on drawing before allowances, fits and tolerances.

**nominal gas capacity** That of gas cells of aerostat under defined conditions of inflation, ambient pressure and flight attitude.

**nominal jet edge** Boundary of discrete high-energy jet [eg from jet engine], conventionally taken as locus of points at which V is 10% of maximum.

**nominal performance** Published, or according to brochure.

**nominal pitch** See standard pitch.

**nominal weapon** Nuclear weapon having yield of approximately 20 KT.

**NOMSS** National operational meteorological satellite system (NOAA).
NON

NON Unmodulated NDB, transmitting no information.

non-co-operative scorer One whose ammunition is not modified, or does not need modification, for scoring purposes (ASCC).

non-co-operative target One without emissions, transponder or enhancement device.

non-destructive testing Methods of testing structures for integrity, esp. absence of manufacturing flaws or cracks, that do not impair serviceability or future life.

non-developmental item For practical purposes = off the shelf.

non-directional spoilers Main feature is that in airbrake mode all spoilers remain extended even in demand for roll (see spoilers).

non-disclosure agreement A legal document, signed by both [or all] parties, confirming that particular information, such as details of a bid, will not be transmitted to any non-signatory.

non-effective sortie Aircraft which for whatever reason fails to accomplish mission (DoD).

non-ferrous Metals and alloys not based on iron; term usually also excludes aluminium alloys and generally means copper and brasses.

non-fluff Lint-free.

non-flying prototype Essentially mock-up built to full flight standard but, for whatever reason, not cleared or intended for flight.

non-frangible wheel Various techniques applied to design and fabrication of turbine disc to preclude possibility of rupture in overspeed or asymmetric condition.

non-galvanic corrosion That due to causes other than formation of electric cells; two important examples are fretting and microbiological.

non-handling pilot Member of civil flight crew not actually flying the aircraft.

non-holding side That on left side of holding course inbound towards holding fix.

non-induced drag Parasite drag.

non-instrument runway No ILS.

non-interchangeable socket Otherwise standard multipin or other sockets on device which ensure correct attachment of several connectors.

non-kinetic-energy weapons Lasers, microwaves, radio and similar wave systems.

non-landing section That length of runway from original threshold to displaced threshold.

non-operating active aircraft Allowance, usually 10%, above UE level to make up for IRAN, modifications and heavy maintenance (USAF).

non-program aircraft Those in inventory other than active or reserve, eg experimental or withdrawn (DoD).

non-radar Self-explanatory, but can mean pilot is not using radar provided.

non-return-flow tunnel Simple wind tunnel open at both ends.

non-rigid airship Without rigid skeleton or stress-bearing covering around lifting cells which are stabilized by internal pressure.

normal mode

non-sked Non-scheduled, ie not operating to a timetable (colloq.).

non-structural Other than primary or secondary structure; physical breakage of part would not imperil continued flight.

non-traffic stop Stop by transport aircraft in public service planned in advance for reasons other than to pick up or set down.

non-volatile Permanent memory.

NOO Naval Oceanographic Office.

Nopac North Pacific.

NOPR Notice of proposed rulemaking (FAA).

NOPT, NoPT No procedure turn required (FAA).

Nora Not only radar, for post-2006 Gripen.


Norcote Spacecraft coatings based on phenolic resin and powdered cork.

Norða, NORDA No radio; also NORDO.

Norden sight Complex but highly accurate optical bombsight for high-altitude level bombing (US, 1941–49).

Norden gear Patented carrier-landing energy-absorption system.

Nordo, NORDO Alternative to NORDA, common in UK.

NOREU Northern Europe.

Norfab Fire-blocking aluminiised material incorporating polyamide binder and glassfibre.

NOR gate Logic circuit usable as either AND or OR, depending on logic levels chosen to represent 0 or 1.

NORM, Norm Not operationally ready, because need for maintenance.

normal Perpendicular to.

2 Maximum continuous, eg engine rating (R).

normal acceleration Acceleration in vertical plane relative to aircraft, along OZ axis (eg as result of rotation about OY axis).

normal axis Vertical axis (note: may not be vertical but must be at 90° to longitudinal axis in plane of symmetry); also called OZ axis. Positive direction is downward.

normal flight Includes all manoeuvres except aerobatics or air combat.

normal force That measured on body in fluid flow at 90° to free-stream direction, symbol Z (rarely N).

normal force coefficient Dimensionless coefficient $C_Z$ derived from $Z$; also written $C_1 \cos \alpha = C_0 \sin \alpha$ where $C_1$ and $C_0$. lift/drag coefficients and $\alpha$ is angle of attack.

normal glide That at which glide ratio is maximum.

normal gross weight Usually same as MTOW; excluding all overload, emergency or alternate gross weights.

normal horsepower Not defined but generally same as rated hp.

normalizing Stress-relieving heat treatment usually comprising heating to above critical temperature followed by cooling in atmosphere.

normal landing For tailwheel aeroplane, three-point landing.

normal load factor That measured along normal axis [the usual meaning].

normal loop Loop, as distinct from inverted loop, starting and finishing in straight and level flight in upright attitude.

normally aspirated Unsupercharged.

normal mode Free vibration of undamped system.
normal outsize cargo

normal outsize cargo  That having cross-section greater than 9 ft x 10 ft, which is C-130 or C-141 size (DoD).

normal pressure drag  $C_{D_p}$, downwind resultant force coefficient.

normal propeller state  Usual condition for helicopter under power, with rotor thrust in opposition to flow direction through disc.

normal rating  Maximum continuous (R).

normal shock  Shockwave at 90° to fluid flow direction.

normal spin  Intentional spin entered from upright attitude and recoverable by centralizing controls or applying opposite rudder (US usually adds ‘within two turns’).

normal turn  Procedure turn through 360° in two minutes.

normal velocity  “The component velocity along the normal axis relative to the air”, (B.S., 1940).

Normand theorem  On tephigram a dry-adiabatic line drawn through dry-bulb temperature, saturated-adiabatic through wet-bulb temperature, and dewpoint line through dewpoint temperature all meet at point which represents condensation level.

NORS, Nors  Not operationally ready, spare parts (or supply, as an order).

Norse  Nuclear, optical and radar [or radiation] signature evaluation [or estimation].

North  Pronounced ‘nortz’, cold, dry north wind over Gulf of Mexico.

northerly turning error  Transient errors in magnetic-compass reading caused by vertical component of magnetic field, at maximum when turning off northerly or southerly course. In N hemisphere compass is sluggish if turning off southerly or northerly turning error.

Norwegian turning error  Tending to rotate nose-down when controls released.

not in  To taxi and park facing terminal building or finger.

2 Aircraft thus parked (see Agnis, Safeway, sidemarker).

nose landing gear  Nose gear.

nose leg  Main leg of nose gear.

nose over  To overturn (eg after landing tailwheel-type aircraft on soft ground) by rotating tail-up to inverted position.

noseplane  Canard foreplane mounted at or ahead of nose; not applicable to conventional modern canards.

noseplate  Metal plate on centreline of hang glider linking leading-edge tubes.

nose radar  Radar whose aerials (antennas) are in nose of aircraft pointing ahead, esp. for use against targets ahead of aircraft.

nose radiator  Piston-engine radiator immediately behind propeller or, esp., on front of pusher nacelle.

nose ribs  Ribs along leading edge extending chordwise only as far as front spar.

nose slots  Maximum-rate yaw induced by rudder.

nose slots  Apertures in low-pressure region of high velocity around nose for discharge of fluid flow, eg cooling air.

nose tow  Standard US Navy method of catapult link for accelerated carrier takeoff by pulling on nose leg.

nose up  To rotate in pitch from level flight to climb.

nosewheel  Wheel(s) of nose gear.

not in-show  Airline passenger who has booked ticket but fails to check in for flight.

nous  No significant meteorological change (ICAO).

Not  NATO operations support cell.

No STEP  Stencilled warning on aircraft: do not put weight on this area.

NOT  Naczelna Organizacja Techniczna (Polish federation of engineering associations).

Notal  Not to all.

Notam, NOTAM  Notice[s] to Airmen, identified as notice or as Airmen Advisory, disseminated by all means to give information on establishment, condition or change in any aeronautical facility, service, procedure or hazard; suffix D distant [wide dissemination], L local (ICAO).

Notam code  Standard code for transmitting Notams; eg QAUED 3 MC 5813 142359 is interpreted as ‘Met com operating frequency of 3 MHz will be changed to 5,813 kHz on 14th of this month at 23.59’.

Notar  No tail rotor, torque reaction supplied by offset thrust from air blown through slit in tail boom (Hughes, then McDonnell Douglas, now Boeing).

notch  Essentially chordwise or streamwise sawcut or groove over nose of aerofoil.

notch aerial  Formed by cutout in skin of vehicle, leaving aperture matched to wavelength (usually in HF com. band) and covered with dielectric skin to original profile.
notched cone nozzle

**notched cone nozzle** Promising primary nozzle in ejector-lift system in which primary flow is discharged through row(s) of fishtail (lozenge-section) nozzles generating plumes orthogonal to long axis of duct.

**notched elevators** Cut away at trailing edge for rudder movement.

**notch effect** Shortcoming of early (1960s) all-flying tailplanes or slab tails in which demands tended to be in noticeable increments [pilot often reverted to flying on trimmer].

**notch flap** Leading-edge flap extended from fuselage.

**notifiable accident** One which cannot legally go unreported, where anyone suffers injury, third-party property is damaged or public are in any way put at risk; variable rules governing scale of damage to aircraft.

**no-transgression zone** Airspace where aircraft under positive electronic IFR control must not penetrate, esp. region 900+ m/2,000+ ft wide between aircraft making ILS approaches on to parallel runways.

**NOTS** Naval Ordnance Test Station [China Lake, Inyokern, etc, now NWC] (USN).

**Notus** Notice to users (Arinc).

**Nourishment** Key word which, in extremes [following failure of other communications] would launch an attack with NW (UK 1953–77).

**Nova** Networked open versatile architecture.

**NOW-AB** Non-persistent Toxic-B gas bomb (USSR).

**Novacam** Non-volatile charge-addressed memory.

**NOVE** Networked operations in a virtual environment.

**Novview** Range of CGI(2) visual systems, some textured (Rediffusion).

**Novram** Non-volatile RAM.

**Nowcast** Report on current weather.

**no-wind position** Geographical position aircraft would have occupied had wind velocity been zero.

**NOx, NOX** Nitrogen/oxygen breathing mixture (normally means supplied in absence of atmosphere).

**NOY, Noy** Subjective measure of noisiness in bandwidths of one-third octave (see noise).

**NOZ** No operating zone.

**nupos** Nozzle position(s), ie angle.

**nozzle** 1 In jet-propulsion or reaction-jet control, aperture through which fluid escapes from system to atmosphere and in which as much energy as possible is converted to kinetic energy (see choked, con/di).

2 Wind-tunnel section immediately upstream of working section.

3 Primary aperture through which fuel is injected into gas-turbine engine combustion chamber [US usage].

4 Section of fluid flow duct upstream of axial turbine, in which flow is controlled to enter turbine at favourable direction, pressure and velocity. Form depends on whether turbine is impulse/reaction or pure impulse.

5 Incorrectly, nozzle guide vane.

**nozzle blade** See nozzle guide vane.

**nozzle block** See nozzle (2).

**nozzle box** Assembly of nozzle guide vanes (all, or a group filling portion of periphery) and surrounding walls of gas duct.

**nozzle bucket** See nozzle guide vane.

**nozzle contraction ratio** Ratio of flow cross-section area at inlet or start of nozzle (esp. con/di or rocket) to area at throat.

**nozzle diaphragm** Nozzle (4) as complete assembly.

**nozzle efficiency** Usually ratio of actual change in kinetic energy across nozzle to ideal value for given inlet conditions.

**nozzle exit area** Area of cross-section of flow at exit.

**nozzle expansion ratio** In supersonic nozzle, ratio of exit area to throat area.

**nozzle guide vane** Radial aerofoils upstream of axial gas turbine, convergent passages between which form nozzle (4) through which gas is directed on to turbine rotor blades. Also called turbine stator.

**nozzle insert** Small blocking body fixed inside nozzle (1) to trim exit area; colloq. = mice.

**nozzle ring** Complete 360° assembly of nozzle guide vanes.

**nozzle throat** Region of con/di nozzle having smallest cross-section area.

**nozzle thrust coefficient** Usually defined as actual achieved thrust divided by product of chamber pressure and throat area (rocket).

**NP** 1 Noise-preferential.

2 North Pacific region (ICAO).

3 Noisy phenotype [optimization variables].

**N/P** Navigator plotter.

**NPB** 1 Nuclear-powered (or propelled) bomber.

2 National Petroleum Council (US).

3 Nuclear planning group.

4 Non-precision approach.

**NPE** Nuclear planning group.

2 Net propulsion force.

**NP** 1 No performance group type aircraft (CAA).

2 Nuclear planning group.

3 Non-unit personnel generator.

**NPDS** National Plan of Integrated Airport Systems (US).

**NPL** National Plan of Integrated Airport Systems (US).

**NPI** Need and planning documents.

**NPDU** Network protocol data unit.

**NPE** Navy preliminary evaluation (USN).

**NPF** Non-persistent force.

**NPG** 1 No performance group type aircraft (CAA).

2 Nuclear planning group.

3 Non-unit personnel generator.

**NPI** Non-precision instrument.

**NPIAS** National Plan of Integrated Airport Systems (US).

**NPL** National Physical Laboratory [1899–; Teddington TW11 0LW] (UK).

**npl** Positive load limit, maximum permissible load factor.

**NPLOs** NATO production and logistics organizations.

**NPL tunnel** A closed-jet tunnel, original * = return flow, standard * = non-return flow.

**NPO** Scientific production unit (USSR, R).

**NPOESS** National, later (2002) changed to New, polar-orbiting operational environmental satellite system (NASA, NOAA, USAF).

**NPP** 1 Research and production enterprise (R).

2 NPOESS preparatory project.
NPPL

NPPL  National Private Pilot’s Licence [proposed, VFR only] (UK).
NPR  1 No power recovery.
  2 Nozzle pressure ratio.
  3 Nuclear posture review (US).
  # Noise preferential route.
PRM  Notice of proposed rulemaking (FAA).
PRS  Non-persistent.
NPS  1 Non-priority service.
  2 Naval Post-graduate School (USN).
NPR  7 National Parachute Test Range.
  2 No procedure turn required.
NPU  Navigation processor unit.
QA  National Quality Assurance [certification authority] (UK).
QIS  Navigation-quality inertial sensor.
QOP  Night Quota Period [usually 23.00–07.00] (airport noise).
QR  Nuclear quadrupole resonance.
NR, Nr 1 Helicopter main-rotor rpm.
  2 Network router.
NR  Navigator, radar.
  # Yawing moment coefficient due to yawing.
  Nr Number (FAA).
  # Night Quota Period.
  # Nuclear reaction analysis, ion-beam technique for light elements.
  2 NASA Research Announcement; hence NRAs, plural.
NRA  Non-metallics research advisory group (MRCC).
NRAF  North American Rockwell Corporation (US).
NRL  Naval Research Laboratory (USN).
NRMM  Nav aids remote maintenance and monitoring.
NRO  National Reconnaissance Office (US).
NROSS, Nross  Navy remote ocean sensing system or satellite (spacecraft, USN).
NROTC  Naval Reserve Officer Training Corps (US).
NRP  1 Normal rated power.
  2 Narrow programmable receiver.
  3 National Route Program, or Plan (US).
  # Non-return point.
NRP  1 Net return on productive assets.
NRPB  National Radiological Protection Board.
NRR  Noise-reduction rating (EPA).
NRSC  National Remote Sensing Centre (in civil enclave at former RAE Farnborough, UK).
NRST  Nearest.
NRT  Near real time [DF adds data fusion, RAS resource allocation system].
NRTC  National Rotorcraft Test Center (US).
NRTF  National Radar Test Facility (US).
NRTS  Not repairable this station (USAFA).
NRV  Non-return valve.
NRZ  Non-return to zero.
NS  1 Non-skid.
  2 Network service.
Nsr  # Nimbustress.
  2 Newton-second, also N-s.
s  Nanosecond[s] (10⁻⁹s).
s max  Maximum sustained normal acceleration.
NSA  1 National Security Agency (US).
NSAP  Network service access point.
Nasu  National Space Agency of Ukraine.
NSAR  National Sea air-combat manoeuvering instrumented range.
NASC  Naval Strike and Air Warfare Center (USN).
NSC  1 National Security Council (US).
  2 No significant cloud.
  3 New Scottish [ATC] Centre, Prestwick.
NSCA  National Safety Council of America.
NSDA  National Space Development Agency (J).
NSDU  Network service data unit.
NSE  Near-synchronous equatorial.
NSEU  Neutron single-event upset.
NSF  National Science Foundation (US).
NSFAC  Non-Scheduled Flying Advisory Committee (CAA, 1945).
NSG  1 NATO Standardization Group.
  2 North-seeking gyropassomach.
NSGr  Night close-support group (G, WW2).
NSIU  Navigation switching interface unit.
NSKK  Ag-aviation association [office, Tokyo] (J).
NSM  Non-contact stress measurement.
NSMS  Non-intrusive stress-monitoring [or measurement] system.
NSMV  Near-space maneuvering vehicle (USAFA).
NSN  National [or NATO] stock number[s].
NSNF  Non-strategic nuclear forces.
NSO

NSO  Navigation/systems operator.
NSOC  Naval Satellite Operations Center (Pt Mugu, CA).
NSP 1 Normal sea-level power.
NSP 2 Night surveillance payload.
NSPE National Simulator Program; O adds Office (FAA).
NSPE National Society of Professional Engineers (US).
NSPOL Non-scheduled policy (ECAC).
NSR 1 No scheduled removal.
NSR 2 Naval [or NATO] Staff Requirement.
NSRI National Soil Resources Institute (U. of Cranfield).
NSRL National Space Radiation Laboratory (BNL).
NSRP National Search and Rescue Plan (US).
NSS 1 National seismic station (US).
NSS 2 Near-source simulation.
NSS 3 Navigation subsystem.
NSS 4 National Security Space (US).
NSS 5 National Space Society (US).
NSSA 1 National Safe Skies Alliance (US).
NSSC Naval Ship Systems Command (USN).
NSSFC National Severe Storms Forecast Center (Kansas City).
NSSI National Security Space Integration; O adds Office (DoD).
NSSL National Severe Storms Laboratory [Oklahoma] (US).
NST 1 NATO Staff Target.
NST 2 Noise, spikes and transients.
NSTAP National strategic technology acquisition plan (UK).
NSTB National satellite testbed.
NSTD Non-standard.
NSTL 1 National Space Technology Laboratories (NASA, previously MTF, now SSC (4)).
NSTL 2 National security threat list (US).
NSTO Near single stage to orbit.
NSTP National space technology programme (DTI, UK).
N-strut Interplane or other bracing system having general shape of N.
NSVN NATO secure voice network.
NSW 1 Nominal specification weight.
NSW 2 No significant weather [TAF or Metar].
NSWC Naval Surface Warfare Center (USN).
NSWP Non-Soviet Warsaw Pact.
NT Non-traditional (ISR2).
NT Nanotesla; terrestrial field varies from c 25,000 (magnetic equator) to c 70,000 nT (poles), vertical component usually being measured in geophysical prospecting and ASW.
nt Nit (name not usually used).
NTAOC Notice to AOC holders (CAA).
NTAP Notice to Airmen publication (USGPO).
NTAS Norad tactical Autovon system (USAF).

Nuac, NUAC

NTAT Near-term Acme technology.
NTB 1 National test bed (US, SDI).
NTB 2 Nuclear test ban; T adds Treaty.
NTC 1 National Training Center (US DoD).
NTC 2 Numerator time constant.
NTC 3 Notice.
NTD National Test Director (ISS).
NTDD Normalized total departure delay.
NTDR Near-term data radio (USA).
NTDS Naval tactical data, or distribution, system.
NTE 1 Not to exceed.
NTE 2 Northerly turning error.
NTE 3 Notice to operators.
NTE 4 Nitrotriazolone [explosive].
NTF 1 No trouble found.
NTH 2 NATO task force.
NTFWTC NATO Tactical Fighter and Weapons Training Centre.
NTG Nachrichtentechnische Gesellschaft im VDE (G).
NTI Next [runway] turn indicator.
NTIA National Telecommunications and Information Administration (US).
NTIS National Technical Information Service (US).
NTISR Non-traditional intelligence, surveillance and reconnaissance; also written NTI STAR.
NTK Scientific and technical committee (many in USSR, R).
NTM 1 National technical means, of verification of MBFR and precise Earth mapping.
NTM 2 NDT manual.
NTM 3 NATO Tiger Meet.
NTMV National technical means of verification.
NTNF Royal Norwegian council for scientific and industrial research.
NTO 1 Nitrogen tetroxide.
NTO 2 Notice to operators.
NTO 3 No technical objection[s].
NTO 4 Nitrotriazolone [explosive].
NTOS No time on station.
NTP Normal (ie standard) temperature and pressure.
NTPD NTP dry (gas bottle capacities).
NTPS National Test Pilot School [Mojave, CA] (US).
NTS 1 Negative-torque signal.
NTS 2 Navigation technology satellite (USN).
NTS 3 Night targeting system.
NTSB National Transportation Safety Board (US, from 1966).
NTSC National Television Standards Committee (US).
NTT Non-threat traffic.
NTTC National Technology Transfer Center (NASA).
NTU 1 State technical administration (USSR, R).
NTU 2 Navigation training unit.
NTU 3 New-threat upgrade.
NTU 4 Not taken up [civil registration].
NTW Navy theater-wide; BMD adds ballistic-missile defense (USN).
N2O4 Nitrogen tetroxide.
NTWS New threat-warning system.
NTZ No-transgression zone.
NU 1 Nose-up.
NU 2 Not usable.
Nusselt number.
Nuac, NUAC Nordic upper air, or area, control centre.
### Nucap

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
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<tbody>
<tr>
<td>nuclear airburst</td>
<td>Explosion at height AGL greater than maximum radius of fireball.</td>
</tr>
<tr>
<td>nuclear bomber</td>
<td>Ambiguous but generally taken to mean aircraft able to deliver nuclear weapons.</td>
</tr>
<tr>
<td>nuclear capable</td>
<td>Nuclear bomber.</td>
</tr>
<tr>
<td>nuclear cloud</td>
<td>All-inclusive term for volume of hot gas, dust, smoke, and other particulate matter from nuclear bomb and environment carried aloft with fireball (DoD, NATO).</td>
</tr>
<tr>
<td>nuclear column</td>
<td>Hollow cylinder of water and spray thrown up from underwater nuclear explosion through which hot high-pressure gases escape to atmosphere (DoD, NATO).</td>
</tr>
<tr>
<td>nuclear defence</td>
<td>Defence against attack by nuclear or radiological weapons.</td>
</tr>
<tr>
<td>nuclear dud</td>
<td>NW which after being triggered fails to provide any explosion of that portion designed to produce nuclear yield (DoD).</td>
</tr>
<tr>
<td>nuclear emulsion</td>
<td>Thick layer used on photo-type plates for recording tracks of energetic particles.</td>
</tr>
<tr>
<td>nuclear energy</td>
<td>That liberated by fission; more rarely, that liberated by fusion reaction, and some definitions include radioactive decay.</td>
</tr>
<tr>
<td>nuclear explosive</td>
<td>Material designed to achieve greatest uncontrolled fission or fission + fusion reaction.</td>
</tr>
<tr>
<td>nuclear heater propulsion</td>
<td>Using nuclear reactor to heat working fluid for rocket propulsion.</td>
</tr>
<tr>
<td>nuclear incident</td>
<td>Unexpected event short of NWA but resulting in damage to NW or associated facilities or increase in possibility of explosion or radioactive contamination (DoD).</td>
</tr>
<tr>
<td>nuclear radiation</td>
<td>All EM and particulate radiations from nuclear processes.</td>
</tr>
<tr>
<td>nuclear reactor</td>
<td>Device for containing controlled nuclear fission (rarely, fusion) reaction.</td>
</tr>
<tr>
<td>nuclear rocket</td>
<td>Usually one whose working fluid is heated in nuclear reactor.</td>
</tr>
<tr>
<td>nuclear safety line</td>
<td>Line drawn (if possible through prominent topographic features) on map to serve as reference in describing levels of protective measures, degrees of damage and limits allowed for effects of friendly NW.</td>
</tr>
<tr>
<td>nuclear surface burst</td>
<td>One in which centre of fireball is below that height equal to maximum radius.</td>
</tr>
<tr>
<td>nuclear underground burst</td>
<td>One in which centre of detonation lies below original ground level.</td>
</tr>
<tr>
<td>nuclear weapon</td>
<td>One in which almost all released energy results from fission, fusion or both; Abb. NW. Original 1945 designs used chain-reaction triggered by critical mass of uranium with unnaturally high concentration of isotope U-235. Second form was based on plutonium Pu-239. Loosely called atomic, or fission, bomb. See hydrogen bomb.</td>
</tr>
<tr>
<td>nuclear-weapons accident</td>
<td>Unplanned occurrence resulting in loss of, or serious damage to, nuclear weapons or components resulting in actual or potential hazard to life or property (DoD, NATO).</td>
</tr>
<tr>
<td>nuclear-weapons degradation</td>
<td>Degeneration of NW to such extent that anticipated yield is reduced.</td>
</tr>
<tr>
<td>nuclear-weapons employment time</td>
<td>Reaction time of NW, nuclear-weapons exercise Exercises involving real NW but excluding launching or flying operations.</td>
</tr>
<tr>
<td>nuclear yield</td>
<td>Energy released in detonation of NW measured in terms of mass of TNT required to liberate same amount: categorized as very low (less than 1 kT), low (1–10 kT), medium (10–50 kT), high (50–500 kT) and very high (over 500 kT).</td>
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### NURBS

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<td>NURBS</td>
<td>Non-uniform national B-spline(s).</td>
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</table>
**NURK**

NURK  Astronautics Society (J).

**Nurse balloon**  Fabric gas container used as reservoir or to maintain constant inflation pressure in aerostat on ground.

**Nusselt number**  Non-dimensional parameter \( \text{Nu} = \frac{qD}{\lambda \delta T} \) where \( q \) is quantity of heat, \( D \) is typical length, \( \lambda \) is thermal conductivity and \( \delta T \) is temperature difference.

**Nut**  Near-unitry probability.

**Nutating feed**  Microwave feed to tracking radar in which beam oscillates in one plane while plane of polarization (and usually aerial [antenna] reflector) remains fixed.

**Nutation**  Oscillation of axis of rotating body (eg gyro).

2  Irregularities in precession of equinoxes and other effects and of rotary precession of Earth’s axis in period of 18.6 years (* period) with maximum displacement of 9.21 s (constant of *).

**Nutator**  Drive mechanism causing dipole or aerial [antenna] feed horn to gyrate about focus of paraboloidal aerial without changing plane of polarization.

**Nutcracker**  V/STOL aeroplane whose fuselage hinges near mid-length to vector main-engine thrust.

**Nut plate, nutplate**  Nut, esp. elastic stop nut, provided with flat-plate base attached permanently to airframe to provide anchor into which attachment bolt can be screwed for securing access panel or other removable item.

**Nut runner**  Large nut threaded on screwjack so that when either ** or screw is rotated a linear motion results (eg to drive tailplane).

**NV**  Naamloze Vennootschap (Netherlands, Belgium, company constitution).

2  National Variants, to FAR-25 and similar.

3  Night vision.

4  Non-volatile.

**NVCA**  National Venture Capital Association (US).

**NVCD**  Night-vision cueing and display.

**NVD**  Night-vision device[s].

**NVE**  Night-vision equipment.

**NVEO**  Night-vision electro-optics.

**NVESD**  Night Vision Enhanced [or and Electronic] Sensors Directorate (USA).

**NVG**  Night-vision goggles; T adds training.

**NVIS**  Near-vertical incident skywave.

2  Night-vision imaging system.

**NVL**  Nederlandse Vervoerings voor Luchttransport, Netherlands air transport association [office, Amsterdam]

**NVLAP**  Netherlands Aerospace Writers Association [office, NL-2514 s’Gravenhage].

**NVM**  Non-volatile memory.

2  Night vision, monocular.

**NVPS**  Night-vision pilotage [or piloting] system.

**NVQ**  National Vocational Qualification (UK).

**NVR**  Netherlands astronomical society [NL-3512 Utrecht].

**NVRAM**  Non-volatile RAM.

**NVS**  Night-vision system.

2  Noise and vibration suppression [or simulation].

**NVT**  Neutron volts, measure of ionising radiation.

**NV thrust**  Nominal vacuum thrust.

**NVTS**  Night-vision targeting sight.

**NVV**  Nederlandse Vereniging voor Luchtvaarttechniek.

**NW**  Nuclear weapon, or warfare.

2  Nosewheel.

**NWA**  Nuclear Weapon Accident.

**NWAA**  North West Aerospace Alliance; 180+ companies [office, Nelson BB9 9BT] (UK).

**NWC**  Naval Weapons Center (China Lake, USN).

2  National War College (US).


**NWDC**  Navy Warfare Development Command (USN).

**NWDS**  Navigation and weapons-delivery system.

**NWEF**  Naval Weapons Evaluation Facility (Albuquerque, USN).

**NWMA**  North Wales military training area.

**NWP**  Numerical weather prediction.

**NW plans**  Plan A governed use of NW under the SIOP, i.e., against counterforce such as ICBMs and ADD airfields. Plan B spelt out the use of NW against counter-value targets, especially cities (UK, US, 1953-c1980).

**NPBRA**  National Women’s Pylon Racing Association (US, from 1964).

**NWS**  National Weather Service (NOAA, US).

3  Nosewheel steering.


5  NW (1) state, or status.

6  Navigation and weapons system.

**NWSSG**  Nuclear weapon system safety group.

**NWT**  Natural work team.

**NWTS**  Naval Weapon Test Squadron (NAS Point Mugu).

**NWSA**  Nuclear Warfare Strategy Association.

**NY**  Not yet operating.

**Nz**  Normal acceleration, or load factor, ie along OZ axis.

2  AMSU normal-acceleration ouput.

**NZ**  NZ (1) state, or status.

**NZA**  New Zealand Association of Women in Aviation; 180+ companies [office, Wellington].

**NZAA**  New Zealand Aviation Federation Inc. [office, Wellington].

**NZAF**  New Zealand Airwomen’s Association (1959–), [see NZAA].


2  National Aerospace Writers Association [office, NL-2514 s’Gravenhage].

3  Night vision.

4  Non-volatile.

**NZ VCA**  National Venture Capital Association (US).

**NZV**  National Variants, to FAR-25 and similar.

2  Night vision.

4  Non-volatile.

**NZCA**  NZ College of Aviation [Papakura].

**NZDF**  NZ Defence Force.

**NZG**  Near-zero growth (tyres).

**NZGA**  NZ Gliding Association [office, Wellington].

**NZGA**  NZ Gliding Association.

2  Nuclear weapon, or warfare.

2  Nosewheel.

**NZFA**  Nuclear Weather Complex Infrastructure Task Force.

**NZFA**  NZ Airwomen’s Association.

2  Nuclear weapons complex infrastructure task force.

3  Night Vision Enhanced [or and Electronic] Sensors Directorate (USA).

**NZFAA**  Nuclear Flight Association of America.

**NZFAF**  NZ Aircraft Foundation (office, Auckland).

**NZFAA**  National Women’s Pylon Racing Association [office, Wellington].

**NZFA**  National Women’s Pylon Racing Association (US, from 1964).

**NZPRA**  National Women’s Pylon Racing Association (US, from 1964).

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**NZMAA**  NZ Model Aeronautical Association.

**NZMS**  NZ Meteorological service.

**NZRA**  NZ Rotorcraft Association.

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2  Nosewheel.

**NZSA**  NZ Space Flight Association Ltd.

**NZA**  NZ Association of Women in Aviation; 180+ companies [office, Wellington].

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**NZFAA**  National Women’s Pylon Racing Association [office, Wellington].

**NZFAF**  NZ Aircraft Foundation (office, Auckland).

**NZAPA**  The NZ Airline Pilots’ Association [office, Wellington].

**NZAT**  NZ Air Cargo Association (trade association, 19 members).

**NZAWA**  NZ Association of Women in Aviation; 180+ companies [office, Wellington].

**NZAA**  New Zealand Aviation Federation Inc. [office, Wellington].

**NZCA**  NZ College of Aviation [Papakura].

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**NZMS**  NZ Meteorological service.

**NZRA**  NZ Rotorcraft Association.

**NZSA**  NZ Space Flight Association Ltd.
O

1 Opposed configuration (US piston engine designation).
2 Operating cost over given period.
3 Ground speed ‘on’ (outward from critical point).
4 Observation aircraft category (US services from 1922).
5 Aircraft category: hang gliders and paragliders (FAA).
6 Instantaneous e.m.f., unit volt.
7 Origin of axes or graphical plot.
8 Omni-directional.
9 Other meanings include odd, over, oxygen and optional.
o Lateral acceleration.
O Oxygen.
o Ozone.
o O-ring Flexible fluid-sealing ring having O-section in free state.
OA 1 Output axis.
2 Operational analysis.
3 Observation amphibian (USAAF, USAAF, 1925–47).
o A On or about.
OA AA 1 Orient Airlines Association.
2 Open Aviation Area.
OA AN Organismo Autónomo Aeropuertos Nacionales (Spain).
OAB Outer air battle.
OAC 1 Operations Advisory Committee (UK CAA).
2 Oceanic Area Control [C adds Centre].
3 Österreichischer aero club [office, Vienna] (Austria).
OACE Open-airfield computing environment.
OACI ICAO (F).
OACS Optically active coding system.
OADF Office of Aviation Development [CAA, 1949 on].
OA DS Omnidirectional air-data system (helicopter).
OAE Optimized after erosion (helicopter blade profile).
OAF Optical-alignment facility.
OAFS Open apron, free-standing [ie, no air-bridge].
OAFU Observers advanced flying unit.
OAG 1 Operational Advisory Group (BATA, USN).
2 Official Airline Guide.
OAI Office of Accident Investigation (FAA).
OAIRMS Open-architecture integrated radio management system.
OA L C Ogden Air Logistics Center (Hill AFB, Utah).
OALT Operationally acceptable level of traffic.
OAM 1 Office of Aviation Medicine (FAA).
2 Oilfield mist.
OAMC Organic airborne mine countermeasures.
OAMO Office of Air and Marine Operations (ICE8).
OAMP Optical airborne measurement platform.
OAMS Orbital attitude and manoeuvre system.
O&C Operations and checkout.
O&D Origin and destination.
O&I Operations and integration.
O&M Operations & maintenance [CM adds configuration management].
O&O Organizational and operational (RPV).
O&S 1 Operational, or operating, and support (costs).
2 Operations & Sustainment, of hardware in service (USAF).
OANS Observers air navigation school.
OAO 1 Orbiting astronomical observatory.
2 Out-of-area operations.
OAOI On-and-off instruments.
OAP 1 Organizzazione dell’Aviazione Privata e d’Affari (I).
2 Offset aiming point.
3 On-board attitude processor.
OAPD Online airline product database (IATA).
OAPEC Organization of Arab Petroleum Exporting Countries.
OAPP Office of Aviation Policy and Plans (FAA 1).
OAPS Oblique air photograph strip.
OAR Office of Aerospace Research (USAF and FAA/DoT).
OARB Orient airlines research bureau.
OARF Outdoor Aerodynamic Research Facility (NASA, Ames).
OARN Off-airways R-nav.
OART Office of Advanced Research & Technology (NASA; now AST).
OAS 1 Offensive avionics system.
2 Offensive air support (air support directly linked to land operations, US).
3 Omnidirectional airspeed system (helo).
4 Open-access service.
5 Optimal aircraft scheduling.
6 Obstacle assessment surface.
7 Office of Aviation Safety (CAA).
8 On active service.
9 Oceanic Automation System (FAA/USN).
OASC Officer and Aircrew Selection Centre, [Biggin Hill, now Cranwell] (RAF).
OASD Office of the Assistant SecDef (US).
OASF Orbiting astronomical support facility.
Oasis 1 Oceanic and atmospheric scientific information system (NOAA).
2 Operational application of special intelligence system (AAFC).
3 Omnidirectional approach-slope indicator system.
4 Operational and supportability implementation system (USAF/FAA).
5 Organic airborne and surface-influence sweep [sea mines] (USN).
6 Oceanic Area system improvement study.
7 On-board aircraft server and information system.
8 Opto-electronic application-specific integrated subsystem.
9 Trade name (du Pont) for sandwich for aerospace wiring, red/white fluoropolymers on polyamide core.
OASPL Overall sound pressure level.
OAST Office of Aeronautics and Space Technology (NASA), more usually AST.
Oasys Obstacle-avoidance, or awareness, system.
OAT 1 Outside air temperature.
OATA

2 Operational acceptance test.
3 Operational air traffic (ie military).
4 Oxide aligned transistor.
5 Operational, or optional, auxiliary terminal (Acars).
6 Operational airfield test set.
7 Orbit and attitude tracking; $ adds system.
8 One at a time [experiments].

OATA Overall ATM/CNS target architecture (Eurocae, Eurocontrol).

OAV Organic air vehicle.

OAVUK Society for aviation and gliding of Ukraine and Crimea.

OB 2 Outbound.
   2 Balloon club (Austria).
   3 Off-bore sight.
   4 Operations base (USA).
   5 Operational Bulletin.

O/B 1 Outbound.

OBA Outbound boom avoidance (SST).

OBAP 1 Organization of Black Airline Pilots (US).

OBBA 2 Off-bore sight angle.

OBC 1 Optical barrel, or BAR, camera.
   2 On-board computer.

OBCO(S) On-board cargo operations (system).

OBL Oberkommando der Luftwaffe (G).

OBDMS On-board data-monitoring systems.

OBE 1 Off-board expendables.
   2 Over-taken by events.

OBEMS 1 On-board electronic warfare simulation.
   2 On-board EW system(s).

OBFM Offensive basic flight manoeuvres.

OBI Omni-bearing indicator.

OBiggs On-board inert gas generating system.

OBIS On-board information system.

objective 1 Normally, in optical, EO or IR system, first lens or lens group to receive incoming radiation.
   2 Military target for capture or other action by surface forces; not used for target for aerial attack.

oblue Oblique photograph.

oblue camera One mounted in aircraft with axis between vertical and horizontal.

oblue flying wing Aeroplane [airplane] designed to fly with wing set diagonally, one side swept forward, the other back.

oblue photograph One taken by oblique camera; subdivided into high * in which apparent horizon appears and low * in which it does not.

oblue projection Map projection with axis inclined at oblique angle (say, 20° to 60°) to plane of Equator.

oblue shock inlet Inlet designed for use in supersonic vehicle and provided with centrebody, wedge or other projecting portion intended to focus oblique shock wave on opposite lip.

oblue shockwave Inclined shock formed whenever supersonic flow has to turn through finite angle in compressive direction.

oblue wing 1 Wing arranged to pivot at mid-point as single unit so that, as one half is swept back, other half is swept forwards. Also called slew wing.
   2 See oblique flying wing.

OBIRS On-board life-monitoring system.

OBMS On-board medical site.

Oboe WW2 precision navaid of SSR type with Cat station near Dover and Mouse station in Norfolk sending synchronized pulses which formed continuous note along correct flightpath over distant target; Mouse operators also sent signals to tell aircrew when to release bombs or Tls.

Obos On-board oxygen generation, or generating, system.

OBE 1 On-board processor, or processing [satcom].
   2 Omnidirectional ball panel.

OBEW 1 On-board EW operation (system).

OBEWS On-board EW system(s).

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5 Observe/observed/observing (ICAO).

6 Observation-balloon system (tethered near major highway).

Obs 1 Obstruction lights.
   2 Observe[d], observation.

Obstacle.

Obs Be Obscure/obsured/obsuring (ICAO).

obscuration methods Instrument techniques for measuring visible smoke (eg from jet engine) such as HSU and PSU where cutoff of calibrated light beam is measured over known distance.

observation 1 Many military definitions, most agreeing that * platform is for gathering all possible tactical information about an enemy. Increasingly [1942–, and especially in Korea and SE Asia] US * aircraft guided tactical aircraft to point targets.
   2 Complete set of meteorological readings at one place and time.

observation balloon In bygone wars, tethered balloon carrying human who reported on fall of shot and on enemy activity.

observation balloon system In US, usually tethered at airfield to monitor potentially conflicting road traffic, eg at runway crossing.

observation mirror A horizontal mirror with superimposed graticule used in the same way as a camera obscura.

observed/observing (ICAO).

observer Common title for second crew member in two-seat military (especially combat) aircraft whose functions may include navigation, systems management, electronic warfare, command guidance of weapons and other tasks; title is traditional and may bear no relation to actual duties.

observers Orbiter boom sensor system.

OBST, obst Obstruction, obstacle.

obstacle clearance height Lowest height above runway threshold or aerodrome elevation used to establish compliance with obstacle clearance criteria in instrument approach.

obstruktion Obstruction (FAA).

obstruction Also called obstacle, a real or notional solid body forming hazard to aircraft on or near runway or flight path. For certification purposes has height of 10.7 mm (35 ft) or 15 m (50 ft).

obstruction angle Angle between horizontal and line
obstruction clearance surface
joining highest point of object in flightway [ie, approach path] to nearest point of appropriate runway.

**obstruction clearance surface** Surface in form of plane or flat cone sloping at obstruction angle.

**obstruction-free zone** Free from all fixed obstacles except light frangibly mounted navaisds.

**obstruction light** Red light visible 360° on top of object dangerous to moving aircraft in air or on ground.

**obstruction marker** Object of approved shape or colour marking obstruction or boundary of hazardous surface on airfield.

**OBT** Off-block[s] time.

**OBTD** On-board training device.

**Obtex** Off-board targeting experiment[s].

**obturator** Rigid or flexible body tailored to preventing escape of gas under pressure from particular orifice or other leakage path.

**obturator ring** Piston ring of L-section intended to be gastight.

**OBW** 1 On-board wheelchair (for disabled pax).

**OCC** 1 O’clock.

2 Officer commanding.

3 Officer candidate.

4 Oil consumption.

5 On course.

6 Operational conversion, see OCF, OCU.

7 Overcast.

8 Oil consumption.

9 On course.

10 Operational conversion, see OCF, OCU.

**OCA** 1 Obstacle clearance [followed by number 1 or 2].

2 Oceanic control region.

3 Oceanic clearance delivery.

4 Oceanic clearance delivery processor.

5 Oceanic clearance error report.

6 Oceanic clearance issue.

**OCAMS, Ocams** On-board checkout and monitoring system.

**OCC** 1 Operation[s] or Oceanic control centre.

2 Occulting.

3 Occupied [telephone line].

4 On-officer control console.

5 Off-block[s] time.

6 Occulted front.

7 Oceanic clearance height.

8 On-chip debug.

**oceanic airspace** Controlled airspace over ocean areas.

**oceanic clearance** Clearance delivery to enter oceanic airspace.

**oceanic navigation error report** Filed when surveillance monitor observes aircraft exiting oceanic airspace seriously off track.

**ocean spatial spectrum** Readout of the topography of the oceanic surface, measured by a WSOA.

**OCF** 1 Occluded frontal passage.

2 Oceanic Conversion Flight (RAF).

**OCFNT** Operational Conversion Flight (RAF).

Occluded frontal.

**OCL** Occlude.

**OC level** Height [usually in thousands of feet a.m.s.l.] of overcast.

**OCLC** Oklahoma City Air Logistics Center (Tinker AFB).

**OCMS, Ocams** On-board checkout and monitoring system.

**OCS** 1 Operation[s] or Oceanic control centre.

2 Occulting.

3 Occupied [telephone line].

4 Office of Commitments and Requirements.

5 Occur.

**OCS** 1 On-condition replacement.

2 Oceanic clearance delivery.

3 Oceanic clearance delivery processor.

4 Office of Commitments and Requirements.

5 Occur.

**OCF** 1 Oceanic control region.

2 Oceanic Control System (NZ).

3 Oceanic clearance delivery.

4 Obstacle clearance surface.

5 Operational control segment.

6 Officers Command School (RAF Henlow).

**OCT** Octane (FAA).

**octa** Unit of visible sky area representing one-eighth of total area visible to celestial horizon, now okta.

**Octagon** Trade-name of a range of de-icing fluids, including potassium and sodium acetates, sodium formate and propylene glycol.

**octal** 1 Standard base for electronic device having eight connector pins.

2 Counting system to base 8.

**octane number** Standard system for expressing resistance of hydrocarbon or other fuel to detonation in piston engine, ranging from 0 (equivalent to n-heptane) through 100 (iso-octane) upwards to about 150. Measures are taken with lean mixture and with rich, latter giving higher values. Also called knock rating (strictly, anti-
octane rating

knock or performance number, esp. when above 100. See MON, RON.

octane rating See octane number.

octane test Standard test in which sample of fuel is used to run special variable-compression single-cylinder engine and compared with mixtures of n-heptane and iso-octane, or (above 100 performance number) with other reference fuels.

octant Bubble sextant able to measure angles to 90°.

octave Interval between any two frequencies having ratio 1:2.

octet Complete set of four pairs of electrons forming layers 2 and 3 (in all noble gases except He, outer shell).

octopus Operational and certified takeoff and landing performance universal software.

Octu Officer Cadet Training Unit (UK).

OCU 1 Operational Conversion Unit (UK).

2 Optical coupler, or control unit.

3 Operational capabilities upgrade.

4 Operator control unit (IRCM).

oculogyral illusion Apparent movement of fixed objects seen under high-g.

OCV Organisme de Contrôle en Vol (F).

OCXO Oven-compensated crystal oscillator.

OD 1 Ordnance delivery.

2 Olive drab colour.

3 Optical disk.

ODA Overseas Development Administration (UK).

Odals, ODALS Omnidirectional air-data system.

Odapi Omnidirectional approach-path indicator.

Odaps Oceanic display and processing [or planning] system.

ODC Office of Defense Co-operation (US DoD office in Germany).

ODEs Ordinary differential equation[s].

ODF Operational degradation factor.

ODFDMU Optical disk flight-data management unit.

ODID, Odid Operational display and input development.

Odin Operational data interface.

Odis Operational data interface system.

ODL Optical, or Oceanic, data-link.

ODM 1 Ministry of Overseas Development (UK).

2 Operating data manual.

3 Operational development model.

4 Ordnance deployment manager.

5 Optical driver modem.

6 Original design manufacturer.

ODMS 1 Oil-debris monitoring system.

2 Operational data-management system (ATC).

odometer Digital readout of numerical quantity, esp. distance, as in DME.


ODR 1 Overland downlook radar.

2 Operator difference requirements.

3 Overnight defect rectification.

ODS 1 Oxide-dispersion strengthened.

2 Operational debrief station.

3 Optical-disk system.

4 Ozone-depleting substance[s].
OFDM

OFDM 1 Operational flight-data monitoring.
2 Orthogonal frequency-division [or domain] multiplexing.

OFDFS Oceanic flight-data processing system.

OFEMIA, Ofema Office Français d’Exportation des Matériels Aéronautiques.

OFF, Off Officer.

off-block [s] time When aircraft leaves gate [probably travelling backwards] or starts to taxi.

offboard Released or ejected from the platform [aircraft or ship], usually as decoy.

offboard data Supplied by sensors outside the aircraft.

off-design 1 Any operating condition other than that or those [defined numerically] for which equipment was intended.
2 Less common definition: at or near stall or buffet boundary, or in severe turbulence.

offensive avionics Those carried in attacking aircraft to assist fulfilment of mission, eg by providing navigation, target sensing and weapon guidance.

offensive sweep Low-level flight by fighters over enemy territory looking for targets of opportunity.

office Cockpit or flight deck (colloq.).

off-line 1 Connected to computer but not forming part of dedicated controlled system.
2 Computer peripheral not directly communicating with central processor.

Off Not on airline’s route network (eg Western Airlines has an * office in Washington DC).

off-maintained SSR aerial [antenna] not mounted on primary radar but on its own turning gear, and can thus be either synchronized to primary radar or rotated at predetermined data rate.

offset 1 In major international purchase, eg of quantity of combat aircraft, agreement in reverse direction in which purchasing country is awarded one or more contracts for products which may or may not be connected with original hardware. This kind of * may be (1) purely window dressing to render costly import less unpalatable, (2) important commercial deal to benefit original importing country, (3) designed to bolster ailing home industry, or (4) important vehicle for transfer of advanced technology to importer.
2 Linear distances, usually small, measured from baseline to joggled or tapered edge, bevel, flange at angle other than 90°, or similar part dimension.
3 Precisely defined point on ground in surface attack (see * bombing) or in space in air interception (see * point).
4 Linear or angular difference between major axis (eg of aircraft or engine) and axis of drive shaft from gearbox.
5 In fir-tree root, distance between teeth measured parallel to major axis of blade.
6 Length of normal common to landing-gear castor axis and wheel axle [can be zero].

7 Lateral and vertical distances from desired G/S and runway centreline of (a) an actual landing aircraft, or (b) ILS beam (ocus of peak signal strength).
8 Bearing/distance to runway threshold from point navaid, eg Tacan.
OFW

OFW Oblique flying wing.

OFE  Obstacle-free zone.

OG 1 Observation group (USAAC, USAAF).

2 Operations Group (USAF).

OGA 1 Outer gimbal angle.

2 Office Général de l'Air (F, export distribution).

OGE 1 Out of ground effect; supported by lifting rotor(s) in free air with no land surface in proximity.

2 Operational ground equipment.

ogre  See ogive.

OGEI  Open General Export Licence (UK).

oggin, the  The sea (RN colloq.).

ogive 1 Loosely, any shape formed by planar curve whose radius increases until it becomes straight line.

2 Wing plan having approximate form of curve becoming straight line parallel to longitudinal axis on each side of centreline; so-called 'Gothic window' shape.

3 Body of revolution formed by rotation of curve as in (1) about axis parallel to line on same side of line as curve.

4 Any of various other shapes such as conical * (body formed by rotation of two straight lines forming cone/cylinder), tangent * (circular arc tangent to line) or secant * (circular arc meeting line at angle).

5 Common definition is 'surface of revolution generated when circular arc and line segment are rotated about axis parallel to line'; this is incorrect since curve need not be circular arc and shape can be planar and not body of revolution.

OGO  Orbiting geophysical observatory.

OGV  Outlet guide vane, or straightener vane.

OGW  Space agency (Austria).

OH 1 Overhaul.

2 Overhead.

O/H 1 Overheat.

2 Overhead.

OHA  Operating hazard analysis.

OHAR  Overhead attendant rest (above ceiling of wide-body centre fuselage).

OHC 1 Operating hours counter.

2 Overhauled condition.

3 Overhead camshaft.

OHD  Overhead.


ohm 1 SI unit of electric resistance, defined as that of conductor across which potential difference of 1 V produces current of 1 A; symbol Ω.

2 By analogy with (1), mechanical measure of resistance derived by dividing applied force by velocity; has dimensions of g/s.

Ohmist, OHMIST  Offshore helicopter meteorological information self-briefing terminal.

ohmmeter  Usually, compact instrument for giving quick approximate indication of resistance of circuit to direct current.

OHP  Overhead projector, or projection.

OHRC A Occupational Health Research Consortium in Aviation (US).


OHU, Ohud  Optical head, or overhead, unit of HUD.

OHV  Overhead valve(s).

OI 1 Operational interruption.

2 Office of Information.

OIC 1 Organized immigration crime.

2 Officer in charge.

OICRs  Operational intelligence collection requirements.

OID 1 Optical incremental digitiser.

2 Outline installation drawing.

3 Operator input and display; S adds system.

OIDT  Operator interactive display terminal.

OIG  Office of Inspector-General (US, eg NASA).

oil  Vague term which could mean crude petroleum, hydrocarbon-based lubricant or other 'oil-like' materials. Even ester- and polyester-based synthetic lubricants are often marketed as turbine oils.

oil bottle  Container of lubricating oil fed by air/gas pressure or even spring-loaded plunger, to short-life engine, eg of cruise missile.

Oil Burner routes  Published routes within continental US along which USAF, USN and USMC conduct high-speed training missions at low level in VFR and IFR.

oil-can  Noun and verb, portion of metal skin where compressive stress imposed in manufacture has resulted in slight local bulge between rows of rivets or other attachment which, when subjected to pressure difference or perpendicularly force at centre, can suddenly spring inwards noisily; potential fatigue hazard with thin skin.

oil control ring(s)  Piston rings whose main purpose is to prevent loss of lubricating oil from cylinder wall up into combustion chamber; usually one or two, below main compression rings.

oil cooler  Heat exchanger whose purpose is to remove heat from lubricating-oil circuit; usually cooled by air or fuel flow.

oil coring  See coring.

oil dilution  Mixing petrol with lubricating oil to reduce viscosity to facilitate starting large piston engine at very low temperature.

oil drive  Hydraulic drive, usually signifying infinitely variable ratio.

oil-free engine  The principal route to this objective is use of active magnetic bearings.

oil jet  Fine nozzle through which lubricating oil is projected, either as liquid or a fine spray.

oil radiator  See oil cooler.

oil ring  Scraper ring.

oil trough  Small cup surrounding lowest teeth of a gear-wheel into which oil drains after shutdown, providing lubrication during the first few seconds of engine start.

OIML  Organisation Internationale de la Métrologie Légale (Int.).

OIN 1 Organisation Internationale de Normalisation (Int.).

2 Overhaul information notice.

OIP  Optimum implementation plan.

OIPC  Organisation Internationale de Protection Civile [= ICDO] (Int.).

OIPS  Optical imagery presentation system[s].

OIR  French for CCIR.

OIS 1 Obstacle identification surface.

2 On-board information system.

3 Orbit improvement system.
OMS 1 Oil movement control and distribution system, manages fuel [not lubricating oil] installation at airport including separation of contaminants.
OMCFP Optimized MAC computer flight plan.
OMCM Operational and maintenance configuration management (software).
OMD 1 On-board maintenance documentation.
2 Oils deterrents.
OME 1 Operating mass empty, usually same as OWE. 2 Operational mission environment.
Omega Accurate long-range radio navaid of VLF hyperbolic type, covering entire Earth from eight ground stations and usable down to SL or underwater.
\omega 1 Angular velocity (SI unit is rad/s).
2 Angular frequency.
3 Any generalized frequency, thus \omega_n is natural frequency and \omega_d is undamped natural frequency of nth mode.
OMEV Independent naval helicopter squadron, Bulgaria’s naval air unit, previously OPLEV.
OMG Operational manoeuvre group (USSR).
OMI Omnibearing magnetic indicator.
OMIS Operations-management information system.
OMM 1 Organisation Météorologique Mondiale = WMO (Int.).
2 Oxygen-mask microphone.
OMMS Oxygen-mask-mounted sight.
Omni VOR (colloq.).
oneaxial nozzle Rocket motor nozzle capable of being vectored to any angle within prescribed limits about pivot point defined by intersection of axes of symmetry of propelling system and nozzle.
omni-bearing indicator VOR panel instrument.
omni-bearing selector, OBS Knob on most VOR/ILS indicators which is turned to each required VOR bearing, which appears in a three-digit window display, left/right needle thereafter showing difference from required heading.
onmifalldirectional aerial Antenna emitting to all points of compass (assumed equal signal strength throughout 360°).
onmifalldirectional beacon Removable floor panel containing free-running balls on which cargo containers are moved.
onmiflasher Fixed ground radio station giving non-directional signals for airborne DF receivers (rots).
onmiflasher Airborne flashing (strobe) light visible equally through 360° in azimuth.
omni-range See VOR.
OOH
Out of operating hours.

OOK
Department of special constructions (USSR, obs).

OOOI
Out [from gate], off [T-O], on [landed], in [at gate] (Acars).

OOP
Object-oriented programming.

OOR
Out of region.

ORA
Object-oriented requirements analysis.

OOS
1 Department of special aircraft construction (USSR, obs).
2 Out of service.

OOSA
Office for Outer Space Affairs (UN).

OOTW
Operations other than war.

OVO
Objects of verification.

OP
1 Observation post, position or point.
2 Oil pressure.
3 Operating procedure.
4 Overhead panel.
5 An operational flight, hence ops.

OPA
1 Component of GB Sarin, isopropylamine plus isopropylalcohol.
2 Office of Price Administration (US).
3 Opaque (icing).
4 Open planar array.
5 Optionally piloted aircraft.

OPAC
Operations of aircraft [ECAC working group].

OPACI, Opaci
Opera Pionieri e Anziani dell’Aviazione Civile Italiana.

opacity
In optical systems or photographic film, reciprocal of transmittance (log \( O = \) density \( d \)); term absorbance is now recommended.

OPAL, Opal
1 Order processing automated line.
2 Orbiting picosat automated launcher.

Opale
Optical piloted aircraft long-endurance.

opaque plasma
One through which EM signals cannot pass; generally plasma is opaque for EM frequencies below plasma frequency.

opaque rime
White icing of porous form caused by rapid freezing of small droplets.

OPAS, Opas
1 Overhead-panel Arinc-629 system.
2 Operational assignment (ICAO).

OPAT
Office des Ports Aériens de Tunisie.

Opats
Object-position and tracking sensor.

OPB
Oxygen preburner.

OPBC
Overhead-panel bus controller.

Op By
Operating authority.

OPC
1 Operational control (ICAO).
2 Optical-phase conjugation.

Opcom
Operational command.

OPCW
Organisation for the Prohibition of Chemical Weapons.

OPD
Oil-pressure diffuser.

Opdef
Operational defect.

OPEC
Organisation of Petroleum Exporting Countries.

open
1 Aircraft has * cockpit with no canopy.
2 With normal control path disconnected; such failure interrupts or seriously distorts signal passing along that channel.
3 Another meaning is that customer has not yet decided something, such as which of two competing engines to select for new fleet.

open angle
Angle of mating part slightly greater than 90° or other angle of edge of metal structure such as angle section; fault condition in sheet metalwork.

open architecture
Easily added to or modified.

Open Aviation Area
Proposed [from 2003] EU-US agreement on North Atlantic carriers, covering ownership, sabotage and many other issues.

open-bladed
Not enclosed in a shroud or duct.

open-centre system
Hydraulic system without an accumulator.

open circuit
1 Electrical, circuit interrupted.
2 Wind tunnel, one having no return path.

Open Class
FAI/CIVV categories for competition sailplanes, in one case with Standard Class span of 15 m and alternatively with span unrestricted but usually 17 to 20 m. In each case all refinements such as flaps are permitted.

open cockpit
Not provided with a canopy, leaving occupant’s head [and possibly upper torso] in slipstream.

open-coil armature
Ends of each coil connected to different bars of commutator.

open competition
Industrial competition in which all proposals, promises or offers are communicated to all participants.

open cycle
Thermodynamic cycle in which the working fluid passes through the system once, then being discharged to atmosphere. All existing aero engines are of this type.

open delta
Three-phase transformer comprising two single-phase transformers linking three lines.

open-ended
Spaceflight continued until either all possible information has been gained, and mission objectives met, or spacecraft systems run low or become faulty.

open-gore
Parachute in which fabric is absent from one gore to assist trajectory control.

open-hearth
Principal method of high-quality steelmaking in many countries, using shallow regenerative furnace with or without oxygen.

open improved site
Open-air site for military storage whose surface has been graded and surfaced with topping or hard paving.

open-jaw ticket
Generally, airline booking out by one route and return by another or over return route to different destination.

open-loop
Inactive, but in a state ready to resume production should further aircraft be required.

open loop
Servomechanism or other system comprising control path only, with no measurement of result or feedback to give self-correcting action.

open production line
Activity of shut down.

open production line
Activity of shut down.

open rate
Situation in which fares on particular air carrier route are fixed by each operator independently.
open rotor

open rotor  Open propfan.
open section  Structural member devoid of closed and thus uninspectable surface.
Open Skies  Country allows unlimited traffic rights to foreign carriers, usually reciprocal.
Open system  Using stored food/oxygen and discarding all body wastes.
oper  Operate (FAA).
operand  EDP (1) quantity entering or arising in instruction; can assume many forms, from argument to address code; generally a word on which operation is to be performed.
operating active aircraft  Those for which funds are provided, as distinct from non-operating active aircraft (DoD).
operating envelope  Plot of extreme boundaries of conditions to which hardware is subject, eg acceleration/temperature, or (in case of aircraft) altitude/Mach or Vn gust envelope.
operating expenditure  Airline’s total costs of generating ATRs.
operating ratio  Airline operating revenue divided by operating expenditure.
operating revenue  Gross income from an airline’s air-carrier operations, normally excluding other activities and any state subsidy.
operating speed  Traditionally 87.5 per cent of rated rpm for light piston engine (US, obs.).
operating weight empty  Total mass of aircraft ready for flight, including oil, water, food and bar stocks, passenger consumable stores, flight and cabin crews and their baggage and, according to most definitions, empty baggage containers where appropriate, but excluding fuel and payload. In case of military aircraft, ADI fluid and drop tanks are excluded but EW pods are included.
operation  1 A military action, or carrying out of mission.
  2 Operational flight, recorded by individual’s logbook; if enemy opposition was weak, a completed * might count as only ½ in assessing individual’s total.
operational  Ready to accomplish mission.
operational agility  ‘The ability to adapt and respond rapidly and precisely with safety and poise to maximise mission effectiveness’, also defined as ‘airframe agility + systems agility + weapons agility’.
operational aircraft  In British usage, one intended and ready for combat missions, as distinct from transport or training.
operational air traffic  Generally, that which cannot conform to requirements of flights within airways or controlled airspace.
Operational Bulletin  Issued when necessary, eg following difficulty or technical failure, giving advice, especially to flight crews [but not giving mandatory instructions].
operational characteristics  Those numerically specified parameters describing system performance; system can be aircraft, radar, etc.
operational command  Normally synonymous with operational control, and covers all functions involving composition of forces, assignment of tasks, designation of objectives and direction of mission; does not include such matters as administration, discipline or training.
operational performance categories  Categories I to IIIC
operational control  1 Authority granted a commander to direct forces to accomplish missions (NATO, etc).
  2 Exercise of authority over initiation, continuation, diversion and termination of a flight (ICAO).
operational control communications  Communications required for operational control (2) between aircraft and operating agencies.
operational control segment  That portion of communications link of GPS or Navstar used to transmit commands.
Operational Conversion Unit  Turned qualified pilots and other crew members into crews fit for operations (RAF WW2 and later).
operational development model  Almost same as a prototype, but to evaluate hardware for a new or modified mission, eg an AEW/ AWACS airship.
operational effect rate  Usually, flying rate.
operational error/deviation[s]  Action by an air-traffic controller that results in reduced separation [of anything, including on ground].
operational evaluation  Test and analysis of system under operational conditions, with consideration of capability offered, manning and cost, potential enemy accomplishments and alternatives, to form basis for decision on quantity production. In practice ** is often not accomplished until long after production decision.
operational factors  Those exercising constraints on flightplan, notably ATC (1), pilot workload, available aids, specified refuelling locations, etc.
operational flight  In the face of the enemy, carrying weapons or cameras or troops or food parcels or towing glider, etc, and underlined in red in logbook. US = combat mission.
operational flightplan  Operator’s plan for safe conduct of particular flight.
operational interchangeability  Ability to substitute one item for another of different composition or origin without loss of effectiveness or performance.
operational interruption  Period during which an item is unserviceable.
operational load measurement  On-going structural audit to establish safe fatigue life, esp. of fighter or military trainer.
operational loss or damage  Loss or damage to military item caused by reason other than combat.
operational manoeuvrability ceiling  Maximum height at which, for any given weight, aeroplane can sustain specified load factor (vertical acceleration) at onset of buffet.
operational meal  Special treat for aircrew returned from an operational mission; key element: a fried egg (RAF, WW2).
operational mission  Many definitions, all faulty; suggested: a military flight in furtherance of armed conflict. Aircraft need not be armed, and need not encounter enemy.
operational mode  Any of selectable alternative methods of operation for functioning system, eg computer-controlled, automatic with feedback, automatic open-loop, semi-automatic and manual.
operational net assessment  Study of a hostile country from economic, military, political and diplomatic viewpoints, and potential for fomenting revolution (US).
operational performance categories
operational phase

defining ILS and blind (automatic) landing installation performance. See Categories (3).

operational phase Period from acceptance by first user to elimination from inventory.

operational readiness Capability of unit or hardware to perform assigned missions or functions. Hence ** inspection.

operational readiness platform Ramp where aircraft at various ready states (including alert states) are parked, with all required connections (eg telebrief) in place.

operational readiness training Consolidated instructional period wherein qualified personnel for operational units are given integrated training in operational mode.

operational research Generally, analytical study of problems to provide numerical (some definitions say *scientific*) basis for decision-taking; in US often called operations research.

operational test and evaluation Test and analysis of system under operational conditions, promulgation of associated doctrines and procedures, and continuing evaluation against new threats or changed environment or circumstances.

operations Engaged in operational flying.

operations manual Usually, definitive handbook for user of system, as distinct from engineering, repair or design manuals; for aircraft called flight manual.

operations room Too many meanings to define. In a modern airline it undertakes real-time monitoring of engines and systems and ensures that required repair or maintenance can begin as soon as an aircraft is parked. See ops room.

operative 1 Able to operate; in true fail-* system there is no loss in performance (though there may be in integrity) after failure.

2 Employee engaged in routine operation of tool or machine on production work.

operator 1 Person, organization or enterprise engaged in or offering to engage in aircraft operation (ICAO).

2 Licensed air carrier.

3 American term for employee other than foreman or manager.

operator’s local representative Agent located to obtain meteorological information for operational purposes and to provide operational information to local met. office.

Opeval Operational evaluation.

OPF Orbiter processing facility.

Opfor The opposing force[s] [tactical simulation].


OPIAR Association of aerospace companies (Romania).

OPLE Omega position-locating equipment; synchronous satellite providing control beyond LOS.

OPEV See OMEV.

OPM 1 Office of Personnel Management.

2 Operation performance monitor.


Opmet Operational meteorological information or service.

OPN Optimised-profile navigation.

opn Operation, open, opening.

Opos, OPOC Opposed piston[s], opposed cylinder[s].

Opos Open purchase order summary.

OPOV Oxygen preburner oxidiser valve.

opportunity servicing Servicing carried out at any conver-
optical landing system

velocities and other parameters of hardware or phenomena.

optical landing system Refined form of mirror sight in which gyrostabilized light beams indicate to approaching pilot deviation from glidepath (USN, USMC).

optical line of sight LOS through atmosphere, which in precision measures is not to be regarded as straight.

optical linescan Term used for various line-by-line scanning at optical wavelengths, including RBV (video).

optically flat panel Window used in visual sighting systems through which light passes with near-zero distortion.

optical masher See laser.

optical MemS Mems operating at optical wavelengths.

optical pyrometer Instrument giving numerical readout of temperature of hot surface by measuring incandescence brightness.

optical reference point Index mark on canopy or elsewhere providing pilot with sightline guidance in vertical or near-vertical landing.

optical turbulence Fluctuating distortion of light rays caused by time-varying gradients of refractive index.

optimal control model The most recent [1970] model of a pilot [for example], based on the assumption that “a well-trained well-motivated operator behaves in a near-optimal manner, subject to his inherent limitations, constraints and task.”

optimized profile Flight trajectory calculated to minimize energy consumption throughout flight (but for operational reasons seldom attainable).

optimum angle of attack That giving maximum L/D and thus highest cruise efficiency.

optimum angle of glide That at which glide ratio is a maximum.

optimum coupling Matched radio impedance in which load equals output of amplifier or transmission line, for maximum power transfer.

optimum height Height of air burst or conventional explosion producing maximum effect against given target.

option 1 Acquisition of particular place in aircraft or other major equipment item production programme, with or without deposit and without agreement to purchase.

2 Variation in standard of product offering customer choice, eg avionic fit, long-range tankage, de-icers etc.

3 Alternative decisions open to commander engaged in battle.

optional, or optimal, yield management Determining traffic mix by class code and fare type to maximize revenue.

opto-electronic Combining optical and electronic subsystems in single device; term appears to be used synonymously with EO.

optronics Technology of systems using wavelengths from optical to electronic. Appendix 4.

optrotheodolite Doubtful designation for precision position-correlating instrument combining laser and video camera.

OPU Overspeed protection unit.

Opute Operational utility evaluation (Pads, 4).

OPV Optionally or operationally piloted vehicle; some of this class are helicopter UAVs.

OQAR Optical quick-access recorder.

OQPXS Offset quadrature phase-shift keyed, or keying.

orbiter

OR 1 Operational research.

2 Operational requirement[s] (UK).

3 Operational readiness; also (1985) operationally ready (DoD).

4 See OR gate.

5 Open rotor.

6 Other ranks.

7 On request.

8 Over-run lights.

9 Operational reliability.

OIR, orf On request.

Oracle 1 Operational research and critical-link evaluation.

2 Optical and RF combined-link experiment (USAF).

Orads Optical ranging and detecting systems (USA).

Or alley Classified metal alloy, not necessarily based on U-235, used as preferred primary fissile material in NW, with or without tritium.

Orange Could be friendly or hostile, uncertain.

Orange Force Simulated hostile force during exercise (NATO, IADB).

Oranges Weather (RAF, WW2).

Oranges Sour Air-intercept code: weather unsuitable for mission (DoD).

Oranges Sweet Air-intercept code: weather suitable for mission (DoD).

Orasis Optical real-time adaptive spectral identification system.

ORB, Orb 1 Operations record book (RAF).

2 Omnidirectional radio beacon.

orbit Order of battle.

orbit 1 Closed elliptical or quasi-circular path of body revolving around source of gravitational attraction balanced by its own centrifugal force.

2 Closed pattern, usually circular or racetrack, followed repeatedly by aircraft, eg in air-intercept loiter or when holding.

3 To follow an * as in (1) or (2).

orbit[al] decay Decay (1).

orbital elements See orbital parameters.

orbital manoeuvring vehicle Used from Shuttle and later from space station to position and retrieve satellites about 1,000 miles distant (NASA).

orbital parameters Basic numerical values describing orbit, such as apogee, perigee, inclination and period.

orbital period Time to complete one revolution (relative to space, ignoring such irrelevancies as rotation of primary body); symbol P, whose square is always proportional to cube of semi-major axis of orbit (distance from centre of primary to apogee).

orbital rendezvous See rendezvous.

orbital transfer vehicle 1 The first * was a reusable tug shuttling between a planetary or lunar orbiter and higher orbits.

2 Part of the planned MSP, a vehicle for orbit transfers and servicing, potentially reducing spacecraft weight and extending on-orbit life.

orbit determination Calculation of orbital parameters of unknown satellite.

orbiter 1 Portion of spaceflight system designed to orbit, as distinct from booster stages, tanks, etc.

2 In particular, bus to inspect planetary body from a distance, with or without probes.
**orbit improvement system**

*orbit improvement system* Suppresses yo-yo of VLF antenna.

*orbit point* Geographically or electronically defined location above Earth’s surface used as reference in stationing orbiting aircraft.

*ORC* Oversight and review committee.

*Orca* 1 Optimized raster chart analyzer [sic].

2 Optical-relay com. architecture.

*Orchidée* Observatoire radar cohérent heliporté, d’investigation des éléments ennemis; name means orchid (F).

*Orcofilm* Proprietary films based on PET3.

*Orcon* Fire-resistant insulation batting using RK carbon fibre.

*ORD* 1 Order.

2 Operational, or operations, Requirement[s] / Document.

3 Operational readiness demonstration.

4 Optional retirement date (RAF).

*Ordalt* Ordnance alteration.

*order book* Real or symbolic book containing list of customers for major equipment item, esp. commercial transport, broken down into firm orders, options, leases, etc. and fading from importance with programme’s maturity and second-hand customers.

*order of battle* 1 Complete list of all combat units in a given command.

2 Schedule of individual unit status (e.g., RAF, historically) available (typically 15 min); readiness (5 min); cockpit readiness (2 or 1 min); released.

ordinate 1 Vertical axis on graph or other geometric plot.

2 Vertical distances measured from datum, eg from chord line to upper/lower surfaces of aerofoil.

*ornament* Explosives, chemicals and pyrotechnics for use against an enemy, including nuclear, together with directly associated hardware such as guns, rocket launchers, etc.

*ornament alteration* Change [usually last-minute] to load carried by attack aircraft.

*ornament devices* Explosive or pyrotechnic parts of spacecraft, RPV or other [especially non-weapon] system.

*ornament work rate* Various measures intended to offer single numerical value of rate of application of ordnance in particular theatre or against one target.

*ORDT* Objectives/requirements definition team (NASA).

*ORE* Operational Readiness Exercise.

*Orel* Omnidirectional runway-edge lights/lighting.

*Oreos, OREOS* Optical radar/EO [electro-optical] sensor.

*Orex* Orbital re-entry experiment.

*ORF* Optical and radio frequencies; CLE adds combined-link experiment (USAF).

*ORGALIME, Orgalime* Organization for liaison between European electrical and mechanical engineering industries.

*organic* 1 Originally, living material; today broadened to cover all compounds of carbon and hydrogen, and often with other elements.

2 Assigned to, and forming essential part of, military formation.

3 In many applications involving heat exchange (e.g. reactor, * Rankine cycle), use of organic (1) fluid, often mixture of polyphenyls.

**orthogonal biplane**

*organic air vehicle* Organic(2) aircraft; but the first meaning is a small UAV controlled by a squad of infantry (SOF, USA).

*organizational-level maintenance* Performed on a squadron or other operator unit, eg on an installed or back-up engine.

*organometallic* Compound having metal atom attached to organic radical.

*OR gate* Logic device which, whenever a voltage (eg a 1) appears at any input, responds with voltage at output.

*ORHE* On-ramp handling equipment.

*ORI* Operational readiness inspection.

*orientation* 1 Determination of approximate position or attitude by external visual reference.

2 Turning of instrument or map until datum point or meridian is aligned with datum point or true meridian on Earth (ASCC).

3 Direction of fibres in lay-up, prepreg or finished FRC part.

*orifice meter* Fluid-flow measuring technique where pressure is measured upstream and downstream of transverse plate with calibrated hole.

*origin* 1 Point 0.0 on cartesian graph.

2 Base from which map projection is drawn.

*originator* Command by whose authority a message is sent.

*ORLA* Optimum repair-level analysis.

*ornithopter* Aerodynamic intended to fly by means of wings flapping or oscillating about any axis, but not in continuous rotation.

*Orca* Off-route obstruction-clearance altitude.

*orographic uplift* Large-scale uplift and cooling of air mass caused by mountains; hence * rain or precipitation.

Generally synonymous with mountain-wave turbulence.

*Oronite* High-temperature hydraulic fluid; principal type for up to M2.5 *M2V (California Chemical).

*OROS, Oros* Optical read-only storage.

*ORP* 1 Optical reference point.

2 On-request reporting point.

3 Operational readiness platform.

*ORPP* On-request reporting point.

*ORS* 1 Off-range site.

2 Offensive radar system.

3 Occurrence reporting system.

4 Operational Research Section.

5 Operationally responsive space[lift]. [Space Command] (USAF).

*ORT* 1 Optical relay tube (TADS).

2 Optical resonance transfer.

3 Operational readiness test.

*ORTA* Office of Research and Technology Assessment.

*orthicon* Camera tube with secondary emission reduced or eliminated by using low-velocity electrons to scan two-sided sensitive mosaic, one side scanned and reverse face illuminated, resulting in stored charges on mosaic being removed by beam and generating output signal.

*orthodrome* Great circle, hence orthodromic course.

*orthogonal* Originally meant perpendicular; today blurred, as shown below.

*orthogonal aerial* Pair of transmitting and receiving aerials [antennas], or single T/R aerial, designed to measure difference in polarization between radiated signal and echo from target.

*orthogonal biplane* One without stagger.
orthogonal scanning

Orthogonal scanning Use of combined axial and lateral magnetic fields to control low-velocity electron beam in camera tubes.

Orthographic Rectilinear projection of solid objects on two-dimensional sheet by use of parallel rays, in contrast to conical perspective rays; result is six possible views (left, right, front, rear, top, bottom), of which four (front, top, left, right) are normally used (in different relative positions in Europe and N America, see third-angle projection), each representing appearance of object as seen from infinitely large distance.

Orthomorphic Map projection in which meridians and parallels cross at right angles, all angles are correct and distortion of scale is equal in all directions from any point; several variations are in use, chief being Lambert's conformal and Mercator's.

Orthotropic Solid material property of strength along a single axis.

ORTL Optical resonance transfer laser.

ORU Orbital replacement unit.

OS Observation squadron.

OS System(s).

OS Observation, ship-based aircraft category (USN 1935–45).

OSACOM Open-systems architecture mission computer.

OSAF Office of the Secretary of the Air Force (US).

OSAD Operational Support Airlift Command (USA).

OSAMC Open-systems architecture mission computer.

OSA Office of Strategic Services (US 1942, became CIA 1947).

OSB Option-select button.

OSD Operation(s).

OSA Office of Strategic Trade (US).

OSO Operations support equipment.

OSTA Optical surveillance platform.

OSR Operational special program (JTIDS).

OSTS Office of Strategic Trade (US).

OST Office of Strategic Trade (US).

OSSAI OSAI, Organisatio na d'Aérostation Internationale.

OSOAMC Open-systems architecture mission computer.

OSV Operation(s).

OSOIC Office of Strategic Intelligence (CIA 1947).

OSD Office of Small and Disadvantaged Business Utilization (NASA).

OSDS Oceanic system development support (FAA).

OSE Optical shaft encoder.

OSE Office of Systems Engineering (DoD, US).

OSS Office of Strategic Services (US 1942, became CIA 1947).

OSF Optical fibre sensor system.

OSM Optical support measures, eg laser threat warning.

OSO Optical solar observatory [Nos 1–8].

ORS Overhead stowage compartment(s) for carry-on baggage.

OSR Optical solar reflector.

OSR Office of Scientific Research and Development (US, from 1941).

OST Outline staff target (UK).

OST Office of Small and Disadvantaged Business Utilization (NASA).

OSTA Office of Space and Terrestrial Applications (NASA).
OSTD

OSTD Office of SST Development (DoT, US).

OSTIV Organisation Scientifique et Technique Internationale du Vol à Voile [gliding; office, NL-2629 Delit](Int.).

OSTM Ocean-surface topography mission.

OSTP Office of Science and Technology Policy [White House] (US).

OSTR Optimum-speed tilt-rotor.

OSU Omega/vlf sensor unit.

OSV Ocean station vessel.

Oswatitsch inlet Supersonic inlet/diffuser in form of body of revolution having pointed conical centrebody of progressively increasing semi-angle, thus generating succession of inclined shocks at increasingly coarse angles all focused on peripheral lip.

OT 1 Oil temperature.
2 Other times, or over time.
3 Operational test.

Ot 1 Other times.
2 Operational test.

2 Orbital transfer assembly.
3 Over the [or overflight] top attack.
4 Other transaction agreement[s].

OTAA Office of Trade Adjustment Assistance (US).

OTAEF Operational Test & Evaluation Force (but see OTE, OT&E).

OTAES Optical technology Apollo extension system.

OTAN NATO (F).

OT&E Operational test and evaluation.

OTAR Over-the-air re-keying.

OTAS Over-the-shoulder.

OTC 1 Operational training course (USAF).
2 One-stop tour charter.
3 Overseas Telecommunications Commission of Australia.
4 Operational [or official] test centre.
5 Officer in Tactical Command.

OTCNS Office in tactical command information exchange system.

OTD 1 Origin to destination.
2 Optimal terminal descent.
3 Optical-transient detector.
4 Other training devices.

OTDA Office of Tracking and Data-Acquisition (NASA).

OTDF Outlet temperature distribution factor.

OTE National telecommunications organisation (Greece).

OTE, OT&E Operational test and evaluation [A adds Agency, C adds Command](USA).

OTER Over-temperature emergency rating.

Otewfor Operational test and evaluation for operational requirements (USN).

OTFP Operational traffic flow planning.

OTH 1 Origin to destination; hence * radar.
2 Other.

OTH-B Over the horizon, backscatter.

other ranks Soldiers who are not yet NCOs, army equivalent of airmen (UK).

OTH-R Over the horizon, radar.

OTH-SW Over the horizon, surface wave.

OTH-T, OTHT Over the horizon, target[ing].

OTIS 1 Optronic tracking and identification system.

outbrief 2 Optimal trajectories by implicit simulation.

OUTK Outlook.

OTN Optical transport network.

otolith Organ of inner ear sensitive to attitude and acceleration.

OTP 1 Office of Telecommunications Policy (White House, US).
2 On-top position [ie, above submerged submarine].
3 Operation[al] test programme [S adds set].

OTPI On-top position indicator.

OTPS Oceanic traffic-planning system (FAA).

OTQ Over-temperature qualification.

OTR 1 Operational turn-round.
2 Oceanic transition route.
3 Other.
4 Overberg Test Range (SAfrica).
5 Operational Test and Readiness; R adds Review.

OTS 1 Over the shoulder.
2 Orbital test satellite.
3 Out of service.
4 Operational test programme[s].
5 Off the shelf.
6 One-man ticketing system, or structure.

OTSC Optical transmissive star copier.

OTSI Operating time since inspection.

OTT Operational Test Team (DoD).

Otto cycle General name for four-stroke spark-ignition cycle for piston engine.

OTU Operational training unit.

OTV 1 Orbital transfer vehicle.
2 Obstruction to vision.

OTW 1 On the wing; hence * replacement of engine module.
2 Over the wing; B adds bridge.

OTWD Out-the-window display (simulator).

OU Operations unit.

OUBD Outbound.

OUE Operational utility evaluation.

ounce Imperial mass, contrary to SI: 28.3495 g; reciprocal 0.0352739; abb. oz.

OUSD Office of the Under-Secretary of Defense (US).

out 1 Radio procedure word: conversation is completed.
2 Unserviceable.
3 When applied to airbrake[s], normally means in use, not out of use.

outage 1 Loosely, failure to function, especially of communications.
2 Period during which communications station is faulty.

outboard 1 In direction from centreline to wingtip.
2 Further from centreline (eg * engine, in relation to other[s] on same side).
3 Carried outside main structure.

outbound 1 Towards destination; hence VOR * radial.
2 Away from Conus (US military usage).
3 In holding pattern, side opposite to inbound (which heads towards holding fix).

outbound bearing That of outbound leg of holding pattern or of VOR radial en route to destination or next waypoint.

outbound radial That linking fix or beacon to next waypoint.

outbrief Short list of key items which captain runs
outburst
through on way to aircraft; can include authorization and Notams.

outer
Lateral spread across surface of air arriving in downburst.

outer air battle
Taking place 100 nm or more from surface fleet Battle Force, beyond radius of ship-to-air weapons.

outer area
Defined region around airport within which height of building is severely limited.

outer fix
Fix in destination terminal area, other than approach fix, to which aircraft are normally cleared by ATC and from which they are cleared to approach for final approach fix (FAA).

outer marker
ILS marker beacon normally on approach centreline approximately 4½ nm (8.3 km) from threshold; usually identified by 400 Hz aural dashes and synchronized blue panel light.

outer panel
Left or right wing outboard of centre section.

outer wing
Apart from obvious meaning: in a turn, that pointing away from centre of turn, experiencing increased airspeed.

outfall valve
Usually synonymous with outflow valve.

outflow
1 Violent low-level wind radiating out from downburst, or created beneath hovering VTOL aircraft.

2 Slipstream (confusing).

outflow pattern
Isobar pattern above wing at positive angles of attack.

outflow valve
That incorporated in isobaric cabin-pressure regulator through which air is allowed to escape to atmosphere during climb to isobaric altitude.

outgassing
Emission of gas from metals and other materials in high-vacuum conditions.

outlet guide vanes
A ring of fixed [rarely, variable] stator vanes downstream of a fan or compressor. Their purpose is to remove swirl and produce a truly axial flow.

outlet temperature distribution factor
Combustion chamber outlet peak temperature (T) minus outlet mean T divided by mean combustion chamber T rise.

out of alignment
In case of propeller or rotor blade, having incorrect sweep (bent forward or back in plane of rotation).

out-of-control lights
Two superimposed red lights 6 ft (2 m) apart hoisted at night on mast of marine aircraft whose engines have failed and which is not anchored.

out of phase
Not synchronized; two or more cycles or wavetrains which have same frequencies but pass through maxima and minima at different times.

out of pitch
In case of propeller or rotor blade, having blade angle different from that of remaining blades.

out of step
Not synchronized; two or more series of digital pulse trains or other discrete phenomena having essentially same frequency but occurring at different times.

out of the box
First entry to service of new product.

out of track
In case of propeller or helicopter rotor blade, having incorrect tilt so that particular tip does not lie on tip-path plane.

output
1 Total product or yield from system, eg tonne-km for airline.

overall length
2 Delivery from computer, as hard copy or graphics display.

3 One of five basic functional sections of most EDP(1) systems.

4 Signal from transducer or other instrumentation.

5 Power developed by engine or other prime mover.

6 Shaft at which power is extracted from shaft-drive engine.

7 Verb, to deliver an * (2), hence outputting.

outtrigger
1 Primary structural members carrying tail of aeroplane with short fuselage, nacelle or boat hull, also called booms.

2 Ancillary landing gear near wingtip or at other location well outboard from centreline on aircraft with bicycle or other type of centreline landing gear.

outshop
To complete manufacture, or at least a stage of manufacture; hence outshopped.

outside air temperature
1 Free-air static temperature (UK).

2 The uncorrected reading of the OAT instrument, requiring corrections [e.g., for kinetic heating] to obtain true static temperature (US).

outside loop
Inverted loop, performed with aircraft upper surface outwards and thus under negative g.

outside roll
One started from negative g, esp. from inverted attitude.

outside wing
That on outer side of spin, having greater airspeed than inside wing.

outsourcing
1 Subcontractor brings in someone else to help.

2 Airline subcontracts aircraft maintenance.

outsone
On outer side of spin, hence * uler or rudder.

outsin
Yaw inevitably present in normal spin, usually function of pitch attitude.

outturn
What actually happened, or a measured value [as distinct from prediction].

outyears
Period during which item is in operational service (USAF, later general use).

OV
Over-voltage.

2 Aircraft mission code, observation V/STOL (DoD).

3 Outside vendor.

4 Location (ICAO).

5 Orbiting vehicle.

OVA
Overide vision angle.

OVAC
Main office of national aero club [Vienna A-1040] (Austria).

Ovalisation
Structural distortion such that circular parts become ovals, esp. on pylon-mounted turbofans.

oval office
The President of the United States; thus * green = his authority to proceed.

OVC
Overcast.

oversize
To bake electronic device to simulate overload test condition.

over Radio procedure word: ‘My transmission is ended and I expect a response from you’.

overall efficiency
In case of aircraft propulsion system, usually thermal efficiency multiplied by propulsive (Froude) efficiency, \( \eta = \eta_p \eta_e \).

overall length
Most definitions for aircraft stipulate in flying attitude; distance between local peripherals aligned with extremities of basic airframe (but usually
overall pressure ratio

excluding pitot or instrument probes, static wicks etc). See length.

overall pressure ratio OPR, ratio of total pressure at delivery to combustion chamber to that at engine inlet [the latter taken as unity, so OPR 26:1 can be written as 26]; in a turbofan OPR = FPR × compressor PR.

overbalanced Provided with excessive balancing mass, aerodynamic area or other source of control-surface moment assisting pilot, so that control surface has little feel (and in extreme case can move by itself to hard-over deflection).

overboard bleed From compressor to assist starting, not used in normal running.

overbooking Practice of selling more tickets for a particular flight than there are seats, to compensate for multiple reservations for one journey.

overbuilt Made stronger than necessary, usually to allow for future development.

overburn Operation of rocket or other space propulsion system for too long a period (0.1 s can be significant), resulting in incorrect cutoff of velocity and/or trajectory.

overcast Means 0.9+ cloud cover except IWC = ¾+ [= 0.875+]. One authority insists “8 oktas”, = 100%. 

overcontrol To apply more control deflection than necessary, commonly resulting in succession of excursions on each side of desired flight condition.

oversized 1 Stronger than necessary to meet requirements.

2 More refined than necessary, usually resulting in lighter structure at expense of high cost and complexity.

oversized nozzle One in which jet leaves at below ambient pressure.

overfin Fin added above high [T-type] horizontal tail.

overflight Flight over particular route, esp. across unfriendly territory.

overflight top attack Class of missiles which detonate shaped charges downwards as they pass over armoured vehicle.

overfly To fly over.

overhang 1 Spanwise distance from junction of wing and bracing struts to tip; length of cantilever mainplane. 2 Spanwise distance to tip of upper wing of biplane from point vertically above tip of lower wing. 3 See next.

overhang balance Mass distributed along leading edge of control surface, as distinct from horn balance.

overhaul Regularly scheduled procedure of dismantling (the extent varying with which *), inspection, replacement of parts if necessary and return to service. For large aircraft a major * can take weeks and involve refurnishing and exterior repaint.

overhaul period Also called TBO, the time between consecutive overhauls. For aircraft or engine or other functioning item * is actual operating time in hours. For missile and some other items such as ejection seat it is total elapsed time.

overhead 1 Apart from normal meanings, involving the use of one or more satellites. 2 As a noun, a panel for controls and instruments mounted above the windscreen or in the cockpit roof.

overhead approach Landing procedure in which pilot flies downwind over point of touchdown and then makes descending circular pattern centred on extended landing centreline; also called 360° landing.

overhead camshaft In upright cylinder, above the head; thus, beyond horizontal cylinder, below an inverted cylinder.

overhead stick Control column pivoted to cockpit roof.

overhead stowage Provision in passenger transport for hand baggage and other rigid or heavy items to be stowed in latched bins above seats.

overhead suspension Docked rigid airship hung from roof of shed.

overhung 1 Cantilevered beyond last point of support, esp. applied to fan, compressor or turbine stages mounted at extremity of shaft system beyond nearest bearing. 2 Projecting beyond tip of fixed surface, adjective normally applied to aileron or elevator.

overlap 1 Percentage of photograph duplicated on next frame of same film (see lap). 2 See overlap zone.

overlap tell Transfer of information to adjacent air-defence facility (of normally hostile or unidentified) tracks in latter’s region.

overlap zone Designated area on each side of boundary between adjacent tactical air control or defence regions wherein co-ordination and interaction are required.

overlay Upper (exoatmospheric) layer of layered defence system (SDI).

overlay report Filed by ATC controller when workload could lead to safety being compromised.

overlay response Procedures designed to enable an inadequate ATC system to handle traffic at peak periods (UK).

overlay weight 1 Alternate MTO weight authorized only in unusual circumstances.

2 Any takeoff weight exceeding permitted maximum.

overpressure 1 Limiting values reached above and below normal atmospheric pressure during passage of blast wave of explosion (nuclear or conventional).

2 Peak positive pressure reached during passage of boom from supersonic aircraft.

override Facility for bypassing or overcoming normal limit on command action to obtain exceptional response, usually in emergency (eg * boost).

override boost Emergency higher boost pressure available in exceptional circumstances such as overload takeoff or in combat.

overrun 1 To fail to stop within available landing distance. 2 Control facility causing camera to continue operating for preset number of frames or seconds after cutoff of control.

overrun area Paved area beyond end of runway which for any reason is not in use; usually marked with herringbone pattern.

overrun barrier Layer of material beyond end of runway provided to arrest overrunning aircraft with minimal damage; PFA is preferred to gravel.

overrunning clutch One allowing driven member (eg helicopter rotor) to run ahead of drive system.

overseer Common term for software used in managerial role in large system.

overshoe Externally attached de-icer of pulsating-rubber mechanical type; also called boot.

overshoot 1 To abandon landing and make fresh
overshoot area

approach; in US called missed approach or go-around, a term fast becoming universal.

2 To land too far across available landing area and make uncontrolled excursion into region beyond.

3 To exceed desired IAS, altitude, heading, bank angle or other flight condition.

# In an interception, to pass through enemy aircraft’s future flight path in plane of symmetry.

overshoot area Designated area of semi-prepared ground available to overshooting (2) aircraft (usually GA only) from which they may taxi relatively undamaged.

overside vision angle Maximum angle between horizontal and pilot’s lateral field of view downwards.

overspeed condition Normally applied to rotating machinery, and permissible for brief specified period and within specified limit. An exceptional and usually undesired condition, and in no way synonymous (as claimed in one source) with takeoff rpm.

oversquare 1 Of an aeroplane [airplane], having length greater than the span.

2 Of a piston engine, having the bore greater than the stroke.

oversize position Inoperative position of target-type reverser with geometry which precludes inadvertent operation in flight.

overstrain Quantitative extension of material stretched beyond yield point.

overstress Application of load which could cause structural failure [particularly positive or negative pitch input which could break wing].

oversweep Ultra-acute setting of VG pivoted wings [eg, to make carrier-based F-14 aircraft more compact when parked].

overswing Undesired azimuth excursion by aircraft with long, heavy body during fast turn while taxiing, esp. on slippery surface.

overtake velocity Excess speed over that of aerial target ahead.

over the fence Immediately before touchdown (colloq., normally GA).

over the horizon Beyond the visible or LOS horizon; region accessible only to particular species of radar.

over-the-shoulder delivery See toss bombing.

over the top On top (1).

over the weather At pressurized cruising levels; basic meaning is free from turbulence except CAT, but cloud may still be present and cu-nims must be avoided.

over the wing Aeroplane configuration in which turbosan is located above wing to give USB powered lift but without surface scrubbing losses.

overtip leakage Escape of high-pressure fluid around the small gap between the tips of turbine blades and the surrounding casing.

overtur boundary Limiting sea state for safe operation of float or pontoon-mounted helicopter.

overturn pylon Strong structure to protect occupants of small aircraft in overtur on ground.

overwater Particular provisions apply to commercial transports for use on sea crossings where power-off glide to land is not possible. Adjective also applied to extended-range versions, irrespective of actual intended routes.

OVHD Overhead.

OVHT Overheat.

Oxygen mask

OVI Department for war inventions (of RKKA, USSR, defunct).

OVR, orv Over.

ovrd Override.

OVRN, ovrn Overrun.

OVS Overhead video system.

OVT Vectored thrust (R).

OVTR Optical videotape recorder.

OW Oblique (slew) wing.

OWB Over-the-wing bridge (passenger loading).

OWE Operating weight empty.

OWF Optimum working frequency.

OWL 1 On-wing life (main engine).

2 Obstacle-warning radar.

3 Over water and land.

4 On-target weapon, long-range.

OWLD Obstacle warning, location and detection.

OWM One-way mission.

OWP Outer wing panel.

OWRM Other war reserve materiel (US).

OWS 1 Orbital workshop.

2 Obstacle warning system (helio).

3 Optical weapon sight.

4 Ocean Weather Station.

OWSF Oblique-wing single fuselage.

OWSPS Operational weather squadron production system (USAF).

OWTF Oblique-wing twin fuselage.

OWWS Operational windshear warning system.

OX, Ox 1 Longitudinal axis about which aircraft rolls; confusingly, some authorities now make Ox the pitch [transverse] axis.

2 Oxygen: OX1 HP gaseous, OX2 LP gaseous, OX3 HP replacement bottles, OX4 LP bottles, no code for liquid.

3 Oil(s) miscellaneous [not covered by OEP, OM or OMD].

oxidant Chemical carried as rocket propellant for combination with fuel; examples arelox, nitrogen tetroxide, nitric acid and mixtures of fluorine and oxygen (flox).

oxidation 1 Removal of electron from atom or atomic group.

2 Combination with oxygen, as in burning or rusting.

oxidiser Oxidant (N American usage).

oxidising flame In gas welding or cutting, one having excess oxygen.

oximeter Instrument giving numerical readout of blood oxygen concentration.

OXRB Oxygen replacement bottles available.

oxy Oxygen.

oxide Ox, odourless gas, vital to life, density 1.43 gf1 0.089212 lb/ft3; liquid [lox] density 1.1, Mpt –218°C, Bpt –183°C. For aircraft breathing purposes, Grade A mandatory, 99.5% pure, many other requirements including water <0.005 mg/l. In US OX1/2/3/4 are respectively HP gas, LP gas, HP replacement bottle and LP replacement bottle.

oxy glove Container for gaseous oxygen under pressure.

oxygen converter Liquid oxygen converter (ie boiler) supplying gox to breathing system.

oxygen mask Face mask for supplying gaseous oxygen to wearer, usually on demand, and separating exhaled breath.
Oxygen microphone  Microphone fitted to oxygen mask (probably arch.).

OY  Option Year.

OY, Oy  Lateral axis about which aircraft pitches; confusingly, some authorities now make this the roll [longitudinal] axis.

OYM  Optional yield management.

OZ, Oz  Vertical axis about which aircraft yaws.

oz  Ounce, \( \frac{1}{16} \) lb = 28.35 g.

OZB  Civil aviation directory, under Ministry of Works (Austria).

Ozone  \( \text{O}_3 \), allotropic form of oxygen present in minute quantities in air, liquid faintly bluish, very reactive, \( \text{BPT} \) \(-182.97^\circ\text{C} \).

Ozonosphere  Layer of upper atmosphere, roughly at 20–40 km altitude, where ozone concentration is much higher than at SL and ozone plays major role in establishing radiation balance.
P

1 Generalized symbol for force, or a point load.
2 Power, esp. bhp of shaft engine, or peak power of transmitted signal; unit: watt.
3 Aircraft category, pursuit (USA, USAS, USAAC, USAAF, 1925–47, USN 1923), and patrol (USN from 1923, USAF from 1962).
4 Prohibited area.
5 Poise [see entry]
6 Period, eg orbital.
7 Aircraft designation suffix, photographic (USN, to 1962).
8 Pressure: normally p but gas-turbine pressures normally written P0, P1 etc.
9 Pulsed, or pulse (eg with suffix numeral P1, P2 etc).
10 Pilot, with numerical suffix 1, 2, 3 etc to show hierarchical ranking of pilots in same crew.
11 Prefix, plus (wind component).
12 Production cost.
13 Ratio of full-scale length to model length, esp. in radio aerials and related fields.
14 Probability.
15 Telecom code: aircraft has Tacan only and 4096-code transponder.
16 Radar (JETDS).
17 Missile launch environment: soft pad (DoD).
18 Phosphorus.
19 Provisional.
20 Aerospace craft (FAI category).
21 Primary, primary frequency, or winding.
22 Precision (DME, GPS, MLS).
23 Packet (TDM mode).
24 Paved surface.
25 Prefix peta = 1015, thousand million million.
26 Airport with instrument-approach procedure; also means PAPI.
27 Number of persons on board.
28 Polar air.
29 Positive.
30 Precipitation.
31 Prototype.
32 Propeller pitch.
33 Polarization [electric].
34 Wing planform shape parameter, S/bl, where S is area, b span and l chord from LE at root to TE at tip.
35 Spectral density [covariance] matrix.
36 Spectral density, or spectrum.
37 P0 Total static pressure head; stagnation pressure.
P1 Compressor inlet total pressure.
P2 1st pilot, captain of aircraft.
P3 Compressor delivery pressure (two-spool).
P4 Runway has 4 PAPIs.
P5 Compressor delivery pressure (single-spool) or fan delivery.
P6 Copilot.
P7 Two PAPIs.
P2P Confusingly, peer-to-peer.
Pp Compressor approach (esp. to carrier).
P-factor 1 Asymmetric propeller loading.
P-alt Pressure altitude.
P-band Frequency band, 225–390 MHz (Appendix 2).
P-channel Packet-mode channel, in two forms, Pd and Prone.
P-charge Projectile-charge warhead (SAM).
P-clamp For ordinary electric/electronic cables.
P-clip For convoluted conduit with raised rib to prevent lateral movement.
P-code Precise or protected navigation code, billions of pseudo-random numbers on 10.23 MHz repeating each 267 days, each 168-h (one week) segment unique to particular GPS satellite.
P-display Radar display of PPI type.
P-factor 1 Asymmetric propeller loading.
P-lead Primary (switch) cable of magneto.
P-line Electric cross-country power line.
P-time Proposed departure time.
p-type semiconductor One in which majority of charge-carryers are holes (electron absences).
PA 1 Public, or passenger, address.
2 Performance appraisal.
P-factor First pilot, captain of aircraft.
P-lead Primary (switch) cable of magneto.
P-line Electric cross-country power line.
P-time Proposed departure time.
p-type semiconductor One in which majority of charge-carryers are holes (electron absences).
PA 1 Public, or passenger, address.
2 Performance appraisal.
3 Public affairs.
4 Proposal architecture.
5 Product assurance (especially software).
6 Precision attitude.
7 Pilot’s associate, or assistant.
8 Porte avions, aircraft carrier (F).
9 Pressure altitude.
10 Pursuit, aircooled (USA 1919–24).
11 Power[ed] approach [esp. to carrier].
PACAF, Pacaf

/P/A adds improved air/ground sight system.

reconnaissance, rocket thrust-boost, gun and ammunition or air-conditioning.

PACIS 1 Performance assessment and checkout facility [satellites] (ICAO).

PAAMS 1 Principal anti-air missile system.

PAAG 1 Portable aircraft arresting gear.

PAAGS 1/2/3 adds improved air/ground sight system.

PAAMS 1 Principal anti-air missile system.

PAAS 1 Precision assessment and evaluation (DoD).

PAE Program and evaluation (DoD).

PABX 1 Passenger-address amplifier.

PACAF, Pacaf

1/3 Precision approach, suffixes 1/2/3 for Categories I/II/III.

1/4 Point Arguello, CA, US.

1/5 Pad abort.

1/6 Pilot awareness.

1/7 The Pathfinder Association [East Molesey KT8 9AF] (UK).

PA Total power available.

PA/A Payload/altitude curve (sounding rocket).

PAI 1 Pascals, SI unit of pressure.

PAK 1 Polar Atlantic.

PAA Action-time average chamber pressure; sometimes abbreviated as Pa.

PAAMS 1 Principal anti-air missile system.

PAAS 1 Precision-assault air-to-surface missile.

PAE 1 Pilot awareness.

PAF 1 Precision aircraft control technology (CCV).

PAFCS 1 Precision aircraft condition evaluation recorder.

PACF 1 Precision aircraft control technology (CCV).

PAC/1 1 Portable aircraft condition evaluation recorder.

PACIC 1/2/3 adds improved air/ground sight system.

PACIS 1/2/3 adds improved air/ground sight system.

PACIS Pilot aid and close-in surveillance.

Pack 1 Bag in which parachute is packed. Other authorities insist that this term includes the complete parachute, contained inside the * cover.

2 Complete system in demountable package which may be attached inside or outside aircraft, eg for multi-sensor reconnaissance, rocket boost-boost, gun and ammunition or air-conditioning.

3 In particular, ECS air-conditioning unit comprising a bootstrap ACM(1) plus air/air heat exchanger.

package 1 See pack (1).

2 Complete offer of international contract covering either collaborative development or manufacture of aircraft complete with associated offsets, loan, training and other attractions, and with agreed share to each partner of overall effort and/or cost.

3 Complete offer of international contract covering sale of aircraft with associated offers of offsets, training, service support, construction of support facilities, etc.

4 Assembly of attack aircraft, tankers, EW jammers, etc, to carry out a mission.

package aircraft 1 Subject of package (2, 3) deal.

packet 1 FWG FPDC (GPS).

pack 1 Power amplifier.

PAC Private automatic branch exchange.

PAC 1/2/3 adds improved air/ground sight system.

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4 Assembly of attack aircraft, tankers, EW jammers, etc, to carry out a mission.
pad abort

*Network of resistances or impedances to couple to transmission lines effectively.

**pad abort** Abort before launch from pad (1).

**padder** See *paddling capacitor*.

**paddling capacitor** In series with superhet, local-oscillator tuning capacitor to match exactly to frequency.

**paddle** In a rate gyro, damping drag surfaces which generate angular difference proportional to first-order rate term.

**paddle blade** Propeller blade having unusually wide chord maintained to tip.

**paddleplane** See cyclogiro.

**paddle switch** Ambiguously used to denote electrical switches operated by dynamic air pressure, dynamic water pressure in ditching and various other activation sources.

**PADIS, Padis** Procedures for analysing the design of interactive solutions (fire-control software).

**Padlocked** "I have my vision fixed on bogies/bandits and will not look away".

**PADM** Persistant area-dominance munition.

**pad output** Power rating of shaft at each pad (3) location on engine, APU or MEPU.

**PADR** Product-assurance design review.

**PADS, Pads** 1 Passive advanced sonobuoy. 2 Position and azimuth determining system. 3 Precision automatic dependent surveillance. 4 Precision airdrop system (MIT/USAF).

**PADUS** Principal Assistant Deputy Under-Secretary (US).

**PAF** 1 Parabolic aircraft flight. 2 Police de l’Air et des Frontières (F). 3 Potassium acetate fluid (de-icer). 4 Portuguese air force [UK usage].

**PAFM, Pafam** Performance and failure assessment monitor (independent flight guidance with flight-display displays during autorouting).

**PAFU** Pilots’ advanced flying unit.

**PAG** 1 Programmable automatic gauge, for NC dimensional checking. 2 Portable arrester gear. 3 Presidential Airlift Group (USAF).

**Pageos** Passive GEOS [Geodynamic experimental ocean satellite(s)].

**PAH** 1 Anti-tank helicopter (G). 2 Polycyclic aromatic hydrocarbon. 3 Production approval holder (FAA).

**PAI** Parachute Association of Ireland Ltd.

**Paid, PAID** Parked-aircraft intrusion detector.

**paint** To create blip on radar display, esp. one giving position of aircraft or other object.

**paintless aircraft** Instead of usual finishes, covered with protective film of appliqué materials, saving weight, cost and support requirements.

**paint-on bag** Flexible vacuum bag formed in place to cover layup of composite material fabrication and seal tool in prototype moulding of large parts.

**paint-stripe loading** Vertical stripes inside cargo aircraft to assist loaders in achieving correct load distribution, esp. with regard to e.g.

**PAIR, Pair** Precision-approach interferometer radar.

**pair** Section of two fighters operating together.

**paired channels** Selecting Vortac or ILS frequency automatically also selects a DME.

**PAK** Anti-armour cannon (G).

**PAK-FA** Future air complex for tactical aviation, loosely = next-generation fighter (R).

**PAL** 1 Passive augmenting (or augmentation) lens, eg Luneberg. 2 Standard German TV/video system; from phase alternation, or alternating, line. 3 Permissive action link. 4 Portable airfield lighting; S adds set. 5 Programmable array logic. 6 Propulsor d’appoint liquide (F).

**PAKPA** Preprocessor assignment logic. 7 Peripheral station. 8 Protuberance air load.

**PALC** Point Arguello Launch Complex.

**Palea** Philippine Airlines Employees Association.

**PALF** Paritally aloft (precipitation not reaching ground).

**palsar** Large hinged flight-deck barrier (RN carriers 1919–32).

**palladium** Pd, silvery malleable metal, density 12.0, MPt 1,552°C.

**pallet** 1 Standard platform for air freight, eg (Imperial measures are still used) 88 in × 125 in, 88 in × 108 in and 96 in × 125 in. 2 Flat base, not necessarily of above dimensions, for combining stores or carrying single item to form unit load, in some cases retained as temporary or permanent base in operation. 3 Standard-dimension base on which can be assembled experiments, ancillaries and other payloads, eg for Spacelab. 4 Standard-dimension base carrying work-pieces in mechanized and automated manufacturing. 5 Configured (shape-matching) payload carrier for attachment close against airframe exterior, eg fuel * (FAST Pack).

**palletnet** Webbing or rope net for restraining a pallet or igloo.

**pallette** Subsystems.

**palletized bladder** Flexible container for liquid mounted on pallet (1) for airfreighting.

**pallettrolley** Pallet (2) with wheels for ground transport, eg for Sea Skua missile.

**Palma** Protection of aircraft against man-portable air defence systems.

**Palmachin** On coast south of Tel Aviv, base for space-flight, IRBM, ABM (Israel).

**Palmer scan** Radar scanning technique in which conical scan is superimposed on some other, eg Palmer-sector (beam oscillates to and fro over azimuth sector while continuously making small-angle conical scan), Palmer-raster, Palmer-circular etc.

**palm tree** Upward bomb burst (formation aerobatics).

**Palnut** Thin nut, usually pressed steel, screwed tightly above ordinary nut to prevent loosening of latter.

**PALS, Pals** 1 Precision approach and landing system. 2 Precision approach lighting[ing] system; -1 adds with sequenced approach Cat 1; -2 adds with red barrettes and sequenced flashing lights in ILS Cat 2 configuration. 3 Portable airfield light set (USAF). 4 Positioning and locating system. 5 Performance-based agile logistics support.

**palsar** Phased-array L-band SAR.
PAM, p.a.m.

PAM, p.a.m. 1 Pulse-amplitude modulation; also, confusingly, phase-amplitude modulation.
  2 Payload assist module.
  3 Picture assembly multiplexer.
  4 Plasma-arc machining.
  5 Precision attack missile.
  6 Peripheral adapter module.
  7 Portable automated mesonets (weather).

PAMA Professional Aviation Maintenance (formerly Mechanics) Association (office, St Ann, MO) (US).

PAMC Provisional acceptable means of compliance (ICAO).

Pamela 1 Process abstraction method for embedded large applications.
  2 Process for advanced management of end-of-life aircraft (Airbus).

Pan 1 Passive airborne modular IR.
  2 Phased-array multifunction imaging radar.

Panam Stormy line squalls (Argentina, Uruguay).

Panir Public-access mobile radio.

PAMS Point anti-missile system.

Pan 1 Polyyacrilonitrile, precursor of carbon fibre in most processes.
  2 Originating station has urgent message to transmit concerning safety of vehicle or occupant(s) (DoD); see Pan...
  3 Porte avions nucléaires (F).

Pan Radio code indicating uncertainty or alert, general broadcast to widest area but not yet at level of Mayday.

Pan 1 Base of seat tailored to pilot with seat-type pack.
  2 Paved dispersal point for single aircraft.
  3 Carrier for air-drop parachuted load.
  4 Drum-type magazine for automatic weapon [vertical axis] (chiefly WWJ).

Pancake 1 Vague term supposedly indicating landing at abnormally low forward speed and high sink rate (arch.).
  2 Air-intercept code: “I wish to land”, usually followed by word giving reason, eg * fuel (DoD).
  3 Verb, to land (arch.).
  4 Flat-topped fuselage regarded as a lifting surface.

Pan cam Panoramic camera (planetary lander).

P&EA Priorities and allocations.

Panda Personnel and administration.

P&ES Personnel and equipment supply.

P&F Particles and fields.

P&I Paint and interior.

P&O Plant and operations.

P&P 1 Plans and programs (DoD).
  2 Payments and progress (NATO).

P&SS Provost and Security Service (RAF).

P&T Priorities and traffic.

P&TC Personnel and Training Command (RAF).

Panel 1 Single piece of aircraft skin, eg fuselage *.
  2 Major section of wing as finished component, eg outer *.
  3 Essentially planar base carrying instruments.
  4 Complete portion of stressed-skin structure, sandwich or, rarely, other constructional form, used for fatigue or static test purposes; not necessarily portion of actual aircraft.
  5 Subdivision of parachute canopy, or aerostat gasbag, either complete gore or portion thereof.
  6 Body of experts, eg examining *.
  7 Marking panel.

PAPS, Paps

Panel code Standard code for visual ground/air communication (IADB).

Panel elements Items mounted on panel (3) such as instruments, switches and displays.

Panel fill factor The percentage of the complete instrument panel facing the pilot that is occupied by multifunction displays.

Panelled Equipped with instruments and avionics, thus well * (colloq.).

Pan-handle Aircraft dispersal of frying-pan shape.

Pan-handle Ejection-seat firing handle on seat pan.

Pan-head screw One having thin, large head with slightly convex upper surface.

Panic button Gives emergency recovery to unaccelerated horizontal flight with wings level (USAF).

PANNI Psychological assessment of noise and number indicator (see noise).

Panier 1 Small 1-, 2- or 4-tube rocket launcher added to CBLS or other stores carrier.
  2 Common meaning, removable container for cargo of any kind.

Panoramic camera One which by means of system of oscillating or rotating optics or mirrors scans wide strip of terrain usually from horizon to horizon. Mounted vertically or obliquely to scan across or along line of flight.

PANS, Pans Procedures for Air-Navigation Services; /OPS adds aircraft operations, /RAC adds radio com. procedures.

PANS-ABS PANS abbreviations and codes.

Pantera Precision attack navigation and targeting with extended range acquisition.

Panting In/out springy movement of thin skin under compressive stress; generally similar to oil-can effect.

Pantobase Landing gear designed for land, water, snow and possibly other surfaces.

Pantry Aircraft kitchen without provision for heating prepacked meals.

Pants Fixed fairing over landing gear leg and, esp., wheels; generally similar to spats but chiefly US usage.

Pants duct Large-diameter Y-piece forming junction or bifurcation in duct system.

PANYNJ Port Authority of New York and New Jersey.

PAO Poly-alpha olefin.

PAP 1 Precision approach path.
  2 Plug and play (transport a/c fuselage).

PAPI Precision approach path indicator.

PAPM, p.a.p.m. Pulse amplitude and phase modification; narrows signal bandwidth to quadruple carrying capacity per channel.

Paprica Passenger relief in co-operation with airlines.

PAPS, Paps 1 Periodic armaments planning system (NATO).
  2 Phased armaments programme systems.
PAR

1 Precision-aiddrop planning software, or system (USAF).

PAR  Precision approach radar, [strictly, should be PA(R)].

2 Progressive aircraft rework (USAF, USN).

3 Phased-array radar, ie electronically steered instead of mechanically scanned.

4 Rectangular-acquisition radar (ABM).

5 Pulse-acquisition radar (SAM).

6 Program(me) appraisal and review.

7 Preferential, or preferred, arrival route.

8 Power analyser and recorder.

9 Parachute/airbag recovery.

10 Parallel.

11 Physiological ageing rating.

12 Performance and reliability.

13 Private pilot, airplane, recreational.

Par Precision aircraft reference (Lear-Siegler twin-gyro platform).

Para  Parachute.

2 Paragraph.

Parabola Conic section made by cutting right circular cone parallel to any of its elements; locus of point which moves so that distance from line (directrix) equals distance from point (focus), so eccentricity = 1.

Parabolic aerial One whose reflecting surface forms portion of parabola, thus converting plane waves into spherical waves or vice versa, and either emitting pencil beam from point feeder or focusing incoming radiation to single-point receiver. Also called parabolic antenna/mirror/reflector.

Parabolic trajectory As eccentricity is unity it represents least eccentricity for escape from attracting body.

Paraboloid Shape in 3-D formed by rotating parabola about major axis.

Parabrake Braking parachute.

Parachute/airbag recovery Precision aircraft reference (Lear-Siegler twin-gyro platform).

Parachute Any device comprising flexible drag or drag + lift surface from which load is suspended by shroud lines. Originally canopy was umbrella-shaped but today may be of Rogallo or other semi-winged types offering precision control of landing within large area. Distinction between * and hang glider is blurred, but chief features distinguishing * are rapid deployment from packed condition and suspension of load well below canopy.

2 Verb, to use (1).

3 Verb, to deploy an aerodynamic-drag system (UAV).

4 See braking *.

Parachute deployment height Height AGL at which canopy is fully deployed.

Parachute flare Illuminating flare equipped with parachute to prolong descent.

Parachute gore See gore.

Parachute harness That to which personal parachute is attached.

Parachute pack Bag containing packed parachute.

Parachute signal light Usually comprises two lights, one green, one red, to indicate when parachutists should start leaving aircraft.

Parachute tower 1 Tower or mast from which parachute descents are made for sport or instruction.

2 High-ceiling part of parachute section of airbase wherein parachutes are hung to dry after use.

Parallel heading square Training manoeuvre in which helicopter is flown at low level around a square, each of the four legs being flown with helicopter aligned with that side of square.
parallel ILS

Parallel ILS Serving parallel runways, with minimum lateral separation of 1,500 m, 5,000 ft.

Parallel-line design Aircraft whose wing LE/TE, tips and sharp edges are all parallel. This concentrates radar signature into very narrow beams, easily missed by enemy. B-2 is example.

Parallel offset Airway R-Nav route running alongside designated airway.

Parallel of origin Parallel of latitude used as an origin (2).

Parallel redundancy Addition of channels in parallel (3) mode purely to increase redundancy (1).

Parallel resonant circuit Tuned circuit with inductive and capacitive elements in parallel (3).

Parallel runways Runways at same airport on same alignment and with sufficient lateral separation to permit simultaneous use, including parallel ILS approaches. Designators have suffix L or R [left or right] thus 28L is south of 28R.

Parallel servo One located in control system so that servo output drives in parallel with major input; usually arranged to drive both cockpit controls and flight-control system and thus performing as alternative to pilot.

Parallel warfare Use of a sensor network and EBO to render an enemy helpless (USAF).

Parallel yaw damper One connected direct into pilot/rudder control loop and, in some cases, resulting in movement of cockpit pedals. Normally superseded by series damper.

Paramagnetic Possessing magnetic permeability above 1 and permanent magnetic moment; atoms tend to align in direction of external field giving resultant magnetic moment and tend to move to strongest part of field.

Paramatta Code for RAF WW2 blind target-marking by PFF using precision-aimed TIs of sophisticated types repeated at intervals; usual form with electronic aids called Musical *.

Parameter Basic definable characteristic or quality, esp. one that can be expressed numerically; specialized meanings in maths, EDP (1) and statistics.

Parametric amplifier Reactance amplifier dependent on time-varying reactance (fed by signal and a pump source) forming part of tuned circuit; variable-capacitance usually Varactor or crystal diode. Also called Mavar (mixed amplification by variable reactance).

Parametric study Study based on numerical values of system variables.

Parametric take-off number Product of (landing wing loading × 1.11) × (MTOW ÷ [total installed thrust × CL2]).

Paramotor Aircraft, invariably aeroplane, which for portion of flight relies on another for propulsion and possibly also for lift. Can ride on back of parent, or be attached elsewhere externally or internally, or be towed.

Parasite Aircraft, invariably aeroplane, which for portion of flight relies on another for propulsion and possibly also for lift. Can ride on back of parent, or be attached elsewhere externally or internally, or be towed.

Parasite drag Sum of all drag components from all non-lifting parts of body, usually defined as total drag minus induced drag. Not normally used (see profile drag).

Paramagnetic element Resonant element of directional aerial excited to produce directional pattern; eg reflector added to Yagi aerial.

Paramagnetic material RAM added [usually by adhesive] to exterior skin to reduce RCS.

Paramagnetic oscillation Generated by stray inductances and capacitances and eliminated by paramagnetic stopper.

Paramount Technique of using parasite.

Paraski Sport combining downhill ski with lifting surface such as parachute, paraglider or hang glider; competitions test landing precision.

Parkaswing One from which rest of aircraft is suspended by ties; hence, parasol monoplane.

Park Aviation Variation of basic Rogallo flexible wing developed at NASA Langley for payload recovery and marketed by Northrop; not current term in hang gliding.

PARC Particle-Astronomy Research Council (UK).

Parallel Pacific Alaska range complex (USAF).

Parcel Any small volume of gas, esp. of atmosphere.

Pares Perimeter acquisition radar characterization system.

Pardop Passive ranging Doppler.

Parent Main aircraft in composite or carrier of parasite.

Parent 1 Aircraft carrying one or more RPVs over which it exercises control following release.

Parent body Primary around which satellite orbits.

PARES Passive-radar ESM system.

Parity 1 Symmetric property of wave function or other phenomenon; value is 1 if function is unchanged by inversion of its co-ordinate system.

2 Precise keying of two or more sets of data [eg EDP (1) software, tapes, reconnaissance pictures or wire recordings] so that they run to common time-base. System parities are assigned individual tracks in such devices as reconnaissance signal recorders.

Park To establish synchronous satellite at its operating position, where it is parked.

Parking brake That applied continuously after aircraft is parked, to prevent subsequent rolling; also (US) called park brake.

Parking catch Fitted to normal handbrake (rarely, toe brake) to convert to parking brake.

Parking orbit Temporary spacecraft orbit for such
purposes as waiting for correct timing or for delivery of components, spacecraft or station assembly, or rectification of fault.

**PARL**Parallel.

Parm, PARM 1 Persistent anti-radiation missile.
2 Pressure acquisition runway monitor, = PRM (2).

Parma Progressive aircraft rework modification (USAF, USN).

Paros Prevention of an armed [or arms] race in outer space.

parrot Code for IFF transponder (DoD).

PARS, Pars 1 Programmed airline reservation system.
2 Primary attitude-reference system.

parsec Unit of length on cosmological scale equal to distance at which object has heliocentric parallax of 1" (one second of arc) = 206,265 times semi-major axis of Earth’s orbit = 3.26 light-years = 3.0857 × 10^16 m, abbr. pc.

parrot Code for IFF transponder (DoD).

Pars 1 Programmed airline reservation system.
2 Primary attitude-reference system.

**pass**One in which working fluid enters around only part of periphery.

partially evaporative cooling Piston-engine circuit in which coolant is briefly allowed to boil.

partial priority That exerted by each gas in gaseous mixture; Dalton's law states value is same as if that gas occupied whole volume occupied by mixture at same temperature.

partial-pressure suit Skin-tight suit covering body except head, hands and feet and inflatable (usually by stitched-in tubing) to press on wearer and oppose internal pressures.

partial pressure That exerted by each gas in gaseous mixture; Dalton's law states value is same as if that gas occupied whole volume occupied by mixture at same temperature.

partial-pressure suit Skin-tight suit covering body except head, hands and feet and inflatable (usually by stitched-in tubing) to press on wearer and oppose internal pressures.

partial shielding Protection against micrometeorites incident from one direction only.

2 Radiation shielding of crew of nuclear-propelled aircraft whilst leaving radiation free to escape in other directions.

particle separator Device for cleaning solid (and possibly-liquid) particles from air entering engine or other device, typically by centrifuging effect in vortex.

particle static Radio-communication static, thought to be due to accumulation or shedding of particulate matter in flight (not defined and suggested arch.).

parting out Procedure for dismantling aircraft to yield certifiable parts.

Partner Partnership for air transportation noise and emission reduction (FAA).

Part-Publication Category of military aircraft whose characteristics could be openly published except for such items as performance, fuel capacity and other sensitive details (UK).

parts crew Scrapyard team which removes items capable of being reconditioned for further use.

part-span shroud Snubber [clapper] near mid-length of fan [rarely, compressor] blade; abuts on neighbours to damp out flutter or other vibration.

part-span stall 1 In an axial compressor, a stall affecting only the outer portions of the fixed and rotating blades, usually at several places simultaneously and with rapid irregular rotation within the casing.
2 Self-explanatory, a stall affecting only part of an aircraft wing, usually at the root or tip.

part surface Surface being cut in GPP.

part-throttle reheat Augmentation of engine by afterburner brought in at less than maximum cold thrust, giving smoothly increased thrust and avoiding sudden augmentation by selecting afterburner at maximum rpm. Afterburner stays lit as throttle is closed, extinguished only at low fuel flow at low thrust level.

Parylene Conformal (vapour-deposited) barrier coating used to protect precision parts, especially electronics, from hostile environments (Union Carbide).

PAS 1 Performance advisory system (Simmonds subsystem offering minimum fuel and maximum propulsion efficiency).
2 Public-, or passenger-, address system.
3 Power available, shaft (UK, CAA = spindle).
4 Polycarbonate sulphide.
5 Projector approach sight.
6 Paralkatone adhesive sealant [I adds inhibiting, TP temperature protection].
7 Police Air Support (UK).
8 Prime and suppliers.
9 Perch and stare (UAV).
10 Primary alerting system.
11 Pulse-analysis system.
12 Precision-aircraft system(s).
13 Precision-attack system(s).

PAS-2 A pioneer PAS (4) processed at relatively low temperatures for advanced airframes (Phillips Petroleum).

**Pass** Podded advanced synthetic-aperture radar; S adds system.

PASC Pacific Area Standards Congress.

Pascal Software language, becoming disused.

pascal SI unit of pressure, Pa = N/m² = 0.002088 lb/ft², 0.000145038 lb/in². As it is such a small unit kPa or MPa are more common.

Pascal's law In fluid at rest, all pressures acting on given point are equal in magnitude in each direction (neglects acceleration due to gravity).

PASD Pulsed arrested spark discharge.

PASE Planning assumption for service entry [a future date].

PASI Pre-application statement of intent.

Paso, PASO Pacific Aviation Safety Office, a Coscap group including Australia but [2005–] not NZ (ICAO).

Paspo Precision-attack systems program office.

Pass, PASS 1 Parked-aircraft security system.
2 Passive and active sensor subsystem.
3 Passive aircraft surveillance system.
4 Primary avionics subsystem.
5 Pylon-accommodated self-protection suite, or system.
6 Personnel-access security system.
8 Production and service support.

pass 7 Single run by aircraft past point on ground or other object such as aircraft in flight on same heading at markedly lower speed.
passenger
2 Short tactical run or dive by aircraft at target; single sweep through or within firing range of enemy air formation (DoD, IADB).
3 Single orbit by satellite, starting at point Equator is crossed northbound.
4 Single passage by satellite overhead.
5 Single period of time during which satellite is within radio contact of control or data-acquisition station.
passenger In addition to basic meaning of humans carried in vehicle other than vehicle’s crew; normal meaning in air-carrier terminology is FFP (fare-paying *), normally, excluding company employees on cheap rate. Latter, however, are normally included in traffic statistics.
passenger loading bridge Covered walkway linking terminal and parked aircraft; see bridge.
passenger profile Distribution of pax at one airport through 24-h period.
passenger service charge Fee levied by airport authority on each departure passenger to help cover its costs.
passenger service unit Hand-held audio-visual interface with cabin lightup, temperature, outside camera(s), communication and entertainment.
passenger terminal Covered walkway linking terminal and parked aircraft; see bridge.
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passenger service charge Fee levied by airport authority on each departure passenger to help cover its costs.
passenger service unit Hand-held audio-visual interface with cabin lightup, temperature, outside camera(s), communication and entertainment.
passive 1 Receiving but not emitting.
2 System, eg PFCS, which can only fail open.
3 Includes such activities as cover and concealment, camouflage, deception, dispersion and shelter.
passive attack weapon Precision dart[s] designed to destroy CBW containers [usually without explosive charge, which would scatter contents].
passive countermeasures Detection and analysis of hostile emissions (see ECM).
passive guidance Use of received signals from whatever source in order to navigate.
passive homing Tending to fly towards source of emission from target, usually IR.
passive jamming Use of chaff and confusion reflectors.
passive landing gear One utilizing optimised self-adaptive damping devices.
passive missile One equipped with guidance able to home on emissions generated by the target.
passive mode Use of airborne radar in receive-only mode, eg AWACS.
passive munition 1 Delivered safe and then triggered either by timing system or radio signal.
2 Inert until disturbed, eg mine.
passive paralleling Simplest and most common type of redundancy wherein two parallel functional devices are utilized such that, if one fails, second is still available. Limited to simple elements of control system which can only fail passive, such as springs and linkages. When failure of one element occurs, there is an acceptable change in performance or capability.
passive pilot One who, on long-haul, is relaxing or taking a nap.
pathfinders
passive radar Misnomer; normally interpreted as passive mode.
passive ranging Trajectory-measuring systems that do not require a transmitter or transponder in vehicle, eg Pardop. See next.
passive ranging subsystem Doppler plus phase rate of change to give direction and range.
passive sonar Listens for emissions from submarine.
passive thermal control Changing attitude of spacecraft to even-out incident solar flux, esp. by roll through 180°, so-called barbecue manoeuvre.
past off To test and clear development or production item.
pass-off testing The test of each assembled production item.
PAT 1 Process action team (AFLC).
2 Pilot access, or applications, terminal.
3 Private pilot, airplane, recreational, transition.
4 Pulse active thermography.
5 Pop-up [satellite] archival tag.
PATA 1 Polish air-traffic agency.
2 Pacific Asia Travel Association (Int.).
PATC Professional, administrative, technical and clerical.
Patca Plurilateral agreement on trade in civil aircraft.
Patch Precision approach to coupled hover.
patch 1 Strong fabric attachment cemented to aerostat envelope (see ETA, channel *, split *, rigging *).
2 Embroidered or printed badge worn on working (especially flying) clothing.
3 Area of ground illuminated by airborne radar.
patching Ceremonial admission to exclusive group, such as Thunderbirds (USAF).
Patec Portable automatic test equipment calibrator.
path 1 Track of aircraft under control of TMA.
2 Projection on Earth’s surface of satellite orbital plane; same as track.
3 Loosely, aircraft trajectory in 3-D.
pathfinder 1 Software with immense capacity to extract intelligence from vast amounts of data.
2 Passive thermal Flir for navigation, detection and enhanced resolution.
pathfinder aircraft One with special crew plus drop-zone/landing-zone marking teams, markers and/or electronic nav aids to prepare DZ/LZ for main force (NATO).
pathfinder drop-zone control Communication and operation centre from which pathfinders exercise guidance (DoD, LADB).
Pathfinder Force Elite sub-force within RAF Bomber Command 1943–45 charged with marking targets for main-force attack. Abb. PFF. Pathfinder Association supports needy survivors.
pathfinders Four meanings, all defined as plural:
1 Experienced aircrew who lead formation to DZ, RP or target.
2 Teams dropped or air-landed at objective to operate nav aids.
3 Radar or other nav aid used to facilitate homing on objective, esp. in bad visibility.
4 Teams air-delivered into enemy territory to determine...
path-stretching

best approach/withdrawal lanes, LZs and sites for heliborne forces (all DoD, LADB).

path-stretching Deliberately routing incoming traffic over longer path (1) to achieve correct spacing on approach.

Patio Platform for ATM (7) tools integration up to pre-operation (Europe).

PATN See Pro-ATN.

PATP Packed Aircraft Transit Pool (RAF).

Patrick AFB USAF base at Cape Canaveral supporting AMR.

Patriot Provide appropriate tools required to intercept and obstruct terrorism (US).

2 Phased-array tracking to intercept of target.

patrol Flight by one or more military or quasi-military (e.g. customs) aircraft over prescribed area. Defensive * no longer required in airspace with radar surveillance. Offensive * actively seeks hostile aircraft. Standing * is mounted at same time each day.

patrol aircraft Generally accepted term for aircraft engaged in offshore duties such as search/rescue, customs/immigration and enforcement of marine laws.

2 US designation for large ocean combat aircraft engaged in ASW, maritime reconnaissance and mining.

PAT, Paths (1) Precision automated tracking station.

3 Primary aircraft training system.

4 Precision-attack targeting system.

pattern Flying instructor’s well-rehearsed flow of verbal instructions and comments.

pattern 7 Replica of part used in constructing casting mould.

2 Radiation of transmitting aerial as plotted on diagram of field strength for each bearing.

3 Circuit (1) (US).

4 Shape traced out on ground by track of aircraft, esp. in circuit, making procedure turns, in holding stack or other circumstance demanding accurate geometry.

5 Authorized flightpath (1) to point of touch-down.

pattern aircraft One supplied to participant in program for avionics and weapon systems.

2 Prototype automatic target scanner.

3 Primary aircraft training system.

4 Precision-attack targeting system.

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4 Precision-attack targeting system.

pattern bikini Pattern generator Signal generator whose output provides VT-type pattern for testing TV, video, EO or visual-display systems.

PATTS Programmed auto trim/test system.

PAT3 Parallel advanced tactical targeting technology.

PATU Pan-African Telecommunications Union.

Patuxent River US Naval Air Test Center.

PATWAS, Patwas Pilots’ automatic telephone weather answering service (FSS, US).

PAU Passenger-address unit.

PAUC Program-acquisition unit cost.

PAV Power assurance valve (CAA).

2 Prototype air vehicle.

Pave With this prefix the USAF designated numerous tactical electronic systems.

pavement Airfield paved area, including runways, taxiways, aprons and possibly dispersals.

pavement condition index A subjective scale based on heave, cracking and surface spalling.

PBAN

P avg Average power of pulsed-radar signal.

PAW Plasma-arc welding.

PAWES Performance assessment and workload evaluation system.

Paws Phased-array warning system.

Paw Passive attack weapon.

PBAN Polybutadiene acrylic acid (solid rocket propellant).

PBA Polybutadiene acrylonitrile (solid rocket propellant).
PBATS

PBATS Portable battlefield attack system, all-weather all-aspect SAM.

PBB Passenger boarding bridge, see bridge.

PBC Practice bomb carrier, or container.

PBCPI Permanent bar-code parts identification.

PBCT Proposed boundary crossing time.

PBD Program budget decision, or document (US DoD).

PB/D Place, bearing and distance (waypoint).

PBDI Position, bearing and distance indicator.

PBE Protective, or passenger, breathing equipment (smokehood).

PBF Personnel (occasionally pilot) briefing facility.

PBG Private pilot, free balloon, gas.

PBH Private pilot, free balloon, hot air.

PBI Polybenzimidazole, fire-blocking chemical incorporated into felts and other fabrics (Celanese).

PB/BD Post-burn-in data.

PBIL Predicted, or projected, bomb-impact line.

PBJ Partial-band jammer.

PBL Probable.

PB/L Performance-based logistics.

PBM Pulse-bias modulation.

PBMS Propeller balance monitoring system.

PBPO Performance-based organization.

PhO Lead oxide.


PBPS Post boost propulsion system.

PBS Prefabricated bituminous surface.

PBT Polymer-based thermosetting.

PBOA Lead sulphide.

PBSI Pushbutton selector/indicator.

PhSi Lead silicide.

Ph Sn Te Lead tin telluride.

PBT Polymer-based thermosetting.

PBVS Post boost vehicle.

PBB Particle-beam [or plasma-based] weapon.

PC Power by wire.

PCX Atmospheric pressure (USSR, R).

PC/ Y Family of special explosives used to trigger NW devices; PBX-9505 is related to, and used with, Cyclotrol; PBX-9404 is still in general use; PBX-9502 is IHE.

PB Private branch exchange.

PC Production, or positive, control.

PC/ C Printed circuit.

PC/ D Physical conditioning.

PC/ E Permanent Commission (RAF).

PC/ F Pulse compression.

PC/ G Personal computer [now the most common meaning].

PC/ H Pilot, or production, certificate.

PC/ I Pilotage chart.

PC/ J 9 Programmable controller.

PC/ K 10 Power converter.

PC/ L 1 Potential conflict.

PC/ M 12 Plug-in card.

PC/ N 13 Pressure capsule.

PC/ O 14 Polynomial chaos.

PC/ P 1 Chamber pressure (any rocket).

PC/ Q 2 Polar continental, or Canadian, air mass.

PC/ R 3 Cumulative probability of detection (radar).

PC/ S 1 Burn-time or action-time average chamber pressure.

PC/ T 2 Capsule pressure.

PC/ U Load on a compression member.

PC/ V Parsec[s].

PC/ W Personal-computer aviation-training device[s].

PC/ X Printed-circuit board.

PC/ Y Plenum-chamber burning.

PC/ Z Polyvinylchlorinated biphenyl(s).

PC/ A Pilot control bay (UAV-GCS).

PC/ B Publications Clearance Branch (UK MoD).

PC/ C Provisional combat bomb wing (USAAF).

PC/ D Parts-consumption cost.

PC/ E Pin-cushion correction.

PC/ F Polycarbonate.

PC/ G Powered flight control systems.

PC/ H Pre-conditioned air.

PC/ I Propulsion-controlled airplane (no aerodynamic controls).

PC/ J Presidency of Civil Aviation (Saudi Arabia).

PC/ K Polychlorinated biphenyl(s).

PC/ L Pilot and sensor (fire control system).

PC/ M Plenum-chamber burning.

PC/ N Photovoltaic concentrator array.

PC/ O Polychlorinated biphenyls.

PC/ P Power converter.

PC/ Q Process-change design notice.

PC/ R Power converter.

PC/ S Powered flight control systems.

PC/ T Precipitation.

PC/ U Plenum-chamber burning.

PC/ V Polar continental, or Canadian, air mass.

PC/ W Positive-controlled airspace, or area.

PC/ X Photovoltaic concentrator array.

PC/ Y Test facility (aircraft).

PC/ Z Propulsion-controlled airplane (no aerodynamic controls).

PC/ A Presentation control information.

PC/ B Pressure converter.

PC/ C Proving ground.

PC/ D Polychlorinated biphenyls.

PC/ E Pressure capsule.

PC/ F Provenance.

PC/ G Power converter.

PC/ H Potential conflict.

PC/ I Proving ground.

PC/ J Precision forward attack system.

PC/ K Pressure capsule.

PC/ L Pressure capsule.

PC/ M Pressure capsule.

PC/ N Pressure capsule.

PC/ O Pre-conditioned air.

PC/ P Pressure capsule.

PC/ Q Pressure capsule.

PC/ R Pressure capsule.
pcBIRD

pelBIRD A 6-DOF magnetic tracker with processor card.

PCID Preliminary change in design.

PCIDM Personal control, or plug-in card, improved data modem.

PCIG Personal computer image generator.

PCIP President’s Critical-Infrastructure Protection Board (US).

PCU 1 Power control lever [not flight controls].

PCU 2 Pilot controlled [cabin] lighting.

PCU 3 Passive coherent location.

PCV Persistent cell [storm stays in same place].

PD A Pulse-code modulation, or modulated.

PDADs Passenger digital-activated display system.

PDAM Probabilistic data association filtering.

PDAR Preference departure and arrival route.

PDAT Portable data access terminal.

PDF F Performance data-base.

PDFN Personal-computer memory-card interface association.

PDFS Performance command system.

PCD Max Fillet radius.

PCO 1 Photochemical oxidant, = smog.

PCO 2 Procuring (or procurement) contracting officer (DoD).

PCOA Phase-control-only array.

PCP 1 Platoon command post (SAM).

PCP 2 Program change proposal.

PCPN Precipitation amount.

PCPSC Precipitation.

PCPSCB Precipitation in single look or sweep (radar).

PCPSCB 1 Probability of detection in single look or sweep [radar].

PCPSCB 2 Dynamic pressure.

PCPSCB 3 Potential difference.

PCPSCB 4 Post-deflection modulation.

PCPSCB 5 Photon detector assembly (space telescope).

PCPSCB 6 Problem detection audit.

PCPSCB 7 Personal digital assistant.

PCPSCB 8 Premature-descent alert.

PCPSCB 9 Power-distribution assembly.

PCPSCB 10 Programme development card; /PMM adds performance-monitor module.

PCPSCB 11 Power distribution centre.

PCPSCB 12 Pre-departure clearance.

PCPSCB 13 Pressure-drop control.

PCPSCB 14 Pressure-drop control governor.

PCPSCB 15 Pressure-drop control orifice.

PCPSCB 16 Performance data-base.

PCPSCB 17 Power distribution system.

PCPSCB 18 Personnel despatch centre.

PCPSCB 19 Public dividend capital.

PCPSCB 20 Programme development card; /PMM adds performance-monitor module.

PCPSCB 21 Power drive electronics.

PCPSCB 22 Power distribution assembly.

PCPSCB 23 Power distribution system.

PCPSCB 24 Personnel despatch centre.

PCPSCB 25 Pressure-drop control.

PCPSCB 26 Power drive electronics.

PCPSCB 27 Pressure-drop control governor.

PCPSCB 28 Pressure-drop control orifice.

PCPSCB 29 Performance-data computer system (Lear-Siegler/Boeing).

PCPSCB 30 Panel data concentration unit.

PCPSCB 31 Pressure drop control valve.

PCPSCB 32 Pre-delivery development.

PCPSCB 33 Package design document.

PCPSCB 34 Product definition data interface.

PCPSCB 35 Pulse detonator, or detonation engine.

PCPSCB 36 Partial differential equation[s].

PCPSCB 37 Power drive electronics.

PCPSCB 38 See PD&E.

PCPSCB 39 Pulse-Doppler elevation scan; PDNES plus electronic scanning in vertical plane to give target height.

PCPSCB 40 Product-data exchange specification.

PCPSCB 41 Passenger per day each way, measure of total flow.

PCPSCB 42 Precise direction finding.

PCPSCB 43 Primary display function.

PCPSCB 44 Paint-definition freeze [last point at which customer can change specification].

PCPSCB 45 Probability density, or distribution, function.

PCPSCB 46 Phase-distortion at first null.
(Continued)

**PDG**

PDG  1 Precision-drop glider.
2 Président directeur-général (F).
3 Programmable display generator.
4 Pilot’s display group.

**PDI**

PDI  1 Powered descent insertion.
2 Primary direction indicator.

**PDID**

PDID  Pulse-doppler identification.

**PDM**

PDM  1 Pulse-duration modulation.
2 Primary development model.
3 Programmed depot maintenance.
4 Presidential decision memorandum.
5 Product-data management.
6 Pilot decision-making.
7 Propulsion deobstr module.

**PDME**

PDME  Precision DME.

**PDMM**

PDMM  Pulse-Doppler map matching.

**PDMS**

PDMS  Point-defense missile system.

**PDN**

PDN  1 Public data network.
2 Pulse-Doppler navigation.

**PDNE**

PDNE  Pulse-Doppler non-elevation scan; surveil-
lance down to surface, without indication of target height.

**PDO**

PDO  Pendulum dynamic observer.

**PDOP**

PDOP  1 Phase degradation of performance.
2 Position dilution of precision (GPS).

**PDOS**

PDOS  Powered-door operating [or opening] system.

**PDP**

PDP  1 Program(me) decision package.
2 Plasma, or performance, display panel.
3 Portable data processor [S adds system].
4 Project definition phase.
5 Polar-diagram plotter.
6 Photo-data quantiser (or quantifier).
7 Pre-defined qualities.

**PDR**

PDR  1 Preliminary design review.
2 Pulse-Doppler radar.
3 Pilot’s display recorder (Ferranti).
4 Predetermined routing.
5 Primary defect rate.
6 Preferential departure route.
7 Programmable digital radio.
8 Pressure-drop regulator.
9 Program-development review.

**PDRC**

PDRC  Pressure-drop ratio control.

**PDRC**

PDRC  Pulse-Doppler radar jammer.

**PDRR**

PDRR  Product-program/project definition and risk re-
duction.

**PDS**

PDS  1 Passive detection system.
2 Prestocked dispersal site.
3 Pulse-Doppler search mode.
4 Passenger distribution system.
5 Post-design services(s), or support.
6 Primary display system.
7 Project definition study.
8 Portable data store.

**PDSTT**

PDSTT  Pulse-Doppler single-target track mode.

**PDT**

PDT  1 Pyrotechnic door [or deployment] thruster.
2 Pacific Daylight Time (US).
3 Pliable display technology.

**PDU**

PDU  1 Pilot’s display unit.
2 Power drive, or distribution, unit.
3 Pneumatic drive unit.
4 Protocol data unit.

**PDV**

PDV  1 Pressurizing and dump valve.

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**Pecenometers**

2 Parachute-delivered, or-deployed, vehicle, for MOP(5).
3 Pressure-drop valve.

**PDVOR**

PDVOR  Precision DVOR.

**PDW**

PDW  1 Pulse-detonation wave [rocket] or ramjet.
2 Priority delayed weather.

**PDWC**

PDWC  Post-departure weather change.

**PDWE**

PDWE  Pulse-detonation wave engine.

**PDZ**

PDZ  Parachute dropping zone.

**PDZC**

PDZC  Pathfinder drop-zone control.

**PE**

PE  1 Procurement Executive [MoD, Abbey Wood,
Bristol BS12 7DU] (UK).
2 Position error, also p.e.
3 Pilot error.
4 Piston engine.
5 Program, or processing, element (DoD).
6 Professional engineer (US).
7 Permanent echo.
8 Ice pellets.
9 Pre-emptive.
10 Precision engagement.
11 Polyethylene.
12 Passive element [warning system].

**P_e**

P_e  Pressure in core-engine jetpipe.

**Pe**

Pe  See Péclet number.

**P_e**

P_e  Total installed power of shaft-drive engine(s).

**PEAD**

PEAD  PE(10) assessment definition.

**peak**

peak  1 In production programme, time or rate of
maximum output.
2 In aerospace vehicle, highest points in sine-wave
flight, typically 200,000 ft.

**peaking circuit**

peaking circuit  Extends frequency response of video
amplifier at highest frequencies.

**peak suction**

peak suction  Lowest pressure on upper surface of wing
or on 2-D aerofoil profile; rarely, lowest pressure on other
convex surface of aerodynamic body.

**peak/trough ratio**

peak/trough ratio  Peak (usually summer) traffic rate
divided by lowest (usually winter) traffic rate.

**peaky**

peaky  Aerofoil section (profile) of traditional type
causing large acceleration of flow over leading edge and
hence very low pressure (large peak suction) over narrow
strip at 8–15% chord; opposite to supercritical or roof-
top.

**PEAT**

PEAT  Procedural event analysis tool.

**PEC**

PEC  1 Personal equipment connector.
2 Pressure, or position, error correction.
3 Pulsed eddy current.
4 Precision-engagement capability.

**PECHS**

PECHS  Percussion/electric conversion hardware
system [ammunition].

**pecked line**

pecked line  Broken or dashed line in graphics or
artwork.

**pecking**

pecking  Touching ground with propeller tips, esp. on
takeoff.

**Péclet number**

Péclet number  \[ \text{Pe} = \frac{Vl}{\lambda} \]

where \( V \) is fluid flow velocity,
\( l \) a length and \( \lambda \) thermal conductivity; applies in heat
transfer at low airspeeds.

**PECM**

PECM  1 Passive electronic countermeasures.
2 Pulsed electro-chemical machining.

**PECO**

PECO  Primary entry control point, to hostile airspace.

**Pectenometers**

Pectenometers  Class of aerodynes weighing 66.5g, 0.23
oz, which fly like, e.g., butterflies, by clapping aerofoils
together, ejecting air rearwards. On separation, air is
sucked in from the front (NRL).
PED

PED 1 Program(mme) element description.
2 Post-exit deflector.
3 Passenger [or portable, or personal] electronic device(s).

pedal turn  Changing heading (azimuth) of hovering helicopter or Stovil using pedals only.

pedestal 1 Raised box between pilots on flight deck carrying numerous control and system interfaces.
2 Pillar supporting aircraft on ski (and, it is suggested, float).

Pedola Portable electronic device(s) on board aircraft.

PEDS Portal explosive detection system.

PEE Photoelectron emission.

PEEK Polyetheretherketone.

peeoff  To roll away from straight-and-level flight, esp. from a formation, and dive away; normally manoeuvre performed in sequence by all aircraft of formation.

peon 1 To cold-work metal surface by repeated light blows of ball-pane hammer [peen forming] or bombardment with hard balls [shot peening].
2 To deform metal part by series of hammer blows, eg to set rivet or burr end of bolt to prevent loss of nut.

PEFT Performance evaluation flight test.

PEG Polyethylene glycol.

Pegasus Precision and extended-glide airdrop system (USA).

PEI 1 Polyetherimide, important family of resins.
2 Professional engineering institutions.

PEL 1 Personnel licensing.
2 Precision elastic-limit.

PELS Personal equipment life-support system.

Peltier effect  Generation of current by making circuit containing two different metals and keeping two junctions at different temperatures; some definitions refer to generation or absorption of heat at junctions upon passage of current.

PELTI Personnel Licensing and Training Panel (ICAO).

PEM 1 Parametric estimation model.
2 Program element monitor (DoD).
3 Plastic-encapsulated microcircuit, hence plural Pems.
4 Proton exchange membrane.

PEMB Procurement Executive Management Board (UK).

PEN Photonic exchange network.

penaids See penetration aids.

penalty Deficiency in one aspect of aircraft design or performance in return for improvement in another; eg adding thermocouple in jetpipe to indicate temperature performance in return for improvement in another; eg

penetrometer Measures ability of airfield surface to support static or moving aircraft.

penguin Helicopter of normal configuration (colloq.).

penetrometer Post-exit deflector.

penetrate Passive enhanced navigation with terrain-referenced avionics: radar altimeter and INS plus 3D terrain model in database (Ferranti).

penetration 1 Flight into hostile, esp. defended, airspace.
2 Ability of sailplane to keep going by trading kinetic energy for distance with minimal loss of height or speed while heading for next thermal.
3 Flight deep into cloud, esp. one with large vertical extent and severe turbulence.

penetration fighter One intended to fly deep into hostile territory (term now rarely used).

penetration aids Devices and systems assisting vehicle to accomplish penetration (1), eg jammers, chaff, flares, decoys and warning systems, low (lo) flight level, reduced RCS and improved vehicle hardness.

penetration area That within which enemy defences are to be neutralized to degree assisting succeeding aircraft to reach targets.

penetration factor Reciprocal of amplification factor of valve.

penetrometer Measureability of airfield surface to support static or moving aircraft.

penney-farthing Helicopter of normal configuration (colloq.).

pentode Thermionic valve having three grids.

penthouse roof Top of cylinder combustion space having sloping sides.

pentode Thermionic valve having three grids.

PEO Program Executive Office, or Office (US).

PEP, p.e.p. 1 Peak envelope power.
2 Pre-engine production.
3 Productivity enhancement programme.
4 Pulse envelope programming.
5 Prespecified ejection point.
6 Pulsed-energy projector.
7 Performance-enhancing proxy [satcom].
8 Confusingly, also means proxy-enhancement protocol or protocol-enhancing proxy.

PEPDC Primary electrical power-distribution centre.
PEPE

PEPE Parallel-element processing ensemble (or element).

PEPP Planetary-entry parachute program (Martin Marietta/NASA).

PEPS, Peps 1 Positive-expulsion propellant system.

2 Pintle escape propulsion system.

PER Performance.

PERA Production Engineering Research Association (Melton Mowbray, UK).

perceived noise level See noise.

perch position In pattern (3) with touchdown point 45° behind.

percussion cap Detonator/igniter for ammunition activated by sudden deformation.

percussion drilling 1 Originally, mechanical drilling hard material by repeated physical impact, plus abrasive.

2 More recently, using a laser fired directly at the workpiece, not [as most commonly] via a 45° mirror.

percussion gun Device for cheaply making loud sounds to scare birds.

perfect fluid Usually implies inviscid and incompressible, as well as homogeneous.

perfect gas One exactly obeying Joule and Boyle laws so that PV = nRT; also obeys Charles, Gay-Lussac and several other laws.

perforated Pierced by holes, in case of aerodynamic surface typically removing 25–30% of projected area; perforation of flap or airbrake can reduce actuation power requirement and increase drag of surface, esp. when at large angle to airflow, but destroys value of flap as lifting surface and thus confined to divebrakes and airbrakes.

performance 1 From operational viewpoint, ability of system to perform, esp. expressed in numerical values.

2 From flight-safety viewpoint, ability of aircraft to perform required functions and manoeuvres, esp. in degraded condition and under adverse circumstances, again expressed numerically. Subdivided into three categories: 1, measured *, that actually recorded for particular aircraft at particular time; 2, gross *, factored from measured to allow for poorest aircraft in fleet, guaranteed-minimum instead of average thrust propulsion and possibly other degrading factors; and 3, net *, factored from gross to allow for further possible temporary variations (airframe damage or icing or certain non-critical fault conditions) and minimum standard of pilot skill and experience.

3 Narrow interpretation of numerical values of aircraft flight limits such as speeds, altitudes and payload/ranges.

performance-command system Microprocessor-based crew advisory system in commercial transports which optimises performance and saves fuel.

performance factors Those deriving from aircraft performance which affect airline traffic achieved, as distinct from commercial and operational factors.

performance groups UK aeroplane categories; those whose first C of A was issued before 1951 are NPG (no performance group); those built since 1951 are Group A, large multi-engined; B, spare; C, light multi-engined; D, single-engined; X, foreign multi-engined imported before particular date.

performance index Non-dimensional comparator for radars, derived from xmt r peak power, prf, beam width, pulse width, antenna gain and receiver noise.

performance limiting conditions Those demanding flight to near boundaries of flight performance or point at which auto-ignition, stick-shaker or other subsystem is triggered.

performance management system See flight management system.

performance number Knock rating; below 100 called octane number.

performance reduction Historically, calculations to reduce measured aircraft performance to standard values at a chosen weight and in particular atmospheric pressure and temperature.

performance-type glider Sailplane, esp. competition sailplane.

peripaps Pericentre of orbit.

pericentre Point on orbit closest to primary.

pericynthian Point in spacecraft trajectory trajectory closest to Moon.

perifocus See pericentre.

perigee Pericentre of Earth orbit.

perihelion Pericentre of solar orbit.

perilune Pericentre of lunar orbit.

perimeter 1 Periphery of airfield flying area.

2 Boundary of defended area.

perimeter track Taxi track linking ends of runways, revetments or dispersals and main hangar/apron area.

period 1 Time interval between successive passages through particular point in same direction of SHM or other wave motion = or .

2 Time interval between successive passages through particular bounding plane in same direction of satellite, usually time between successive northbound transits of Equator (orbital *); see sidereal *, synodic *.

periodic inspection Inspection, with or without tear-down, according to published schedule of time intervals irrespective of performance (1) of device.

periodic reservation Several aircraft book slots on same Satcom T-channel.

period of performance Timeframe in which work is done.

peripheral hem Leading edge of parachute canopy.

peripheral VLS Distributes SAM launchers along ship to enhance survivability.

peri track Perimeter.

PERM Permanent.

Perm alloy Family of American Fe/Ni alloys which are magnetically soft, with high permeability at low magnetizing forces.

permanent echo Terrestrial features as seen on radar at fixed site.

permanent magnet One which retains its magnetism in absence of strong demagnetizing field.

Permawage Patented fluid-tight method of connecting pipes.

permaturon Gas tube similar to thyratron with magnetic-field control.

PERME, Perme Propellants, Explosives and Rocket Motor Establishment (Westcott, Waltham Abbey, UK).

permeability 1 In magnet, ratio B/H where B is magnetic flux induction and H is magnetizing force, symbol µ, this is divided into absolute and relative or specific *, µr, except in emu system, where * of free space is defined as unity; measured in henry/metre.
permeability tuning

In aerostat, measure of rate at which gas at STP can pass through fabric, usually expressed in litres per 24 h.

In amphibian, ratio of volume of landing-gear compartments that can be occupied by water to whole buoyant volume.

permeability tuning Radio tuning by varying permeability of inductor core, usually with translating bar of ferrite.

Perminvar Family of low-hysteresis alloys of Fe/Ni/Co.

permissive action link Highly secure, jam-proof data links (various categories) which enable bomber crew to trigger nuclear weapon live from cockpit when bomber is at safe distance (hi-alt laydown only).

permittivity Dielectric constant: relative * is ratio of electric flux density in medium to that which same force would produce in vacuum, symbol ε*, unit farads per metre; absolute * ε0 is in vacuum, often called free space (see Coulomb law).

Permit to fly Issued to categories, such as homebuilts, warbirds, classic GA aircraft and micros, that do not qualify for a C of A but may be flown with restrictions. (UK CAA).

Permy Permanently (FAA).

PERP Peak effective radiated power.

perpendicular-heading square Training manoeuvre in which helicopter is flown around square, crABBing at 90° sideways along each of the four sides.

persistance A measure of flight endurance, especially over target area or other hazardous environment.

persistent area-denial Use of loitering robotic systems [eg, UAVs] to provide non-stop surveillance/attack over battlefield for period of days to months.

Pervis Persistently elevated recon[naissance] surveillance intelligence unmanned system (USN).

personal equipment connector Quick-make/break multi-channel coupling for aircrew oxygen, R/T, intercom, g-suit and EC. Not necessarily synonymous with AEA.

Personal Proficiency Index Assessment of pilot experience and capability, principally prior to qualification on V/LJ (2005–).

personal transport unit Airlift bed providing intensive care.

personnel locator beacon Miniature transmitter sending coded signal and worn on flying clothing.

personnel reaction time Time from nuclear warning to all defensive measures taken.

Perspex Family of methyl methacrylate plastics important as aircraft transparent material (IC1).

Pert, PERT Programme Evaluation and Review Technique; critical path method.

perturbation velocity Difference between local and free-stream velocities, symbol usually \( V_p \).

PES 1 Passenger entertainment system, audio plus film.

2 Polystyrolphone.

1 Pre-entry (to inlet) streamline.

Pesa, PESA Passive electronically-scanned antenna.

PESCO Product engineering services office.

PET 1 Piston-engine time.

2 Positron emission tomography.

3 Polyethylene terephthalate.

4 Point of equal time.

5 Pacific engineering trials.

PETA, Peta Pulsed-ejector thrust augmentor.

Peta Prefix, \( 10^{-15} \), symbol P.
PFFT

1. Perspective [prospective is meant] frontal fighter (US).
2. Panel fill factor.
3. Preformed fragment.

PFFT  Parallel fast-Fourier transform.
PFH  Per flight (or flying) hour.
PFHE  Prefragmented high explosive.
PFHUD  Pupil-forming head-up display.
PFI  Post-flight inspection (US = after-flight).

1. Private (or project) finance initiative.

PFIAB  President’s Foreign Intelligence Advisory Board (US).
PFIIS 1 Portable flight-inspection system.
PFIIS 2 Passenger flight-information system.
P, H,  Pentaborane rocket fuel.
PFL  Practice forced landing (A adds ’area’).
PFLD  Pilot’s fault-list display.
PFM 1 Pulse-frequency modulation.
PFC 2 Pre-flight message.
PFMA  Post-flight mission analysis.
PFMGO  Pre-flight message-generating officer (RAF).
PFP 1 Pulse-forming network.
PPN 2 Pulsed fast-neutron analysis.
PFPO  Port-facing oblique.
PPF 1 Partnership for peace (NATO).
PFXM 2 Proximity-fuz,Xe programme.

1. Primary flight permit.
PFS 1 Portable flight-planning system.
PFS 3 Preliminary flight qualification test.
PFR 1 Permitted flying route (CAA).
PFSO  Passenger flow rate.
PPR 3 Post-flight report.

1. Primary flight reference.
PFRT  Preliminary flight rating test.
PFS 1 Primary flying squadron.
PFS 2 Product file sets.
PFV 1 Planetary Fourier spectrometer.
PFSV 2 Pilot-to-forecaster service.
PFT 1 Payload flight-test article.
PFTI  Phototelesis fast tactical imagery.
PFTS 1 Production flight-test schedule.
PFU  Private Finance Unit (MoD, UK).
PG 1 Processing gain.
3. Peelable graphics, esp. airline livery or logo on aircraft.
4. Program management assistance group (USAF).
5. Photographic group (USAAF).
6. Aircraft category pursuit, ground attack (USA 1919–24); powered glider (USAAF 1943–47).
PGM 1 Planning software.
PGN  Passenger-generated noise.
PGO  Foreplane, canard (R).

1. Post-boost guided re-entry vehicle (has IMU and TPU).
2. Precision-guided re-entry vehicle (DoD).

PGS 1 Pilot-guard system.

1. Prompt global strike.
PGSC  Personnel guide surface canopy.
PGSE  Peculiar (ie, to type) ground-support equipment.
PGSM  Precision-guided submunition.
PGT  Private pilot, gyroplane [autogyro], transition.
PH 1 Hit probability (also P). 2 Porte hélioscapers (F).
PHH 1 Public holiday.


PHAK  Pilot’s Handbook of Aeronautical Knowledge (US Government).

1. Phantom beacon R-Nav waypoint where no beacon actually exists.
2. Phantom contract One using phantom lines.
3. Phantom drawing Geometrically accurate but incomplete lines merely giving location of item or alternative positions thereof, eg to show avionic equipment in structural airframe drawing.

1. Phantom member Non-existent member added in pre-computer era to assist solution of structural analysis.
2. Phantom order Draft contract with manufacturer with provision for preplanning immediate production in time of crisis or conflict (DoD).

PHAR  Program for harmonized air-traffic-management research [E adds in Europe, or Eurocontrol].

1. Pharos Plan-handling and radar operating system.

1. Phase In any periodic cycle, fraction of period (1) measured from any defined reference.
2. In reactive circuit, relationship between current and voltage.
3. In physical chemistry, distinct homogeneous physical states separated by sharp boundaries, eg liquid/solid, solid/solid, or immiscible liquids.
4. Periodic variation in solar illumination of Moon as seen from Earth.
5. Normal meaning often applied to programme planning, amphibious assault, establishment of military government etc. In DoD, Phase 1 is concept, 2 is proof of concept, 3 is downselect and demonstration.

1. Phase-advance Subsystem which senses aeroplane rate of change of pitch and triggers stick-pusher progressively earlier as rate increases, so that pitching momentum never takes AOA beyond prescribed limiting value.
2. Phase angle 1 Phase (1) difference between two sets of periodic phenomena expressed in angular measure.
3. Angle between sightlines to Sun and Earth measured at remote locations, eg other celestial body.
phased array

phased array  Physically fixed antenna (aerial) scanned electronically, usually in both x and y (horizontal and vertical) axes.

phase difference  Measure of phase angle (1) from any VOR radial related to that on bearing 000°.

phase discriminator  Detector of phase modulation.

phase inverter  Radio or other signal-processing stage with unity gain whose output is reciprocal of input (not synonymous with half-wave rectifier).

phase modulation  Carrier phase angle (1) varies from carrier angle by amount proportional to instantaneous amplitude of modulating signal and at a rate proportional to modulation frequency, PhM.

phase out, phaseout  Progressive withdrawal from production or active service.

phase shift  Phase difference (not necessarily VOR); change of phase angle (1).

phase shifter  Circuits which steer the beam emitted by a planar-array radar antenna.

phased array  That of equiphase surface of travelling plane wave along normal wave; also called wave speed/velocity.

Phasst  Programmable high-altitude single-soldier transport.

PHB  Pilot’s handbook (USGPO).

PHD  Pilot’s horizontal display.

PHDD  Projection head-down display.

PHE  Penetrating high-altitude endurance.

PHEI  Penetrator HE incendiary.

p-HEMT  Pseudomorphic high-electron-mobility transistor.

phenolic/epoxy  Family of resins and adhesives much used in composites derived from phenol (carbolic acid) and characterized by oxygen bridges linking hydrocarbon radicals.

phenolics  Large family of synthetic polymers (plastics/resins/adhesives) dating from 1907 and mainly unmodified phenol-formaldehydes or (esp. in case of adhesives) resorcinol-formaldehydes.

PH-15-7Mo  Refractory stainless steel, primary structure of B-70.

PHI  1 Position and homing indicator.

2 Pilot-head inoperative.

Phibuf  Performance buffet-limit.

Phigs  Programmers’ hierarchical international graphic standard.

Phillips entry  Shape of leading edge of typical modern wing [Horatio Phillips, patent, 1884].

Phils  Portable hyperspectral imaging low-light spectrometer.

Phinom  Nominal bank angle.

PHLD  Powered high-lift device.

PHM  1 Proportional hazards modelling.

2 Prognostics[s] and health monitoring, or management.

phon  See noise; not used in modern management.

phonetic alphabet  See Appendix 4.

phony war  Northern France, 3 September 1939 to 10 May 1940.

phonic wheel  Sensor for tachometer, disc with precise peripheral teeth which transmits signal at frequency proportional to shaft speed.

phosphate esters  Fire-resistant hydraulic fluids based on esters of P(18) acids.

phosphor  Substance which is luminescent; those in radars/CRT/TV etc are commonly zinc sulphide/zinc and selenide/copper compounds, but cadmium and rare earths are common. Those for printing on opaque substrates are unrelated.

phosphorescence  Luminescence which continues more than 10^{-4} s after cutoff of excitation, usually being visible to eye for days thereafter.

phosphorus  P, three main forms, esp. white * soft non-metal, spontaneously flammable, MPt 44°C, density 1.8.

phot  Non-Si unit of illuminance = lm/cm² = 10⁴ lx.

photint  Photographed intelligence.

photoactivated  Activated by light.

photocathode  Electrode for photoelectric emission.

photochemical  Involving chemical change and emission/absorption of radiation.

photochronic  Having colour, transmittance or other optical property changed by variation in incident light. Also called photochromatic.

photochrome  Colour photography.

photoconductive  Having electrical resistance varied by illumination.

photodiode  Diode converting light into electricity; hence * array yields signals which when processed analyse incident light pattern.

photodrafting  See photographic lofting.

photoelectric  Involving light and electricity, usually by absorbing photons and emitting electrons.

photoelectric cell  Transducer converting EM radiation in visible, IR or UV wavelengths into electricity; abb. photocell.

photoelectron  Electron ejected, eg from metal surface, by impact of energetic (short wavelength) photon.

photoelectronics  Involving electrons and photons (many devices).

photoemissive  Emitting electrons (ie electric current) when illuminated.

photoflash  Pyrotechnic cartridge producing brief but intense illumination, esp. for lo-level night reconnaissance.

photogrammetry  Making accurate measurements and drawings, esp. surveying and mapmaking, by photographic means.

photographic layout drawing  Photographic lofting.

photographic lofting  Lofting entirely with photographs.

photographic reconnaissance  Photo reconnaissance.

photographic transmission density  Log of opacity (base 10), thus perfectly transparent film has *** = 0, while one transmitting only 10% has *** = 1.

photometer  Instrument for measuring luminous intensity, luminance or illuminance.

photometrical calibration  Regular measurement of output of all airfield lighting, especially on Cat II, III runways.

photometry  Science or technology of measuring luminous flux, luminous intensity, luminance and illuminance.

photomultiplier  Tube containing photocathode, several intermediate electrodes (dynodes) and output electrode; also called multiplier phototube.

photon  Elementary parcel of EM energy emitted by transition of single electron, with energy hv (h = Planck constant, v frequency) and momentum hv/c where c is velocity of light.

photonic material  Material designed to manipulate light,
photons

as distinct from electrons, with properties based on an arrangement of atoms on an artificial structure.

photons Using light to process RF signals.

photon rocket Theoretically achievable rocket whose working fluid is light, ie stream of photons; small thrust but in deep space very high Ip, and vehicle velocity could be significant fraction of that of light.

photopic vision Using retinal cones, hence colours distinguishable.

photo reconnaissance Military mission to bring back images of scenes in enemy territory, such as buildings and structures, troop movements, ships and results of previous attacks. Can be high vertical, low oblique, stereo, overlapping strip, etc.

photosensitivity Degree to which substance changes chemical or electrical state when light falls on it.

photosensor Device operating by photoconductivity, eg light valve.

photosmoke method One of two techniques for measuring smokiness of jet by direct determination of optical density (other is Hartridge); gives output in PSU.

photosphere Intensely hot, bright outer layer of Sun's atmosphere.

photothermalite Instrument comprising camera whose azimuth and elevation are precisely recorded (usually on its own film).

phototransistor Solid-state device, originally Ge wafer, generating holes by light absorption and multiplying this photocurrent by transistor action at collector.

phototube Electron tube (vacuum tube) containing photoemissive cathode and collecting anode (usually plus other sub-devices).

photovoltaic cell Transducer which, like photovoltaic, converts EM radiation in visible or near-visible wavelengths into electricity, unlike photocell its purpose is to generate usable current instead of merely giving signal or serving other purpose calling for very low power; example is solar cell.

phraseology Accepted forms of speech, codes phonetic alphabet, etc, used to facilitate telecommunications, usually by voice.

PHS Precision hover sensor.

PHT 1 Private pilot, helicopter, recreational, transition.

2 High-temperature platform.

phugoid One of the five classical modes of aeroplane motion, a long-period oscillation of pitch axis, perpetually hunting about level attitude and trimmed speed, a switchback trajectory at almost unvarying AOA; noun and also adj, eg * oscillation.

phut-plut Put-plut.

PHY Physical interface (device).

PFD Fluid system pressure, esp. hydraulic test pressure of rocket motor case.

physics package Warhead of an air-delivered NW [freefall or cruise missile] (RAF usage).

PI 1 Point of interception (navigation plot).

2 Photographic interpreter (or interpretation).

3 Process (or program) instruction.

4 Practice interception.

5 Program introduction (D adds 'document').

6 Production investment.

7 Production installation, of new equipment in Service aircraft.

8 Product improvement.

pickoff excitation

9 Precipitation identification.

10 Parameter identifier.

11/ Pipeline inspection.

12 Principal investigator.

13 Performance Index [usual meaning in flight-control systems].

14 Parallel interface [bus].

Pi Input power, esp. of jammer.

PIA * Pilots' International Association [office, Minneapolis, MN] (US).

2 Pilot-interpreted approach.

3 Proprietary Industries Association (US).

4 Performance integrity and availability.

5 Pittsburgh Institute of Aeronautics [PA15236] (US).

PIAC, Piac Peak instantaneous airborne count[s].

PIAG, Flag Propulsion Installation Advisory Group (Int.).

Plane, Planet Planning the implementation of an improved AFSA/AFTN network (ICAO).

piano hinge One continuous along edge of hinged item.

piano keys Black/white runway end markings (colloq.).

piano wire Finest steel wire normally produced; 0.8–0.95% C, very high uts, accurate dimensionally.

PIB Preflight information bulletin.

Pibal Pilot-balloon aloft (observation).

PIC 2 Pilot in command.

1 Prime integration contract.

2 Price-improvement curve.

3 Potential icing [category].

PCA, PICA Phenolic-impregnated carbon ablator.

Picoa, PICAO Provisional ICAO (1945–47).

Picasso Predicted ionograms correlated against segmented swept output (ionospheric analysis).

PICC Processor interface controller and communication.

piccolo actuator PFCU or other actuator whose output is generated by row of parallel jacks fitting within thin aerofoil.

piccolo tube Tube perforated by (usually linear) row of holes from which hot deicing air is blown, usually to impinge on inside surface of a leading edge.

pick-a-back 1 See composite aircraft.

2 Superimposed printed-circuit boards.

picket 1 AEW or AWACS aircraft.

2 Instrumented oceangoing ship on missile range.

picketing Securing aircraft against movement when parked in open, normally by attachment to heavy masses or spiral rods screwed into ground.

picketing anchor Spiral rod with eye at upper end.

pickle Tactical air code: moment of manual triggering of system, esp. release of ordnance on surface target.

pickle button That commanding release of airdropped stores.

pickled facility Warm long-term storage, esp. for NW.

pickling Soaking in dilute acid solutions to remove oxides or other surface films or inter-crystalline carbides and surface scale. Principal acids are HCl, H2SO4, HNO3 and HFL.

pick-off Sensor of angular motion or position; many types, eg electric potentiometer, angular digitizer, photocell, magnetic coil moving-iron reluctance bridge, or fluidic valve or gate.

pickoff excitation Normally a frequency.
pickoff sensitivity

**pickoff sensitivity** Usually signal voltage per unit angular travel.

**pickup** A fault or omission noticed and corrected later.

**PCL, Pic** Pool-item candidate list.

**pico** Prefix, $\times 10^{-12}$; hence one picosecond (1 ps) is one millionth of one millionth of a second.

**picocell** Small radio tower on passenger aircraft to instruct handsets to communicate with it exclusively and at lowest power.

**picosatellite** Mass $\leq 0.5$ lb, 0.2268 kg.

**picric acid** Trinitrophenol.

**Pics, PICS** Photogrammetric integrated control system.

2 Protocol implementation conformance statement[s].

**picture manoeuvre** Manoeuvre made by large aerobatic team involving wide separation of aircraft to fill large part of display area, eg bomb-burst.

**pie** 1 Photographic image.

2 Passive identification device.

3 Positive identification system.

4 Post-impact delay.

5 Portable intruder detector.

6 Parameter, process or primitive identifier.

7 Passenger-information display.

8 Proton-induced damage.

**PIDP** Programmable indicator data-processor (USAF).

**PIDS, Pids** 1 Prime-item development specification.

2 Pylon integrated dispenser system.

4 Perimeter, or portable, intrusion detection system.

**piece of cake** A task posing no problems (RAF colloq., piece of cake).

**piece** To cut part from sheet; hence large family of presswork dies such as * and cut off, * and form, * and trim.

**pierced-steel planking** Standard (mainly WW2 to 1950) unit of prefabricated airfield surface; mild steel plates measuring 119.75 in × 16 in and weighing 65 lb (29.5 kg) with interlocking edges.

**pie-shaped** NLG steering, or other, inceptor having shape of segment of disc.

**pierce** Non-Si unit of pressure used in French legal system = 1 N/m$^2$ = 1 kN/m$^2$ = 1kPa = 0.14503 lb/in$^2$.

**piezoelectric** Relationship exhibited by certain crystalline substances, esp. single crystals, between electric potential difference and mechanical stress; eg applying voltage (DC or AC) across opposite faces results in expansion/ contraction or vibration, while applying stress or vibration results in potential difference. Purists divide sensors into: piezoelectric, in which the output is generated by the stress; and piezoresistance, in which the stress changes the resistance sensed by an applied current.

**PIF** 1 Photo-interpretation facility.

2 Pilot's Information Guide.

**Piga** PIG accelerometer.

**Pigeon, pigeons** Air-intercept code: “Your base bears X” and is Y miles away”.

**piggyback** Composite aircraft, or aircraft carrying large vehicle superimposed.

**Pigma** Pressurized-inert-gas metal arc.

**pigtail** Projecting rigid pipe, usually with 90° bend and threaded connection for attachment to fluid system.

2 Short length of any other kind of cable or transmission line projecting from device for attachment to system.

**PIHM** Protective integrated hood mask.

**pilothouse** Dracone or similar flexible fluid storage.

**pillow tank** Dracone or similar flexible fluid storage.

**piloted** Supervised by human beings, usually on board, playing active and direct role in control of vehicle.

**pilot** Person designated as *. Previous definitions involved operation of particular controls (in one case ‘mechanisms’) or guidance of aircraft in 3-D flight, none of which need be done in advanced aircraft, though * required to monitor. In case of RPV * may be in other aircraft or on ground. For command-guided missiles preferred term is operator.

**pilotage** Contact flying, navigating by visible surface landmarks.

**pilot assistant** Qualified pilot in right-hand seat of aircraft training navigators or other crew members [generally = copilot].

**pilot balloon** Meteorological balloon; alternatively, small free balloon devoid of instrumentation, observation of which from ground enables wind at different heights to be calculated.

**pilot canopy** Small auxiliary canopy, ejection of which pulls out main canopy (personal, cargo and braking parachutes).

**pilot case** Original term for capacious briefcase for pilot’s documents, headset, etc.

**pilot certificate** In many countries, title of document licensing pilot according to five to 11 categories. In UK and many other countries called licence. 

**pilot chute** Pilot canopy.

**pilot control bay** Location of flight trajectory and navigation interface in UAV GCS.

**pilot deviation** Person responsible for aircraft in flight.

**pilot-induced oscillations** Potentially dangerous or even catastrophic pitch oscillations caused by pilot trying to stop them. Cause may be oversensitive system with very light input forces, or restricted hydraulic flow rates in PFCUs so that pilot is always making late corrections with ever-greater magnitude.

**pilot-interpreted system** One, eg early AI radar, requiring skill and judgement on part of operator, in contrast to modern digital readout and unambiguous indications. Note: early systems were often interpreted by other members of crew but no term exists.
pilotless aircraft

pilotless aircraft Ambiguous: aircraft whose pilot has departed or aircraft designed to fly unmanned (arch.).
pilot opinion rating Subjective assessment of aircraft stability and handling, measured according to Cooper scale.
pilot parachute 1 See pilot canopy.
2 Parachute worn by pilot, eg with seat-type pack or forming part of ejection seat.
pilot plane Auxiliary surface mounted ahead of main surface (some definitions add ‘and free to take up position in line with wind’).
pilot pushing Unlawfully urging aircrew to work excessive hours.
pilot rating See pilot opinion rating.
Pilot’s Associate Artificial intelligence aid for fighter pilots combining software, hardware and advanced pilot/vehicle interfaces (McDonnell Douglas, Texas Instruments).
pilot’s automatic telephone weather answering service Weather advisory continuously available by telephone (US).
pilot’s discretion ATC has given pilot freedom to choose timing/place/rate of climb or descent.
pilot shop Retail outlet for readily portable items needed by pilot or enthusiast.
pilot’s notes Handbook providing operating instructions, helpful advice and all significant images and numerical data for pilot of particular type or sub-type of aircraft.
pilot’s preference kit Small bag of allowed personal effects (NASA).
pilot’s reference eye position Assumed position of eyes of normal pilot looking ahead (as for landing) in particular type of aircraft, esp. in designing cockpit.
pilot’s trace Rough overlay to map made by pilot of reconnaissance aircraft immediately after sortie showing locations, directions, number and order of sensing runs together with sensors used on each.
pilot’s view Working section of tunnel as seen by notional pilot of vehicle under test.
PIN, Pin 1 Previous intended movement, of aircraft carrier.
2 Processor in memory.
3 Platform interface module (NCCT).
Pinawa’s Passive IR missile-approach warning system.
PINAMP Programmable intelligent multi-purpose fuze.
PIN, p-i-n Semiconductor p-n junction diode with inter-leaved layer of intrinsic semiconductor (from ‘positive-intrinsic-negative’).
pinch hitter Safety pilot, esp. one who is unlicensed, and frequently the spouse or partner of the PIC (US colloq.).
pin joint Joint between structural members where link is pivot, thus no bending moment can be transmitted and members of structure entirely pin-jointed must all be in pure tension or compression.
pink and green Uniform of former USAF (colloq.).
pinked Cut with zig-zag edge (with pinking shears); almost universal with fabric coverings.
pinking See knocking, detonation.
pinking shears Shears or scissors which make a zig-zag cut.
Pinnacle Miniature light source of discrete-device type.
pin stowage Authorized and clearly visible attachments for safety pins removed from ejection seat.
pint Non-SI measure of capacity, pt = (UK) 0.568261 l = 568.261 mm3; US liquid * = 0.473176 l; dry * = 0.550610 l.
pin point 1 Precise fix.
2 Small positively identified ground feature providing fix.
PINS Pipeline Inspection Notification System, warns low-flying military of low-flying GA, esp. PI(11) helicopters and ag-aircraft.
pins 1 Palletized INS.
2 Pipeline inspection notification system (UK).
pit runway Precision instrument runway.
Pin stowage Authorized and clearly visible attachments for safety pins removed from ejection seat.
pitch Non-SI measure of capacity, pt = (UK) 0.568261 l = 568.261 mm3; US liquid * = 0.473176 l; dry * = 0.550610 l.
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PIR

PIR 1 Pilot-induced oscillation(s).
2 Processor input/output.
3 Public Information Officer (UK).
PIP 1 Product-improvement programme.
2 Predicted impact point (NASA).
3 Pulse-interval processor.
4 Program initialization parameter.
5 Production investment phase.

pip 1 Small blip on CRT, especially one used (usually as one of series) as timing mark.
PIPA, Pipa Pulse integrating pendulous accelerometer.
Pipals Pilot-interpreted precision-approach [and] landing system.
Piperack Advanced jammer for AI radars (RAF 192, 214 Sqns 1944).
pipper Aiming mark, typically 2-mil-diameter dot on HUD or other sight system.
Pip pin Patented family of connecting pins having one end headed (often with knurled drum) and other chamfered and provided with two spring-loaded round-head plungers 180° apart which keep pin in position; usually steel and not normally used as permanent fixture.
PIPIR Pose-invariant pattern recognition.
PRI 1 Precision instrument runway.
2 Pilot incident report.
3 Property irregularity report. dealing with loss/damage to baggage and other pax possessions.
4 Priority intelligence requirement(s).
5 Passive IR, see next.
6 Passive IR radiometry.
PIRA, Pira

7 Parachute Infantry Regiment (USA).

PIRA, Pira Precision-impact range area.

piracy Used in traditional sense for unauthorized appropriation of aircraft, ie hijacking.

Piran site gauge Measures vacuum by Wheatstone bridge and resistance wire.

Pirat Passive IR airborne tracking equipment.

Piraz Positive-identification and radar advisory zone.

PIRC Pre-emptive IR countermeasure.

Pircm Proactive IR countermeasure (USAF).

PIRE Pipe internal roll extrusion.

Piref Automatic pilot report programme; pilot reports actual weather on discrete frequency to chosen VOR nearby where message is taped and rebroadcast by VOR until an amending Prep is received (FAA, from 1960).

Pira Portable ILS receiver-signal analyser.

PISA Pilot’s IR sighting ability.

PIT 2 Portable ILS/VOR signal analyser.

piston Aircraft, esp. newly built, with piston engine(s) (US collog.).

piston engine One in which working fluid yields energy by expanding and driving piston along cylinder, specif. IC engine of Otto (by far most common in aviation), diesel or Stirling type.

piston ring Precision-ground abrasion-resistant ring fitted in groove around piston to make spring-tight fit against cylinder (see gas ring, junk ring, obturator ring, oil-scraping ring).

piston-ring seal One of hard metal pressed against cylinder wall by its own elastic stress.

PIT 2 Prioritized image-transmission.

PTI Telecommunications research institute (Poland).

pit Location, usually referenced to ground, of air-refuelling contact; a * stop (collog.).

pitch 4 Angular displacement (rotation) about lateral (OX) axis.

4 Arguably, angular displacement about that axis which, at any moment, is perpendicular to both vehicle longitudinal (OX) axis and local vertical; thus in vertical bank, according to this widespread definition, * = yaw.

3 See propeller *.

1 In case of ballistic vehicle, rotation about axis perpendicular to vertical plane containing vehicle’s longitudinal axis.

5 Angular setting, measured at defined station, of helicopter main- or tail-rotor blade relative to axis of rotation.

6 Uniform distance between evenly spaced objects in row, eg rivets, bolt threads or passenger seats (in each case measured from same reference point in each object).

7 Rotation of camera about axis parallel to vehicle lateral axis; also known as tip.

8 See porpoise (1).

5 Rotation of main landing-gear bogie beam about transverse axis.

pitch attitude Angle between vehicle longitudinal (OX) axis and defined reference plane, eg local horizontal.

pitch axis See lateral axis.

pitch bucking Repeated sequence in which canard foreplane stalls, nose drops, canard unstalls, aircraft pitches up and repeats cycle.

pitch circle See pitch curves.

pitch cones Contacting cones of bevel gears on which normal pressure angles are equal.

pitch control 1 That giving manual control of propeller pitch (3), eg by moving datum of CSU.

2 That, normally effected by stick, giving control in pitch (1) of VTOL aircraft at zero or low airspeed.

3 That giving control of pitch attitude of spacecraft.

4 Combined cyclic/collective systems of helicopter (in this case, rotor pitch).

pitch curves Intersection of tooth surfaces in pitch cones.

pitch cylinder Notional cylinder containing all points of contact between teeth of spur or helical gears.

pitch damping derivative Common symbol C m, this [usually negative] term determines the moment that opposes any pitch rate.

pitch diameter That of pitch line in circular wheel.

pitch indicator Cockpit instrument based on tube containing coloured liquid, also called fone/afte level, replaced by artificial horizon.

pitching See pitch (1).

pitching moment One causing pitch (1), measured as positive when nose-up or tail-heavy. Basic equation M = C m½ ρV 2 Sc, where C m is total moment coefficient, ρ density, V velocity, S wing area and c wing chord.

pitching tank Towing tank in which tendency of marine aircraft to porpoise (1) can be studied.

pitch jet RCJ providing low-airspeed control in pitch (1).

pitch line Locus of points at which centres, contact points or pitch (6) of gearwheel teeth or bolt threads are measured.

pitch lock Propeller subsystem which reacts to either overspeed or loss of oil pressure. Normal pressure or rpm keeps two mating rings of ratchet teeth apart.

pitchover Pronounced departure from upwards-pointing attitude, eg at point where ballistic vehicle is programmed to pitch (4) away from vertical, aircraft in stall-turn pitches at highest point and aircraft attempting absolute-altitude record runs out of kinetic energy.

pitch plane That common to both pitch cylinders of helical or spur gears, pitch cones of mating bevel gears, or both pitch cylinders of wormwheel (on which axial and transverse pitches are equal) and pitch line of mating gear.

pitch point Point of contact of two pitch circles.

pitch pointing Advanced FCS mode giving ability to vary pitch (1) and thus AOA at constant flightpath angle.

pitch range Angular range of travel of blade, esp. of propeller.

pitch rate With stick held back, rate of change of the longitudinal axis about the c.g., i.e. rate of rotation about the lateral axis, q.

pitch ratio Ratio of pitch (3) to diameter.

pitch setting 1 Act of setting up propeller or helicopter rotor so that all blades have correct pitch according to that commanded.

2 Actual pitch of blade(s) at particular time, in case of propeller usually at 0.75 radius.

pitch speed Product of mean geometric pitch and number of revolutions made in unit time (latter is s or h depending on unit used to express answer).

pitch-stiffness derivative Common symbol C máx, the slope of the curve of the static coefficient of pitching moment against AOA [θ] with cockpit controls neutral.

pitch trim compensator See Mach trimmer.
pitch trimmer

pitch trimmer Scissors link connecting bottom of main-leg outer casing and one end of landing gear bogie beam.
pitch-up Uncommanded positive pitch (1) experienced by some aeroplanes at high subsonic Mach numbers or (tip-stall on swept wing or tailplane in wing downwash) at large AOAs.
Pitho Hard tool steel formerly used for piston-engine valves.
PITL Pilot in the loop [of the flight-control system].
pitot bomb Pitot head carried on free-weathercocking mass towed on cable.
pitot comb Row of pitot tubes, eg in vertical row behind wing.
pitot head Sensing head for pitot/static system. In case where static pressure is taken from skin vent, pitot pressure only, thus essentially = pitot tube.
pitot pressure That sensed by pitot head, intended to be close to stagnation pressure.
pitot rake See pitot comb.
PitotShield Weatherproof covering for pitot head with scarlet banner [tears off on takeoff if inadvertently left in place].
pitot/static system Instrumentation system fed by combination of pitot pressure and local static pressure, difference giving dynamic head and thus ASIR.
pitot traverse Taking successive measures of pitot pressure under same conditions but at different places, esp. along vertical (less commonly horizontal) line in wake of wing or other body; result indicates fluid momentum transfer and thus drag.
pitot tube Open-ended tube facing forwards into fluid flow, thus generating internal pressure equal to stagnation pressure (in case of supersonic flow, that downstream of normal shock).

PIKS, PIs Passive identification and targeting system.
PIU Processor, or pylon, or programmable, interface unit.
1 Interim contingency power (F).
| Pressure isolating valve.
PIV Pressure isolating valve.
Pivé Programmation et interprétation des vols d'engins de reconnaissance (F).
pivot-door reverser Jet-engine [usually turbofan] reverser in which either the fan jet [only] is deflected by from two to four doors, or the entire engine efflux is deflected, usually by two doors pivoted on swinging links.
PIXE Sensing head for pitot/static system. In case where static pressure is taken from skin vent, pitot pressure only, thus essentially = pitot tube.
pixel Picture element, from which electronically transmitted picture is assembled.
PJ Parajumper, in helo rescue crew.
Pj 2 Jetpipe pressure.
Pj1 Radar received-power from jammer.
Pj2 Jetpipe pressure.
PJBDS Permanent Joint Board on, or of, Defence (Canada/US).
PJC Permanent Joint Council (Russia-NATO).
PJE Parachute-jumping exercise.
PJJ Partially jet-borne flight.
PJK PLRS/JTIDS hybrid.
PJI Parachute-jumping instructor.
PJND Perceived just-noticeable difference(s).
Pk, Pk 1 Kill probability. 2 Peak.

Planck Law

PKAF Pakistani air force (UK usage).
PKB Programmable keyboard.
PKD 1 Path of known delay.
2 Parts knock-down, aircraft or other product supplied unassembled.
PKE Pluto Kuiper Express (NASA).
PKI Public key infrastructure.
PKM Perigee kick motor.
PKO Cosmic (space) defence forces (USSR).
PKP 1 Passenger-kilometres performed.
2 Predicted kill point.
PK screw Parker-Kalon.
PL 1 Position line.
2 Plain language (often P/L).
3 Pulse, or parameter, length.
4 Pilote de ligne (F).
5 Parts list.
6 Powered lift; often used for helicopter power loading.
TIP 1 Primary lighting.
2 Public Law (U.S.).
9 Power line (d.c. electrics).
P/L Payload.
2 Plain language.
3 Penetrator/lander [lunar].
PLA 1 Programmable logic array.
2 Power-lever angle.
3 Power-lift aircraft.
4 Pre-launch activities, for new aircraft.
5 Post-launch autonomy.
6 Practice low approach.
7 Plain-language address.
8 Private pilot, lighter-than-air, airship.
PLAB Napalm (USSR, R).

Placemark value Published numerical values of aircraft performance, esp. those concerned with safety or limiting speeds and often displayed on placard (small plate) fixed in cockpit.
place Seat; hence ‘4-* ship’ = four-seat aircraft (US usage).
FLACO, Placo Planning committee (ISO).
Plaid Precision location and identification.
plain bearing One in which rotating shaft is simply run in surrounding fixed support, usually lined with bearing metal, without needles, rollers, balls or dynamic pressure from air or gas, but with interposed oil film.
plain flap Simple flap in which trailing edge of wing is hinged.
plain language Message not coded for security.
plan One of three basic orthogonal views, that showing object from above; hence *-form.
planar Essentially lying in one plane, 2-D; hence * technology or * electronics include solid-state devices constructed as various deposited layers, with etching, metallization and other layer-modification.
planar-array radar One whose aerial comprises numerous (normally identical) elements in flat array; probably electronically scanned and probably synonymous with phased-array.
Planck constant Symbol h, = 6.626196 [a later value is 6.62607755] × 10–34 Js.
Planck Law Fundamental law of quantum theory: E = hv where E is value of quantum in units of energy, h is Planck constant and v is frequency.
plane

plane 1 Aeroplane or airplane (colloq., rarely used in professional aerospace).

2 A wing, either left or right or complete tip-to-tip.

3 To move over water at speed sufficiently high for hydrodynamic and aerodynamic lift to predominate over buoyancy.

plane angle Angular measure in 2D, planar, unit rad [radian] = 57.2958°; hence 1° = 0.0174533 rad, 1' = 2.90888 × 10^-4 rad, 1" = 4.8184 × 10^-6 rad.

plane-change engine Small rocket, usually MHR, whose thrust alters orbital plane of satellite.

plane flying Navigation without electronic aids over short distances such that curvature of Earth is negligible (in Editor’s view, nonsense).

plane-guard Routine duty of aircraft (today helicopter) stationed off port (left) quarter (towards stern) of carrier while flying operations are in progress; rescues ditched aircrew and performs other tasks.

planemaker Aircraft manufacturer (colloq.).

plane of reference That, perpendicular to plane of symmetry and in front of (or possibly touching) the nose, from which all nose-to-tail stations are measured.

plane of rotation That in which tips of blades of rotating object travel; in case of helicopter main rotor synchronous with tip-path plane, and thus seldom perpendicular to shaft axis.

plane of symmetry That containing OX and OZ axes, dividing aircraft into (usually mirror-image) left/right halves.

plane-polarized EM radiation, eg light, in which electric force and direction of propagation remain in one plane.

planer Machine tool, often large, whose workpiece is cut by linear motion past fixed tool. Skin mill has revolving cutters.

planetary boundary layer From planet surface to geostrophic wind level, including Ekman layer.

planetary gear Reduction gear in which driven sun-wheel turns planet-wheels with fixed outer annulus; any gearwheel whose centre describes circular path around another.

planetary lander Spacecraft designed to (usually soft-land on planet.

planetocentric Related to planet’s centre, eg * orbit.

plane wave One whose front is normal to propagation direction.

planform Geometric shape in plan, esp. of wings and other aerofoils.

planimeter Instrument for mechanically measuring area on plane surface.

planing bottom Faired smooth surface on underside of float or hull (BSI); this omits to need for deadrise, chine, step etc, needed to plane (3).

plank Loosely used to mean a principal spanwise wing-skin member, especially if integrally stiffened.

plank antenna Antenna formed from planar assembly of waveguides in vertical plane, fixed parallel to aircraft longitudinal axis (usually on struts above fuselage).

plank wing Traditional wing, as distinct from swept or other modern planform (colloq.).

plan-label display Radar display on which SSR alphanumeric information can be written in association with positional echo or symbol; usually fast synthetic, or mixed-phosphor (hard for high-refresh alphanumericics and soft for raw position symbol).

planned flight One for which flightplan is filed and which has specific purpose, ie not air experience or joyride.

planned load One made up in advance and tailored to cargo-aircraft type and mission.

planning-programming-budgeting Integrated system for management of DOD budget and Five-Year Defense Program (USA).

planometer Surface plate.

plan-position indicator P-type display in which scene appears in plan with observer, radar or other sensor at centre; objects at radial distance giving range (usually linear scale, often selectable to several values) and with correct bearing (000° usually at top or 12 o’clock position); offset PPI moves sensor to position away from centre, typically to 6 o’clock margin. Expanded-centre PPI has zero range at ring surrounding centre.

plan range In air reconnaissance, horizontal distance from sub-aircraft point (that where local vertical through aircraft intersects surface) and ground object.

PLAP, Plap Power-lever angle prime, throttle in UFC (1) to which engine responds irrespective of pilot demand.

PLASI, Plasi Pulse-light approach slope indicator.

plasma Assembly of neutral atoms, ions, electrons and possibly molecules in which particle motion is determined by EM interactions; electrically conductive, hence responds to magnetic field. Study called MHD or hydro-magnetics.

plasma antenna Glass or ceramic container of ionized gas.

plasma-based stealth Making aircraft morwe or less invisible to hostile radars by enveloping them in an intense EM field.

plasma engine See plasma rocket.

plasma flame stabilization Use of nanosecond pulses of high-voltage current to stabilize very lean combustion.

plasma ignition Source of 1,000 J/s at 5,000K for solids, liquids or gases.

plasma jet Jet of plasma produced by MHD.

plasma panel Electronic display of gas-discharge type, usually AC, usually orange (Ne), but many other colours with different gases.

plasma plate Deposition of refractory, abrasion-resistant or anti-corrosive coating by means of intensely hot (c16,600°C) plasma jet moving at supersonic speed into which coat material is introduced as powder.

plasma rocket One whose working fluid is a plasma, accelerated by intense EM field (ie, plasma jet).

plasma sheath That surrounding re-entry vehicle or spacecraft, serving as barrier to radio communications.

plasma torch See next.

plasma welding Process similar to TIG welding except that the current is carried by the plasma itself, not by a pulsed arc.

plasma wind tunnel One capable of simulating spacecraft re-entry to Earth atmosphere.

plastic Not elastic, tending to remain in deformed shape or position (see plastics).

plastic effect Electronic display shows relief but little tonal value.

Plasticine Transparent plastic which, unlike Pyralin, is non-inflammable and does not discolour with age.

plastic flow That caused by stress beyond elastic limit and remaining when stress is removed.
plastic gyro

plastic gyro Wheel assembled from moulded plastics components.
plastic instability Column failure due to plastic flow in compression rather than to bending.
plasticity Ability to be deformed to new permanent shape.
plasticizer Substance added to polymer to change properties to improve mouldability or other useful properties; usually liquid of high boiling point. In solid propellants used chiefly to increase flexibility, strengthen bonding and eliminate cracking.
plastics General terms for vast range of synthetic materials made by mixing constituents of which prime members are polymers, for distribution as liquid, fibre, granules or sheet subsequently moulded (see thermoplastic, thermosetting) or used as reinforcement with adhesive bonding. Properties range from rubbers to highly crystalline fibres. Singular ‘plastic’ is adjective; in describing part or finished product preferred usage is ‘plastics’ or, if possible, name material, eg PTFE, PVC, GRP or CFRP.
plastic factor Additional factor, typically 1.2–1.5, applied in designing primary structure in fibre-reinforced composite; this ‘factor of ignorance’ is being relaxed as experience is gained.
PLAT Pilot’s landing-aid TV.
Plate 1 Sheet thicker than 0.25 in (6.35 mm); in airframes invariably machined or chem-milled. Not to be confused with sheet.
2 Principal anode of vacuum tube.
3 Pocket-size sheet of paper, plastics or aluminium on which are printed details of facilities, aids and approach data for one airport.
plate brake Mechanical brake for rotating shaft, eg landing wheel or helicopter rotor, where retarded moving member is ring fabricated from heavy plate (steel, titanium or beryllium, or CFRP-based) often stacked in parallel; essential difference from disc brake is that ring is gripped from both sides.
plate-wired memory Advanced and highly compact memory, woven on loom giving non-volatile storage and low-nanosec speeds.
platelet Small plate, esp. one which is perforated by, or whose surface contains precision channels usually produced by, photo-etching, for fluidic or rocket-injector system.
platelet injector Rocket injector assembled from large stack of platelets to give optimum multiple paths for (usually two) liquid propellants.
platform 1 Vehicle carrying sensors and/or weapons, eg aircraft or spacecraft.
2 Extended root of turbine (rarely, other) blade linking root attachment to outer aerofoil.
3 Raised operating area for helicopter or V/STOL, esp. on surface vessel, also called pad.
4 See airdrop platform.
platform drop Drop of loaded platform (4) from rear-loading aircraft with roller conveyor.
platform dynamics Those resulting from motion of platform (1), esp. as they affect ECM/ESM, eg range, range-rate (velocity), acceleration and acceleration-rate (jerk); can cause receiver to lose lock or synchronisation.
platform face That forming inner end of aerofoil portion of turbine rotor blade and part of inner wall of gas duct.
platform operator This usually means pilot.
platform strength Number of aircraft available.
Platinizing Coating steel with Zn.
platinum Costly non-corroding metal, density 21.5, MPt 1,773°C, symbol Pt.
Plato 1 Program logic for automatic teaching operations.
2 Pilot low-altitude terrain overlay.
platypus Flat 2-D jet-engine propulsive nozzle.
playing area Area of operations possible with digital ATC (1) simulator, typically, 256, 512 or 1,024 miles square.
PLB 1 Personnel (or personal) locator beacon.
2 Passenger loading bridge.
3 Propeller log book.
PLC Programmable logic controller.
plc Public limited company.
PLCU Primary-lighting control unit.
PLD 1 Pulse-length discrimination (in MTI circuits eliminates fast-moving clouds and other moving objects whose size precludes their being targets).
2 Precision laser designator.
3 Proportional lift-dump [mode].
4 Programmable, or programmed, logic device.
pleasure flight One made by private pilot landing back at the point of departure.
plenum chamber Airtight chamber, esp. one containing fluid-flow sink such as operative air-breathing engine; essential for gas turbine having double-entry or reverse-flow compressor with ingestion all round periphery.
plenum-chamber burning Boosting thrust of vectored-thrust turbofan by burning additional fuel in the ‘cold’ nozzles downstream of the fan.
plenum-chamber door Blow-in door to increase airflow into chamber when internal depression falls below selected level, eg on take-off.
Plesetsk Soviet, now Russian, ICBM base and launch establishment for Cosmos and many other large ballistic systems; in Leningrad military district at 62°9’N 40°1’E.
Plexiglas Registered name (Rohm & Haas) of family of acrylic-acid resin plastics, esp. transparent, widely used for blown mouldings; essentially US counterpart of Perspex, though different material.
Plexus Proprietary aerosol non-abrasive cleaner for transparencies.
Plezit PLZT.
PLF 1 Precise local fix.
2 Parachute landfall.
3 Powered-lift facility.
4 Passenger load factor.
PLGR Precise, or precision, lightweight, or location, GPS receiver.
PLGS Precision laser guidance set.
PLH Propeller load horsepower.
pli Pre-load indicator (projects from head of structural bolt).
P-lines Power lines [cables].
pliss See PLSS (2) (colloq.).
PLL Phase-lock[ed] loop.
PLM 1 Pulse-length modulation.
2 Pulse-length monitor.
3 Product life-cycle, or lifetime, management.
PLN Flight plan.
P-LOCAAS

P-LOCAAS Powered derivative of the low-cost autonomous attack submunition.

Plod Passenger landed on deck (carrier onboard delivery).

PLOG Pilot’s [flight-planning] log.

Plog Pilot-log record(s), no formal definition.

Plonk AC2 or ACH/GD, lowest form of life (RAF, WW2).

plot 1 Graphical representation of two or more variables on 2-D surface.

2 Graphical construction for solving navigation problems, eg triangle of velocities.

J Map, chart or graph representing data of any sort (DoD).

J Visual display, eg on radar, of aerial object at particular time; hence * extraction.

J Portion of map or overlay showing outlines of areas covered by reconnaissance or survey photographs.

plot extraction Translating radar plot (4) into quantified target position information, formerly done manually.

plot extractor Electronic system which detects replies from primary or secondary radar and, after making validity check, digitizes information ready for transmission over narrow-band link equipment or high-grade telephone line; where input is SSR basic range/bearing information can be supplemented by identity and height. ‘Extraction’ derives from fact system eliminates information not needed.

plotting board Large horizontal (rarely vertical) surface upon which positions of moving objects are shown with respect to co-ordinates or fixed reference points.

plotting chart Chart designed for graphical methods of navigation.

ploughing, plowing Taxing marine aircraft at below planing speed.

PLP 1 Pipeline patrol.

2 Parallel-line planform.

PLRO Plain-language readout.

PLRS Precision (or position) location (and) reporting system.

PLO 1 Precision landing system; R adds receiver.

2 Palletized loading system.

J Personnel locator, or location, system.

J Plasma subsystem, to measure solar wind.

PLSS 1 Precision location strike system.

2 Portable life-support system.

PLU 1 Position (or preservation of) location uncertainty.

2 Program load unit.

plug 1 Extra section, usually of constant cross-section, added in front of or behind wing when stretching fuselage.

2 Air-refuelling contact, hence wet * dry *.

J As verb, one meaning is to blank over passenger window with metal skin.

plug aileron Has form of curved sheet forming segment of cylinder, extended on pivoted brackets from curved slot in wing.

plug door One so designed, eg with inward/upward travel or with retractable upper and lower portions, that it is larger than doorway, two mating with thick tapered edges to increase security of pressurized fuselage. Pressurization load merely forces door more tightly against frame.

plug gauge Male-type gauge, not always of circular cross-section and often tapered or threaded, for checking dimensions of holes and internal threads.

plug inlet One form of inlet for air-breathing propulsion at Mach 3.5–6 in which axisymmetric duct tapers from sharp lip to rear, and contains large plug (spike) which when translated fully aft can seal flow; in most forms rearward spike travel renders shock-on-lip operation impossible.

plug nozzle Proposed for rocket engines: combustion chamber is annular toroidal form discharging around central cone with curved profile which converts initial inwards radial component into pure axial flow. Also called spike nozzle.

plug ring Translating ring surrounding rear of piston engine cowl to control cooling airflow; not necessarily provided with hinged flaps or shutters (ie gills).

plug section See plug 1.

plug tap Final non-bevelled or bottoming tap for completing threaded hole.

plug weld One made by drilling through part of structure, eg boom splice or skin/stringer, and welding through hole to increase strength of joint.

plug window Overlarge window with tapered periphery (as plug door) used as emergency exit in pressurized fuselage.

plumber[] Ground crew (RAF colloq.).

Plumbicon Photoconductive camera tube similar to vidicon but using semiconductor PbO target doped to behave as reverse-biased PIN.

plumbing Pipework for liquid systems, eg hydraulics, lube oil, Lox etc (colloq.).

plume Originally having specific applications, today a general word meaning entire wake from jet (airbreathing or rocket) bounded at periphery and at some vague downstream extremity by envelope enclosing all parts having significant effects on environment, eg thermal, aerodynamic, acoustic, contrail formation or as IR source.

plume target Aerial target emitting plume simulating that from hostile jet aircraft.

Plus Patient-loading utility system.

plus count Forward count begun at lift-off of spaceflight, continued throughout mission to provide GET reference.

plutonium Silvery metal, many isotopes, all radioactive and toxic, density 19.8, MPt (typical) 641°C, most important constituent of NW devices, alone or with an alloy, symbol Pu.

pluviometer Rain gauge.

PLV Payload launch vehicle (ABV).

PLV L Present level.

PLW Ploughed (US).

PLWS Precision lighting warning system.

Plymetal Plywood/aluminium sandwiches, invariably non-structural.

PLZT Lead lanthanum zirconate titanate. (DoD).

P-LOCAAS Powered derivative of the low-cost autonomous attack submunition.

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9 Phase margin [coupling between FCS and structure].
10 Pilot monitoring.
PM Polar maritime.
PM Presentation/manoeuvring (simulator).
PMA 1 Projected map assembly.
2 Parts manufacturing [or manufacturer] approval, or authority.
3 Permanent-magnet alternator.
4 Pressurized mating adapter (docking).
5 Portable maintenance aid.
6 Positive mental attitude (US).
7 Propagation management and assessment [algorithms].
8 Post-mission analysis.

PM-MA Political-Military Affairs (US).
PMAA 1 Probable missed approach per arrival.
2 PMADS Pneumatic/metal-hydrofoil [defense] system.
PMAI Prime mission aircraft inventory.
PMAS Performance measurement analysis system, for assessing contractors and management (DoD).
PMAT Portable maintenance access terminal.
PMAWS Passive missile approach warning system.
\(P_{\text{max}}\) 1 Maximum power (electronic).
2 Maximum pressure (usually MEOP).
3 Maximum continuous power (F).
4 Polymer/matrix composite.
5 Power management control.
6 Performance management computer (S adds “system”).
7 Personal multimedia communications.
8 Provisional memory cover.
9 Private military [including air] companies.
10 PCI mezzanine card.
PMS Portable mission control station (UAV).
PMD 1 Projected map display.
2 Maximum take-off power (F).
3 Panel-mounted display.
4 Programme management directive.
PMDT Production management system.
PME 1 Professional military education (US).
2 Precision-measurement equipment [L adds laboratory] (USAF).
PMEF Processseur militaire Francais.
PMEF Pilot, or primary, or principal, multi-function display.
PMEFT Post-maintenance flight test.
PMMG Permanent-magnet generator.
PMMH Patrol missile hydrofoil (US Navy).
PMMI 1 Payload margin indicator.
2 Performance management indicator.
3 Principal maintenance inspector (FAA).
4 Planned maintenance interval.
5 Polar moment of inertia.
PMMR Pressure-modulated IR radiometer.
PMM Performance monitor module.
PMMA Poly-methylmethacrylate.

Pneumatic

PMN Lead/magnesium niobate [-PT adds lead tinate].
PMO 1 Program(me) management office.
2 Principal medical officer.
3 Prime maintenance organization(s).
PMOP Phase modulation on pulse.
PMOS Positive (p-type) metal-oxide silicon, or semiconductor.
PMPP 1 Program management proposal.
2 Propulsion modernization program.
3 Premodulation processor.
4 Provost Marshal prohibited (RAF).
PMPS Portable mission-planning system (USAF).
PMQC Purchase-material quality control (UK, quality assurance).
PMR 1 Pacific Missile Range, from Vandenberg (WTR) and Pt Mugu (US); F adds Facility, at Kauai, Hawaii, and Kwajalein Atoll.
2 Proton magnetic resonance.
3 Portable MLS receiver.
4 Private mobile radio.
5 Permit Maintenance Release [ Permit to Fly ] (CAA).
6 Product material release.
7 Provost Marshal restricted (RAF).
PMRAFNS Princess Mary’s RAF Nursing Service (UK).
PMRT Program management responsibility transfer (DoD).
PMIS 1 Performance/power/programme management system.
2 Projected map system (or subsystem).
3 Personnel Management Squadrons (RAF).
4 Performance measurement system (of programme).
5 Process and materials specifications (manual).
6 Poor-man solution.
PMSP Parallel-module signal processor.
PMST Project-management support team.
PMSV Pilot-to-metro service.
PMTC Pacific Missile Test Center.
PML Maximum contingency power (F).
PNSC Performance and navigation computer system.
PND 1 Pilot numerical display, including distance to go, G/S.
2 Primary navigation display.
PNSB Perceived noise decibels (see noise).
PNDT Pakistan National Development Complex.
Pneu, Pneumdraulic Combined hydraulic and pneumatic operation.
Pneumatic 1 Air-operated; term usually reserved for services taking very small flow at high pressure energized by shaft-driven compressor or one-shot bottle. Ambiguously also often used for services taking very large
pneumatic altimeter

flow at low pressure to drive turbines, air motors and cabin environmental controllers.

2 Also describes panel instruments driven by air pressure or air-driven gyro.

pneumatic altimeter Traditional barometric altimeter.

pneumatic bearing Externally pressurized gas bearing.

pneumatic deicing Removal of ice accretion by alternate inflation and deflation of flexible tubes along [wing or tail] LE.

pneumatic logic That used in fluidics.

pneumodynamic System supplies air, or other gas, in rapidly time-variant controlled manner.

PO Pilot not flying, the non-handling pilot.

PNG Pseudonoise generator.

PNM, pnm Per nautical mile. See next.

PNLT pneumodynamic rapid high-power release.

Stores energy for extremely rapid high-power release.

PNTS Pneumatic power module Stores energy for extremely rapid high-power release.

pneumodynamic logic

pneumatic deicing

point-designation grid

1 Preliminary orbit determination.

2 Probability of detection.

3 Proof of design.

4 Proper orthogonal decomposition.

pod Streamlined container carried on pylon, strut or other attachment entirely outside airframe and housing propulsion system, reconnaissance sensors, flight-refueling Hose and similar devices.

PODA Pre-operational data-link applications.

Podas Portable data-acquisition system.

poddled Accommodated in pod.

poddled Philosophy and technique of using pods, esp. for accommodation of main engines.

pod formation Formation of friendly aircraft disposed so that ECM assets give maximum mutual protection.

podium Desk for boarding agent at airport gate.

POSDS, Pods Portable data store.

2 Portable digitizer subsystem.

pod strike Impact of under-wing engine on runway.

POE Probability of error.

2 Port [includes airfields] of embarkation.

Poems Pre-operational European Mode-S (ATC).

POES Polar-orbiting environmental satellite.

Poet Portable opto-electronic tracker.

2 Primed oscillator expendable transponder.

POF Plastic optical fibre.

POFM Plastic optical fibre module.

Pogo See pogo effect.

2 Tail-sting VTOL (colloq.).

3 Local below-airways ATC linking Paris airports.

4 Air-intercept code: "Switch to preceding channel or, if unable to establish communications, to next channel after " **" (DoD).

5 Mechanical link in PFCS which in case of any jammed components automatically overrides drive cam.

6 Precision on-board GPS optimization (missile guidance).

7 Project on Government Oversight (US).

pogo effect Longitudinal oscillation or vibration, esp. of vehicle having high ratio of thrust to mass and whose propulsive thrust may suffer short-term variations; characterized by significant and uncomfortable axial accelerations and, in large ballistic rocket, severe propellant sloshing.

pogo-stick Precisely calibrated penetrometer for measuring strength of paved or unpaved surfaces.

POH Pilot operator’s [or pilot’s operating] handbook.

2 Put on hold.

Pokhwaro Pulsated overheated water rocket (FFA, Switzerland).

POI Programme of instruction.

2 Probability of intercept.

3 Point of interest.

4 Principal operations inspector (FAA).

5 Proximity orbit insertion.

Point Arguello At south Vandenberg, Western Test Range (US).

point defence Defence of specified geographical areas, cities and vital installations; distinguishing feature is that missile guidance radars are near launch sites (USAF).

2 Defence of single surface ship, esp. against incoming missile.

point-designation grid Grid drawn on map or photo-
point discharge

A gaseous electrical discharge from surface of small radius (point, or tip of static wick) at markedly different potential from surrounding; unlike corona discharge, * is silent and non-luminous.

point light

Luminous signal without perceptible length (ICAQ).

point mass

Simplifying equations of motion by assuming aircraft has no dimensions, thus eliminating torques and moments.

Point Mugu

Location of Naval Missile Center and Naval Missile Range (US).

point navaid

Electronic navigation aid located at a single site, e.g. NDB, VOR.

point of attachment

Where balloon rigging cable joins flying cable.

point of entry

Where aircraft enters control zone.

point of equal time

Same time to reach destination or return to start.

point of interest

Airfield, or point navaid.

point of inversion

Height at which lapse rate at last passes through zero; where temperature begins to fall.

point of no alternate

Geographical position on track or time at which fuel remaining becomes insufficient to reach declared alternate.

point of no return

Geographical position on track or time at which fuel remaining becomes insufficient for aircraft to return to starting point (DoD, NATO wording ‘to its own or some other associated base’).

point parallel

Standard form of rendezvous for boom-type tanker and large receiver, in which aircraft fly reciprocal tracks to ARCP, tanker then turning 180° to point parallel ‘to its own or some other associated base’.

point target

One requiring accurate placement of conventional ordnance in order to neutralize or destroy it (DoD).

P point mass

One with NW, one in which target radius is not greater than one-fifth radius of damage.

point to point

Linear motion of tool between NC-instructed commands.

point vortex

Section of straight-line vortex in 2-D motion.

Poise

Pointing and stabilization platform element (USA, RPVs).

poise

Non-SI unit of dynamic viscosity, defined as 1 dyn.s.m⁻² = 0.1 Ns.m⁻² = 0.067197 lb.s/ft². Poise (USA, RPVs).

Poisson’s equation

In stressed material \( \sigma = (E/2n) - 1 \) where \( \sigma \) is Poisson’s ratio, \( E \) is Young’s modulus and \( n \) is modulus of rigidity.

Poisson’s ratio

Ratio of lateral contraction (in absence of local waiting) per unit breadth to longitudinal extension per unit length for material stretched within elastic limit, symbol \( \nu \) or, less often, \( \sigma \).

polar navigation

Poits Payload orientation and instrumented tracking system.

poka yoke

Japanese words meaning foolproof, ie eliminating disruption caused by faulty work.

poke

Propulsive thrust or power (colloq.), hence ‘poker’, etc.

poke welding

Similar to spot welding but using single ‘poked’ electrode, the other being clamped to any convenient point on workpiece.

POL Petrol, or petroleum, oil and lubricant.

Pol, pol Polarity (but P in FFP).

Polar Precision over-the-horizon land attack rocket.

Polar

Air mass supposedly originating near pole, hence cold and usually dry: thus * Atlantic, * continental, * front, * maritime.

Polarization diversity

Having ability to switch from plane-polarized to circular-polarized (radar).

polar maritime

Air mass that is cold and, though absolute humidity and dewpoint temperature low, relative humidity is high; abb. Ps.

polar moment of inertia

Moment of inertia of area about axis perpendicular to its plane. Traditional symbol not I but J.

polar navigation

Navigation at high latitudes, distinguished in bygone days on account of unreliability of magnetic compass, possible electrical/radio interference and other problems such as rapid change of meridians and map-projection difficulties.

petrol

Petrol, or petroleum, oil and lubricant.
polar orbit

**polar orbit** Orbit passing over, or close to, poles of primary body.

**polar Pacific** Air mass originating over N Pacific or N America, seasonal characteristics; abb. Pp.

**polar plot** Locating a point, eg target, by polar co-ordinates.

**Polar stereographic** Map projection, that of high-latitude region projected on flat sheet touching Earth at Pole by light source at opposite pole. Parallels expand at sec² co-lat².

**polar triangle** One formed by three intersecting great circles.

**pole** 1 Origin of polar co-ordinate system.

2 Point of concentration of magnetic charge (magnetic pole).

3 Point of concentration of electric charge (dipole and sought-after monopole).

4 Intersection of Earth’s surface and axis of rotation (geographic pole).

5 For any circle on spherical surface, intersection of surface and normal line through centre of circle.

6 Parts of surface of magnet through which magnetic flux emanates or enters (theoretical but necessary concept).

7 Terminal of battery.

**pole model** Miniature or full-scale model, eg complete aircraft, mounted on tall pole to measure RCS (2) from all aspects.

**pole piece** That part of core of electromagnet which terminates at air gap.

**poll** 1 To ask specific questions of number of sensors; questions are normally asked sequentially, and answers constitute an update of information in system.

2 Technique used in data transmission whereby several terminals share communication channels, particular channel chosen for given terminal being determined by testing each to find one free, or to locate channel on which incoming data are present. Also used to call for transmissions from remote terminals by signal from central terminal; method used for avoiding contention.

**polled** ACARS mode in which airborne system transmits only in response to received uplink message.

**poll the room** To obtain consensus in solving problem in manned space mission.

**polonium** Po, grey semi-metal, energy source for spacecraft, density 9.3, MPt 254°C.

**polyanilines** Range of electrically conducting plastics made by oxidising aniline and then polymerizing with various acids; basis of smart skins.

**polybutadiene acrylic acid, PBAA** Important solid rocket propellant and monofuel.

**polybutadiene acrylonitrile, PBAN** Important solid rocket propellant and monofuel.

**polyconic** Mapmaking by projecting latitude bands on the succession of cones, each centred on Earth’s axis and each touching surface along parallel passing through centre of map, subsequent strips on single-curvature conical surface being unrolled.

**Polydol** Alcohol-resistant foam liquid for firefighting made from protein hydrolysate and an organometallic complex; mixes with fresh or sea-water.

**polygon warhead** One having several (typically 8–16) radial faces from which are projected tailored fragments, steels balls, shaped-charge jets or other damage mecha-

anisms. Common type of warhead for SAMs and AAMs, radial blasts being so timed that their plane passes through target.

**polymerization** Basic processes for making large (high-polymer) molecules from small ones, normally without chemical change; can be by addition, condensation, rearrangement or other methods.

**polymer optical backbone** Airframe structure on which are printed fibre-optic conductors.

**polyphase coding** Pulse-compression technique for radar, esp. for fighters, in which successive phases are rotated by fixed angles such as 90°.

**polyvalence, polyvalent** Multitude (F).

**POM** 1 Printer output microfilm.

2 Program objective(s) memorandum, or memoranda (DoD).

**Pomcus** Prepositioned overseas materiel configured in unit sets (ie, grouped by user units).

**POMO, Pomo** Production oriented maintenance organization (USAF).

**Pomros** Power-off minimum rate of sink.

**POMS** Production-oriented maintenance system.

**pond** Reservoir for cooling water below testbed for large rockets.

**ponding** Settlement of runway subsoil leading to formation of standing-water pond in rain.

**P1E** Phase 1 enhancement.

**pongo** Member of friendly army (RAF colloq.).

**PONO** Project office nominated official.

**pontoon** Inflatable buoyancy bag used as permanent alighting gear for helicopter.

2 Rigid float, of circular or rectangular section, used on early water-based aircraft.

**POO** 1 Payload of opportunity.

2 Pronounced poo, to clear manned-spacecraft computer display prior to solving fresh problem, from P-zero-zero (colloq.).

**Pooley’s** Flight guide to UK and Ireland, commercially published annually.

**pool fire** Burning pool of fuel surrounding crashed aircraft.

**poopy suit** Flight-crew overwater survival suit (colloq.).

**POP** 1 Probability of precipitation.

2 Product optimization programme.

3 Plug-in optronic payload.

4 Period of performance.

5 Point of presence.

**pop** Sudden rise by target, from ground cover or out of clutter on radar.

**Popeye** Air-Intercept code: “I am in cloud or reduced visibility”.

**popouts** Fast-inflating buoyancy bags for flotation in emergency.

**poppet valve** Common mushroom-type valve of piston engine.

**Pop rivet** Pioneer form of tubular rivet closed by withdrawing central mandrel which forms integral part of each rivet and is gripped by jaws of tension tool.

**POPS, Pops** 1 Position and orientation propulsion system.

2 Pyrotechnic optical-plume simulator.

**pop-up** Manoeuvre made by attack aircraft in transition from lo penetration to altitude from which target can be
pop-up alert
identified and attacked; eliminated by BFPA (blind first-pass attack).

pop-up alert Unmissable warning caption [e.g., terrain proximity] on a cockpit display.

pop-up delivery In delivery of NW, was usually from 500 to 1,000 ft altitude at maximum rate (RAF) See * point.

pop-up missile One ejected, often by gas generator/piston or other device not forming part of missile propulsion, from launch system in vertical direction, subsequently making fast pitch-over on target heading. Launcher need not move in azimuth or elevation, thus minimizing reaction time.

2 Missile making pop-up manoeuvre as it nears previously located target on which it then dives.

pop-up point Ground position at which PU delivery is initiated, 25,000 ft [103 s] before overflying target.

pop-up test Test of pop-up missile (1) launch system.

POR 1 Pilot opinion rating.
2 Pacific Oceanic Region.

PORM, Porn Plus or minus.

Poroly Porous metal produced by incomplete sintering, mainly used as filter.

porous friction asphalt Asphalt whose constituents and lay-down process are tailored to give high-μ surface which will not permit standing water to remain. Preferred top layer to runway.

porpoise 1 Undulatory (near-phugoid) motion of marine aircraft and some landplanes with bicycle landing gear characterized by pitch oscillation and limited-amplitude vertical travel; normally problem only at particular speed(s).

2 In absence of radio contact, deliberate roller-coaster flight to indicate to pilot of friendly intercepter (more rarely, tower) that aircraft is in distress.

port 1 Left side or direction, aircraft viewed from rear.
2 Aperture in solid rocket motor case opened for thrust termination.

3 Aperture[s] in volume under pressure regularly opened and closed by valves, such as in piston engine or reciprocating-compressor cylinder.

portable data store Computerized flight-planning data carried by member of flight crew and plugged in before take-off.

portal 1 Air/land interface: airfield or heliport.
2 Airline website.

port drift From pilot’s viewpoint, wind from the right.

Porteous loop Loop with 360° aileron roll added at zenith.

portfolio Owner’s catalogue of aircraft [usually used] for lease or sale.

POSt Peacetime operating stocks.

2 Position.
3 Positive.

posgrade In direction of travel, hence * rocket increases speed of satellite in order to reach higher orbit. Opposite of retrograde.

POSInit Position initialization.

position 1 For celestial body, bearing and altitude.
2 Location of crew member, esp. in military aircraft.
3 Location of manually aimed defensive gun(s) in military aircraft (today archaic); gun .
4 Location of AAA defending land target; gun .
5 To fly aircraft to where it is needed; hence * or positioning flight.

position error That induced in ASI system by fact that stagnation pressure sensed is seldom that of true free stream (see airspeed).

positioning Flying aircraft to airport from which productive [commercial carrier or business] flight will start. Rarely, to launch point of military mission.

position light See navigation light.

position line Line along which vehicle is known to be at particular moment, eg by taking VOR bearing. Two PLs are needed for fix.

position stabilized Held to linear trajectory, eg LOS, in absence of commanding signal (eg antitank missiles).

positive acceleration Acceleration upwards along OZ axis, to right along OY and forwards (ie to increase speed) along OX. Axes are always vehicle related.

positive area That enclosed on tephigram between path of rising particle and surrounding air when particle is throughout warmer than surroundings.

positive coarse pitch Locked minimum-drag setting of non-feathering propeller after engine failure.

positive control 1 Operation of air traffic in radar/non-radar ground control environment in which positive identification, tracking and direction of all aircraft in airspace is conducted by authorized agency (DoD).

2 Command/control and release procedures, and operational procedures that provide acceptable level of assurance against misuse of nuclear warheads, when these warheads are part of a weapon system (USAF).

Positive Control Line Notional frontier at which, in time of crisis, NW-armed aircraft would wait for PRM4; in 1960–90 the PCL for RAF Strike Command was 8° E.

positive coupling Mutually inductive coupling such that increase in one coil induces rising voltage in other similar in sense to that caused by increasing current in other.

positive-displacement pump One delivering fluid in discrete parcels in irreversible way, eg pumps using pistons, vanes or gearwheels in contrast to centrifugal blower.

positive-driven supercharger Mechanical drive as distinct from turbo.

positive-expulsion propellant system One in which liquid propellants are forced from container by gas pressure, esp. acting on flexible bag containing propellant(s).

positive feedback Feedback that results in increasing amplification; also called regenerative.

positive g See positive acceleration.

positive-identification and radar advisory zone Specified area established for identification and flight-following of aircraft in vicinity of fleet defended area.

positive ion One deficient in one or more electrons.

positive pitch 1 Nose-up.
2 Propeller set for forward flight as distinct from braking.

positive pressure cabin Arch., see pressure cabin.

Positive Recall An order to turn back before reaching the Go-NoGo Line [see Automatic*] (USAF, RAF).

Positive Release Message Brief command sent with authority of head of state, authorizing bomber to cross Positive Control Line and drop NW on designated target, in effect start of WW3 (USAF, RAF).

positive rolling moment Tending to roll right-wing-down.

positive stability Aeroplane tends of own accord to resume original condition, esp. level flight, after
positive stagger

disturbance (upset or gust) in pitch, without pilot action. Term applies only to motion in vertical plane, along OZ axis.

positive stagger

Leading edge of upper wing is ahead of that of lower.

positive stall

Stall under 1 g flight or positive acceleration, ie not from inverted attitude or negative g.

positive yaw

Tending to rotate anticlockwise about OZ axis seen from above, ie nose to left.

positron

Short-lived particle equal in mass to electron but positive in sign.

positron emission tomography

Technique for measuring fluid flow in which positrons are used as labels, generating 511 keV gamma rays which can be read from outside the structure of an engine or other container.

Posix

Portable operating system interface for computer environments. 2 Also translated as Portable operating system IX.

POSN, Posn

Position.

POS-Ref

Position reference.

POSS, Poss

1 Power-off stalling speed.

2 Precipitation-occurrence sensor system.

3 Possible (ICAO).

POST

1 Portable optical sensor testbed (hardened sites).

2 Passive optical seeker technique (or technology).

3 Production-oriented scheduling technique.

4 Point-of-sale terminal.

post

1 Vertical primary structure, eg fin *, king-*.

2 Main landing leg, thus MLG of YC-14 described as of four-* type.

post-attack period

Between termination of nuclear exchange and cessation of hostilities.

post-boost

After cut-off of mainstage propulsion.

post-boost vehicle

Vehicle and payload after cut-off of mainstage propulsion, and hence posing new problems to SDI acquisition and tracking systems.

post-exit deflector

Powered flap(s) downstream of powered nozzle, able to vector entire thrust for STOVL or air combat.

post-flight report

Basically comprises ECAM warnings and maintenance status, printed on demand.

post-integration

Occurring after assembly of complete space launch system but before lift-off.

post-pass

After (usually soon after) satellite has passed overhead.

post-stall gyration

Uncontrolled motions about one or more axes, usually involving large excursions in AOA, following departure (3).

post-stall manoeuvres

Manoeuvres carried out [more or less] under full control with AOA near or even beyonf 90°.

post-strike

Immediately after attack on surface target, hence * reconnaissance provides information for damage assessment.

posture

Military strength, disposition and readiness as it affects capabilities (DoD).

POT, pot

Potentiometer.

pot

Piston engine cylinder (colloq.).

potassium

K (from kalium), reactive silvery metal, MPt 64°C, density 0.86.

potential

1 In electric field, work done in bringing unit positive charge to that point from infinite distance.

2 Value atmospheric thermodynamic variable would have if expanded or compressed adiabatically to 1,000 mb (100 kPa).

3 Specialized meanings in thermodynamics, geodesy and celestial mechanics.

potential density

That which parcel of air would have if adjusted adiabatically to 1,000 mb (100 kPa), given by

\( \rho' = \rho R \theta \) where \( \rho' \) is **, \( \rho \) is pressure at 100 kPa, \( R \) is gas constant and \( \theta \) is potential temperature.

potential difference

Measured between any two points in conductive circuit, in volts; if between terminals of battery, when no current is flowing.

potential energy

That possessed by mass by virtue of position in gravitational field; can yield ** by 'falling', ie moving towards region of lower **. 

potential flow

Fluid motion in which vorticity is everywhere zero.

potential gradient

Local space (linear) rate of change of potential.

potential refractive index

That so formulated that variation with height in adiabatic atmosphere is zero.

potential temperature

That which parcel of dry air would have if adiabatically brought to pressure of 100 kPa.

potentiometer

1 Variable resistance (rheostat), esp. one of precise type giving, eg, accurate radar pointing information.

2 Instrument for measuring EMF (potential difference, esp. DC), usually without drawing current from circuit measured.

POTS

Production off the shelf.

2 Plain old telephone service, or system.

potted device

Electronic component encapsulated in resin, mainly to give mechanical protection.

pounce

Inch [measurement unit] (F).

Pounce

Air-intercept code: "I am in position to engage target".

pound

Non-SI unit of mass, abb. lb, = 0.45359237 kg. Note, plural also lb. Strictly, not the same as force or weight of 1 lbf.

poundal

Non-SI unit of force, abb pdl, = 0.138255 N = 0.31081 lbf.

pound force

Abb. lbf, see pound weight.

pounds per square inch

Non-SI unit of pressure, abb. psi/sq in (psi or lb psi not recommended), = 6,894.76 Pa = 6,894.76 kPa = 14.696 psia = 2.036 kg in Hg.

pound weight


pour point

Temperature established by standard pour test as lowest at which liquid, esp. fuel or lube oil, will flow.

POV

Pigmented oil varnish.

POW

Prisoner of war.

Powdered

Tactical code: enemy aircraft broke up in the air.

powder metallurgy

Production of finished or near-finished parts by fusion under heat and pressure of metal in form of finely divided powder. Usually synonymous with sintering.

power

Rate of doing work; SI unit is watt (W) = J/s;

kW = 1.34012 hp = 1.359621 cv, PS; hp = 0.745700 kW; cv, PS = 0.7355 kW.

power amplification

Ratio of AC power at output to AC power at input circuit.

power amplifier

Amplifier designed to deliver large
power-assisted flight control
output current into low impedance to obtain power gain as distinct from voltage gain.

power-assisted flight control FCS in which power inputs assist pilot by overcoming major part of hinge moments while leaving pilot to move surfaces directly and experience direct feedback, and with difficulty control aircraft in event of system failure.

power brake US term for sheet-metal press, esp. one using mating male/female dies or rubber.

power bumping Sheet-metal forming on bumping hammer.

power by the hour Contract for total support of customer’s engines at agreed rate per hour flown. Contractor may be O&M or OEM.

power centroid Point which will be selected by seeker (radar or IR) as centre of target; in case where both real target and decoy (eg flare) are visible, ** likely to be in space between them.

power coefficient In calculating propeller performance by the Drzewiecki method, a grading curve to torque component plotted against blade radius may be drawn for each pitch angle to arrive at function KQ, constant for each value of advance ratio J; ** equals KQJ², and has powered-lift aircraft ability to fly at very low airspeed or hover. Almost all PL aircraft can fly at very low airspeed or hover.

powerful-lift aircraft Aircraft can fly at very low airspeed or hover.

powerful-lift regime Flight regime in which sustained flight at below POSS is possible because lift and control moments are derived from installed powerplants.

powerful-slat One positively driven to extended position instead of being moved by its own aerodynamic lift.

power egg Complete ECU, usually without propeller (normally piston engine).

power factor 1 That by which product of alternating current and voltage must be multiplied to obtain true load, = cos φ where φ is phase angle between current and voltage. (φ is also common). p.f. = P [watts]/VI.

2 Measure of dielectric loss of capacitor.

3 In wind tunnel, ratio of driving power to kinetic energy multiplied by mass flow in working section.

power feedback Feedback in which significant amount of power (electrical, electronic or acoustic) is transferred.

power folding Folding wings by power actuation, usually controlled from cockpit and sometimes by external protected control.

power gain 1 Ratio of power, usually expressed in dB, delivered by amplifier or other transducer to power absorbed by input.

2 In any direction, 4π × ratio of radiation intensity sent out by aerial to RF power input; with strongly directional (eg pencil beam) aerial close to zero except on axis of main lobe.

power gearbox In a turboprop engine, that which drives the propeller.

power head On large machine tool, cutter and associated drive.

power in, power out Aircraft parks at airport and departs without use of towing vehicle.

power in, push out Tug is used to push aircraft from nose-in stand to taxilane.

power jet In traditional carburettor, fuel jet which comes into operation only when throttle advances beyond maximum-cruise position.

power lever Throttle, esp. for gas turbine of any kind.

power loading 1 For propeller-driven aircraft, W/Pe, total mass (usually taken as MTOW) divided by total installed horsepower, ehp in case of turboprop; units lb/hp = 0.60864 kg kW⁻¹, reciprocal 1.643. Jet equivalent = thrust loading.

2 Input shaft power divided by projected area of propeller [not propeller disc].

power-on spin One entered from power-on stall.

power on stall Normal stall in which propulsive power is maintained at significant (eg normal cruising) level throughout; nose is raised higher to lose speed at acceptable rate and slipstream usually adds to lift, generally resulting in more extreme attitude and more violent pitchover when stall finally occurs.

power-optimized aircraft Research programme which aims to identify, optimize and validate aircraft equipment which reduces consumption of non-propulsive power (EC7).

power overlap Overlap of firing strokes in multi-cylinder piston engine; for four-stroke engine more than four cylinders are needed to make this concept of continuous power effective.

power performance index Computerized index of helicopter engine power corrected for atmospheric pressure/temperature, altitude, power-turbine temperature and drive torque.
power plant, powerplant

power plant, powerplant / Those permanently installed prime movers responsible for propulsion, including their number; thus * of L-1011 TriStar is three RB.211 turbofans (some authorities would add ‘plus ST6 APU’).

2 One prime mover, of any type, in complete form plus accessories, silenced nozzle, propeller and associated subsystem and, in some cases, surrounding cowling. This is a different meaning from (1).

power port / Socket beside passenger seat for laptop or to charge switched-off mobile.

power press / Any press whose actuation force does not derive from human muscle; need not have vertical motion.

power processing unit / Converts electricity from solar panels into power for a Hall-effect thruster.

power rating / Rating (1).

power-recovery turbine / Driven by exhaust gas from piston engine to put extra power into crankshaft or other output.

power section / Gas-generator part of engine, especially where two share a common output gearbox and drive.

power shear / Shear for cutting heavy sheet or plate, with hydraulic ram(s) moving blade.

power spectral density / The assumption that a random [Gaussian] process can be made up of an infinite number of sinusoidal components of infinitesimal amplitude and frequency difference.

power spectrum / Plot of \( S_a(f) \), signal amplitude against frequency, normally symmetrical about peak at \( f_c \) and with form varying with modulation.

power/speed coefficient / Function in propeller performance calculation, introduced by F.E. Weick:

\[
C_1 = \frac{J}{2C_p} \left( \frac{V}{\rho} \right)^{\frac{1}{2}} \left( \frac{P}{\rho V^2} \right)^{\frac{1}{2}}
\]

where \( J \) is advance ratio, \( C_p \) power coefficient, \( \rho \) density, \( V \) slipstream velocity, \( P \) power consumption and \( n \) rotational speed.

2 Variation of installed power or thrust with airspeed, esp. for jet engine; normally plotted at constant air density.

power take-off / Shaft from which power is normally available to drive accessory or other item.

power train / Assembly of gearwheels, shafts, clutches and possibly other items for transmitting shaft power. Generally synonymous with transmission.

power transfer unit / Interconnection between otherwise totally separated hydraulic systems, eg Green and Yellow, which enables power to be transferred from one to the other.

power turbine / Mechanically independent turbine (ie connected to engine only by shaft bearings and gas path) driving propeller gearbox of turboprop or output shaft of turboshaft.

power unit / Power plant (2) (not recommended).

2 Device which either generates electrical or EM radiative power or produces required currents or signals from raw AC or DC input.

2 Source of energy, other than propulsion, for missile, RPV or spacecraft where there is no shaft-driven alternator or other supply.

2 Prime mover of APU or EPU/MEPU.

power venturi / Venturi used to operate air-driven instruments or other devices relying on suction.

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PPL

POWS / Proximity operations work-station (NASA Ames).

PP / Descent through cloud (ICAO code).

2 Present position.

3 Pilot production.

4 Peak-to-peak, also p.p.

5 See P/P.

6 Pre-production aircraft.

7 Probability percentage.

8 Polypropylene.

P/P / Private, or pilot, pilot.

2 Push/pull.

Pp / Polar Pacific.

p.p. / Peak-to-peak.

PPA / Pre-planned attack.

2 Passengers per annum.

3 Pre-production aircraft.

PPAC / Product performance agreement center (US).

PPARC / Particle Physics & Astronomy Research Council [Swindon SN2 5SZ] (UK).

PIPATM / Passengers per air transport movement.

PPB / Program/planning/budgeting; ES adds evaluation system, S adds system (US).

2 Parts per billion; (M) adds by mass, (V) by volume.

3 Passenger protective breathing; E adds equipment.

PP&E / Planning, program review, budgeting and execution(s).

PPC / Production possibilities curve.

2 Pulse position code [uplink/downlink].

PPCR / Product and process confirmation review.

PPD / Proximity/point detonating.

PPDU / Physical-layer protocol data unit.

PPE / Passengers (per year) per employee.

2 Personal protective equipment.

PPF / Production-phase financing.

2 Payload processing facility.

PPFRT / Prototype preliminary flight rating test.

PPFR / Pilot-pilot flight rating test.

PPG / Planning policy guidance.

2 Powered para-glider.

3 Pacific Proving Ground[s] (USA).

4 Pulse pressure gain [combustion].

PPH, phh / Pounds or, less commonly, pints, per hour.

PPHA / Passive phased-array radar.

PPHE / Prefragmented preprogrammed high explosive.

PPI / Plan-position indicator.

2 Power performance index.

3 Photo production and interpretation.

4 Personal Proficiency Index.

5 Public/private initiative[s].

PPIF / Precision photographic interpretation facility (pre-1980, photo processing [or production] and interpretation facility).

PPINA / PPI (1) not available.

PPINE / PPI (1) normal, no echoes observed.

PPJOM / PPI (1) out for maintenance, or inoperative.

PPL / Private Pilot’s Licence; (A) adds aeroplane, (AS) airship, (B) balloon, (G) gyroplane/autoogyro, (GR) ground examiner, (H) helicopter, (IR) instrument rating, (microlight), (R) examiner, (SLMG) self-launching motor-glider, (X, followed by appropriate suffix) examiner authorized to conduct flight and ground tests (CAA).

2 Polypropylene.

3 State airports enterprise (Poland).
PPLI

- Pulsed plasma thruster.
- Processor-to-processor link.

PPLI Precise participant location information.

PPM 1 Pulse-position modulation.
2 Pounds, or pages, per minute.
3 Production performance measurement (IATA).
4 Performance programs manual.
5 Pre-processor module.
6 Programmable processing module.
7 Periodic permanent magnet.
8 Pneumatic power module.

ppm Parts per million.

PPMF Permanent periodic magnetic focusing.

PPMFD, P'M'FD Projection primary multi-function display.

PPMS Precision power-measurement system (EW).

pp Precipitation.

PPO 1 Prior permission only.
2 President's Pilot Office.
3 Position pick-off, U adds unit.

PPS Present position.

PPP 1 Synoptic chart: pressure referred to normal mean sea level.
2 Public/private partnership.
3 Point-to-point protocol (computers).
4 Pulse-pair processing.

PPR 1 Prior permission required.
2 Periodic performance report.
3 Prospective price redetermination.
4 Plans, programmes, [and] requirements.

PPRM Power plant recording and monitoring.

PPRN Professional pilots' rumour network (website www.pprune.org.uk, with wealth of advice for pilots and controllers).

pprune See Prune.

PPS 1 Passenger processing system.
2 Photovoltaic power system.
3 Pilot’s performance system.
4 Polyphenylene sulphide.
5 Parliamentary Private Secretary (UK).
6 Post-production support.
7 Precise position[ing] service [GPS, or system].
8 Provisional project structure.
9 Precision pointing system.
10 Policy planning staff.
11 Propulsion pod system (J-Stars).
12 Packets per second (see next).
13 Propulsion prognosis system.

pps 1 Pulses per second.
2 Pixels per second.
3 Pounds per square inch [not recommended].

PPSN 1 Public packet-switching network.
2 Present position.

PPT 1 Perspective-pole track (HUD).
2 Pulsed plasma thruster.

PPU Power processing unit.

PPV Pre-production verification.

PQ Category, man-carrying target (USAAF 1942–47).

POAR Product quality action request.

POC Poor-quality cost.

POE Product-quality engineer.

PQO Principal Quality Officer (UK).

PQS Personal qualification standards (USN).

PQT Production qualification and test.

PR 1 Photo-reconnaissance.
2 Pitch rate.
3 Pressure ratio.
4 Polysulphide rubber.
5 Ply rating (tyre).
6 Purchase request.
7 Periodic reservation.
8 Precipitation, or primary, radar.
9 Partial.
10 Procurement Regulation (US).
11 Public relations.
12 Personnel Recovery (USAF).
13 Programs and Resources (USAF).

Pr 1 Prandtl number.
2 Radiation pressure.
3 Power required [usually for level flight].
4 Perimeter of torsion box.

PRA 1 Popular Rotorcraft Association (US, office Mentone, IN).
2 Particular risks analysis.

PRAAMS, Prads Parachute/retroticket air drop system.

PRAIM, Paim Predictive receiver autonomous integrity monitoring.

PRAMS, Prams 1 Productivity, reliability, availability and maintainability.
2 Pre-recorded announcement machine [for passengers].

Prandtl–Glaudert equation States that lift, drag or pressure coefficients at high subsonic speeds, where compressibility must be taken into account, are equal to those at lower speeds factored by Glaudert factor $(1-M^2)^{1/2}$ where $M$ is Mach number, ie $C_L = \frac{C_L}{\sqrt{1-M^2}}$.

Prandtl–Glaudert law That describing effect of compressibility on lift of 2-D wing.

Prandtl interference factor Dimensionless factor $\sigma$ used in determining interference between wings or biplane; dependent upon ratios --gap-- and upper span mean span lower span ; where both wings have same span, $\sigma = 0.5$ for gap/span ratio of 0.2 and about 0.375 for gap/span ratio of 0.3.

Prandtl lifting–line First [1918] fundamental theory for wing lift, based on $C_L$ for the difference between geometric and zero-lift angle of attack.

Prandtl–Meyer expansion Original treatment of supersonic expansion round corner, in which entropy remains constant but pressure, density, temperature and refractive index all fall. Prandtl solved 2-D case in 1907.

Prandtl number Ratio of momentum diffusivity to thermal diffusivity, $Pr = \frac{\mu C_p}{\lambda v_\nu}$ where $\mu$ is viscosity, $C_p$ is specific heat at constant pressure, $\lambda$ is thermal conductivity, $v_\nu$ is kinematic viscosity and $\sigma$ is angle of attack.

Prandtl–Schlichting Original treatment of transition flow between laminar and turbulent boundary layers forming link curve on plot of skin-friction coefficient against Reynolds number.

prang To have accident, esp. to crash aircraft; also derived noun (RAF, WW2, colloq.), If written on aircraft (PRANG), Puerto Rico Air National Guard.
PRAT, Prat

PRAT, Prat Production reliability acceptance test.
Pratt truss Basic braced monoplane.
PRAWS Pitch/roll attitude warning system.
prayer mat Portable anti-erosion mat for jet V/STOL operation.
2 Performance Review Commission (Eurocontrol).
3 Pilot Reliability Certification.
PRCA Pitch/roll control assembly.
PRCR Preliminary request for customer response.
PRCS Pitch-reaction-control system.
PRCTN Precaution.
PRD 1 Program review data.
PRDA 1 Primary radar data.
PRDS Processed radar display system.
pre-balanced assembly Gas-turbine module held in store until needed.

precautionary flight zone That beyond left boundary of helicopter h/V (height/velocity) curve, where safe autoro-
descending techniques are unlikely or impossible.

precautionary landing Practice forced landing; various techniques but invariably objective is to arrive at correct point with correct speed for minimum ground run, then overshoot without touching.

precautionary launch Launch of aircraft loaded with NW from airbase or carrier under immediate threat of nuclear attack, not necessarily on mission to enemy target but to preclude friendly-aircraft (ie, its own) destruction.

precission Rotation of axis of spinning body, eg gyro, when acted upon by external torque, such that spinning body tries to rotate in same plane and in same direction as impressed torque; ie axis tends to rotate about a line (axis of *) normal to both original axis and that of impressed torque. Horizontal component called drift; vertical called topple.

precision cone That described by longitudinal axis of slender body, eg ballistic rocket, devoid of attitude or roll stabilization; two cones each having apex at vehicle c.g.

precipitation Moisture released from atmosphere, esp. in large enough particles to fall sensibly, ie excluding fog and mist; examples are rain, snow, hail, sleet and drizzle.
precipitation attenuation Loss of RF signal due to presence of precipitation.
precipitation drug That caused by slush or standing water on aircraft wheels; snow not normally included in this term.
precipitation hardening Usually synonymous with ageing (aluminium alloys).
precipitation heat treatment Artificial ageing, usually preceded by solution heat treatment.

precipitation interference Static discharge, normally considered to be caused by precipitation and atmospheric dust, which increases ambient noise level, making some reception (eg NDB) difficult.
precipitation static See previous.

precise encrypted Accurate GPS using not only L1 (1,575 MHz) but also L2 (1,227 MHz), available only to US and Allied armed forces; abb. P(Y).
precise local fix An offset (3) near inconspicuous ground target.
same.

pre-flight line

On entering aircraft it is then necessary to cockpit (task superficial damage, inspect tyres and landing gear and tasks are to remove removables, check for fluid leaks or standard procedure which varies from type to type. Obvious each flight by flight crew, especially PIC, to broadly stan-

pre-flight inspection

That carried out on aircraft before each flight by flight crew, especially PIC, to broadly standard procedure which varies from type to type. Obvious tasks are to remove removable items, check for fluid leaks or superficial damage, inspect tyres and landing gear and have cleared objects that could be blown by slipstream. On entering aircraft it is then necessary to * cockpit (task sometimes performed by ground crew).

pre-flight line

Parking line for newly completed aircraft where work is carried out prior to first flight; hence pre-flight hangar.

preformed cable

For flight control, one whose individual wires are preformed to final spiral, or spiral-spiral, shape; such they do not splay out should cable be cut.
**preware**

**preware** Software, usually paper and DVD, for self-instruction in PPL, IR or other qualification.

**pre-rotation gear** Landing gear whose wheels are spun-up before touchdown.

**pre-rotation vanes** Upstream of fan in wind tunnel to impart swirl which is eliminated by fan.

**PRESS, Press** Pressure.

**Preselect** Autopilot mode to capture desired condition, usually altitude.

**presentation** Geometric form, character and style of display, esp. one of electronic nature; eg PPI plus alphanumericics, line plot plus cursive writing or TV picture plus alphanumericics.

**2 Presentation flight.**

3 Putting a target to be shot at with guns, SAMs or by fighters; each * can be racetrack, snaketrack, straight line or off other form.

**présentation** The merge (F).

**presentation flight** First showing of new type of aircraft to Press/customers/public, usually [unlike demo flight] in sedate flypasts.

**preset guidance** Pre-programmed autopilot determining mission in advance.

**PRESFR** Pressure falling rapidly.

**pre-simulator training** Training on Technamation and similar animated displays, with mainly dummy controls, to ensure familiarity with systems and procedures.

**PRESRR** Pressure rising rapidly.

**Press** 1 Pacific Range electromagnetic signature study (USAF, DARPA).

2 Project review, evaluation and scheduling system.

**Pressure**

**Pressure switch** Pressure selector with manual input.

**press fit** Loose term which usually means interference fit.

**press tooling** Tooling for use in presses, such as rubber or mating male/female dies for making finished or near-finished parts in sheet; not usually applied to tools for applying curvature to plate.

**press to transmit** Pushbutton on control wheel or other inceptor enabling pilot to use R/T whilst flying manually.

**press-ups** Jet STOVL training: vertical takeoffs and landings repeated on same spot.

**pressure** Force per unit area. The SI unit is the pascal, 1 Pa = N m⁻² = 0.000001 bar = 0.000249089 lb/ft² = 0.00689476 Pa = 1.01325 kNm⁻² = 14.6959 lb/in² = 760.00154 mm Hg = 29.5307 in Hg; 1 kPa = 1013.25 Pa = 0.00101325 atm = 10.132525 mb = 133.322 Pa/m²; 1 bar = 100.001325 torr = 1013250 Pa = 47.822035 ft H₂O = 29.921989 in Hg = 6.89476 atm = 98.0665 m H₂O = 33.415032 ft H₂O.

**pressure bulb** One sealed to serve as boundary of pressure cabin or pressurized section of fuselage.

**pressure chamber** Volume in aircraft occupied by human beings in which pressure is always maintained at or above selected level (eg equivalent to atmospheric height of 2,500 m or 8,000 ft) for comfort of occupants no matter how high aircraft may ascend. Term derives from early (c1930–40) usage when ** was entity installed in fuselage. Today inappropriate for civil transports where entire fuselage is pressurized except for nose tip, extreme tail and cut-out for wing; preferable simply to use adjective pressurized.

**pressure chamber** Strictly, one in which environmental pressure is raised above atmospheric; decompression chamber is preferred.

**pressure coefficient** Local pressure (eg measured on surface of body such as wing) divided by dynamic pressure, thus $C_p = P/\frac{1}{2}\rho V^2$.

**pressure cooling** Cooling of heat-generating device (eg piston engine) by liquid maintained under pressure to raise boiling point.

**pressure-demand system** Demand oxygen system supplying at above wearer’s local pressure.

**pressure differential** Difference in pressure between two volumes, eg pressurized fuselage and surrounding atmosphere, dp.

**pressure door** Sealed to form part of boundary of pressure cabin or pressurized cargo compartment.

**pressure drag** Drag due to integral (summation) of all forces normal to surface resolved along free-stream direction; most wings in cruising flight have small ** because adverse pressures on and immediately leading edge are largely countered by helpful pressures over rear portion.

**pressure-drop control** Called a * valve, * orifice or * system, this turbofan fuel-control unit comprises sliding variable-aperture orifices moved by a centrifugal governor controlling transmission of primary to main fuel pressure.

**pressure error** Instruments using a pitot/static system suffer from *, made up of compressibility error and position error.

**pressure face** Side of propeller or helicopter-rotor blade formed by lower surfaces of aerofoil elements, over which pressure is usually greater than atmospheric.

**pressure fatigue** Structural fatigue induced in pressurized fuselage by repeated reversals of pressurization stress.

**pressure flap** Large fabric inwards (rarely, outwards-) relief valve(s) in skin of airship to allow air to flow in during descent so that internal pressure shall never be significantly below that of surrounding atmosphere.

**pressure garment assembly** NASA terminology for types of space suit, without PLSS.
pressure gradient

Rate of change of pressure along any line normal to local isobar direction, eg in atmosphere or on surface of lifting wing.

pressure head

Combined pitot/static tubes.

pressure height

1 See pressure altitude (4).

defined in terms of height above a reference level, with the reference level at mean sea level equated with the atmosphere at sea level pressure.

2 That, related to standard atmosphere, at which gas cells reach predetermined super-pressure (BSI). Thus, that at which gas release valves open.

pressure helmet

See pressure suit.

pressure instruments

Flight instruments operated by air pressure difference, eg ASI, VSI and simple altimeter.

pressure jet

Helicopter tip-drive unit comprising propulsive jet on or near tip of main-rotor blade fed with compressed air supplied along interior of blade. May or may not have provision for combustion of fuel, which if used results in combustion.* or tip-burning. See next.

pressure-jet atomisation

Gas-turbine injector in which fuel is first spun violently in a swirl chamber. It is then discharged through a central nozzle as a fine conical spray.

pressure lubrication

Lube oil supplied under pressure, usually from gear pump, and ducted through drillings and pipes to main bearings and other parts (see pressure-relief valve system).

pressure manometer

Liquid-filled U-tube at foot of aero-stat gas cell.

pressure-pattern flying

Technique of long-range navigation (1944–60) in which isobar patterns provided basis for flight-planning to make maximum use of following winds.

pressure pump

That supplying fluid under pressure to system. Term usually means pressurized fuselage; see pressure cabin.

pressure ratio

Ratio of fluid pressures between two points in flow, notably between stages of axial compressor (PRPS, per stage) or between inlet and delivery of pump. Value may range from negative at SL to 9.5 at 3,000 ft. Number of stages may become significant for pressure ratio above 2.5.

pressure recovery

Also called recovered pressure, that generated in flow through duct by conversion of kinetic energy, esp. after addition of heat as in cooling radiator. When heat added can exceed stagnation pressure.

pressure-relief valve system

Oil supply, eg for gas-turbine engine, in which delivery oil pressure is opposed by relief valve backed by spring plus atmospheric pressure via oil tank; as engine rpm increases, delivery pressure eventually forces relief valve open, spilling excess back to tank, thus holding steady pressure and flow to bearings at all flight engine speeds.

pressure rigid airship

One combining features of rigid and non-rigid design to maintain shape and skin tension.

pressure seal

Inflatable seal between rigid members which is pressure-tight when inflated but when deflated offers no resistance to relative motion of parts; universal in pressurized doors and canopies.

pressure spike

Sudden change in delivery pressure from aircraft fuel tank [jargon to ‘water hammer’]; there are several causes, and the spike can be violent positive or negative.

pressure stabilized

Having structural rigidity wholly dependent on maintenance of positive internal pressure, eg Atlas missile.

pressure structure

See inflatables.

pressure suit

Suit which, when rigid-facepiece helmet is attached, completely encloses wearer’s body and within which gas pressure is maintained at level suitable for maintenance of bodily function (apart from addition of comment on necessity of adding helmet, this is DoD, NATO). Also called full-pressure suit. Some US definitions call this a pressurized suit, to be distinguished from ** because, according to these authorities, ** merely ‘provides pressure upon the body . . . . a pressure suit is distinguished from a pressurized suit, which inflates, although it may be fitted with inflating parts that tighten the garment as ambient pressure decreases’. This is partial; ** distincion must also be drawn between **, g-suit and water suit.

pressure surface

Curved and irregular surface corresponding to particular atmospheric pressure at any time; usually plotted for 1,000 (often part below Earth’s surface), 900, 800, 700, 500, 300 and 100 mb (see contour chart).

pressure switch

One actuated by reaching preset pressure, esp. that in starter circuit triggered by fuel pressure.

pressure test

Invariably means response of operative device or, esp., inflated structure, eg fuselage; objective not to measure pressure.

pressure thrust

Product of pressure difference between rocket exhaust pressure and ambient pressure multiplied by area of nozzle; value may range from negative at SL to positive at high altitude. Rocket thrust = ** plus momentum thrust.

pressure transducer

Device, based on at least eight principles, for generating output current or signal proportional to fluid pressure or pressure difference.

pressure tube

Tube fitted to aerostat envelope or gas cell to which pressure gauge may be coupled.

pressure vessel

Container for gas under (usually high) pressure.

pressure waistcoat

Pressurized covering over torso, as much to resist gas as to facilitate breathing at high altitude.

pressureization

Inflation: increasing pressure in closed system. Term usually means pressurized fuselage; see pressure cabin.

pressureized blade

Patented (Sikorsky) technique for early warning of crack in helicopter main-rotor blade primary structure by inflating with dry nitrogen or other gas and sealing; loss of pressure signals cockpit lamp or other alarm.

pressureized feed

Supply of liquid rocket propellants under gas pressure.

pressureized ignition

Piston-engine ignition system sealed and held close to sea-level pressure to reduce arcing and electrode wear at high altitude.

pressureized tank

Tank for liquid expelled by pressurizing gas.

pressures

Pre-strike surveillance/reconnaissance system.

pre-stage

Intermediate stage of operation in start-up of large liquid-propellant rocket in which propellants are fed to main chamber by main turbopumps and ignited, but with propellant flow less than 25% of maximum; once
Prestal
proper combustion has been confirmed, main-stage operation is signalled (ie allowing full flow).

Prestal Specially formulated aluminium alloy with exceptional elongation and malleability for large-deformation presswork.

pre-stall buffet Aerodynamic buffet induced by turbulence over wing and/or control surfaces or fixed tail giving warning of imminent stall.

pre-stocked site Storage of POL/ordnance at remote site which might in emergency (crisis or war) be operating base for V/STOL aircraft.

Prestone Trade name of family of coloured and colourless ethylene-glycol coolants.

prestretched cable Control cable loaded to 60% uts for 3 min. immediately before installation.

pre-swirl nozzles Ring of curved stators which impart swirl to cooling air fed to turbine disc and reduce temperature and pressure. There are many other pre-swirl applications.

pre-tensioning Tightening a bolt to such a degree that it is always under tension, reducing stress fluctuation in service.

pre-TR Rapid-switching cell which protects radar transmit/receive tube from undesirable input.

prev Previous.

prevailing visibility Horizontal distance at which targets of known distance are visible over at least half horizon; determined by viewing dark objects against horizon sky by day and moderate-intensity unfocused lights by night. Not necessarily RVR.

preventive advisory Resolution advisory instructing pilot to avoid certain deviations from established vertical velocity (TCAS).

preventive maintenance Systematic inspection, detection and correction of inipient failures either before they occur or before they develop into major defects (DoD).

preventive perimeter Outer perimeter formed during emergency security operations by stationing aerospace security forces at key vantage points and avenues of approach to vital areas of base (USAF).

preview Brief series of tests by military customer of new applications network formerly linking SAC HQ to operating squadrons of missiles or bombers.

primary alerting system Leased-circuit voice communications network formerly linking SAC HQ to operating squadrons of missiles or bombers.

primary area Published area along airway within which obstacle clearance is provided.

primary bodv That around which satellite orbits or to/from which spacecraft escapes or is attracted.

primary control See primary flight controls.

primary cosmic rays Those reaching Earth from outer space.

primary defect rate Failures per unit time, usually 10^6 flight hours.

primary failure Failure of a part that is not the result of a previous failure of another part or system (FAA).

primary effects Of NW: blast, radiation, heat, EM pulse.

primary flight computers Those providing control of trajectory, as distinct from trimmers, drag-increasers and high-lift devices. Conventionally ailerons/spoilers (where latter are used for roll), elevators and/or tailplane (or foreplane) and rudder. DLC usually excluded.

primary flight display Electronic cockpit instrument telling pilot everything he needs to know in vertical plane, to enable him to fly the aircraft. Partnered by ND, for horizontal plane.

primary frequency R/T frequency assigned to aircraft as first choice for air/ground communications in an R/T network.

primary glider Strong and simple training glider in which no attempt is made to achieve soaring capability. Often consists of a skid on which is a lattice-frame linking wing and tail.

primary heat-exchanger That which removes heat from source and rejects it to atmosphere or to a secondary circuit.

primary holes Those through which primary air enters gas-turbine combustor.

primary inspection Minimum scheduled periodic lubricating and servicing check applied to aircraft and its removable equipment, including examination for defects and simple functional testing of systems such as flight controls, radio and electrics (ASCC, qualified by ‘UK usage’).

primary instability Failure of strut or other compression...
primary instruments

member through buckling (transverse movement near centre).

primary instruments Those giving basic information on flight trajectory and airspeed, eg traditionally horizon, turn/slip, ASI, VSI and altimeter. Heading information not included.

primary lighting Usually that essential for safe flight; cockpit lighting, navigation, rotating beacon, icing, formation.

primary member Any part of primary structure, though not usually applied to sheet or machined skin.

primary modulus of elasticity That for sandwich or other multi-component material below yield point (if applicable) of weaker component.

primary nozzle 1 That through which main flow of fuel passes in fuel burner or injector.

primary stress Basic applied tension or compression, as distinct from stresses induced by deflection of structures such as buckling.

primary structure That whose failure at any point would imperil safety.

primary surveillance radar In ATC system, determines aircraft range and azimuth in controlled airspace.

primary target Main target of surface-attack mission.

primary trainer That on which pupil pilot begins flight instruction, also called ab initio, elementary (but not basic).

primary zone See primary combustion.

PRIME, Prime 1 Precision recovery including manoeuvrable re-entry. 2 Products comprising interdependent mechanical and electronic parts.

prime See prime contractor or priming.

prime airlift Number of aircraft of force that can be continuously maintained in cycle: home base, on-load base, off-load base, recycle.

Prime Beef Worldwide Base Engineer Emergency Force for direct combat support or to assist recovery from natural disasters (USAF).

prime contact That for entire responsibility for design, development and (usually) assembly and test of complete functioning system, eg aircraft, missile etc. Manufacture, esp. in production, may be assigned by prime contractor to other companies or shared by consortium. An essential is control of programme management. (Strict DoD definition: any contract entered into directly by DoD procuring activity).

prime contractor That awarded prime contract.

prime crew 1 Crew of strategic bomber/tanker/ICBM flight with long experience of combat duty.

2 That assigned to fly space mission (see back-up crew) (NASA).

prime maintenance organization A maintenance partner to shoulder airline’s engineering responsibilities.

prime meridian Longitude 0°.

priority designated

prime mission This emerged as Pentagonese in 2004; it varies according to class of aircraft.

prime mover 1 Source of mechanical energy, eg engine. 2 In military sense, surface vehicle designed chiefly for towing and normally accommodating crew, ammunition etc.

primer 1 Subsystem, usually energized by hand-pump in cockpit, for spraying fuel into piston-engine inlet manifold (rarely, elsewhere) to facilitate starting from cold. 2 Pressure-fed injector of atomised fuel towards igniter in vapourising combustor to initiate combustion in starting cycle.

priming 1 Use of primer. 2 Sensitive high explosive for detonating main charge.

priming pump Primer.

principal axes 1 Traditionally, those orthogonal axes which eliminate product of inertia terms from equations of motion. Modern computers make these redundant. 2 Axis of relative wind. 3 Principal inertia axis.

principal parallel 4 Rectilinear axes in plane of cross-section of structural member about which moment of inertia is maximum and minimum.

principal plane On oblique photograph, vertical plane containing principal point, perspective centre of lens and ground nadir.

principal point On oblique photograph, foot of perpendicular to photo plane through perspective centre, usually determined by joining opposite collimating or fiducial marks.

principal site concept All prototypes of new combat aircraft do entire flight-test programme at one customer central site under close customer control (USN).

principal tensile stress For cutout in pressurized cylinder, that along axis where stress is maximum, hence *** factor. = maximum ***/hoop stress. For neutral hole (ellipse in proportions 2/3) *** = hoop stress.

principal vertical On oblique photograph, line through principal point perpendicular to true horizon.

Print Present indication.

printed circuit Electric or electronic circuit formed by deposition of conductive and/or semiconductive material on insulating base; many techniques and many substrates, eg thin/thick film, foil etc.

printed-circuit board Printed circuit on rigid substrate provided with multiple plug-in or other contact terminals and on which are mounted discrete devices.

printed communications Telecommunications network providing printout at each terminal of all messages.

print reference Identifying reference of each air-reconnaissance photograph.

print-through Unwanted transfer of strong signals from one part of magnetic tape to one pressed against it on spool.

priority designated Two-digit number from 01 to 20
priority induction

resulting from combination of assigned force/activity designator and local urgency-of-need designator (USAF).

priority induction 
Immediate transfer to USAF of Air Force Reserve members who fail to participate in training.

prior permission
1 That which must be granted by appropriate national authority before start of flight(s) landing in or flying over territory of nation concerned.

2 Specific permission to land at particular airfield within particular times.

Prism
1 Programmed real-time information system for management (Northrop/USA).

2 Panchromatic remote-sensing instrument for stereo mapping.

3 Photo-reconnaissance intelligence strike module.

4 Portable resource for the investigation of suspected unmanned MAMPs.

5 Planning tool for resource integration, synchronization and management (DoD).

prisoner nut
Lock nut.

private aircraft
One owned by private pilot.

private flight
One made by private pilot from one airfield to another [see pleasure].

private pilot
One licensed by national authority to fly particular type, class or group of aircraft without payment, and precluded from carrying fare-paying passengers.

private venture
Major product designed, developed and tested at company risk, esp. in case of military aircraft not requested by government.

PRJMP Pressure jump.

PBG Parking.

PRM 1 Presidential review memorandum.

2 Precision runway monitor[ing].

3 Proposed rule-making.

2 Positive Release Message.

PRMD Pilot’s repeater map display.

PRN Pseudo-random noise.

P-RNAV Precision RNAV, accurate ≥ 1 nm (1.8 km), adequate for TMAs.

PrNK Pritsino navigatsionni kompleks. Nav/attack system of production article; composed of sum of administrative lead time and production lead time (DoD).

PRNSA Pseudo-random noise signal assembly.

PRO 1 Anti-rocket (ie anti-ICBM/SLBM) forces (USSR, R).

2 Procedures and Requirements Overview (ICAO).

3 Public Records Office (Kew, UK).

PROAR Area forecast, height indicated in pressure units (ICAO).

Pro-ATN Prototype aeronautical telecoms network (Euret).

Proavia Paris-based international airport trade organization, 39 members.

PROB Probable, probability percentage, of weather.

Proba Project for on-board autonomy.

probability density function
The probability that a random vector will lie within the differential region dx centred at ξ.

probability percentage
Likelihood of prediction in Met. report; only two are used, 30% and 40%.

probable
1 See probably destroyed.

2 Qualifying term in photo interpretation where facts point to object’s identity without much doubt (ASCC).

probable errors
In range, deflection, height of burst etc, those which are exceeded as often as not (DoD).

probably destroyed
Assessment on enemy aircraft seen to break off combat in circumstances which lead to conclusion it must be a loss, though not actually seen to crash (DoD, NATO).

Probag Installation for heat-shrink-wrapping baggage.

probe
1 Instrument boom; see * errors, * parameters.

2 Rigid receiving tube for fuel passed by flight-refuelling drogue.

3 Any device used to obtain information (esp. quantified) about environment, esp. unmanned instrument-carrying spacecraft.

4 In particular, a sensor which leaves an orbiter and descends to planetary surface.

5 Loop or straight wire for coupling to waveguide and extracting energy from electric or magnetic component of radiation.

6 Transducer which converts shaft speed, sensed as sinusoidal magnetic field from toothed wheel on shaft into alternating signal current; also called MSP.

7 The sensing element in a magnetic chip detector.

probe and drogue
British (Flight Refuelling) method of refuelling aircraft in flight.

probe errors
Those originating in probe (1), as far as possible corrected by ADC.

probe parameters
Subject to particular installation can include AOA, yaw/sideslip, total pressure, total temperature and static pressure.

PROC 1 Procedure.

2 Procurement.

procedure alpha
Ceremonial manning of flight deck of carrier, eg when entering harbour, often with crew arranged to spell vessel’s name or a slogan.

procedure manoeuvre
Accurately flown and/or timed flight manoeuvre for identifying or ATC purpose.

procedure turn
Flight manoeuvre in which turn is made at constant rate away from track followed by constant-rate turn in opposite direction to enable aircraft to capture and hold reciprocal; precision manoeuvre used in radio range, holding over point fix prior to joining stack, joining ILS without radar vectoring, or in simulator training of traditional (Link) type. Designated left or right depending on first turn direction.

process annealing
Heating ferrous alloys to below critical temperature followed by cooling in air or other medium.

Procon Protocol convertor.

Precod Production cost by drawing number.

Procu, ProCru Procurement oriented crew-station model.

procurement
Process of obtaining personnel, services, supplies and equipment (DoD).

procurement lead time
Interval in months between initiating procurement action and receipt into supply system of production article; composed of sum of administrative lead time and production lead time (DoD).

prod
Make probe/drogue inflight-refuelling contact (colloq.).

product definition data interface
Standardizes digital descriptions of part properties and configurations required by manufacturer.

product improvement
Significant change in design of hardware to improve desirable features, and marketed as such; usually initiated to meet market need, either because of competition or to rectify deficiency.

production
Ideal * is manufacture of successive items
production base

which are identical, also called series * With complete aircraft successive items tend to differ in furnishing, equipment and even engine type.

production base Total national production capacity available for manufacture of items to meet material needs (DoD).

production investment Funding for tooling, or the cost of same.

production lead time Time between placing contract and receipt of hardware; subdivided according to whether contract is initial or reorder.

production phase Period between production approval until last item is delivered and accepted.

productive potential Payload multiplied by range.

productivity In airline performance, traffic units (eg LTM) generated per hour per aircraft of particular type or per employee.

product life cycle See life cycle.

product support Assistance provided by manufacturer to all customers throughout period of product’s use in form of training, publications, spare parts, modification kits, product-improvement and immediate response to difficulties.

PROF Profile.

Profi Product, or project, financing (multinational).

proficiency student One on refresher course.

proficiency training Flight training for desk-bound flight personnel.

profile Outline of body in side elevation; many sub-meanings. Common use is to describe shape of cross-section of wing or other aerofoil section. Outboard * is external shape of body, esp. aircraft fuselage. Inboard * is longitudinal cross-section showing how interior is utilized. Flight * is orthogonal projection of flightpath on vertical surface containing nominal track showing variation in height (either AGL or AMSL) along straight bottom axis representing track.

ProfiledData Library of NC-machining software (Ferranti).

profile descent Uninterrupted from TOD (1) to interception of glide-path.

profile drag Total drag minus induced drag; sum of form drag and surface-friction drag. One interpretation suggests ‘drag of wing with camber and twist removed’.

profile-drag power loss Suggests ‘drag of wing with camber and twist removed’.

profilesdrag Power loss of total profile drag of propeller blades.

profile line Profile of terrain, eg near airport drawn as line to mean inset.

profile milling Milling variable profile (surface levels) in plate, eg in machined or integrally stiffened skin panel.

profile template Template for hand-guided machine tool, eg router.

profile thickness Maximum distance between upper and lower contours of aerofoil profile, each measured normal to mean line; essentially wing thickness.

profimetre Instrument for measuring surface roughness.

prog 1 Prognosis, prognostic, progress.

2 In particular, progress page on MCDU.

prognostic chart Forecast of meteorological elements for specified time and location depicted graphically.

prognostics and health monitoring System assigned to notice small change in component performance and trigger maintenance action to prevent failure.

prograde Direct, or progressive orbit; satellite launched into Earth orbit with inclination from 001° to 179°.

program 1 Vast topic, covered in EDP (1) dictionaries; simplest definition is group of related instructions which when followed by computer will solve a given problem.

2 Programme (US).

program acquisition unit cost Includes average procurement unit cost plus the unit slice of the total R&D cost since program inception. These are sunk costs, and do not affect price paid for production aircraft (DoD).

Program Aircraft Total of active and reserve aircraft (USAF).

programmable Capable of being controlled by different programs by change of software.

programmable display generator Generator of 3-colour raster formats plus calligraphic symbology, all under variable software control.

programme Life history of major project, typified by such * milestones as definition of requirement, feasibility study, project definition, engineering design, hardware manufacture/development/flight test, flight development, service clearance (eg qualification or certification), production, modification and product-improvement, fault-rectification, phaseout.

program(me) element Portion of giant system (eg, SDI) which is broken down to facilitate assignment of tasks to companies or participating nations.

programmer Human being engaged in programming.

programmer comparator Versatile automatic testing station providing serial evaluation of all kinds of analog and digital signals, eg in checking avionic systems in aircraft, missiles or spacecraft.

programming Art of preparing set of terms and instructions which EDP (1) machine can understand and obey and which when followed by that machine will result in solution to problem for which program was written.

progressive burning See progressive propellant.

progressive die One which performs series of operations (usually on sheet metal) at successive strokes of press.

progressive feel Artificial feel proportional to dynamic pressure.

progressive orbit See prograde.

progressive powder Solid fuel, usually not gunpowder, which burns increasingly fast as combustion pressure increases.

progressive propellant Solid rocket-motor grain so shaped and ignited that area of combustion, and hence speed of burning, rate of consumption and thrust, all increase throughout period of burn. Any radial burning technique tends to be * unless original grain has deep star centre such that combustion area is constant (neutral burning).

progressive servicing Servicing performed at military airbase where major tasks are subdivided into sections performed at times fitting in best with operational readiness requirements.

progressive stall Ideal stall quality where breakdown of wing flow occurs gradually, with well-signalled symptoms; to obtain it a breaker strip or fence may be needed.

progressive strip See Flight progress strip.

Prob. prob. Prohibited.

prohibited area Airspace of defined dimensions identified by area on surface within which flight by aircraft is prohibited, usually for reason of national security or to
safeguard wildlife. Height ranges from surface to published value such as 4,000 ft or 18,000 ft (FAA).

**Proj** Projection.

**project** Planned undertaking of something to be accomplished (DoD).

**Project Blue Book** Official dossier on UFOs (USAF).

**project cycle** Life history of platform or weapon system [concept, not individual examples].

**project design** Programme phase in which design is refined by evaluating alternative choices, making performance/capability/cost trade-offs and ultimately arriving at optimized configuration on which engineering design can begin. Work possible in this stage includes tunnel testing, cockpit mock-up improvement and basic systems design, but excludes stressing (detail engineering design).

**projected area** Area projected from 3-D surface to plane, or from one plane to another.

**projected blade area** Area of propeller or other blade projected on to plane normal to axis of rotation; solidity is not based on this but on total area.

**projected flightpath** That which aircraft, esp. aeroplane, will follow in immediate future in absence of further disturbance.

**project engineer** Engineer assigned to oversee design and technical management of specific project, reporting to chief engineer or v-p engineering.

**projectile velocity** Resultant of muzzle and aircraft velocities.

**projection** In cartography, any systematic arrangement of parallels and meridians portraying quasi-spherical planetary surface on plane of map.

**project officer** Military or civilian individual responsible for accomplishment of project; usually limited-duration appointment and not one already established within organizational and supervisory channels (USAF).

**projector** 1 Illuminating source sending out pencil beam of visible light, eg vertically up at cloudbase.

2 Long-dash broken line to show projection of line or surface from one plane to another in engineering drawing (drafting).

**projector (approach) sight** Mirror sight or similar landing guidance optical system on carrier.

**proliferation** Spread of NWs to additional nations.

**PROC** PROM Programmable read-only memory.

**PROM, Prom** Programmable read-only memory.

** protrusion** Pin, radioactive metal, among other things used in small batteries, MPt 1,168°C, density 7.2.

**prominent target** Used in small batteries, MPt 1,168°C, density 7.2.

**proof factor** Arbitrarily assigned factor of safety imposed above proof load; for UK civil aircraft * is 1, thus proof and limit loads are same; for UK military aircraft * is 1.125, thus proof load is 1/8 higher than limit load. See ultimate factor.

**proofing** Treatment of fabric to render it gastight or water-resistant.

**proof load** Design limit load × proof factor. Maximum which primary structure is designed to bear whilst remaining serviceable. This vague definition survives in official publications, yet does not mention fatigue effect of repeated loading.

**proof of concept article** Prototype.

**proof positive/negative** Two sets of proof loads established for particular aircraft type and demonstrated in static test.

**proof strength** That required to survive proof loads (pos/neg).

**proof stress** Stress at yield point.

**prop**, Propeller, or aeroplane with propeller[s] (colloq.).

**propaganda balloon** Free balloon carrying propaganda leaflets scattered at timed intervals when prevailing wind is expected to carry it over enemy cities.

**propagation constant** Complex quantity of plane wave; real part is attenuation constant (nepers/unit length) and imaginary part is phase constant (radians/unit length).

**propagation error** In ranging system, algebraic sum of propagation velocity error and (important at long ranges and low angles) curved-path error.

**propagation ratio** Between two points in path of plane wave, ratio of complex electric field strength.

**propagation velocity** For EM wave (light, radio) in vacuum taken to be 2.997925 × 10^8 m/s.

**propagation velocity error** Difference between assumed and effective velocities over ray path.

**propellant** Medium used for propulsion, as in * charge of gun ammunition or material burned to form jet of rocket. Rocket * can be solid, liquid or gas, or combination. Where two are mixed rocket is bi-*, common mixture being fuel plus oxidant (oxidiser). Where catalyst is consumed and adds to jet this also is *. In uncommon case where single liquid is used rocket is mono-*. In rockets and thrusters where no chemical combustion takes place preferable to use term ‘working fluid’.

**propellant mass fraction** See mass ratio.

**propellant specific impulse** See specific impulse.

**propellant volume** Total volume occupied by propellant, esp. solid grain, Vp.

**propeller** Rotating hub with helical radial blades converting shaft power into aerodynamic thrust. Shaft power provided by human or prime mover. Tip-drive * possible (would require modified definition). Most existing definitions state ‘power-driven’, implying use of engine. Left and right-hand rotation respectively mean anti-clockwise and clockwise seen from behind. Can be pusher or tractor, latter at one time often being called airscrew (now arch.). Types of propellers (co-axial, reverse-pitch etc) are covered separately (see also
propeller angle of attack

(propeller). Similar screw for converting energy of slipstream into shaft power is windmill or RAT (ram-air turbine). Note: in 1930–50 UK usage resulted in a 1939 glossary having the entry ‘Propeller : colloquial term meaning “airscrew”.

propeller angle of attack

Angle between axis of rotation and free-stream airflow, usually close to zero, one symbol \( \alpha \).

propeller area

Usually means total area of blades obtained by integrating total of areas of elementary chordwise slices, taking blades as having no thickness; ie each slice is projected in plane of its local chord. Essentially same as outline area of blades with twist removed.

propeller balance stand

Trestle having two horizontal and parallel steel knife-edges (about 1–3 mm radius) on which propeller can be balanced on short slave-shaft.

propeller blade

Thrust-generating aerofoil of propeller.

propeller blade angle

Except in feathered position (when propeller blade angle \( \phi \), it is likely to be almost constant from root to tip. This is sometimes called aerodynamic pitch, represented by \( \lambda \). Experimental pitch, also called ideal pitch, is the distance the propeller would move forward in one revolution when giving neither thrust nor drag. Actual pitch, also called effective pitch, or practical pitch or advance per revolution, is the distance travelled forward relative to the atmosphere (not to the slipstream). Standard pitch, also called nominal pitch, is the pitch angle at standard radius. The pitch ratio is the ratio of geometric pitch divided by the circular distance travelled by the blade tip (circumference).

propeller blade-width ratio

Ratio of widest chord to propeller diameter.

propeller brake

Brake to stop rotation of propeller after engine shut-down, either to speed passenger disembarkation or, in case of free-turbine engine, to prevent prolonged windmilling with aircraft parked.

propeller camber ratio

Ratio of blade maximum thickness to chord at any station.

propeller cavitation

Generation of near-vacuum on suction face near tip at high Mach numbers (not necessarily at high flight speed).

propeller characteristic

Fundamental curve of \( V/nD \) (velocity of advance divided by \( \pi \times \text{diameter} \)) plotted against \( C_t \) (speed/power coefficient) (see Weick).

propeller disc

Circular area swept out by propeller.

propeller efficiency

Useful work expressed as thrust imparted divided by power input, \( \text{thrust hp/\text{hp}} \) \( \times \) slipstream velocity divided by \( 2\pi n \) where \( n \) is rpm and \( Q \) is drive torque. Some authorities cite two values of **, one called net (net thrust \( \text{hp/\text{hp}} \)) and the other propulsive (propulsive thrust \( \text{hp/\text{hp}} \)).

propeller governor

Usually simple centrifugal governor which keeps shuttle valve oscillating about null position feeding oil to increase or decrease rpm and thus hold rotational speed constant irrespective of aircraft forward speed.

propeller hub

Central portion of propeller carried on drive-shaft, usually made as separate unit into which blades (with simple fixed-pitch propeller, whole propeller) are inserted.

propeller interference

Aerodynamic effects, mainly drag, of bluff bodies immediately downstream, eg radiator or cylinders.

propeller pitch

The angular setting of the blades of a propeller. The blade angle \( \theta \) is the angle between the chord at any element (station) on the blade and the axis of rotation. The helix angle \( \phi \), also called the angle of advance, is the angle between the actual direction of motion (velocity) at any element relative to Earth and the actual direction of motion relative to the aeroplane; it is equal to the blade angle minus the angle of attack \( \alpha \). The geometric pitch \( p \) or \( P \), rarely \( H \) is a linear dimension equal to the distance any blade element would move forward in one revolution in absence of any slip \( (= 2\pi\tan \alpha) \). The propeller angle of attack \( \alpha \) is the angle between the actual direction of motion (velocity) at any element relative to Earth and the actual direction of motion relative to the aeroplane; it is equal to the blade angle minus the angle of attack \( \alpha \).
propeller width ratio

**propeller width ratio**  Product of blade-width ratio and number of blades; akin to solidity.

**propelling nozzle**  That at exit from fluid jet system used for propulsion, esp. turbojet or ramjet; for supersonic flight variable in shape (con-dit) and area.

**propan**  1 Advanced propeller for use at high Mach numbers, characterized by having six to 12 blades each with thin, sharp-edged lenticular profile and curved scimitar shape, overall solidity exceeding unity and loading being high. Can be tractor or pusher, shrouded or open, and for highest efficiency at about Mach 0.8 has two contra-rotating units.

2 Complete engine whose thrust is generated by (1).

**prop**  See *turboprop* (colloq.).

**proportional control**  Effect at output, eg surface movement, is proportional to input, eg stick movement; opposite of flicker or bang-bang.

**proportional flow control**  A fuel control system for large turbofans in which main flow is adjusted by precision control of a small parallel flow [often incorporating a pressure-drop control connected to a kinetic valve].

**proportional navigation**  Control of trajectory in order to home on target by changing course by several times (typically 3.5) rate of change of sightline to target; thus angular rate of velocity vector is proportional to angular rate of line of sight to target.

**proposal**  Formal and comprehensive document in which manufacturer sets out before government procurement officials complete technical specification and performance of proposed item, including timing and prices of development and, possibly, production programme.

**proprioceptive**  Pertaining to stimuli produced within body, esp. human body, by proprioceptors.

**proprioreceptor**  Internal receptor for stimuli, such as tendon tension, originating in somatic organ. Body balance maintained by * plus eyes and ear labyrinths.

**proprotor** 1 Large propeller(s) of VTOL aircraft whose axis can be rotated 90° to give lift.

2 Convertiplane with fixed-axis propeller(s) and lifting rotor.

**prop strike**  Tips of propeller(s) hitting ground, eg on takeoff.

**propulsion d’appoint**  Strap-on-booster (F).

**propulsion efficiency**  Term not recommended (see *propeller efficiency, propulsive efficiency*).

**propulsion integration**  The aerodynamic integration of the propulsion system into the air vehicle, ignoring physical [structural] considerations.

**propulsion system**  Sum of all components which are required to propel vehicle, eg engine, accessories and engine-control system, fuel system, protection devices, inlets and cooling systems.

**propulsive duct**  Not recommended; usually means pylon or subsonic ramjet.

**propulsive efficiency**  1 Broadly, energy imparted to vehicle as percentage of energy imparted to jet (from propeller or other prime-moving device) or expended in burning fuel. Basic equation is Froude efficiency \( \eta_F = V/(R + 1) \) where \( V \) is velocity of vehicle and \( \delta V \) is total increase in velocity of air in jet measured as difference between air well ahead of vehicle and at that fastest-moving part of jet (with propeller this is well behind plane of blades but with turbojet probably in plane of nozzle exit). Theoretically but not practically \( \delta V \) could be zero and jet would remain stationary with respect to free-stream; \( \eta_F \) then is 100%. Another expression for same relationship is \( \eta_p = 2/(R + 1) \) where \( R \) is ratio of jet velocity relative to vehicle velocity, which in theoretical perfect case becomes unity. This can also be written \( \eta_p = \delta V/V \), thrust times free-stream \( V \) divided by engine power.

Another treatment is \( * = \) work done on aircraft

which reduces to \( 2V/V + V_j \), where \( V \) is aircraft speed and \( V_j \) is jet.

2 Some authorities insist definition is input energy from burning fuel divided by energy of jet, allowing for all engine losses, expressed as percentage.

**propulsor**  1 Multi-bladed fan, usually with variable pitch or constant-speed control, used as superior alternative to propeller; in most cases surrounded by profiled duct.

2 Since 1980 US usage has introduced a different meaning: the core of a turbofan engine, comprising compressor, combustor and HP turbine.

**propwash**  Airflow caused by propeller alone, usually helical but velocities are measured in axial directions only.

**propylene oxide**  Stable liquid used in rapidly dispersed form as fuel/air explosive.
production; as far as possible representative of definitive article but usually inevitably deficient in many respects. In case of modern aircraft traditional * now rare; with civil programmes production is initiated in parallel with engineering design/development and even first examples are likely to be sold. With military aircraft first batch may be termed development aircraft. Aerodynamic * merely has correct shape. Breadboard or brassboard * is used to develop avionics. Purpose of * is to assist development; secondary role is to permit customer evaluation.

PROV Provisional (ICAO).

Proverse rudder Application of rudder to augment roll commanded by lateral control system.

proving flight Unscheduled flight by new type of commercial transport over intended routes by crew at least partly provided by customer to establish compatibility with sectors, aids, airfields and, esp., terminals and airline’s ground equipment and staff.

proving ground Military area dedicated to testing of ordnance, esp. of new types.

provisioning Precisely calculated schedule of necessary spare parts, types, numbers, prices, dates and locations to support operation of functioning system, eg commercial transport, fighter, radar or computer.

PROX Proximity, or GPWS.

proximate splitter Term coined (Pratt & Whitney) for aerodynamic flow splitter added to eliminate afterburner light-up pulsations in afterburning turbofan from reaching compressor.

proximity fuze Fuze which initiates itself by remotely sensing presence, distance and/or direction of target or associated environment by means of signal generated by fuze or emitted by target or by detecting disturbance in natural field surrounding target (DoD). Can be radio (radar), IR, visual (EO), acoustic or magnetic.

proximity operations work-station Enables Astronaut or other human to control motion of real or simulated manned or unmanned vehicles in space.

proximity scorer Hit/miss device triggered by entry of munition into spherical volume with scorer at centre; indicates only that munition entered this volume, without giving miss-distance.

proximity switch Switch today used in place of microswitch in exposed locations (MLG, trim tab etc) to signal mechanical position; usually variable-reactance microswitch in exposed locations (MLG, trim tab etc) to proximity switch giving miss-distance.

cates only that munition entered this volume, without

munition into spherical volume with scorer at centre; indicates only that munition entered this volume, without
cating only that munition entered this volume, without giving miss-distance.

PRV P/S, P-S

Pulse-repetition rate.

Production, or processing, readiness review.

Power ready relay.

2 Power ready relay.

3 Production, or processing, readiness review.

4 Pulse-repetition rate.

PRRC Pitch/roll rate changer assembly.

PRF Planar randomly reinforced fibre composite.

PS 1 Pressure-ratio sensor(s).

2 Public regulated service (satcom).

PRSD Power reactant storage and distribution subsystem, LO2 and LH2 for fuel cells generating electric power (Space Shuttle).

PRSG Pulse-rebalanced strapdown gyro; INS gyro whose dynamic error is reduced by compensating re-balance loop electronically.

PRSOV Pressure regulating, or pressure-raising, or pressure-reducing, and shut-off valve.

PRSS Passive ranging subsystem.

PRST Persist [enl].

P/RST Press to reset.

PRT 1 Pulse recurrence (or repetition) time.

2 Pulse rise time.

3 Propeller research tunnel.

4 Power-recovery turbine.

5 Processing remote terminal.

Pw, PRT Aggregate perimeter of all jets of aircraft.

PRTB Mobile ICBM repair technical base (R).

PRTCS Portable radar tracking [and] control system (UAVs).

PRTR Printer.

PRTV Production representative, or readiness, test vehicle.

PRU 1 Photo-reconnaissance unit (RAF, WW2).

2 Performance reference unit.

prudent limit of endurance Time during which aircraft can remain airborne and retain given safety margin of fuel (NATO).

prudent limit of patrol Time at which aircraft must depart from its operational area in order to return to base and arrive there with given margin (usually 20%) of fuel.

Prune Accident-prone person, esp. pilot, from mythical Pilot Officer Percy Prune, (RAF, WW2).

PRV 1 Pressure regulating [or reducing, or relief, or release] valve.

2 Personal or personnel, recovery vehicle [a helicopter].

P RW Passive radar warning.

PS 1 Pferdestärken = cv = 0.98632 hp = 0.7355 kW.

2 Pitot/static.

3 Passenger-service costs.

4 Procurement, or performance, specification.

5 Photoemission scintillation.

6 Photo squadron.

7 Payload specialist [spacelift].

8 Primary/search director.

9 Power supply or set.

10 Plus.

11 Positive.

12 See P/S.

13 Polar station [lunar].

Ps 1 Static pressure.

2 Radar power received from target.

3 Time rate-of-change of specific energy.

4 Standard pitch of propeller.

5 Specific excess power.

6 Probability of survival. (Suffix bare, lone unsupported aircraft;Suffix E or enhanced, all possible on-board avionics and EW/ECM systems).

7 Stagnation pressure.

8 Panel-stiffener end load.

ps Picosecond (10^-12s).

P/S, P-S 1 Pitot/static.
PSA

2 Primary/search director.
3 Pressure-sensitive.
4 Primary to secondary (airports).

PSA Prefabricated surface, or surfacing, aluminium, or semi-permanent airfield [meanings can be same].
2 Pressure-swing acceptance.
3 Pressure absorption.
4 Pilot’s associate.
5 Power-spindle angle (TLA is preferred).
6 Lb/in2 absolute (deprecated).
7 Problem-statement analyser.
8 Precision Strike Association (US).
9 Plasma stealth antenna.
10 Power supply, or switching, assembly.
11 Process-simulation article.
12 Point of service activation [comsat].

p.s.a. Passed staff college [air] (RAF).

PSAC Presidential Science Advisory Committee (US).
PSAI Public Safety Aviation Institute (US).
PSAS Pitch, or primary, stability augmentation system.
2 Program support/annual sustaining.
3 Persistent surface-attack system (USA).

PSB Plough, sweeper and blower [snow].
2 Professional Standards Board (RAeS).

PSBL Possible.

PSBR Public-sector borrowing requirement.

PSC Principal site concept (USN).
2 Product-support contract (NASA).
3 Program support contract (NASA).
4 Performance-seeking control.
5 Photo safety chase [TB adds testbed].
6 Plasma-sprayed ceramic.
7 Public-sector comparator.
8 Photographic sensor control; S adds system.

PSMMS Propulsion-system control, monitoring and maintenance system.

PSCU Phase-shifter control unit.

PSD Power spectral density.
2 Physiological Support Division (SR-71 ops).
3 Port-sharing device.
4 Preliminary System Design.
5 Passive stealth detection.

PSDF Power spectral density function.

PSDN Packet-, or public-, switched data, or digital, network.

PSDP Programmable-signal data-processor.

PSDS2 Persistent surveillance and dissemination system of systems (USA).

PSDU Phase-shifter drive unit.

PSE 1 Passenger service equipment (reading lights, call button etc).
2 Passive seismic experiment.
3 Project support environment.
4 Phase-shifting element.
5 Packet switching exchange.
6 Peculiar synchronization, or support, equipment.
7 Problem-solving environment.

PSEU Proximity slat, or sensor, or switch, electronics unit.

pseudo-adiabatic Process by which saturated air parcel undergoes adiabatic transformation, water being assumed to fall out as condensed.

pseudo aircraft system Hi-fi multi-aircraft real-time simulation environment to support ATC research (NASA Ames).

pseudo analog Electronic display which simulates traditional instrument, eg by using fixed LED matrix to form ‘dial’ plus computer-driven LEDs to generate ‘pointer’ and alphanumerics.

pseudo fly-by-wire Flight control system in which at least one axis of control is normally, at one point at least, electrical; * systems have capability for manual reversion or override.

Pseudolite A particular scheme using surrogate satellites in a HALE UAV to counter hostile GPS jamming.

pseudolite Transmitter of differential GPS signals from ground to improve acquisition and accuracy [from ‘pseudo-satellite’].

pseudo noise Technique in which PN code generated sends out wideband noise-like signal which is then viewed as carrier on which message is imposed; usually direct-sequence modulation approach is used in which PN code directly balance-modulates carrier.

pseudo-pursuit navigation Homing method in which missile is directed towards target instantaneous position in azimuth while pursuit navigation in elevation is delayed until more favourable attack angle (note: this is not the same as AOA) on target is achieved (DoD).

pseudo radar ADS (5) with display.

pseudo-random noise See pseudonoise.

pseudorange Satellite-derived range uncorrected for errors in synchronization between the two clocks.

pseudo stereo False impression of stereoscopic relief (ASCC).
2 Common audio meaning, simulating stereophonic by using two speakers, one via brief delay, from single channel.

pseudo-3-D Large family of techniques for generating subjective impression of three dimensions on (usually) planar display. One is pseudo stereo (1); various methods used in PPI displays and several techniques in computer-driven OTW displays for simulators, some coming under heading of CGI.

PSF Phospholipid material (fibre) optical fibre.
2 Polystyrene foam.
3 Personnel services flight (RAF).

psf, PSF Pounds per square foot (non-SI and in any case strongly discouraged).

PSFD Product, or production, sustainment and follow-on development.

PSFP Pre-simulator familiarization panel.

PSG 1 Post-stall gyration.
2 Passing, passage.

PSGR Passenger[s].

PSH Prime standard and handbook.

psi, PSI 1 Pounds per square inch.
2 Permanent staff instructor.
3 Pulsing, or pulsating, slope indicator; -L or -R shows which side of runway.
4 Proliferation security initiative.
5 President of the Service Institute.
6 Product-support integrator.
7 Person of special interest.

psi Pounds per square inch.

psia, PSIA Pounds per square inch, absolute.
2 Pounds per square inch, ambient.

psid, PSID Pounds per square inch, differential.
psig, PSIG  Pounds per square inch, gauge.
PSK  1 Phase [rarely, pulse] shift keying; differently used in satcom terminals.
2 Prospect[s].
PSL  1 Polystyrene latex.
2 Problem statement language.
3 Physical Science Laboratory (NM State Univ.).
PSLO Product-support logistic operation.
PSLV 1 Polar-satellite launch vehicle.
PSM 1 Passenger statute-mile.
2 Post-stall manoeuvring, or mode.
3 Personal safety monitor.
4 Power-system, or supply, module.
PSMC Preselected manual control.
Psunc GPS packet-mode channel for system management and control. Continuously broadcast by each satellite to inform system configuration and status, plus time and frequency information needed by an AES seeking to log on.
PSMK Personal-sensor moding key.
PSN 1 Potassium/sodium niobate.
2 Position.
PSO 1 Pilot systems officer, GIB in dual-control combat aircraft (USAF).
2 Protective service operations (mission).
3 Peace support operations.
4 Program[me] support office.
5 Public-service obligation [air carriers].
6 Passenger Shipping Organization (UK).
PSOM Polar strap-on motors.
psophometer Instrument which attempts to measure perceived noise level.
PSP 1 Pierced steel planking.
2 Programmable signal processor [see 8].
3 Personal (or personnel) survival pack.
4 Product support programme.
5 Primary special pay (DoD).
6 Pressure-sensitive paint.
7 Production software package.
8 Presignal processor [AI radar].
PSPL Preferred standard parts list.
PSR 1 Primary surveillance radar.
2 Precision secondary radar.
3 Pulsar.
4 Post-strike reconnaissance.
5 Packed snow on runway.
6 Point of safe return.
7 Parts status report.
8 Passive surface resonance.
PSRE Propulsion-system rocket engine.
PSRU Piston-engine propeller-speed-reducing unit (= gearbox).
PSS 1 Precision slab synchro.
2 Proximity sensor system.
3 Primary [flight-control] surface servo.
4 Product-support services.
5 Payload specialist station.
6 Passive surveillance system.
PSSA 1 Pilot-stick sensor assembly.
2 Preliminary system safety analysis.
PSSPO Precision Strike Systems Project Office (USAF).

PT 1 Power turbine.
2 Primary trainer (USA, USAS, USAAC, 1925–47).
3 Public transport.
4 Pesawat Terbang [company constitution, Indonesia].
5 Procedure turn.
6 Point.
Pt Platinum.
P1 1 Rocket chamber pressure at termination (solid propellant).
2 Total pressure.
3 Pitot pressure, dynamic pressure.
4 Radar power transmitted.
5 Pennant number.
6 Load on a tension member.
pt Pint.
pg Tensile stress.
P2, P2, etc Gas-turbine total pressures at usual numbered locations, ending with P7 for nozzle exit.
PTA 1 Prepaid ticket advice in foreign currency.
2 Polskie Towarzystwo Astronautyczne (Poland).
3 Propan test assessment.
4 Pilotless target aircraft.
5 Part-throttle afterburning (see part-throttle reheat).
6 Practice target area.
PTAB Small hollow-charge anti-armour bomblet, usually followed by figure giving weight in kg (USSR, R).
PTAG Portable tactical aircraft guidance.
PTAN Precision terrain-aided navigation.
PTAS Pilotless target aircraft squadron.
PTB 1 External tank, or drop tank (USSR, R).
2 Patrol torpedo-bomber (USN 1937).
PTC 1 Programming & test centre.
2 Part-through crack.
3 Pitch trim compensator.

psychological warfare Planned use of propaganda and other psychological actions having primary purpose of influencing opinions, emotions, attitudes and behaviour of hostile foreign groups (DoD); (NATO substitutes for ‘hostile foreign ‘enemy, neutral or friendly’).
psychrometer Instrument for measuring atmospheric humidity, usually comprising dry and wet-bulb thermometers.
psyops Psychological operations, psywar plus political, military, economic and ideological ops.
psywar See psychological warfare.
PSZ 1 Ceramic, mix of tetragonal zirconia in cubic zirconia.
2 Public safety zone.
PT 1 Power supply and system selector unit.
PS stall Part-span [usually of axial compressor].
PST 1 Pacific Standard Time.
2 Propeller STOL transport.
3 Lead scandium tntaltate.
4 Pad service tower.
PSTB Propulsion-system testbed.
PSTN Public switched telephone network.
PSTS 1 Public switched telephone service.
2 Precision Sigint tracking system.
3 Propulsion-system test stand.
4 Power supply, or switching, unit (electronic).
5 Passenger service unit.
6 Program-setting unit (IRCM).
PSV Public service vehicle.

PACIFIC STANDARD TIME. 

Pacific Standard Time.
PTCHY

4 Passive thermal control.
5 Personnel and Training Command (RAF).
6 Personal Technical Certificate (NATS).
7 Pack temperature controller.

PTCHY Patchy.

PTCS Portable tracking and control station.

PTCV Primary temperature control valve.

PTD 1 Provisional technical document.
2 Performance test domain.

PTDS Persistentthreat detection system.

PTE Performance test engine.

PTEH Per thousand engine hours.

PTRS Polytetrafluoroethylene.

Pt–Ps The difference between pitot and static pressure.

PTRT Passive thermal protection system.

PTPS Primary technical leaflet.

PTP 1 Primary technical leaflet.
2 Prioritized target list.

PTLY Partly.

PTM 1 Pulse-time modulation.
2 Pressure transducer module.
3 Peripheral transition module (SBC).
4 Power [and] thermal management.

PTMS Power and thermal management system.

PTMU Pressure/temperature measurement unit.

PTN 1 Procedure turn.
2 Postion.
3 Public telephone network.
4 Pattern [S plural].
5 Portion [S plural].

PTO 1 Power take-off (shaft output).
2 Permeability tuned oscillator.
3 Participating test organization.
4 Overhaul by the customer (R).
5 Part-time operation.
6 Pacific theatre of operations (WW2).
7 Personal ticket office (software).

Pt 0 F 1 Permit to fly.
2 Permission to fire.

P-tots Portable transparency optical test system (for rainbownig).

PTP 1 Paper-tape punch.
2 Programmable touch panel.
3 Programming and test panel (CIDS).
4 Purchase to payment (electronic delivery).
5 Point to point (scheduled US carriers).

PTPS Passive thermal protection system.

Pt–Ps The difference between pitot and static pressure.

PTR 1 Part-throttle reheat.
2 Paper-tape reader.
3 Power-turbine rotor.
4 Peak/trough ratio.
5 Production test requirements.
6 Program Trouble Report (Stars).

PTRP Propfan technology readiness programme.

PTRS Program tracking and reporting system (ATOS).

PTS 1 Pilot Training Squadron (US).
2 Photomogrammatic target system.

3 Parachute Training School.
4 Polar track structure.
5 Pre-training screen.
6 Problem-tracking system.

PTSA Prior to sample-approval.

PTSD Production test specification document.

PtSi Platinum/silicide.

PTSN Public telephone switching network.

PTT 1 Part-task trainer (simulator).
2 Post, telegraph, telephone (many European nations).
3 Press, or push, to transmit, or talk, or test.

PTTEM Preliminary tactical technical economical requirement, following UTTEM and leading to prototype(s) (Sweden).

PTTS Pressure/temperature test set.

PTU 1 Power transfer unit, transmits power but not fluid between hydraulic systems. Can provide vital back-up following failure of an engine, esp. left engine.
2 Personal transport unit.

PTV 1 Propulsion technology validation.
2 Propulsion test vehicle.

PTW Precision targeting workstation.

P2P See PTP(4).

Pty Proprietary [company constitution, RSA].

PU, p.u. 1 Pick-up.
2 Propellant-utilization system.
3 Physical unit (SNA).
4 Polyurethane.
5 See several pop-up entries.

Pu Plutonium.

PUAG Purpose-use arresting gear.

Pub Publication.

cubicaddress system, PA Interphone voice circuit used by captain or cabin crew to address passengers.

public aircraft 1 Not public, ie used exclusively in government service (US).
2 Used by the public, including for hire or reward [see Public Service] (UK).

public dividend capital Strange term for direct gift of taxpayer’s money to national airline (UK).

public safety zone Area adjacent to end of runway where development, such as housing, is restricted.

Public Service aircraft Usually helicopters operated by military, police, air ambulance, and similar authorities, principally for disaster relief.

published route One for which an IFR altitude has been published.

puck Replacement pad for plate or disc brake.

packer Local buckling of sheet metal in compression, eg on flange around inside of bend.

PUD Power unit de-icing (CAA).

puddle welding Blind attachment [e.g., of stringers to skin, or of sheet to a core] by Argon-arc torch having access to one side of the workpiece only.

PUDT Portable user data terminal.

puff pipe Pipe taking bleed air to an RCS control valve in jet-lift aircraft. Hence puffuer jet (colloq.).

Pugs Propellant utilization and gauging system (NASA).

pukka True, thus * Gen = reliable info (from Hindustani, RAF WW2).

pull 1 To operate, eg to * spoilers (colloq.).
2 To engage arrester wire.


pull away

1 To engage arrester wire, causing damage or breakage to arrester system.

pull away Ability of a gas-turbine engine to accelerate firmly away from initial ignition in starting cycle, especially in high-altitude refit.

pulled Arrester wire whose anchorage or shock-absorbing system has been damaged.

pulling through Rotating propeller by at least 2 to 3 blades by hand, for whatever reason.

pull lead To pull nose of aircraft further round to aim correct distance ahead of target.

pull-off 1 Practice parachute jump in which slipstream pulls wearer of opened parachute off wing or other suitable part of aircraft.

2 Weak link in anti-spin parachute, calibrated to break at given IAS.

pull out 1 To recover from dive to level flight or zoom.

2 To extend arrester wire or airfield barrier near limits.

pull-out area Carrier deckspace kept clear for decelerating arrivals.

pull-out distance Distance travelled by hook between engaging wire and coming to stop; also called run-out.

pull-ring Parachute operating handle or D-ring.

pull up Short sudden climb from level flight, normally trading speed for height (usually general aviation or tactical attack).

pull-up point Geographical point at which aircraft must pull up from lo approach to gain sufficient height to make attack or execute retirement (DoD).

pulsating rubber De-icer boot.

pulsator Engine instrument showing both engine speed and oil circulation by pulsations of oil in glass dome (rare after 1917).

Pulse Precision up-shot laser-steerable equipment.

pulse 1 Transient phenomenon, esp. in radio or other EM signal, characterized by rise, brief finite duration and decay.

2 Single solid-propellant grain, two or more of which are contained in rocket motor casing, hence two- or rocket can give two impulses, separated by selectable interval.

pulse-amplitude modulation Signal is broken down into discrete values.

pulse-bias modulation Following a skid [loss of wheel traction], determines how long before full pilot pedal pressure is restored.

pulse code Sequences of pulses conveying information.

pulse-code modulation Modulation involving pulse codes, esp. that which translates continuously modulating signal into stream of digital pulses all of uniform height (amplitude), information being conveyed by spacing/duration. PCM output is compatible with all digital EDP (1) and virtually eliminates transmission errors.

pulse compression Radar techniques for increasing pulse amplitude and reducing length, see chirp, binary phase modulation, polyphase coding.

pulse decay time Time pulse takes to fall from high to low value, normally from 90% peak to 10%.

pulse-detonation engine Aircraft propulsion jet engine in which fuel is burned in a high-frequency series of detonations, without moving parts; suitable for up to Mach 5. See constant-volume combustion, HFPD.

pulse Doppler, PD Radar mode using pulse trains and Doppler processing in which received signals are examined by mixers and band-pass filters which eliminate everything except genuine targets or objects of interest. Doppler technique injects information on relative range-rates as well as eliminating non-targets.

pulsed production line Whole line moves regularly to new position at [quite long] intervals.

pulse duration Time that single pulse exceeds stated value, usually 10% of peak; ICAO selects time over 50%.

pulse-duration modulation Also called pulse-time modulation, pulse-width modulation, translates CW signal into succession of constant-amplitude pulses of varying width (time duration).

pulse envelope programming Surveillance-radar mode in which one beam searches for high-altitude hostile aircraft and a second in PD mode searches for low-level aircraft and missiles; possibly a third searches for surface targets.

pulse-forming line Radar circuit generating short high-voltage pulses.

pulse-frequency modulation More precisely called PRF modulation; CW signal is translated into succession of constant-amplitude pulses transmitted at frequency proportional to amplitude of original signal.

pulse interval Time between consecutive pulses both measured at same point.

pulsejet Air-breathing jet engine in which air is intermitently induced or allowed to enter, mixed with fuel, ignited (by electric discharge, residual combustion products or other method) and expelled as single expanded charge of hot gas giving pulse of thrust. Cyclic operation (typical frequency 30–60 Hz) may be inherent in aerothermo-dynamics of duct or imposed by sprung flap-valves or other oscillating one-way valves at inlet.

pulse length Physical length of radar pulse, irrespective of time.

pulse-light approach slope indicator Pilot sees red/white lights which pulse with a frequency proportional to deviation from glidepath.

pulse limiting rate Highest PRF allowing time for echo to reach receiver in gap between pulses.

pulse modulation Variety of methods of translating CW signals into digital pulses to reduce bandwidth required, eliminate errors and, where possible, improve signal/noise ratio (see separate entries).

pulse packet Concept of radar signal pulse as physical entity occupying particular 3-D volume, esp. particular length.

pulse-phase modulation See pulse-position modulation.

pulse-position modulation CW signal is translated into succession of constant-amplitude pulses whose position (ie time from start of each frame or timebase period) is proportional to amplitude of original wave at corresponding point.

pulse radar Most common type, in which signals are in form of pulses: also called pulsed radar.

pulse-repetition frequency Average number of radar pulses transmitted in unit time.

pulse-repetition period Average elapsed time between a point [eg. peak] on radar pulse and same point on next.

pulse rise time Time required for EM pulse to rise from a low to a high value, normally from 10 to 90% of peak but occasionally from 5 to 95 or from 1 to 99.

pulse separator Receiver circuit which removes imposed (regular) pulse train.
pulse sorter

**pulse sorter**  ECM device which selects one pulse from many for detailed measurement.

**pulse spike**  Erroneous sharp super-peak superimposed on pulse.

**pulse-time modulation**  CW carrier is modulated by pulse train of lower frequency which in turn is modulated with variable characteristic, which may be amplitude, duration, PRF or position.

**pulse train**  Succession of pulses.

**pulse width**  Unlike duration, this measure of CW signal is normally defined as width (time) between half-power points.

**pulse-width modulation**  CW signal is translated into train of constant-amplitude pulses whose widths are each proportional to corresponding amplitude of original signal. (Width in this context has no relevance to half-power points).

**pulsometer**  Visual indicator of fluid flow, especially lubricating oil, often showing doses in glass dome calibrated 08-18 [trad. engineering meaning is not used in aerospace].

**pultrude**  Fabrication process combining pulling through die and extrusion under back-pressure (eg Grafil CFC).

**pultrusion**  Raw material or finished section made by a pultrude-type process.

**pulverized fuel ash**  From coal-burning power stations [utilities], brings aircraft to a stop in overrun area with little damage.

**Puma**  Pre-structured maritime aerodynamics; program to generate flow data, eg to predict noise from helicopter landing gear and other complex shapes.

**PUMP**  Pre-upgrade maintenance programme (RAF).

**pump unloading**  Automatic opening of the fuel-system spill valve to enable HP delivery to recirculate after shutdown.

**pump-up time**  Time taken to inflate gas storage in blow-down tunnel.

**PUN**  ICAO code: prepare new perforated tape for message.

**punch, punch out**  1 To eject.

2 Confusingly, to start engine(s).

**punch welding**  Poke welding.

**pundit**  1 Aerodrome beacon with Morse identifying sequence (arch.).

2 Portable ultrasonic non-destructive digital indicating tester.

**punkah, punkah louvre**  Fresh-air jets in passenger cabin, of whatever geometry and location. Typically, overhead each seat, controlled by passenger.

**PUP**  1 Pitch-up, or pull-up, point in pop-up delivery.

2 Performance update programme.

3 Principal-user processor.

**pupil pilot**  General British term for student pilot, other terms being (US) undergraduate pilot, trainee and PUT.

Pilots seeking higher qualifications are not *.

**purchase**  Single grip on yoke, spectacles or other aileron input; thus full aileron may be two*- task.

**purchase cable**  That connecting pendant to arresting gear under flight deck.

**Pure-clad**  Trade name (Reynolds) for Alclad-type material.

**pure jet**  Not defined, but usually meant turbojet as distinct from turboprop (arch.).

**push-push actuator**

**pure pursuit-course lead**  Course in which velocity vector of attacking aircraft is always directed towards instantaneous position of target (ASCC).

**pure research**  In case of aircraft, one whose purpose is to obtain knowledge of general application; aircraft employed may be specially designed or modified version of familiar type.

**Purex**  Plutonium/uranium extraction.

**purge**  1 To clean and flush device, eg liquid-propellant rocket, by high-rate pumping of inert gas, eg dry nitrogen. This removes potentially dangerous propellants and helps preserve hardware; secondary function may be to trigger various valves and leave inert gas occupying internal chambers and piping. Term also sometimes used to mean inhibiting.

2 To prevent admission of air to space above fuel in aircraft tank by continuously pumping in inert gas (usually dry nitrogen).

**purity**  Volume percentage of lifting gas in aerostat gas cell.

**Purolator**  Patented lubricating-oil filter of conventional form.

**Purple**  Air-intercept code: unit is suspected of carrying nuclear weapons (DoD).

**Purple Airway**  Special temporary airway established and promulgated in Notams for Royal flight(s) in UK and certain other areas. Also Purple airspace.

**pursuit aircraft**  Interceptor (US, term faded from use in WW2).

**pursuit course**  Course in which attacker must maintain a lead angle over velocity vector of target to predicted point in space at which gun-or rocket-fire would intercept target (ASCC) (see pure pursuit).

**pursuit missile**  One which can be fired only from astern of air target, eg because IR homing head is unreliable from any other aspect.

**PUS**  Permanent Under-Secretary of State (UK).

**pushback**  Transfer from gate to clear area or taxiway by tractor [AM or tug] attached to NLG, hence * clearance, * crew, * time [usually = OBT], * tug.

**pushboom**  Very long rigid sleeve ahead of aircraft nose, carrying surface radiating elements.

**pushbutton indicator**  Pushbutton which when depressed illuminates.

**pushdown effect**  Generalized rule that new commercial transports enter service on densest routes, pushing older types down to lesser markets; new type is itself then pushed down over 10 to 20 years.

**pusher**  See stick-pusher.

**pusher aircraft**  One with pusher propeller(s) only.

**pusher propeller**  One mounted behind engine so that drive shaft is in compression.

**push fit**  Fit just requiring light force to assemble.

**push-off drift**  See kick-off drift.

**pushover**  Nose-down manoeuvre commanded by stick-pusher; in effect same as pitchover.

**push/pull**  1 Throttle, eg on lightplanes, having linear motion sliding through panel.

2 Amplifier having two similar valves or transistors connected in anti-phase and with I/O circuits combined around earthed centre.

3 Installation of tractor and pusher propellers in tandem, possibly separated by entire fuselage.

**push-pull actuator**  Linear actuator having uni-
pushrod

directional output interleaved by weak or slow return stroke.
pushrod Rod transmitting cam motion of valve gear to rocker or other drive to poppet valve(s).
PUT 1 Pop-up test of ICBM, SLBM, ABM or other launch system of externally energized cold-launch type.
  2 Pilot under training, or tuition, also Pu/t.
put-put Small underpowered aeroplane [onomatopoeia].
PV 1 Pressure/volume or pressure × volume.
  2 Private-venture aircraft.
  3 Product verification (formerly MQT).
  4 Prevailing visibility.
  5 Prime vendor.
  6 Positive vetting.
  7 Post vacant.
  8 Parameter value.
PVA 1 Polyvinyl acetate (or pva).
  2 Plane view area, normally of precision forging.
PVASI Para, or pulsating, visual approach slope indicator.
PVB Polyvinyl butyral (or pvb).
 PVC 1 Polyvinyl chloride (or pvc).
  2 Permanent virtual circuit.
PVD 1 Para-visual director.
  2 Plan-view display; -E adds emulator.
  3 Peripheral-vision display.
  4 Air-data sensor, esp. pitot, pitch, yaw (USSR, R).
PVDF Polyvinylidene fluoride (or pvdf).
PVDU Portable VOR deviation unit.
PVE, pvf 1 Polyvinyl fluoride.
  2 Polyvinyl film.
PVI 1 Pilot/vehicle interface.
  2 Para-visual indicator.
PVL Prevail.
PVLS Peripheral vertical-launch system.
PVM Primary visual marker.
PVO Air defence of the homeland, made up of IA (manned interceptors) and ZR (zenith rockets, ie SAMs) (USSR, R).
PVOR Precision VOR.
PVOS 1 Troops of air defence of ground forces (USSR, R).
PVR Premature voluntary retirement.
PVRD Ramjet (USSR, R).
PVS 1 Pilot’s vision system, or visual subsystem.
  2 Prime Vendor Support (USN).
PVs Pitch of tunnel vane set (distance between vanes).
PVT 1 Product verification test.
  2 Private [operator].
  3 Position/velocity/time.
  4 Personal verifier terminal.
PYTOS Physical vapour transport of organic solids, for space manufacturing.
PVU 1 Portable ventilator unit.
  2 Precision velocity update.
PVY 1 Proof vertical velocity (MLG demo case).
PW 1 Pulse width.
  2 Plated wire (memory).
  3 Potable water.
  4 Pursuit, water-cooled (USA 1919–24).
PWA Public Works Administration (US from 1933).
PWB Pilot’s weather briefing.
PWBH Pilot’s Weight and Balance Handbook (US).
PWC Professional Women Controllers (US),

pyramidal absorber

PWD Present-weather detector (visibility, precipitation, snow depth).
PWG Planning Working Group (Eurocontrol).
PWHQ Primary war headquarters.
PWI 1 Proximity, or pilot, warning indicator.
  2 Preliminary warning instruction.
PWIN Prototype WWMCCS intercomputer network.
PWM Pulse-width modulation, or modulated: hence PWMI = * inverter.
PWP 1 Pylon weight plug.
  2 Plasticized white phosphorus.
PWQT Pylon weight quantity transmitter.
PWR 1 Power.
  2 Passive warning radar.
PWS Prepositioned war reserve stocks.
PWS 1 Proximity warning system (generally helicopter applications).
  2 Performance work statement.
  3 Potable water supply.
PWSC Preferred weapon-system concept.
PWSDE Effective power delivered at shaft of turbo-prop = ehp.
PWT 1 Propulsion wind tunnel.
PWTI 2 Plasma wind tunnel.
PWTID Predictive windshear and turbulence detection.
PWW Predictive windshear warning.
PX Post Exchange, became BX and today AAFEX, which see.
PY 1 Program(me) year.
  2 Spray.
P(Y) Precise encrypted (GPS).
PYBBN Pitch yaw balanced-beam nozzle.
PYBN 1 Rigid pillar-like structure projecting upwards to carry load (eg engine) or protect occupants in overturn (crash *).
  2 Streamline-section structure transmitting stress from external load to airframe, eg engine pod, ordnance, drop tank etc. Can extend above or below wing or horizontally or at other angle from fuselage. For engine pod often extended to *strut.
  3 Object on surface used as landmark for race turning point.
  4 Object on surface used as reference for pilots performing flight manoeuvres.
  5 Aircraft [usually private or club] tipped on nose, tail in air (colloq.).
pylon select I/O device linking crew to WCS (weapon control system) or Navwass, enabling specific pylons, ie particular portions of load, to be selected for attack on particular target.
pylon spar Principal structural member of engine pylon normally (in case of wing engine) linking engine mounts direct to wing box.
pylon strut Pylon (2) linking engine pod to wing or rear fuselage.
Pyralin Cellulose-base transparent plastic formerly used for windows.
pyramidal absorber Family of absorbers of EM radiation (ie RAM 2) and noise, characterized by entire surface of structure being covered by long pointed pyramids with apices pointing towards source of radiation. Similar geometry is found in airframe underlying structure of low-observables aircraft.
pyranometer

**pyranometer** Actinometer which measures combined solar and diffuse sky radiation, sensor viewing entire visible sky. Also called solarimeter.

**Pyrene** Trade name for fire extinguishers and for carbon tetrachloride filling.

**pyrgeometer** Actinometer which measures terrestrial radiation.

**pyrgeometer** Actinometer which measures only direct solar radiation.

**pyroelectric detector** Sensitive detector of IR; radiation enters via precision window of Ge and light pipe directs it to microscopic flake of TGS which rises in temperature, changing polarization and generating surface charge amplified in low-noise electronics.

**pyroelectric detector** Pyroelectric generator; ignition squib for solid-propellant motors comprising electric resistance or bridgewire which ignites hotburning powder charge.

**pyroharness** Network joining pyrometers, usually round an engine.

**pyroelectric** Allotrope of carbon derived from controlled pyrolysis of char-yielding resin (eg phenolic resoles or Novolaks) to form matrix used in carbon/carbon composite, with reinforcement by carbon or graphite fibre. Used in rocket nozzle liners, high-temperature wheel brakes, etc.

**pyrolysis** Chemical decomposition by heating.

**pyromechanical actuator** One energized by solid fuel or other combustible charge.

**pyrometer** Instrument for measuring high temperatures; optical, electrical resistance, thermocouple, radiation, etc.

**pyrometry** Instrument for measuring high temperatures; optical, electrical resistance, thermocouple, radiation, etc.

**pyrogen** Pyrotechnic generator; ignition squib for solid-propellant motors comprising electric resistance or bridgewire which ignites hotburning powder charge.

**pyrolysis** Chemical decomposition by heating.

**pyroelectronic** Igniting spontaneously on contact with air.

**pyrotechnic** Today includes not only visual ‘firework’ devices but also precision igniters for large solid motors, single-shot actuators, hot-gas generators and IR flares giving accurately controlled decoy wavelength.

**Python** Becoming important as a computer language for engineering and science.

**pz** See pièze.

**PZD** Petrolatum/zinc dust.

**Poo** Free-stream static pressure.

**PZK** Portable rocket (missile) air-defence system (R).

**PZT** 1 Lead zirconate titanate.

2 Piezoelectric translator.
Q 1 Quantity of electricity, esp. electric charge; unit, coulomb.
  2 Applied shear force [see q2].
  3 JETDS code: sonar.
  4 JETDS code: special, or combination of purposes.
  5 Probability of failure.
  6 Quantity of light, heat or other EM radiation.
  7 Static moment of area about any axis.
  8 Aircraft category, target (USAF 1948–62).
  9 Modified-mission prefix: drone or RPV (USAF, USN, since 1962).
 11 Generalized symbol for torque.
 12 Common prefix ‘quiet’.
 13 Quadrature, and quadrature component of coherent video (radar) signal.
 14 Squall(s).
 15 Enthalpy (H is more common).
 16 Volume of fluid [gas or liquid]; see next.
 17 Confusingly, also flow rate, especially of fuel consumption [q is preferred].
 18 Reactive power.
 19 Calorific value of fuel.
 20 Interference factor.
 21 Quality, figure of merit.
 22 See Q-factor.
 q 1 Dynamic pressure, \(\frac{1}{2}pV^2\); see \(\overline{q}\), \(\overline{qa}\).
 2 Shear stress [\(\tau\) is preferred].
 3 Tetrode.
 4 Heat flux (rate of flow).
 5 Angular velocity (rate of change) in pitch, i.e. pitch rate.
 6 Generalized symbol for rate of flow, eg volume, energy, fuel, etc.
 7 Range (Breguet formula).
 8 Pitch rate, or AMSU pitch-rate output.
 Q Störindex; German measure of annoyance-weighted sound pressure level (see noise).
 \(\overline{q}\) 1 Replacing q 1, at least in US [marked with asterisk].
 2 Non-dimensional pitch rate \(\overline{q}/\overline{\Omega}\).
 Q-aerial Combination of dipole plus quarter-wavelength of twin-wire line to match feeder impedance to dipole.
 Qq, Q-alpha, QA Free-stream dynamic pressure \(\frac{1}{2}pV^2\).
 Q-ball, q-ball Spherical or hemispherical-nosed instrument package on nose of spacecraft or aircraft sensing q, AOA, AOY, total temperature and other parameters.
 Q-bay Heated and pressurized compartment for reconnaissance sensors, including large camera looking through quartz window.
 Q-code Basic telecommunications code of three-letter groups in three sections: QAA–QNZ are limits of Aeronautical Code; QOA–QQZ is Maritime; QRA–QUZ is for all services. Many of the entries which follow are from this code, of which nine are still in use.
 Q-correction That applied to observed altitudes of star Polaris (because not quite at N celestial pole).
 Q-dinghy Oval, for a crew of up to 9 (RAF, WW2).
 Q-factor 1 Figure of merit of inductance; ratio of reactance to resistance.
 2 Ratio of energy stored to energy dissipated per radian in electrical or mechanical system.
 3 Generally, sharpness of resonance or frequency selectivity of vibratory system having one degree of freedom, mechanical or electronic.
 Q-fan Quiet fan.
 q-feel Flight-control feel synthetically made to resemble natural feedback from aerodynamic loads by making it approximately proportional to dynamic pressure.
 Q-meter Instrument for measuring Q (1).
 q-pot Device, typically a sealed cylinder open to ram pressure, containing a bellows, movable piston or other sensor, to provide an output proportional to IAS.
 Q-series propellants Patented (Thiokol) slow-burning solid fuels for gas generation with LL-521 coolant keeping flame below 1,093°C.
 Q-Shed Proposed QRA hangar for three RAF airfields in UK.
 Q-site Dummy airfield with simulated flarepath and other lights (UK, WW2).
 q, Q-spring Mechanical connection with stiffness proportional to dynamic pressure.
 q-stops Mechanical limits on flight-control system response, and thus surface movement, commanded by q-system.
 Q-switching Extremely rapid switching of laser by means of Kerr cell or similar opto-electronic device; essential for shortest-duration high energy bursts lasting only a few ns.
 q-system That sensing dynamic pressure, eg drawing processed signal from ADC, and feeding it to flight-control and other q-sensitive systems or devices.
 QA 1 Quality assurance.
 2 Quasi-analog.
 3 See Q-alpha.
 QAA Quality Assurance Agency for Higher Education (UK).
 QAAC Quebec Association of Air Carriers, also called AQTCA, [Dorval, PQ] (Canada).
 QAB 1 Quality Assurance Board (MoD-PE, UK).
 2 Code: “May I have clearance for – from – to – at FL –?”
 QAC 1 Quality action case.
 2 Civil aircraft qualification (F).
 QAD Quick attach/detach.
 QADDM Quasi-analog DDM(1).
 QAE Quality assurance evaluator.
 QAF Code: “Will you advise me when you are/were at –?”
 QAG Code: “Arrange your flight to arrive at/over at –?”
 QAH Code: “What is your height above –?”
QAI

QAI Code: “What is essential traffic regarding my aircraft?”

QAK Code: “Is there risk of collision?”

QAL Code: “Are you going to land at –?”

QAM Code: “What is latest met?”

2 Quadrature amplitude modulation.

QAN Code: “What is surface wind?”

QAO Code: “What is wind at your location at different FLs?”

2 Quality assurance office (DoD).

2 Quality-assurance representative.

QA/RM Quality assurance and risk management.

Qasar Quality assurance systems analysis review (FAA from 1971).

QAT Qualified for all three.

QATS Quarterly airline traffic statistics (OAG2).

QAVC Quiescent automatic volume control.

QB Quiet [deceased] Birdmen (US society from 1921).

QBA Code: “What is horizontal visibility at –?”

QBAR Dynamic pressure.

QBB Code: “What is amount, type and height above field of cloudbase?”

QBI Code: “Is flight under IFR compulsory?” Hence, QBI conditions = bad weather. Colloquially said to mean ‘quite bloody impossible’.

QC 1 Quality control.

2 Quick change, ie from pax to cargo configuration.

3 Quiet, clean (as prefix).

4 Quality circle (usually plural).

5 Quota count (noise).

6 Quantum computing.

7 See * card.

QCA Qualifications and Curriculum Authority (UK).

QC card Quadrant correction.

QCDA Quickened climb/dive angle.

QCDP Quality-control development programme.

QCE Quality-control engineer.

QCG Qualifiable Code Generator, embedded graphics tool.

QCAT Quiet, clean general-aviation turbofan.

QC1 Qualified crewman instructor.

QCIP Quality-control inspection procedure.

QC1 Quota count one [quietest].

QCPSK Quadrature coherent phase-shift keying.

QCS Query control station (ECM).

QCSEE, QC-see Quiet, clean short-haul experimental engine (NASA).

QC2, QC3 Quota count standards.

QD 1 Quantity distance (explosives).

2 Quick dump.

3 Quick disconnect.

4 Quantum diode.

QDB Quick-disconnect button.

QDG Quick-draw graphics.

QDL Code: “I intend to ask for series of bearings.”

QDM 1 Code: “Will you indicate magnetic heading for me to steer towards you, with no wind?”

2 Quick-donning mask.

QDR 1 Code: “What is my magnetic bearing from you?”

2 Quality-control deficiency report.

3 Quadrennial Defense Review (US).

QE 1 Quality engineering.

2 Qualified Entities [European nations].

qf At a cut-out corner, ratio of shear stress to that with cut-out absent.

QEC 1 Quick engine change unit, ie ready-to-install powerplant.

2 Quadrantal error correction, or corrector.

QEP Quality-enhancement program.

QET Quick engine test.

QFA Meteorological forecast prefix.

2 The Queen’s Flight Assoc., office at RAF Benson.

QFE Quiet, fuel-efficient.

2 Code: “To what should I set my altimeter to obtain height above your location?” Usually requests airfield pressure [on large airport, at runway threshold]. Thus, altimeter reads zero on landing there.

QFF Code: “What is present atmospheric pressure converted to MSL at your location?”

QFI Qualified flying instructor.

Q-Flow Quota flow control.

QFU Code: “What is [magnetic] direction/designation of runway to be used?”


QHI Queen’s Honorary, followed by third [possibly fourth] letter denoting Chaplain, Dental Surgeon, Nursing Sister, Physician, Surgeon, all military appointments (UK).

QHI Qualified helicopter instructor.

QHNI Qualified helicopter navigation instructor.

QI Quality improvement.

QI/ Quadrature/m-phase.


QinetiQ Supposed PPP created 2001 by renaming DERA; when US refused to share classified projects with a PPP, 25% was split off to form DSTL. In fact by 2009 no private shares had been announced, but flotation was still the eventual objective [office, Farnborough GU14 0LX] (UK).

QIS Quality information system.

Qitars Qualitative intratheatre airlift requirements study.

QK Quick-flashing.

QL Ethyl-2 (di-isopropylamino) ethylnethylphosphonite, component of VX nerve gas.

QM 1 Quartermaster; G adds -General, S -Sergeant.

2 Quality management.

J Quantum mechanics; MA adds material analysis.

QMAC 1 Quarter-orbit magnetic altitude control.

2 Questionnaire on the method of allocating cost[s].

QMDR Quality-monitoring deficiency report.

QML Qualified manufacturers list (Nadcap).

QMMMA Quantum-mechanics material analysis.

QMP Quality management plan.

QMS 1 Quarterly manning statistics.

2 Quality-management system.

QMW Code: “What is/are freezing levels?”

QN Quiet nacelle.

qf Jet dynamic pressure.

QNE Code: “What will my altimeter read on landing at – if set to 1013.2 mb?” Note: answer is pressure height of airfield. Used by all aircraft over FL180 in US.

QNH Code: “To what should I set my altimeter to read your airfield height on arrival?” Assuming ISA
QNM
Throughout, answer is equivalent MSL pressure as calculated by destination ATC. Regional * or lowest-forecast *, is value below which actual * is predicted not to fall in given period and location; gives supposedly safe terrain clearance.

QNNT Quantized normal/MTI (video).

QNT Networking technology.

QNY Code: “What is present weather at your location?”

QR Freestream dynamic pressure.

QOC Quality officer in charge (UK).

QOI Qualified Observer Instructor (RN).

QOP Quality operating procedure[s].

QOR Qualitative operational requirement.

QoS Quality of service.

QOT&É Qualification operational test and evaluation.

QPR Quality problem report.

QRT Qualification test and evaluation.

QSTOL Quiet STOL.

QSY Code: “Change radio frequency now to –.”

QTE 1 Code: “What is my true bearing from you?”; today often changed to “line of position” = PL.

QVR Quality, safety and security.

QWRF 1 Quiet reconnaissance airplane (USA).

QXG Quiet small SST.

QYQ Quiet STOL.

QZBQ Quiet STOL.

QZT One of two or four aircraft flying in formation with others.

QZV Quiet STOL.

QZJ Quiet supersonic jet.

QZT tilo (quad tip)

QZT& L Quadtilotor.

QZEP Quiet supersonic transport.

QZTR Quiet tail rotor.

QZTV Quiet STOL.

QZU Quiet STOL.

QZUS Quiet STOL.

QZVR Quiet STOL.

QZTV Quiet STOL.

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quadruplane

Aeroplane with four superimposed wings.

quadruplex

Instrument recording wind speed/direction, sunshine and rain (not snow).

quadruple register

Aircraft lifted and propelled by four tilt rotors.

quadrupole

SFO/FS, DFO and DFO/FS.

quadrupole resonance

Method of detecting small quantities of specific material by irradiating with RF tuned to that material’s molecules.

quick automatic gain control

Carrier is radiated only during modulation.

quick-change aircraft

One whose interior is configured for passenger or freight operation and whose seat units, passenger-service units, pantries, toilets and often trim can be removed in minutes and replaced by freight restraints (attached to original floor rails) and protective wall panels.

quick-connect parachute

Chest-type pack which user can clip to harness almost instantly.

quick-disconnect couplings

Mating fluid-pipe couplings incorporating self-sealing shut-off valves to allow disconnection under pressure without loss of fluid.

quick-donning mask

Simple oxygen mask, usually of drop-down type but sometimes carried in separate pack, which in theory can be put on with one hand in a few seconds.

quick dump

Switch for getting rid of entire load of rockets, normally by jettisoning launchers.

quick-engine-change unit

Mating fluid-pipe couplings incorporating self-sealing shut-off valves to allow disconnection under pressure without loss of fluid.

quick-start SALT

Cabin pressurization in SALT I, the US-MIG agreement.

quint

Soundproofed (Piper).

quirk

Soundproofed (Piper).
**quiet radar**

**quiet radar**  Scans scene continuously with several thousand very narrow beams in rapid random FH sequence.

**quiet Sun**  Free from significant sunspots or unusual radiation.

**quiet supersonic aircraft**  Specifically means that any sonic boom generated does not reach the ground, or does so innocuously. See QSP, SSBD.

**quill shaft**  Slim drive shaft or driven shaft projecting as cantilever and terminating in splined coupling inserted into mating female portion. Requires no key, tolerates small misalignment, and absorbs torsional vibration. Can be keyed at both ends.

**quilted blanket**  Thermal insulating blanket with insulator, eg rock-wool, sealed in stainless-steel foil layers joined along criss-cross bonds; tailored to particular application.

**quota flow control**  Various methods of metering traffic to congested airports.

**QUJ**  Code: “Will you indicate true track to reach you?”; i.e. zero-wind heading.

**QV**  Quantitative visualization.

**QVI**  Quasi-vertical incidence, sounder for monitoring ionosphere.

**QW**  Net shear flow in vertical web[s].

**QWIP**  Quantum-well IR photodetector.

**QW mechanism**  Quick-wind (reconnaissance camera).

**QZSS**  Quasi-zenith satellite system (Japan).
R

1 Generalized term for range [aircraft, missile, radar or other signal].
2 Generalized term for radius, from sheet-metal work to aircraft mission.
3 Resistance (electrical, fluid flow, marine aircraft on water), or resistor; see ohm.
4 Reynolds number (also Re, Rs).
5 Resultant.
6 Gas constant [which see].
7 US piston-engine code: radial.
10 Generalized term for reliability, and probability thereof.
11 Moment of resistance (also M).
12 Radiance.
13 JETDS code: radio.
14 JETDS code: receiving only, i.e. passive detection.
15 Revenue.
16 Restricted area (ICAO), foold by identifying number, usually effective SL to 9,000 ft.
17 Received, or receive only (ICAO).
18 Repair facilities available (FAA).
19 Right, right-hand.
20 Suffix: radial (thus 234°R = VOR bearing).
21 Generalized term for rate (e.g. code rate, data rate, rate of roll or turn).
22 Total rainfall.
23 Modulus of rupture.
24 US missile code for vehicle type; unguided rocket.
26 Rüstsatz, field conversion kit (G, WW2).
27 Microlight aircraft category (FAI).
28 Reject, rejected (EFIS or nav display).
29 Suffix, area navigation plus altitude-encoding transponder.
30 Red.
31 Airport surveillance radar.
32 Route, or route-tuned (navaid).
33 Reluctance [also denoted as S].
34 Horizontal distance from the intersection with the ground of the vertical from the point where the aircraft starts to flare to the intersection with the ground of the glide slope.
35 General symbol for a vertical load, usually with a suffix.
36 Ratio [when r is unavailable].
37 Requirement [followed by system number].
38 Rotational speed (e.g. rpm); angular velocity in roll.
39 Ratio, especially reaction * in axial compressor, or * of bending to torsion in wing.
40 Rocket burn rate.
41 Angulat velocity, in yaw; AMSU yaw-rate output.
42 Resistivity [p is preferred].
43 Range rate.
44 Range [of radar] resolution.
45 Reduced ricochet [angular] range.
46 Reduced runway reliance, or reduced reliance on runways.
47 Refrigerant 12.
48 Channel Though sometimes said to mean radio, R here means random-access. Used for air/ground signalling and data, see Rd and Rom.
49 Display Extended A-display enabling particular radar echo to be magnified for close examination.
50 Range [of radar] resolution.
51 Mixture of 57% crude oxide monoxylidene and 43% triethylamine (G).
52 Right (ICAO).
53 Receiver attenuation.
54 Research association(s) (UK).
55 Right ascension.
56 Receiver attenuation.
57 Restricted article.
58 Runway/final approach.
59 Resolution advisory; see *TA, *VSI.
60 Research announcement (Darpa).
61 Research Author (NACA, NASA).
62 Risk analysis.
63 Regional augmentation.
64 Reference axis, or [STA] altitude.
65 Rocket-assisted.
66 Relay assembly.
67 Radar summary map.
68 Radius of action.
69 Rate alarm [lightning frequency].
70 Region Aérienne (F, defence; NE, Atlantic, Mediterranean).
71 Routing area.
72 Reportable accident.
73 Common rendering of aspect ratio.
74 Requirement [follewed by system number].
75 Roll-augmentation actuator.
76 Regional Airline Association (Washington, DC 20036–2422) (US).
77 Regional Airport Authority (UK).
78 Regional Airline Association of Australia.
79 Regional Airline Association of Australia.
80 Repair and awaiting allocation (RAF).
81 Royal Australian Air Force.
82 Royal Australian Air Force Association [office, Sydney, NSW 1230].
RAAKS

RAAKS  Russian association of aviation and space insurance companies.
RAAL  Radio-activated airfield lighting.
RAAS  Runway awareness and advisory system, upgrade to EGIPS.
RAATS  Rules of the Air and Air Traffic Services.
RAAWS  Radar altimeter and altitude warning system.
RAB  Régiment Aérienne de Bombardement (F).
rabbit  Video display of beacon response to two unsynchronized [e.g., alien] interrogating radars; also called running rabbits, or rabbit tracks.
rabbit lights  Sequentially flashing lead-in approach lights (colloq.).
Radbart  Rapid aircraft battle-damage augmentation repair team.
Rafbac  Radar beacon, forward air control.
RAC  Rules of the air and traffic control services (UK, and all AIPs).
Radar beacon
determination of altitude of airborne vehicles by means of
radar altimeter. 
Radar altimeter 
Radar altimeter  Measuring system for altitude of airborne vehicles by means of
video display of reflected EM radiation, normally with
wavelength in RF spectrum between 30 m and 3 mm, to
give information on a distant target. Information may
include range, range rate, bearing, height and relative
velocity, or may be pictorial for reconnaissance purposes.
From 1941 US acronym, from radio detection and range,
or ranging, in 2001 rendered as radio aid to detection and
ranging.
radar-absorbent material  Range of surface coatings,
those in use security-classified, which greatly reduce
strength of RF energy reflected back along incident path.
It is not known if RAMs extend to substrates and
structures.
radar advisory  Message providing advice and informa-
tion based on radar observation.
radar advisory service  Outside controlled airspace,
controller provides heading, distance (and, if known, FL)
of conflicting non-participating traffic, together with any
decision necessary.
radar aerial  Portion of radar system used to radiate or
intercept signals; US = antenna.
radar altimeter  See radio altimeter.
radar altimeter area  Large and comparatively level
terrain with defined elevation which can be used in
determining altitude of airborne equipment by means of
radar (DoD, NATO).
radar altitude  Automatic FCS mode in which height
AGL is maintained constant by autopilot slaved to radio
altimeter.
radar approach  Approach executed under direction of
radar controller.
radar approach control  Facility providing approach
control service by means of ASR and PAR (USAF).
radar beacon  Transponder carried by aircraft, missile or
spacecraft which, when it receives correct pulse code from
ground radar, immediately retransmits identifying code
on same or different wavelength.
radar beam  Energy emitted highly directionally because
of antenna geometry, eg centimetric dish, decimetric yagi.
radar blip  See blip.
radar bombing  Level bombing using radar bomb sight.
radar bomb scoring  Aircraft transmits a signal at
radar bombsight

moment of simulated release of free-fall bomb. Plotters on ground determine precisely where an actual bomb would have fallen.
radar bombsight Slight for level bombing in which, irrespective of whether target can be viewed optically, numerical data on target relative position and velocity are fed by radar carried in aircraft.
radar boresight line That along axis of aerial.
radar calibration Use of radar direction and distance information to check another system.
2 More often, use of accurately positioned aerial target to check accuracy of ground radar.
radar camouflage Use of radar-absorbent or reflective materials to change radar-echoing properties of object’s surface; does not include dispensed countermeasures, jamming or other active technique.
radar clear range Bombing or firing range which accepts responsibility for avoiding danger to aircraft straying into it.
radar clutter See clutter.
radar command Command guidance in which target and missile positions and velocities are continuously determined by radar.
radar contact Identification of echo on radar display, esp. as that sought. When thus advised, in civil ATC, aircraft ceases normal reporting.
radar control Control of air traffic based upon position/height information supplied by radars.
radar-controlled gun AAA gun, aircraft turret or other gun system whose aim is controlled by radar and computer which feeds all information necessary (sightline spin, lead etc).
radar controller Air traffic controller whose positional information is provided by radar displays, and holding radar rating appropriate to assigned functions.
radar countermeasures See countermeasures, ECM.
radar coverage Limits within which objects can be effectively detected by radar(s) at given site or installation;
may be angular, polar diagram or in other terms.
radar cross-section, RCS Apparent size of target as judged by its displayed echo, determined (in absence of ECM activity) by true size, range, aspect, geometric shape, materials, surface texture and treatment and other factors including intervening dust and precipitation. Normally defined by ratio \( P_r/P_s \), where \( P_r \) is radar power received at target and \( P_s \) is power reflected, plotted as polar (1) in horizontal plane.
radar display Visual electronic display of radar information.
radar distance Distance to target and return, thus 1 radar-ft = 2 ft.
radar echo Signal indication of object which has reflected energy back to radar.
radar element Radar as portion of large system. e.g. PAR as part of overall GCA.
radar fire Gunfire guided by radar, or against radar-tracked target.
radar fix Obtained from PPI radar map display.
radar flight-following General observation of progress of identified aircraft targets sufficiently to retain their identity or observation of specific radar targets (FAA).
radar foot Radar distance.
radar fuzing Comprehensive duplicated radar altimeters are installed in many NW to detonate device at selected height above surface.
radar prediction

radar drylaying Aiming using radar target position/velocity and, usually, radar input of range; can be manual, automatic with manual override or fully auto.
radar handover Transfer of control using radar.
radar horizon At any location, line along which direct radar rays are tangential to Earth’s surface; in practice, usually same as radio horizon, in the region of 185 km, 115 miles, from a height of 10,000 ft.
radar identification Use of transponder or procedure manoeuvre to establish positive identification of object seen on radar.
radar imagery Imagery produced by recording radar waves reflected from target surface in air/surface reconnaissance.
radar indicator Radar display.
radar information service Controller informs pilot of heading, distance (and, if known, FL) of conflicting traffic, but does not offer advice.
radar integration Automatic integration of information from air-defence, naval and other primary and secondary radars.
radar intelligence Self-explanatory, information gleaned from radar images of both friendly or hostile subjects.
radar intelligence item Feature which is radar-significant but which cannot be identified exactly at moment of its appearance.
radar map Cartographical information superimposed on radar display.
radar mapping Cartography based upon radar, esp. SLAR.
radar mile Unit of time equal to 10.75 μs; time for EM radiation to reach target 1 statute mile distant and return. Rarely, 12.369 μs [also given as 12.359] for nautical mile.
radar navigation guidance One of three types of radar service, ground vectoring of aircraft to provide course guidance.
radar netting Linking of several radars (surveillance, HFR or similar air-defence radars) to single centre to provide integrated target information.
radar netting station Centre which can receive data from radars and exchange these among other radar stations, thus forming netting system.
radar netting unit Optional electronic equipments converting air-defence fire-distribution system command centre to radar netting station.
radar performance Usually means peak power divided by minimum detectable signal power, but there are other meanings.
radar picket Ship, aircraft or vehicle stationed at distance from surface force for purpose of increasing radar detection range. Hence, ** combat air patrol.
radar picket escort Surface vessel dedicated to ESM, ECM and electronic search facilities. USN designation DER.
radar position symbol Computer generated.
radar prediction Graphic portrayal of estimated radar
radar range

intensity, persistence and shape of cultural and natural features of specific area (USAF).

radar range Commonly means distance at which particular object can be detected with (1) 100% reliability or (2, more usual definition) 50% reliability.

radar ranging Use of radar to obtain continuous input of target range.

radar receiver Ambiguous term when used alone; can mean receiver of radar that also transmits, or passive equipment used in ESM, ECM or radar warning.

radar reconnaissance Reconnaissance using radar(s) to determine nature of terrain and enemy activity.

radar reflectivity As in optics, fraction of incident radiation reflected by target, normally measured on unit area perpendicular to radiation. Modified by radar camouflage and RAM (2).

radar response Visual indication on radar display of signal transmitted by target following radar interrogation.

radar return See radar echo.

radar scan See scan.

radar scanner Radar aerial (antenna) able to scan.

radarscope Radar display in which information is presented visually for human assessment.

radarscope overlay Transparent overlay for comparison and identification of radar returns.

radarscope photography Film record of radar display [cassette giving way to CD].

radar screen Radar display.

radar separation Radar service in which air traffic is spaced in accord with established minima.

radar service Monitoring, navigation guidance or separation.

radar signal film Film on which are recorded all signals acquired by a coherent radar and viewed or processed through optical correlator to permit interpretation.

radar signature See signature.

radar silence Imposed discipline prohibiting transmission by radar on some or all frequencies.

radarsonde, radar-sonde Meteorological facility in which balloon carries instrumentation recording temperature, pressure and other atmospheric data which are transmitted when triggered by secondary radar whose observation of balloon position when related to time and known rate of ascent gives wind velocities at different heights.

radar surveillance Radar observation of given geographical area or airspace for purpose of performing radar function, eg traffic control or defence.

radar target designator control Automatically moves acquisition symbology to bracket target prior to lock-on.

radar tracking station Radar facility with capability of tracking moving targets.

radar track position Extrapolation of aircraft future position by computer based upon radar information and used by computer for tracking.

radar vector Heading (course to steer) issued as part of radar navigation guidance.

radar weather echo intensity Scale of six levels of intensity giving rough idea of likely turbulence (NWS).

Radat Freezing-level data.

RAD/BAR Radio/pressure altimeter, or selector switch between both.

radar range radial staging

RADC Rome Air Development Center, New York state (USAF).

Radcon Rapid detection of concealed time-critical targets.

RADE Receive antenna distribution equipment.

Radel Trade name for resins and thermosetting plastics (Amoco).

Radex 1 Rapid-deployment exercise.

2 Ground-based calibrated transmitter/receiver for testing navais.

rad-hard Hardened against radiation, especially from NW.

Radiaz Radiation hazard.

radiac Adjective meaning radioactivity detection, indication and computation; applied to radiological instruments and equipment.

radiac dosimeter Measures aggregate ionising radiation received by that instrument.

radial 1 Piston engine whose cylinders are arranged radially, like spokes of wheel; unlike rotary, cylinders fixed, propeller driven from crankshaft.

2 Magnetic bearing extending from point-source navaid, eg VOR, Tacon, Vortac; usually QDR.

3 Tyre [tire] construction in which rubber casing is coated with ply cords arranged transversely and extending to but not under the bead, stabilized by stiff circumferential belt.

radial cancellation Methods of reducing propeller or propfan noise by sweeping [usually back] the blades.

radial compressor Centrifugal compressor.

radial displacement Distortion of tall buildings in low-level reconnaissance photos.

radial drill Machine tool having drill chuck carried on pivoted radial arm of variable length.

radial driveshaft In a gas-turbine engine, this transmits the drive from the mainshaft or internal gearbox to the external accessory gearbox; it also transmits cranking torque during starting.

radial engine See Radial (1).

radial error Distance between desired point of impact of munitions and actual point, both points projected and measured on imaginary plane perpendicular to munition flightpath.

radial error probable That circle drawn on radial error plane through which 50% of actual munitions pass, with centre at projected target position.

radial flow Fluid flow inwards or outwards along substantially radial path, usually outwards in supercharger or centrifugal compressor and inwards in * turbine.

radial flyability Unquantifiable measure of ease with which pilot can accurately hold radial (2), esp. when near station; varies with terrain-induced errors and other factors which distort or otherwise influence signals.

radial GSI, RGSI Replaced DME in many aircraft; essentially DME panel instrument with inbuilt wind correction facilitating choice of FL giving best ground speed.

radial staging 1 Gas-turbine or reheat combustor with fuel fed selectively to two or more rings of burners at different radii from engine axis.

2 Rocket vehicle able to shed stages at different radii from major axis.
radial struts
 Those connecting inner and outer ridge main joints of airship transverse frames.

radial temperature distribution factor
 Circumferentially measured combustor outlet peak gas temperature minus outlet mean temperature divided by mean combustor temperature rise.

radial velocity
 Velocity of approach or recession between two bodies, ie component of relative velocity along line connecting them.

radial wall jet
 Outward flow along ground beneath jet-lift aircraft or helicopter hovering in ground effect.

radial-wing configuration
 Use of several, eg four, wings mounted radially to permit flight manoeuvre instantaneously along any plane containing longitudinal axis without prior need for roll.

radial wires
 Join vertices of airship’s main transverse frames to central fitting or to those diatomically oppo- site.

radian
 SI unit of plane angle; angle subtended at centre of circle by arc equal in length to diameter, rad = 57.2958° = 57°17′44.8″ = 0.1592 revolution.

radiant energy
 EM radiation, eg heat (IR), light, radio and radar. Arguably, also occasionally used for other energy, esp. acoustic.

radiant-energy density
 Instantaneous value for amount of energy in unit volume of propagating medium, symbol u. With pulse radars depends on pulse length and position.

radiant-energy thermometer
 Instrument which determines black-body temperature; emitter need be ‘black’ only over range of wavelengths studied.

radiant flux
 Time rate of flow of radiant energy, a.

radiant-flux density
 Radiant flux per unit area; when applied to source, called radiant emittance, radiance, symbol W; when applied to receiver, called irradiance or (not recommended) irradiance, symbol H.

radiant intensity
 Radiant flux per unit solid angle, measured in given direction, SI unit W/sr.

Radiant Mercury
 Software for sharing information, including classified (DoD).

radiant temperature
 That recorded by total-radiation pyrometer; when sighted on non-black body is less than true temperature.

radiating element
 Any portion of radar aerial, esp. one of electronically scanned type, which emits or reflects waves. Free-space ** depends on wavelength, feed system and reflector. Field** takes account of real situation in which waves are reflected from ground or other objects so that direct and reflected waves interfere with each other. Also called coverage diagram, aerial (antenna) pattern, lobe pattern.

radiation pressure
 That exerted on solid body by incident radiation (1), symbol P,

radiation pyrometer
 Pyrometer measuring light wavelengths and giving readout in terms of temperature.

radiation scattering
 Diversion of radiation (EM, thermal or nuclear) caused by collision or interaction with atoms, molecules or large particles between source (esp. NW explosion) and remote site; thus radiation is received from many directions.

radiation sickness
 See radiation illness.

radiation situation map
 One showing actual and/or predicted radiation situation, usually intensity, in particular ground area.

radiation source
 Generally a man-made, portable, sealed source of radioactivity.

radiator
 Source of radiant energy, esp. EM or RF, eg hostile operating radar.

2 Heat exchanger, esp. for rejecting unwanted heat to a sink. Common usage restricts term to devices that dump heat overboard, eg to atmosphere, and to call those that use heat sink on board (eg fuel) heat-exchangers.

radiator header
 Tank in which liquid coolant is received from heat source, eg engine, and distributed to cooling elements, ie radiator(s).
Radio

Radio Rapidly deployable integrated command and control system, links navies to Nadge.

Radil ROCC/Awacs digital information link.

Radint, radint Radar intelligence.

radio 1 Use of EM radiation between about 5 kHz and 3 THz to convey information.

2 Qualifying adjective denoting that a height above ground has been measured by radio altimeter, thus '50 ft'.

radioactive ionization gauge Measuring device in which ions produced by radiation (usually alpha particles) from radioactive source discharge a capacitor.

radioactivity 1 Spontaneous disintegration of nuclei of unstable isotope yielding alpha and/or beta particles, often accompanied by gamma radiation.

2 Number of spontaneous disintegrations per unit mass per unit time, usually measured in curies.

radioactivity concentration guide Published values (DoD, NATO etc) of quantities of listed radioisotopes permissible per unit volume of air and water for continuous consumption.

radio altimeter Instrument, invariably of CW FM type, giving readout of height AGL by time-varying frequency and measuring difference in frequency of received waves, this being proportional to time and hence to height. Sometimes called radar altimeter.

radio approach aids Those which assist landing in bad visibility, notably ILS, MLS; also called radio or electronic landing aids.

radio astronomy Study of radio emissions received by Earth, esp. those which can be associated with source of EM emissions on visible, X-ray or other wavelengths.

radio bands Artificially divided segments of the EM spectrum, listed in Appendix 2.

radio beacon Fixed ground station emitting RF signals, esp. those containing identifying information, which enable mobile stations to determine their position relative to it.

radio beam Transmitted by directional antenna to maximize radiated power at long range.

radio bearing Usually, angle between apparent direction of fixed station and a reference direction, eg true or magnetic N. Hence true **, magnetic **.

radio biology Often written as one word, study of effects of radiation on life.

radio channel One band of frequencies sufficient for practical radio communication; sum of emission bandwidth, sideband spread (interference guard bands) and tolerance for frequency variation.

radio check Request to ground station to transmit to confirm audibility [readability].

radiochemistry Chemistry of radioactive materials.

radio command Command guidance using a radio link.

radio compass Originally, fixed-loop receiver with which aircraft could home on to any selected fixed station. Later superseded by ADF and other navaids.

radio control Vague, but generally means control of vehicle trajectory with commands transmitted over radio link.

radio countermeasures Those branches or activities of ECM concerned with telecommunications.

radio coupling box Inputs ADF, VOR, ILS, etc, to autopilot.

radio deception Use of radio to deceive enemy; includes sending false despatches, using deceptive headings and employing enemy callsigns (DoD, IADB).

radio detection Detection of object’s presence by radio, without information on position.

radio determination satellite system Satellite system which enables receiver stations to determine position, velocity or other characteristics by propagation of radio waves.

radio direction-finding See direction finding.

radio direction-finding database Aggregate of information, provided by air and surface means, necessary to support radio D/F operations to produce fixes on target transmitters/ emitters.

radio duct Shallow quasi-horizontal layer(s) in atmosphere wherein temperature and moisture gradients result in abnormally high refraction lapse rate, causing RF signals to become trapped within layer (see anomalous propagation, skip effect).

radio energy That which propagates at radio frequencies.

radio facility chart Original series of US airway maps based on radio range; name still common for modern air maps showing all facilities, airways, control zones, TMAs, etc.

radio fix 1 Fix of mobile station, eg aircraft, obtained by use of radio navaid, esp. by traditional crossings of position lines.

2 Geographical location of friendly or, esp., enemy emitter obtained by various ESM and D/F techniques.

radio frequencies Abb. RF, those EM frequencies used for radio or related purposes. Common-use subdivisions are: VLF, below 30 kHz; LF, 30–300 kHz; MF, 300 kHz–3 MHz; HF, 3–30 MHz; VHF, 30–300 MHz; UHF, 300 MHz–3 GHz; SHF, 3–30 GHz; EHF, 30–300 GHz; unnamed, 300 GHz–3 THz. See Appendix 2.

radio goniometer See direction-finder.

radiography Photography using X-rays, gamma rays or other ionizing radiation; important NDT method, often using radiation source inside test object and film outside.

radio guard Radio station, eg aircraft, which listens out on assigned frequencies and handles traffic and records transmissions.

radio guidance Guidance or navigation system using radio waves, eg point-source aids, area coverage (R-Nav), global (Omega) and command methods.

radial Height above ground measured by radio altimeter.

radio hole Direction of propagation suffering abnormal attenuation or fading, usually caused by local refraction.

radio horizon At any location, line along which direct rays from RF transmitter become tangential to Earth’s surface; extends beyond visual horizon because of atmospheric refraction, and varies according to whether propagation is sub-, normal or super-standard.

radio-inertial guidance Various systems combining inertial and radio tracking and/or command (probably obs.).

radio interferometer Interferometer operating at RF.

radioisotope Unstable isotope that decays spontaneously, emitting radiation.

radioisotope thermoelectric generator Self-contained power system in which a radioisotope is used to heat one junction in a circuit containing dissimilar metals and thus generate sustained electricity.

radiolocation Original UK name for radar.
radiological defence

radio silence  Period during which some or all RF emitters (eg of military force) are kept inoperative.

radio-sonde  Instrumentation for measurement of atmospheric data, usually temperature, pressure and humidity, carried aloft by balloon together with electronics for converting answers into code for RF transmission to ground station at intervals (see radar-sonde).

radar-data interchange network  [Eurocontrol].

radome  Protective covering (and in aircraft aerodynamic fairing) over radar or other aerial, esp. one with mechanical scanning; made of dielectric material selected according to operating wavelength and other factors.

radop  Recording automatic digital optical tracker.

radar  Radiation detected by radio means of determining distance, direction and sometimes nature, of object or event. This is a system of radio astronomy.

radar detection  A radar is a system in which a coherent wave (CW, FM, etc) is transmitted, the reflected wave is received, and the object is detected by the received echo.

radar distance  Distance between two points which can be determined by radar.

radar-sonde  See sonde.

radio  Transmission of electromagnetic waves (EM) in all directions, esp. in short wavelengths, for communications.

radio range  Original radio navaid (US), a land (rarely, ship) fixed station of aeronautical radio service broadcasting continuous coded signals which on one side of an airway are heard as a Morse N (-) and on other as A (-); in a less common system signals are I (-) and A. In the equisignal zone along centre of airway both signals combine, A and N forming continuous note and I and A cancelling to send no signal to pair of reeds which, as soon as aircraft strays from centrelines, vibrate visually and aurally. Now replaced by VOR and later navaids.

radio range of finding  Determination by radio means of another station's identity; DoD wording is 'friendly or another station's identity; DoD wording is 'friendly or another'.
**RADS, Rads**

**RADS, Rads** Retardant aerial delivery system.

**rad/s** Radians per second.

**RADU** Range and azimuth display unit.

**RAE** Royal Academy of Engineering [London SW1P 3LW] (UK).

**RAF** Royal Aircraft Factory [1912–18](UK).

**RAF Aeronautical Society** (UK).

**RAFC** Royal Artillery Hebrides Range (UK).

**RAFBE** Royal Aeronautical Society, founded 12 January 1866 as the Aeronautical Society of Great Britain, prefix Royal 1913, main affiliates HAGB, IAE, SLAET London W1V 0BQ.

**RAEng** Royal Academy of Engineering [London SW1P 3LW] (UK).

**Raevam** RAEng variable-aerofoil mechanism; infinitely adjustable flexible leading edge.

**RAF** Royal Aircraft Factory [1912–18](UK).

**RAF Signal** Station opened as RAE Bedford in 1955.

**RAE College** (Henlow).

**RAFL** RAE Signals Engineering Establishment of Air Force officers (UK).

**RAFS** Rubidium atomic frequency standard.

**RAFSEE** RAF Signals Engineering Establishment (Henlow).

**RAFSPA** RAF Sport Parachute Association, office, Weston-on-the-Green, Oxon (UK).

**RAF** Reconnaissance/attack/fighter training system (USAF).

**RAFES** RAFC Escaping Society, charity for assisting those who helped Allied aircrew evade or escape capture in WW2.

**RAF Escaping Society** (UK).


**RAFRA** Royal Aeronautical Society, founded 12 January 1866 as the Aeronautical Society of Great Britain, prefix Royal 1913, main affiliates HAGB, IAE, SLAET London W1V 0BQ.

**RAF** Regional area forecast center/centre.

**RAF** College [Cranwell, Lincs.]

**RAFCS** Redesignated AFCS.

**RAE** RAE variable-aerofoil mechanism; infinitely adjustable flexible leading edge.

**RAF** Range and azimuth display unit.

**RAE** Radar-assisted flight-information capture (noise-monitoring software).

**RAF** Radar-assisted flight-information service.

**RAF** Rainfall.

**RAF** Reserve of Air Force officers (UK).

**RAF** Rubidium atomic frequency standard.

**RAFSEE** RAF Signals Engineering Establishment (Henlow).

**RAFSP** RAF Sport Parachute Association, office, Weston-on-the-Green, Oxon (UK).

**RAF** Reconnaissance/attack/fighter training system (USAF).

**RAF** Replacement Air Group, supplying aircrew to carriers (USN).

**RAG** RAGS Mixed rain and hail.

**RAG** Rain-and/or azimuth gating.

**RAG** Ram-air heat-exchanger.

**RADS** Redundant array of independent disks.

**RAI** Receiver autonomous integrity monitor(ing).

**RAIL** Radar-assisted flight-information capture (noise-monitoring software).

**RAIL** Radar-assisted flight-information service.

**RAF** Rainfall.

**RAF** Reserve of Air Force officers (UK).

**RAF** Rubidium atomic frequency standard.

**RAFSEE** RAF Signals Engineering Establishment (Henlow).

**RAFSP** RAF Sport Parachute Association, office, Weston-on-the-Green, Oxon (UK).

**RAF** Reconnaissance/attack/fighter training system (USAF).

**RAG** Replacement Air Group, supplying aircrew to carriers (USN).

**RAG** Ragged cloud.

**RAG** Range and azimuth display unit.

**RAG** Ragged cloud.

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**RAG** Range and azimuth display unit.

**RAG** Ragged cloud.
RAIS

RAIS Redundant array of inexpensive systems [architecture].

RAISD Research and Acquisition Information Systems Division (Andrews AFB).

RAIU Receiver autonomous integrity unit.

RAJ Ring-around jammer (ECM).

RAJA Range Joint Project Office.

RAKA Russian aerospace agency, also called Rosaviakosmos, since 2003 the FKA.

rake 1 Angle between local vertical and swivel or castor axis of swivel-mounted wheel, eg tailwheel.

2 Angle between quasi-straight edge of wingtip and aircraft longitudinal axis, called positive * when leading edge is shorter than trailing edge and negative * when trailing edge is shorter.

2 Distance, measured parallel to aircraft longitudinal axis, between front of propeller blade at tip and plane of rotation through axial mid-point of hub (simple fixed-pitch propeller).

4 Acute angle between line joining centroids of propeller blade from root to tip and plane of rotation (often zero and possibly synonymous with 3).

3 Comb, linear or other array of pitot heads.

raked tip Sharp sweepback on extreme outer section of wing, propeller/helicopter blade or other aerofoil.

raking shot Gunfire almost aligned with hostile aircraft longitudinal axis.

RAL Rutherford Appleton Laboratory [SERC, now part of CLRC; Chilton OX11 0QX] (UK).

Ralacs Radio-altimeter low-altitude control system (RPV).

RAL-BCN See next.

RAL beacon Downwind of threshold, shows runway alignment.

RALS, Rals Remote augmented lift system.

RALT Radar altitude.

RAM 1 Random-access memory.

2 Radar-absorbing [or absorbent, or attenuating] material(s).

3 Research and applications module (Space Shuttle).

4 Rapid area maintenance (AFLC).

5 Raid-assessment mode (radar).

6 Reliable/available/maintainable.

7 Rolling-airframe missile.

8 Route-adherence monitoring.

ram 1 Increase in pressure in forward-facing tube, duct, inlet etc as result of vehicle speed through atmosphere: if fluid flow were brought to rest in duct pressure would be q, dynamic pressure. Hence * inlet, * pressure, * -jet, * air, * effect.

2 Main movable portion of hydropress; term not encouraged for most hydraulic devices having linear force output, for which actuator is preferred.

ram air Air rammed in at forward-facing inlet.

ram-air parafoil Flexible double-membrane wing inflated for rigidity by ram air.

ram-air temperature That of ram air brought to rest with respect to vehicle; stagnation temperature. Local temperature on a surface subject to full kinetic heating, as at the peak line along a leading edge, symbol * T_{ram}, normally taken as T_{max} (1 + 0.2M^2).

ram-air turbine Small windmill extended into slipstream to provide shaft power for essential services [eg., flight control or electric power] following total engine or electrical failure.

Ramana Role of agile management in aerospace.

Raman effect Scattering, with change in polarization and wavelength, of light passing through transparent solid, liquid or gas.

ramark Fixed radio beacon continuously transmitting (sometimes coded signal) to cause radial line on PPI radars.

ramburner Turbopfan which at Mach 2.5–4 closes off core to become a ramjet.

RAMCC Regional Air-Movement Control Center (US).

ram compression See ram (1).

RAMCS Rapid airborne mine-clearance system (USN).

Rami, RAMDI Radioactive distance-indicator. See next.

ram drag See momentum drag.

Rams Rapid airborne mine-clearance system (USN).

ram inlet Forward-facing inlet designed to achieve maximum ram recovery, also called ram [or ram-air] intake.

ramjet Air-breathing jet engine similar to turbojet but without mechanical compressor or turbine; compression is accomplished entirely by ram (1) and is thus sensitive to vehicle forward speed and non-existent at rest (hence * cannot start from rest). Inefficient at Mach numbers below 3 but extremely important for unmanned vehicles, esp. in conjunction with rocket (eg ramrocket). Also called athood, Lorin duct; not to be confused with pulsejet or resonant ducts.

RAM net Camouflage net made of RAM (2).

Ramos Remote automatic meteorological observing station.

RAMP, Ramp 1 Robotic applications for modular payloads (USA).

2 Radar modernization program.

3 Reconnaissance avionics maintainability program (USAF).

4 Ramp control service.

ramp 1 Main aircraft parking area at airport, airfield, airbase.

2 Sharp-edged wedge with sloping wall forming inner wall of supersonic inlet duct to create oblique shock(s) and improve pressure recovery, esp. at supersonic speeds; usually has variable geometry.

3 Inclined track for launch of target, RPV, UAV or missile under moderate acceleration.

ramp capacity Number of aircraft, of specified general size class, for which ramp (1) is designed, including nose-in and off-terminal parking.

ramp check Visual external inspection of aircraft plus replenishing hydraulic fluid, oil, water and other consumables, plus checking tyres and brakes.

ramp extension Increase in size of ramp (1) to augment capacity or allow for larger aircraft with wide turning circles.

ram pressure Ram (1).

Ramps Resource allocation and multipath scheduling.

ramp services All services needed by civil aircraft on transit stop or turnaround, normally excluding mechanized freight handling and supplies (eg pantry/bar stocks) brought from terminal.

ramp status Accorded a new prototype after it has gone ‘out the door’ and is being readied for taxi tests.
Ramsbottom
A standard procedure for determining control).
Achieved pressure (pressure recovery)
ram void pressure
RAMU
ram rocket
Important species of propulsion system for unmanned vehicles, comprising rocket (solid, liquid or hybrid) and integral ramjet propulsion. Vehicle is launched by rocket, at conclusion of whose burn at supersonic speed nozzle is jettisoned, leaving larger con-di nozzle, air inlet is extended or opened and ramjet operation takes place with combustion of liquid or hybrid type in original solid motor case and chamber (see ducted rocket).
Ramrod
Day attack by bombers escorted by fighters with primary objective destruction of target (WW2).
RAMS, Rams
1 Remove automatic multipurpose station.
2 Removable auxiliary memory set.
3 Rapid assembly of munitions system, refined procedures for assembling munitions over sustained period (USAF).
4 Reliability, availability, maintainability and safety.
5 Reorganized ATC mathematical simulator (Euro-control).
6 Regional atmospheric modelling system.
Ransbottom
A standard procedure for determining carbon residue left after combustion of lubricating oils. Ramses
1 Radar mode-S evaluation system.
2 Reduced acoustic mode scattering engine system.
ram’s horn
1 Pilot flight-control yoke generally resembling ram’s horn, more upright than spectacles.
Ramjet
One formula is $R=\frac{W}{fV/c\prime F}$ where $W_f$ is mass of fuel [in original solid motor case and chamber (see ducted rocket)].
ramrocket
able dynamic pressure.
expressed as absolute value or as percentage of total available dynamic pressure.
ram recovery
Pressure actually achieved in ram inlet, expressed as absolute value or as percentage of total available dynamic pressure.
random
random access
Ability of computer memory to remember contents and addresses of all memory stores immediately; access time is independent of location of preceding record.
random-demand planning
Planning for supplies necessitated by in-service failures.
random energy
That of fluid particles in disordered motion, rapidly degrading to heat, eg downstream of shock.
random error
Unpredictable, caused by short-period disturbances in system or in measuring method, normally having Gaussian distribution over period; excludes major failures, human errors and errors of systematic nature.
random flight
Unplanned local flight by light aircraft, esp. one without radio.
random R-nav routes
Direct routes making full use of R-nav capability.
random scatter
See scatter (1).
R&QA
Reliability and quality assurance.
R&R
1 Routine and record.
2 Rest and recreation, or Rest and recuperation.
3 Recovery and repair.
4 Repair and return.
Rands
Range, nose, distance, speed.
R&SU
Repair and Servicing Unit (RAF).
R&A
CA90407–2138 (US).
RAN
with primary objective destruction of target (WW2).
Radar attenuator, noise and clutter (US, RANC
1 Radar attenuation, noise and clutter (US, DNA).
RAND
From ‘research and development’, pronounced Rand, non-profit institution [Santa Monica, CA90407–2138] (US).
R&A
Report and accounts.
R&D
Research and development.
R&E
Radio and electronic, as distinct from A&E.
R&M
1 Reports and memoranda (UK).
2 Reliability and maintainability (US).
R&O
Repair and overhaul.
random demand
That of fluid particles in disordered motion, rapidly degrading to heat, eg downstream of shock.
random error
Unpredictable, caused by short-period disturbances in system or in measuring method, normally having Gaussian distribution over period; excludes major failures, human errors and errors of systematic nature.
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R&QA
Reliability and quality assurance.
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1 Routine and record.
2 Rest and recreation, or Rest and recuperation.
3 Recovery and repair.
4 Repair and return.
Rands
Range, nose, distance, speed.
R&SU
Repair and Servicing Unit (RAF).
R&T
Research and technology [A adds acquisition].
range
1 Distance aircraft can travel, under given conditions, without refuelling in flight. By itself has little meaning, except for very small, simple aircraft. Maximum-fuel* normally taken to mean IFR reserves for multi-engine aircraft, VFR for single. Calculations for military aircraft traditionally assume external tank(s) retained, ammunition not fired, includes distance during climb but not fuel for warm-up, takeoff or reserve. Definitions of what constitute short-, * ultra-long * etc, have never ceased to proliferate, but may soon firm up. One formula is $R=\frac{W_fV/c\prime F}$ where $W_f$ is mass of fuel [in practice, of usable fuel], V is TAS, c’ thrust sfc and F net propulsive force. See Breguet.
2 Limiting distance, over intercontinental * measured as great circle, missile, RPV or other unmanned vehicle can travel with specified load and following specified flight profiles.
3 Distance between observer or weapon launch point and target.
4 Land and/or water area equipped and designated for vehicle testing, esp. missile, UAV or RPV, or testing ordnance or practice shooting at targets.
5 Difference between upper and lower limits for variable, eg frequency or wavelength coverage of receiver, pitch of propeller blades or many other variables.
6 To organize aircraft on carrier flight deck into desired sequence with closest packing.
range ambiguity
In several early radio navaisds, eg radio range, possibility of flying reciprocal or obtaining misleading distance indication.
range analog bar
Horizontal bar appearing in some optical, HUD or radar sight displays once full lock-on has been achieved, its length showing range.
range and bearing launch
Missile has these parameters preset, flies on bearing and at last possible moment switches on radar seeker to acquire target.
range attenuation
Inverse-square decrease in radar power density with range.
range bar

*range bar* Bold, usually horizontal, failure warning flag for panel instruments.

range bin Store location in SSR plot extractor; each range increment on given azimuth has store location from range 0 to range limit in which detected targets are stored until end of scan, when each is extracted and, together with scan azimuth, passed out as a plot.

range error Distance measured from imaginary line drawn through desired impact point and one drawn through actual impact point, both parallel and perpendicular to axis of attack (USAF); distance means perpendicular distance.

range error probable Distance between two parallel lines drawn perpendicular to axis of attack and equidistant from desired mean point of impact between which fall 50% of impact points of independently aimed weapons.

range gate pull-off Basic ECM jamming technique usually used to pull hostile radar off target and thus provide infinite JSR for angle jamming; JSR depends on many variables and is seldom effective technique when radar is manually controlled.

range gating Limiting radar or laser to detect targets only within upper and lower (often narrow) range limits.

range lights Row of green lights marking each end of usable runway at simple airfield.

range markers 1 Parallel lines, concentric circles or other fixed graticule on display giving indication of range. 2 Single synthetic echo(es) injected into radar display timebase to give sharp blip, circle or other clear indication at selected range.

3 Two upright markers, illuminated at night, placed so that, when aligned, they assist piloting or in beaching amphibious craft.

range mean pairs Continuous analysis of peaks and troughs of variable function.

range octagon Computer-generated octagon around HUDS sight target which unwinds at rate of one side lost for each 300 m closure.

range-only tracking System for accurately measuring vehicle range by phase-comparison technique; vehicle transponder is interrogated by transmitter and replies are recorded by three or more widely separated receivers. In US operated on 387 and 417 MHz.

Ranger Deep penetration of hostile territory looking for air or surface targets (RAF, WW2).

range rate R, rate at which range changes. \( \frac{dR}{dT} \) [range being to a target, or of radar signal, etc].

range resolution Ability of radar to discriminate (separate) two targets on same bearing but with small range separation; determined mainly by pulse length.

range ring Any circle or arc on PPI display indicating range.

range safety officer Person charged with supervising safety to personnel on range (4) and ensuring that no object travels beyond range boundary.

range strobe See range markers (2).

range tracking element Radar subsurface which monitors received-echo times and operates range gates immediately before each return is received.

ranging Process of establishing target distance, by radar, optical/ir, echo, intermittent, manual, gunfire, explosive-echo or navigational means.

ranging time Time taken by EM (e.g., radar) signal to travel to target and return, approximately 6.7 μs per km, 10.7 per mile, 12.4 per n.m. (nautical mile).

RANK Replacement alphanumeric keyboard.

rank Position in airline fleet: e.g. * 7 is seventh of type to be delivered.

Rankine Absolute Fahrenheit scale of temperature, °R = °F + 459.67, hence K = 5/9R.

Rankine cycle Thermodynamic cycle forming basis of modern steam plant, including many vapour-cycle machines for aerospace, all having closed circuit: boiler/prime mover/condenser/pump/boiler. In space power systems working fluid is usually metallic vapour, eg Hg, Cs.

Rankine-Hugoniot Relationship between pressure and density on each side of plane shockwave (Rankine 1870), from which p, V and y for inclined shocks can be deduced.

Ranntac Reduction of aircraft noise by nacelle treatment and active control.

Ranrap Random-range program (ECM).

RANS Reynolds-Averaged Navier-Stokes.

Ransae Range-surveillance aircraft.

Ransu Regional air-navigation service unit.

RANT, Rant 1 Re-entry antenna test (ABRES). 2 Radio-aids navigation tutor, or trainer.

RAO Régiment Aérien d’Observation (F).

Raob Radio-sonde observation.

RAOC Regional air operations centre.

RAOD Ram-air overboard dump.

RAP 1 Reliable acoustic path (sonar). 2 Resource allocation plan.

3 Reliability analysis program(me).

4 Rocket-assisted projectile (ECM).

5 Radar-absorbent (or absorbing) paint.

6 Radio, or random, access point.

7 Recognized air picture.

8 Rack and pinion.

9 Replacement acoustic processor.

10 Air reconnaissance regiment (R).

11 Repair assessment program (FAA).

Rapcon, RAPCON Radar approach control (FAA).

RAPD Recognized air picture display.

Rapec Rocket-assisted personnel ejection catapult (Martin-Baker).

Raphael Radar de photographie aérienne electronique; -TH adds transmission herzienne (F).

Rapid 1 Real-time acquisition program of inflight data (Sikorsky). 2 Retrorocket-assisted parachute inflight delivery.

3 Rugged[ized] advanced pathogen identification device.

4 Passive identification.

Rapid aerostat initial deployment Use of [usually static] airship[s] with multiple sensors to warn surface force of guerilla attack (USA). (ECM).

rapid area supply support Ability to deliver supply/transport/packaging teams where needed (USAF AFLC).

rapid-bloom Chaff or other ECM dispensed payload which quickly (within 0.1 s) assumes dimensions or emission properties resembling those of actual aircraft.

rapid deployment force Military force, usually trained in amphibious, urban and peacekeeping operations, ready for deployment in near-ideal conditions.
Rapide

for near-immediate deployment to distant trouble spot. American RDF includes armour, air and naval power.

Rapide Reliability and performance in demonstrated engines.

rapid engineer deployment Quick-reaction civil-engineer squadrons that provide heavy construction and repair capability for theatre commander (USAF).

rapid-extraction parachute One designed to deploy in less than 0.5 s from initial mechanical or electrical signal, eg for lo-alt delivery or crew escape at minimum altitude.

rapid-fracture surface That left by high-rate crack propagation, showing as dark (often arrowhead) zones separated by bright zones of slow fatigue failure.

rapid-intervention vehicle Fast off-road vehicle, first at scene of crash on or near [usually military] airfield, equipped to rescue crew.

rapid prototyping Standard life-cycle method of software development.

rapid pucker-factor take-off One on a favourable unbalanced field.

rapid-reload capability Ability of single ICBM silo or SBLM tube system to fire at rapid rate; not defined in SALT II but generally taken as more than one round per 24 h. Note: in West, no reload missiles exist.

Rapids 1} Rapid passive identification system.

2 Real-time acquisition and processing integrated data system [satellite ground station].

Rapnet Regional air-traffic service packet-switched network.

RAPP Recognized air-picture production.

Rapport Rapid alert programmed power-management of radar targets.

RAPPS Remote-area precision positioning system.

RAPS, Raps 1} RPV advanced payload system(s) (USAF RPV ECM).

2} Radar prediction, or protection, system.

3} Recording, analysis, playback and simulation [radar data].

4} RPV autoland position sensor.

Rapsat Rating and processing satellite.

RAPT, Rapt 1} Radar procedures trainer.

2 Recognized air-picture troop.

Raptor Responsive aircraft program for theater operations [USAF UAVs, not connected with name of F-22].

RAPTR, Raptr Resonant antenna pulsed transient radiator (AFRL).

RAR 1} Request radar blip identification (RBI) message.

2 Radar arrival route.

Rara, RARA Reusable active RF augmentation.

RARDE Royal Armament Research & Development Establishment, (Fort Halstead, Sevenoaks and Chertsey, UK).

rare-earth General adjective for electric machines using ** magnetic materials, notably SmCo.

rarefaction Supersonic flow through diverging duct, in which pressure decreases while velocity increases.

Rareps Radar [weather] reports.

RARF Radar, antenna and RF, integrated system in which multiple radar functions are performed with single electrically scanned aerial on time-shared non-interference basis (Emerson).

RARO Remote aerial refuelling operator, or operation.

RARS 1} Radar recording system.

2 Ram-air recovery system.

2} Ram-air recovery system.

RASS 1} Rectified airspeed, see airspeed.

2 Rough air speed, for flight through gust (2).

3] Replenishment at sea.

4 Radar-absorbing, or absorbent, structure.

5 Remote active spectrometer.

6 Radar Advisory Service; A adds Area.

7 Row address strobe.

8 Runway alert system.


RASA 1} Russian Aviation and Space Agency.

2 See RAS6.

RASC Regional AIS system centre.

Rascal 1} Responsive-access, small-cargo, affordable launch (Darpa).

2 Ramjet, small-calibre.

3} Radar do scoperta e controllo aereo locale (short-range air surveillance) (I).

RASD Requirements and system definition.

Radra, RASDA Replicated air support decision aid.

RASE Rapid automatic sweep equipment (ECM).

RASER, Raser Revolutionary aerospace engine research (NASA).

RASH Rain showers.

RA/SI Rate alarm/storm intensity (thunderstorms).

RASM Revenue per aircraft, or available, seat-mile.

RASN Rain and snow (ICAO).

Rasos, RASOS Regional Aviation, Safety Oversight System, a Coscap group for Central America (ICAO).

Rasp, RASP 1} Recognized air and surface picture.

2 Radar Applications Specialist Panel (Eurocontrol).

3} Rapid-acquisition spectrum processor.

Raspberry ripple Colour scheme [red/white] of training and research aircraft (RAF/RN/Qnetu).

RASS 1} Rapid area supply/support (USAF).

2 Radio acoustic sounding system.

3 Radar analysis support system.

Rast, RAST 1} Recovery assist, secure and traverse (shipboard helicopter).

2 Radar-augmented sub-target.

3 Replacement aerial subsonic target.

Rastas Radiating site and target acquisition system (airborne ECM).

raster Generation of large-area display, eg TV screen, by close-spaced horizontal lines scanned either alternately or in sequence.

Raster scan See scan.

RaSTI Rapid speech transmission index.

RaSor Radio surveillance for intelligence purposes.

RASV Reusable aerospace vehicle.

RAT 1} Ram-air turbine.

2} Ram-air temperature.

3 Rock abrasion tool (Martian exploration).

4} Radar active target.

Rat Hostile intruder aircraft flying alone.

Rata, RA/TA Resolution advisory/traffic advisory.

RATC Radar air-traffic control [C adds centre, F facility].

Ratchet Rapid ATC HMI evaluation tool.

ratcheting See roll *.

rate Rate of change, first derivative of variable with respect to time; thus angle *, * gyro. Symbol is dot placed.
rated centrally above value, thus if a is acceleration along flight-path \( a \) is rate of change of acceleration, or acceleration*. 

**rated** Qualified for specific flight duty, especially to fly particular aircraft type.

**rated altitude** That at which piston engine gives maximum power, for supercharged engine usually at height considerably above S/L; lowest altitude at which full throttle is permissible (or, usually, obtainable) or maximum boost pressure can be maintained at maximum rpm in level flight.

**rated coverage** Area within which strength of NDB vertical field of ground wave exceeds minimum value specified for geographical area where situated.

**rated power** Any of several specified limits to gas-turbine power, eg take-off, 2½ min. contingency, maximum continuous.

**rate gyro** Gyro whose indication gives a rate term, rate of change of attitude; single degree-of-freedom gyro with primarily elastic restraint of spin axis about output axis.

**rate integrating gyro** Single-degree-of-freedom gyro whose output axis is linked to spin axis by viscous restraint so that angular displacement is proportional to integral of angular rate of change of attitude. Abb. Rig (not recommended).

**rate of climb** Rate of gain of height, vertical component of airspeed of aircraft (normally aerodyne) established in climbing flight at quasi-constant airspeed (te not in zoom trading speed for height). For helicopter, two values; maximum *** and maximum vertical ***.

**rate-of-climb indicator** See VSI.

**rate of temperature-rise indicator** Fire-warning system; does not respond to temperature but to positive rate of change.

**rate of turn** Rate of change of heading, proportional to bank angle \( \theta \). R (turn radius), for constant speed, is exactly proportional to tan \( \theta \). See turn rate.

**rates of exchange** Tradeoff multipliers, eg numerical value linking takeoff field length or MTOW for unchanged takeoff field length per °C change in ambient temperature.

**Rate 1 turn** Sustained 3°s–1 = 180° min–1. See turn rate.

**rate structure** Comprehensive and in general internationally agreed prices for air carriage of unit mass of all commodities.

**RATG** Ram-air turbine generator.

**rating** 1 Authorized operating regimes, with limiting numerical values, for engine or other functional device or system. For gas-turbine engine can include takeoff, maximum climb, maximum cruise, OEI contingency, etc; for piston engine can include METO, maximum weak mixture, etc.

2 Anti-knock value of piston-engine fuel.

3 Endorsements, additional qualifications, privileges and limitations added to airmen certificate (US) or pilot’s licence (UK), eg night *, IMC *, seaplane *, multi-engine *, instrument * and flying instructor *. See Type.

**rating spring** Spring, usually with linear output, whose change in length is accurately proportional to applied force.

**ratio changer** Device for varying the response of a flight-control surface, especially rudder, to input demand, usually in proportion to \( q \) (dynamic pressure).

**ratio of specific heats** For a gas, ratio of specific heat at constant pressure divided by specific heat at constant volume; for air \( \gamma = C_p/C_v = 1.401 \).

**Rato, RATO** Rocket-assisted takeoff; G or g adds gear, meaning not landing gear but equipment.

**Ratrace** Radar transmitter waveguide shape facilitating use of common aerial for transmitting and receiving.

**RATS, Rats** 1 Rapid area transportation support (USAF).

2 Rescue advanced-tactics school.

3 Roving aerodynamic test system.

**Ratscat** Radar-target scatterer; more fully, radar-target test scatter facility.

**RATT** Radio teletype.

**Rattlr, RATTLR** Revolutionary approach to time-critical long range; S adds strike (USN).

**RAU** Radio access unit.

**RAV** Robotic air vehicle [also called Rave].

**Rave** 1 Rapidly adjustable variable exhaust.

2 Reconfigurable advanced visualization environment, virtual-reality display.

**raven** Electronic-warfare officer, specialist flight crew member (US).

**RAV/VS** Resolution advisory/vertical speed indicator.

**raw** Versatile word meaning ready for next stage of processing; thus * AC is ready for precise frequency control before being supplied to avionics; * data can be of many forms (instrument readings, reconnaissance photos, tabular statistics); and * material is in fact anything but * yet still unmanufactured into product.

**rawin** Wind velocity at different heights computed by radar tracking of balloon (usually with transponder).

**rawinsonde** See radar-sonde.

**RAWS** 1 Radar altitude warning system.

2 Radar attack (and) warning system.

3 Remote-area weather station.

4 Role-adaptable weapon system.

**Rayleigh atmosphere** Ideal atmosphere devoid of all particles larger than about 0.1 wavelength of incident radiation.

**Rayleigh flow** First (1876) theory since Newton for lift of inclined-plane wing: streamlines travel direct to surface, where they are brought to rest, losing all relative energy.

**Rayleigh formula** Another Rayleigh equation gives loss of pitot pressure caused by presence of normal shock, in terms only of Mach numbers, pressures and \( \gamma \) (ratio of specific heats of gas).

**Rayleigh limit** One-quarter of an EM wave, maximum difference in optical path.

**Rayleigh number** Non-dimensional ratio \( R_{na} = \frac{g d^3}{\kappa \nu} \) where \( g \) is acceleration due to gravity, \( d \) is vertical separation of two horizontal planes in fluid system (eg atmosphere), \( \theta_2 - \theta_1 \) is temperature difference across planes, \( \kappa \) is coefficient of thermal expansion, \( \nu \) is coefficient of kinetic viscosity and \( k \) is thermal conduc- tivity.

**Rayleigh scattering** Normal scattering of radiation by particles whose ruling size is 0.1 or less that of radiant wavelength; explains why sky is blue above and red/orange at sunset.

**Rayleigh wave** 2-D barotropic fluid disturbance or wave propagated along free solid surface.

**RB** 1 Rescue boat (ICAO).
RC-2
Rate of climb, all engines operating.
Rate of climb, one engine inoperative.

RC-1
Rate of climb.

r/c
Fan or LPC.

RB, rb
Robot, = guided missile (Sweden).

Rb
See Rockwell.

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RCR
1 Runway condition reading.
2 Route contingency reserve (fuel).
3 Routeing and circuit restoral.

R-CRS
Report on course.

RCS
1 Reaction-control system.
2 Radar cross-section.
3 Ride-control system.
4 Range control station.
5 Remote control system.

RCSM
Resident customer-support manager.

RCSE
Radar cross-section reduction.

RCSU
Remote-control and status unit (navais).

RCT
1 Reply code train (IFF, SSR).
2 Royal Corps of Transport (UK).
3 Reverse-conducting thyristor.
4 Rear-crew trainer.
5 Rear cargo tank.

RCTC
Rear-crew trainer cabin.

RCU
1 Range converter unit.
2 Reaction, or receiver, or rudder, or recorder, or remote control unit.

RCV
1 Reaction-control valve.

RCW
1 Roll-control wheel.
2 Reaction control wheel.
3 Ramp door, thus * uplock.
4 Random discontinuous fibre.
5 Rigged dry, for dusting rather than spraying (ag-avation).
6 Report departure, or departing.
7 Relative density.
8 Restricted data.
9 Long-range (R)
0 Radar ranging (R).

RD
1 Ramp door,thus* uplock.
2 Random discontinuous fibre.
3 Rigged dry, for dusting rather than spraying (ag-avation).
4 Report departure, or departing.
5 Relative density.
6 Restricted data.
7 Long-range (R)
8 Radar ranging (R).

Rd
Radio channel for data.

r/d
Rate of descent.

RDA
1 Runway de-icing agent.
2 Requirements, development and analysis.

RDAF
Royal Danish air force [UK usage].

RDAE
Research, development and acquisition.

RD&E
Research, development and engineering.

RDARA
Regional domestic air-route area.

RDAS
Reconnaissance data annotation set.

RD AU
Remote data acquisition unit.

RDB
1 Requirements data bank (originally AFLC).
2 Raw-data buffer.

RDBM
Relational database management (more often RDM); S adds system.

RDC
1 Rate-of-descent computer.
2 Regional dissemination center (NASA, technology transfer).
3 Radar data converter, or correlator.
4 Ramp door control.
5 Remote data concentrator.
6 Routeing-domain confederation.
7 Resolver-to-digital converter.
8 Rapid deployment capability (USN).

RDCE
Radio distribution and control equipment.

RDCF
Refuel/fuel control panel.

RDD
1 Routine dynamic display (maritime/ASW navigation as distinct from tactical situation).
2 Radar data display.

RDDS
Redundant distributed data-base system.

RDDMI
Remote (or radio) digital direction magnetic indicator.

RDDU
Remote demand and display unit.

RDAF
Royal Danish air force [UK usage].

RDE, R&DE
Research and development engineering (or evaluation).

RDEC
Remote data-entry cassette.

RDECom, RDECOM
Research, Development and Engineering Command (from 1 March 2003) [USA].

RDF
1 Radio direction-finding, security cover for radar, 1936–42 (UK).
2 Rapid Deployment Force (US).
3 Routeing-domain format.

RDG
Ridge of high pressure.

RDH
Reference datum height of ILS.

RDI
1 Radar Doppler à impulsions (F).
2 Reference designated indicator.
3 Routeing-domain identifier.

RDIDS
Rapid-deployment intrusion-detection system.

RDTJF
Rapid Deployment Joint Task Force (US).

RDL, rdl
1 Radial (bearing, heading).
2 Rapid-deployment launcher.

RDM
1 Random-deflection monitor.
2 Relative-distance measurement.
3 Radar Doppler multifunction (F).

RDMA
Remote direct memory access.

RDMI
Radio direction (or distance) magnetic indicator.

RDMSS
Relational database management systems.

RDDBS
Redundant distributed data-base system.

RDBP
Redmiss.

RDO
Redistribution order.

RDP
1 Radar data, or disk, processor, or processing; S adds system, U unit.
2 Range Doppler profile, or profiling.

RDPPS
Radar data processing and presentation system.

RDPS
Radar data processing system.

RDPU
Radar display processing unit.

RDR
1 Radar.
2 Radar departure route.

RDS
1 Rudder-disconnect speed (Autoland).
2 Remote diagnostics server.
3 Radial driveshaft.

RDSS
1 Rapidly deployable surveillance system.
2 Radio determination satellite service (Inmarsat).
3 Replacement data-storage system.
4 Radar-data transfer.

RDT
Radar-data transfer.

RDT&E
Research, development, test and engineering (or evaluation).

RDTS
Remote detection and tracking sensor (USAF).

RDU
1 Remote display unit.
2 Receiver/decoder unit.
3 Receipt and Despatch Unit [RNAS Anthorn] (FAA).
4 Radar departure route.
5 Remote diagnostics server.
6 Radar Doppler multifunction (F).
7 Radar Doppler à impulsions (F).
8 Reference designated indicator.
9 Routeing-domain identifier.
10 Rapid deployment intrusion-detection system.
11 Rapidly deployable surveillance system.
12 Radio determination satellite service (Inmarsat).
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28 Receipt and Despatch Unit [RNAS Anthorn] (FAA).
One in which chemical reaction takes place, specifically that in which reactants produce gas to drive turbopump or to power MEPU. Control moments are imparted by thrusters or reaction-control jet. Thruster or RCV jet.

Control attitude and trajectory of aircraft. Primary attitude/trajectory control system of spacecraft, or of V/STOL aircraft at low airspeed. Pilot operates to broadcast data either from storage or as received. Procedure whereby receiving station repeats all or part of message to originator to verify accuracy.

V/STOL aircraft; at low airspeed pilot operates to control attitude and trajectory of aircraft. Small nozzles supplied with hot, high-pressure main-engine bleed air at extremities of V/STOL aircraft; at low airspeed pilot operates to control attitude and trajectory of aircraft.

Primary attitude/trajectory control system of spacecraft, or of V/STOL aircraft at speeds too low for conventional controls to be effective. Control moments are imparted by thrusters or reaction-control jet.

Component of impedance in AC circuits due to inductance or capacitance; value is \( \frac{\pi}{fC} \) for capacitance where \( f \) is frequency, L is henrys and C is farads; unit is ohm, usual symbol is X.

Any substance consumed in reaction, esp. in rocket motor combustion or other generation of working fluid.

Ratio of mass flow of oxidant to fuel.

\( \text{reacted pressure} \) See \( \text{stalled pressure} \).

See \( \text{positive feedback}, \text{regeneration} \) (2).

Ratio of mass flow of oxidant to fuel.

\( \text{reactor} \)

\( \text{Red} \)

\( \text{Reach} \) Realisable integrated modular avionics common access helicopters. Reach

Length of threaded portion of sparking plug.

Having immediate access to many sources of information and intelligence located far [back] from scene of conflict.

Reliability evaluation and control technique. Rapid execution and combat targeting (Minuteman). Rapidly elevated aerostat.

Radar echoing area (suggest = RCS [2]).

Reactant

Mean pressure rise in each rotor stage to that in each stator stage; often expressed as a percentage, usually close to 50.

In an axial compressor, the ratio of the mean pressure rise in each rotor stage to that in each stator stage; often expressed as a percentage, usually close to 50.

Spacecraft orientation control system comprising free-running dense sphere surrounded by three magnetic coils, one for each attitude axis. Also called free sphere.

Elapsed time between stimulus and response, eg between command to launch missile and actual launch, between first receipt of warning and dispatch of weapon system, or between pilot seeing conflicting aircraft and initiation of manoeuvre to avert collision.

In particular, elapsed time between command to launch vehicle (bomber or ICBM) with live NW and actual departure [1959–72] (US, UK). One in which main tangential driving force comes from acceleration of working fluid through converging passages between rotor blades; rare in gas turbines, which are usually impulse/reaction or impulse.

Patented advanced gyro for spacecraft stabilization (Honeywell).

Use of device in retaliation to appearance of hostile threat, esp. of ARM in response to operative and threatening emitter; opposite of preemptive.

Classified metal/plastics assembly which, upon impacting a target, triggers a reaction which releases intense pressure and heat.

Taking account of previous errors, losses or failures.

Reactant

Core in which nuclear fission (thermal or fast) or fusion reaction takes place.

To obtain information from EDP (1) storage and transfer it to another device or address.

Of humans, to receive and understand telecommunications message.

Numerical scale [1 is best] of audibility of voice radio.

To have direct relevance to quite different programme or problem; eg use of LH2 in space propulsion solved problems which ** to LH2 in future commercial airline operation.

Data played back from tape or other store, eg from flight recorder.

To broadcast data either from storage or as received.

In EDP (1), to transfer word(s) from memory to another location.

Re-Entry air-data system.

Each cell is selected by appropriate signal, and stored data may be sensed at output or by changes in response to other inputs.

Weapon system is available for use with no delay save reaction time.

Combat air patrol aircraft on standby status; ready for take-off.

Indicates particular munition is ready for use.

Designated place where stick (4) waits for helicopter or for order to emplane.

Where hardware is prepared for use, esp.

Ready room

Readout

Ready CAP

Ready light

Ready position

Reads, READS

Read/write memory

Ready

Readiness State

Reactive material warhead

Reaction time

Realisable integrated modular avionics

Reaction engine, reaction propulsion

Reaction factor

Reaction ratio

Reaction sphere

Receiver/exciter.

\( \text{Receiver/exciter} \) (US, UK).

Reach

Reach

Reachback

Reach

Reach

Reach

Read across

Readback

Readout

Reads, READS

Read/write memory

Ready

Readiness State

Reactive material warhead

Reaction time

Realisable integrated modular avionics

Reaction engine, reaction propulsion

Reaction factor

Reaction ratio

Reaction sphere
real fluid

Missiles, RPVs and other unmanned vehicles and esp. aboard warship.

real fluid One exhibiting viscosity.

real precession That induced in gyro by applied force, e.g. friction or imbalance, and not by Earth’s rotation.

real time 1 In EDP (1), operation in which event times are controlled by portions of system other than computer and cannot be modified for convenience in processing; not necessarily simultaneous with time in everyday sense. 2 Absence of delay, except for time required for transmission by EM energy, between occurrence of event or transmission of data, and knowledge of events or reception of data at some other location (DoD). Neither definition has anything to do with time computer is processing as distinct from warm-up time or rest periods, which incorrectly figure in some popular definitions.

real-time choice One indicating actual time.

real-time reconnaissance Sensing, recording and relaying information ‘as it happens’.

real wander See real precession.

REAP, Reap Rapidly elevated aerostat program (USA).

Reaps, REAPS Rotorcraft external airbag protection system.

rear area That behind combat and forward areas in battle.

rear bearing In single-shaft gas turbine, that supporting turbine.

rear-box wing Usually means three-spar.

rear cover Aft closure of piston-engine [esp. radial] crankcase, incorporating drives and mounting faces for accessories.

rear crew This usually means flight crew other than pilots.

rear echelon Elements of air-transport force not required in objective area.

rear gunner Member of crew of [usually large] military aircraft charged with defence against fighter attack from the rear, after 1939 usually occupying a power-driven turret.

rear-loading Provided with door(s) and ramp extending across full cross-section of fuselage interior for loading of vehicles and other bulky cargo, and for air dropping.

rearming Replenishment of consumed ordnance between missions.

rear pit Back seat in tandem cockpit, hence rear-pitter (military colloq.).

rearplane Rear wing of tandem-wing aircraft. Not justified when foreplane is clearly for control rather than lift but correct term where front and rear wings are comparable in size.

rear port Aperture, usually circular, in solid rocket motor case at end or on face opposite to nozzle which can be opened to reduce internal pressure for thrust cutoff.

recession Linear rate at which ablating material is eroded, normally measured normal to local surface.

recency Location near Neubrandenburg of largest and oldest German aircraft/air armament test establishment before 1945.

reciprocal Bearing of observer from remote station.

reciprocal latching Use of phase-shifters to generate computer-controlled sequence and distribution pattern for electronically scanned radar transmission.

reciprocating engine One in which piston(s) oscillate to and fro in cylinder, e.g. Otto, diesel, Stirling, etc.

very near, the tail end of the fuselage, also called tail turret.

ger rear view display HUD system in which information is fed from behind pilot’s helmet via optical fibres to collimating lens and combiner glass close in front of eyes.

REAs Responsible engineering activities.

Réamur Non-SI temperature scale on which ice point (1 atmosphere) is 0° and water boiling point 80°, symbol R.

REB Rolling-element bearing.

ReB Re-entry body.

rebaselining Term coined to describe programme to refine turboprop cruise rotational speeds, e.g. on A400M aircraft.

rebated blade Solid light-alloy (rarely, wood laminate or GRP) propeller blade whose leading edge is cut away to accommodate encapsulated electrothermal anticing element.

Rebecca Pioneer DME used by airborne interrogation of Eureka beacon (1942). Still in production in 1970 as * 12 for airborne forces and used in conjunction with MR 343 air-dropped beacon.

re-blueing Return to USAF after period [e.g., on liaison or training] with another service.

rebreather Closed-circuit oxygen system from which CO2 and water are continuously removed, pressure being maintained by adding fresh oxygen (see * bag).

rebreather bag Gastight sac in oxygen line near mask so that incoming gas is diluted with exhaled breath; normally feature of airline passenger system.

Rebro Relay broadcasting.

REC 1 Received, receiving (ICAO).

2 Radio-electronic combat (USSR, R).

REC7 Recommend.

recalculating Temp temperature, exhibited only by iron and some other ferromagnetic materials, at which on cooling from white heat exothermic change in crystalline structure halts cooling and can cause momentary rise in temperature.

Recap Reliability evaluation and corrective-action program.

recapture Regain of revenue from split passengers (spill effect) who rebook on later flight by same carrier.

Recat Reduced-energy for civil air transport.

receivable Reconnaissance (UK, colloq., pronounced recky).

RECD Received.

receiver autonomous integrity monitoring Can detect a satellite malfunction if five satellites are in view, and can identify the failed satellite if six are in view, thus meeting requirement for sole means of oceanic navigation.

reception All arrangements for receipt of air drop.

recessed Linear rate at which ablating material is eroded, normally measured normal to local surface.

Rechlin Location near Neubrandenburg of largest and oldest German aircraft/air armament test establishment before 1945.

reciprocating engine One in which piston(s) oscillate to and fro in cylinder, e.g. Otto, diesel, Stirling, etc.
Recirc

Recirc Recirculation.

recirculating ball system Mechanical friction-reducing technique in which contact between spiral thread of screwjsck and surrounding nut or runner is transmitted via no-gap stream of bearing balls with rolling contact only, which after reaching end of nut are returned via external tube to start.

reclaiming Repairing or otherwise modifying a part or tool or material to fit it for further use.

Reclamation Please reconsider proposed action or decision (DoD).

RECMF Radio and Electronic Components Manufacturers’ Federation (UK).

recognition In imagery interpretation, determination of type or class of object without positive identification (ASCC).

recon For automatic weapons in aircraft usual measures are average, peak and counter-*; all are reduced by fitting muzzle brake.

recommended practices Not mandatory but published by ICAO.

recon Abb. reconnaissance.

reconciliation Reclaim of baggage by the correct individual, ie the owner. System has many uses, such as automatic offload if passenger does not board.

reconfiguration Change in aerodynamics and external form of aircraft, especially while in flight.

reconnaissance by fire Firing on suspected enemy to draw retaliatory fire.

reconnaissance exploitation report Written, accompanies imagery.

reconnaissance pallet Multi-sensor pallet (1) installed in or under tactical aircraft in lieu of other load.

reconnaissance pod Pod housing reconnaissance sensors carried externally.

reconnaissance reference point Conspicuous geographic location from which reconnaissance objectives can be found.

reconnaissance slipper Fairing housing reconnaissance sensors carried scabbed against exterior skin.

recontouring Improving leading edge of fan or compressor blade[s] after erosion in service.

record as target Code for listing target for reference or future engagement (DoD).

record card Sheet of card, fitting into filing box, issued for each aircraft, on which were recorded all significant modifications or repairs to Service aircraft prior to about 1955, when newer systems became available.

recorder Device translating data into hard-copy record on magnetic tape, wire, film, punched paper tape or other medium.

recorder data package Integrated airborne systems providing record of subsystem performance in flight, eg arming and fuzing of Mirved warheads, for recovery and ground analysis.

recording accelerometer Counts and stores vertical acceleration.

recording altimeter Barograph providing permanent [originally paper] print-out.

recording storage tube Electronic tube which accepts CRT or other display picture, stores for period (eg 12 h) and reads out as often as required for analysis, monitor activation or various conversion processes.

recovery area Small block of airspace within ASW(4) from which UAV can be guided to touch-down.

recovery guidance system Displays on flight-director command bars pitch guidance for recovery during continuous windshear; also for TOGA to maintain familiarity.

recovery initiation window Small block of airspace within ASW(4) from which UAV can be guided to touch-down point.

recovery package Contains devices to assist recovery and retrieval of re-entry body, eg brightly coloured buoyant balloons, radio beacons and coloured pyrotechnics.

recovery parachute Parachute fitted to UAV, pilotless aircraft or test vehicle.

recovery station Occupied by carrier deck crew who run out to attend each landing aircraft.

recovery temperature See adiabatic recovery temperature.

recording accelerometer Counts and stores vertical acceleration.

recording altimeter Barograph providing permanent [originally paper] print-out.

recording storage tube Electronic tube which accepts CRT or other display picture, stores for period (eg 12 h) and reads out as often as required for analysis, monitor activation or various conversion processes.

recovered pressure That measured inside duct downstream of ram inlet.

recovery 1 Retrieval, in air or on surface, of part or whole of used RPV, target, test missile, spacecraft, instrument capsule or other inert body.

2 Retrieval of glider (sailplane) that has landed away from own airfield.

3 Return to base and safe landing (on land or aircraft carrier) of aircraft.

4 Return of combat aircraft from post-strike base to home base or designated recycle airfield.

5 Retrieval, normally by crane helicopter, of crashed or shot-down aircraft, in friendly or enemy territory.

6 Retrieval, by special trailers and vehicles, plus airbags or jacks, of belly-landed or disabled aircraft.

7 Completion of flight manoeuvre and resumption of straight/level flight.

8 Conversion of kinetic to pressure (potential) energy in fluid flow (see ram *).

9 Returning late programme to schedule.

recovery airfield One at which aircraft might land post-

H-hour but from which combat missions are not expected to be conducted (DoD).

recovery air temperature The air temperature outside the boundary layer on surfaces not subject to ram. Symbol T_{ram}.

recovery base Rear-area airfield used for maintenance and servicing to eliminate need for such services at airfields in combat zone (USAF).

recovery capsule Capsule containing reconnaissance pictures, instrumentation records or other data designed to separate from satellite, ICBM or other carrier and survive re-entry at preplanned location.

recovery footprint Area within which recovery capsule, returning manned spacecraft or other object is expected to fall.

recovery guidance system Displays on flight-director command bars pitch guidance for recovery during continuous windshear; also for TOGA to maintain familiarity.

recovery initiation window Small block of airspace within ASW(4) from which UAV can be guided to touch-down point.

recovery package Contains devices to assist recovery and retrieval of re-entry body, eg brightly coloured buoyant balloons, radio beacons and coloured pyrotechnics.

recovery parachute Parachute fitted to UAV, pilotless aircraft or test vehicle.

recovery station Occupied by carrier deck crew who run out to attend each landing aircraft.

recovery temperature See adiabatic recovery temperature.

recovery time Time for gas-discharge tube to return to neutral under grid control.

REC/PLB Recording and playback.

recreational Self-explanatory; * pilot certificate is issued by FAA in US for pilot of * vehicle. By 2007 the RPL was no longer being issued.

RECT Rectangular.

rectangular co-ordinates See cartesian.

rectangular input Input, eg to FCS, which instantaneously jumps from null to a maximum commanded value, to give a rate command.
rectenna

**rectenna** Rectifying aerial (antenna), especially of directionally beamed microwave power.

**rectification** 1 Process of projecting tilted or oblique photograph on to horizontal reference plane.

2 See rectifying.

**rectified airspeed** See airspeed.

**rectified altitude** Sextant altitude corrected only for inaccuracies in reference level (dip, coriolis) and reading (index, instrument and personal).

**rectifier** Static device exhibiting strongly unidirectional conduction properties such that it can convert a.c. to d.c.

**rectifying** 1 Elimination of errors which convert compass heading into track, eg deviation, variation and wind.

2 Converting a.c. to d.c., by any means.

**rectifying antenna** Receives radar wave and separates its two components, the electric field and magnetic field, the former being conducted into the hot jet[s] from the engine[s], which become[s] ionized and cooled, and the magnetic component being dissipated in the hot engine and degaused.

**rectifying valve** Thermionic valve which rectifies by virtue of unilateral conductivity of cathode/anode path.

**rectilinear flight** Straight and level, and 0g imposed and thus in aeronautical sense called +1g.

**rectilinear propagation** Sent out in straight lines (ignoring relativistic effects).

**rectilinear scanning** TV raster (see scan).

**recovery** Recovering heat from engine [turboprop or piston engine] exhaust and inserting it at useful place in operating cycle, hence recuperator.

**recurrent training** Regular review of human performance in normal, abnormal and emergency situations.

**recycle** 1 To stop countdown and re-enter count at earlier point.

2 To return to the start of ED(1) (1) program without entering fresh data.

3 To give completely new checkout to missile or other device (USAF).

4 To remove part or complete module from engine, avionic device or other hardware and put through re-manufacturing or inspection sequence to clear it for reuse with undiminished life.

**recycle airfield** One from which combat aircraft can be prepared for reuse away from home base.

RED/RED/RED 1 Reconnaissance Engineering Directorate (US AFSC).

2 Reference engineering drawing or data.

3 Retractable ejector duct.

**red** Hostile. Thus, colour of threat on radar, or of any team in exercise or R&D effort acting part of enemy.

**Redac** Research Engineering Development Advisory Committee (US Congress).

**Red airway** One running more or less east/west.

**Redar** Reference engineering data automated retrieval system.

**Redcap** Real-time electromagnetic digitally controlled analyser processor.

**Red channel** Airport route for arrivals declaring the possession of dutiable goods.

**REDCOM** Readiness Command (USA).

**Red endorsement** Manuscript endorsement in flying logbook confirming bad airmanship or other (usually potentially dangerous) act or failure to act.

**redeployment airfield** One not occupied in peacetime but available upon outbreak of war for use by units redeployed from peacetime locations: substantially same facilities as main airfield (DoD, NATO).

**red-eye** Long overnight flight.

**Red Flag** Major tac-air exercises based on Nellis AFB, taking place several times per year over instrumented air/air and air/ground ranges under various ‘real war’ scenarios.

**Red Force** Hostile force in exercise.

**Red Horse** Rapid engineering deployment and heavy operations repair squadron, engineering (USAF).

**REDL** Runway edge lights.

**Red Label** Hardware used in first build, or other early development, that is physically representative but not cleared for flight.

**red-line value** One never to be exceeded, eg VNE or * fan speed.

**Redmiss** Remotely deployable mission support system.

**red-on-red** Traditional rule for setting up simple magnetic compass and avoiding mistakenly flying reciprocal.

**red-out** Loss of vision in powerful and sustained negative acceleration, ie where subject is restrained in seat only by harness over shoulders. Vision is replaced by primarily blood-coloured input.

**red pole** North-seeking.

**redrive** Propeller drive incorporating speed-reducing gears or belt (homebuilts).

**red-to-red** Following nautical practice, the rule that aircraft on opposing courses pass left side to left side, left wingtip having a red light at night.

**reduced frequency** Ratio of product of frequency of oscillation and representative length of oscillating system to airspeed (nl/V); dimensionless parameter determining flutter amplitude.

**reduced modulus of elasticity** Theoretical value expressing relationship between modulus of elasticity and tangent modulus beyond limit of proportionality.

**reduced vertical separation minima** Progressive introduction of reduced minima [initially, 1,000 ft, 305 m] for aircraft whose altitude measuring, maintaining and reporting systems meet RVSIM numerical standards. Introduced on N Atlantic between FL310–FL390, and extended 2002 to include all airspace of ECAC member states above FL290.

**reducing mask** Metal-sheet stamping enabling small instrument to be mounted in space on panel for larger one.

**reduction valve** Valve which reduces pressure in fluid system to precise lower value at * output.

**reduction** 1 Removal of oxygen or other electronegative atom or group; hence reducing flame.

2 Conversion of raw measured values of flight performance or met. observations into standard forms, limiting values and, esp., graphical plots and derived values for comparative purposes.

**reduction factor** Large number, usually power of 10, used as divisor of all values in calculations to reduce size of whole numbers involved.

**reduction gear** Speed-reducing gear, ie output turns slower than input, torque being increased in the same ratio.
redundancy

redundancy 1 Provision of two or more means of accomplishing task where one alone would suffice in absence of failure. In parallel * several usually similar systems all operate together so that failure of one either leaves remainder operative or, in majority-rule *, can always be over-powered by remainder. Standby * has primary systems automatically switched in by malfunction-detection system.

2 Design of primary structure so that even after failure of any component there will remain enough load paths to carry all expected loads with adequate margin of safety.

3 In EDP (1) or information handling, amount by which logarithm of number of symbols available at source exceeds average information content per symbol.

redundant attitude-control system Cold-gas jet control of roll during powered flight, three-axis control during periods coasting.

redundant structure Basically, one possessing too many members; in practice one not amenable to simple stress analysis, eg because it has joints that are fixed instead of pinned or more than one member sharing load in way calling for elegant analytical solution. Not synonymous with fail-safe structure.

Redux Family of adhesives for most structural materials, including metals, normally applied in form of sheet, powder or liquid and cured (bonded) under heat and pressure (Aero Research Ltd./CIBA).

Redwood Together with * Admiralty, a traditional instrument for measuring kinematic viscosity; rare in aerospace.

Red X Flying prohibited by weather (USAF).

REDZ Recent drizzle.

Red zone Zone of intersection on Red airway (US) in which Red traffic maintains height and conflicting traffic procedure is published.

reed valve Leaf valve, usually of thin spring steel, giving unidirectional flow of fluid, eg in air-conditioning system or pulsejet.

reef 1 To make sudden deliberate maximum-rate departure from straight flight [normally fighter combat].

2 To fit restraining cord round parachute, see next.

reefed parachute One in which canopy is (usually temporarily) restrained against full deployment by encircling cord.

reefing sequence Systematic timed deployment of parachute, first in reeled condition and later to full deployment (eg Apollo CM recovery).

reefing Paying out or drawing in cable for a tow-target; hence RM = * machine and RMCS * machine control system, offering: out, stop (preselected length), in, and other functions.

re-entrant angle Sudden change in direction of external surface (of aircraft skin, structural member etc) such that angle measured externally is less than 180°; in case of ** on surface of body, one causing local acceleration of airflow and, in supersonic flight, local attached shock-wave.

re-entry Process of travelling [returning is implied] from outer space into and through planetary (esp. Earth’s) atmosphere, in case of Earth proceeding down to planetary surface where recovery takes place. Strictly the term should be entry.

reference landing distance

re-entry body Body designed to survive extreme aerodynamic heating, high temperatures and large sustained deceleration of re-entry, eg ICBM RV, manned spacecraft, instrument or reconnaissance capsule.

re-entry corridor Optimum trajectory through atmosphere for lifting body returning to Earth.

re-entry plasma Plasma inevitably formed around all bodies arriving in Earth’s atmosphere from outer space due to kinetic heating and ionization, forming barrier to radio signals.

re-entry system That portion of ballistic missile designed to place one or more RVs on terminal trajectories so as to arrive at selected targets. Includes penaild, spacers, deployment modules and associated programming, sensing and control devices.

re-entry vehicle That part of a strategic ballistic missile or space vehicle designed to re-enter Earth’s atmosphere in terminal portion of its trajectory; can be manoeuvrable **, or one of several multiple ** or multiple independently targeted **.

REF J Reference.

2 Refuge. refan To replace original fan or LP compressor of turbojet, bypass turbojet or turbofan with fan having larger diameter but fewer stages, for greater economy and less noise; hence refanned engine.

reference area Area used in components or coefficients of aerodynamic forces acting on a body.

reference axes Those in relation to which a body’s attitude and motion are described; in case of aircraft they normally include body axes, all normal to each other and passing through eg., called O (OX fore/aft, longitudinal; OY laterally, lateral or axis of pitch; OZ vertically, vertical or axis of yaw); wind axis (direction of free-stream relative wind); and principal inertia axis passing through eg in plane of symmetry and at small angle to OX.

reference datum J Arbitrary location at or beyond extremities of structure, eg aircraft, or on centreline or other major axis, from which all distances are measured and station numbers derived. Normally ** remains throughout life of aircraft even if stretching of fuselage or alteration of span of wing changes actual distances to established stations.

2 Imaginary vertical plane at or near nose of aircraft from which all horizontal distances are measured for balance purposes; called balance station zero (NATO).

reference designated indicator Display which enables aircraft [with or without input by ground engineers] instantly to identify any electronic or mechanical fault.

reference parameter groups In studying [turboengine] performance, if second-order terms are ignored, the parameters can be referred to temperature and pressure only.

reference eye position Typical position of pilot’s eyes used in design of cockpit or flight deck.

reference fix Known position inserted into INS at start of flight.

reference frame For practical purposes = reference axes.

reference fuel Piston-engine (Otto) fuel of known antiknock rating used as reference to fuel whose octane or performance number is to be established.

reference humidity That specified for mandatory performance information; whichever is lesser of 70% RH to 33°C or 35 mb vapour pressure.

reference landing distance Abb. RLD, BCAR procedure
reference line

for calculating landing distance on wet runways [especially jet transports] assuming 3° approach at constant thrust and 15 kt excess speed at 30 ft, excessive [usually 7s] float and slow application of deaccelerating devices.

reference line 1 Conveniant line on surface used by observer, eg FAC, as line to which spots (4) are related.
2 Single horizontal level showing correct operation by group(s) of systems or measured parameters indicated on vertical-tape instruments; thus a malfunction immediately stands out as a discontinuity.

reference meridian That selected to establish grid north or local time (ASCC).

reference phase Non-directional signal emitted by VOR having constant phase through 360° azimuth.

reference plane See datum plane.

reference plate Minimum-size plate cut from cheap material or scrap containing witness holes or slots cut from every tool in NC program and incorporating part of every sub-routine in program.

reference point Fixed datum near centre of airfield landing area (obs. except general aviation).

reference pressure \( \frac{1}{2} \rho v^2 \) where \( p \) is fluid density and \( V \) is relative velocity.

reference pressure ratio Pressure ratio published for engine, and specialized meanings.

reference section Traditional definition: a section of structure, displacements of which are taken as co-ordinates in a semi-rigid representation.

reference signal That against which telemetry data signals are compared to check differences in time, phase, etc.

reference speed On its own, too vague. \( V_{REF} \) is a reference speed used for comparative purposes in takeoff and landing modes; commonly stall speed \( V_s \) or target threshold speed \( V_{T,T} \), but needs to be defined whenever used [for example, whether clean or full flap]. Reference speeds [plural] invariably means \( V_1, V_2 \) and \( V_T \).

reference wet hard surface Numerically specified slippery runway surface for determining braking standards.

reference zero Datum point from which horizontal and vertical distances are measured to each point on takeoff net flightpath.

refire time Time required after initial launch to fire second missile (ICBM is assumed) from same silo or other launcher (see rapid-reload).

Refl Reflector.

reflectance Ratio of reflected to incident radiant flux, symbol \( p \).

reflected interrogation A misnomer, as reply is fresh signal (SSR).

reflected memory bus High-speed parallel data bus connecting all nodes or subsystems in a large EDP system.

reflected shockwave That reflected when a shock-wave strikes a boundary between its original medium and one of greater density; part of energy generates shock which continues through denser medium but remainder is reflected in original medium, important case being in boundary between tunnel wall and tunnel working fluid.

reflection coefficient Measure of mismatch between two impedances; ** a = \( \frac{Z_1 - Z_2}{Z_1 + Z_2} \) where \( Z_1, Z_2 \) are impedances.

reflection-interference waves Intermittent peaks in sea state caused by reinforcement of incident and reflected waves near cliff or sea wall.

reflection interval Time for radar pulse to reach target and return.

reflection-plane model Tunnel model comprising one half of model aircraft sliced down axis of symmetry which rests on floor of tunnel.

reflection suppression False echoes (ghost aircraft) in radars, esp. SSR, are usually suppressed by a suppression transmitter feeding a separate Yagi which, at moment main interrogator scans reflecting surface, sends two pulses, first larger than second; this suppression pair take direct path to aircraft and suppress its transponder before arrival of interrogation signal via reflector; thus no spurious reply is received.

reflectivity factor Measure of the fraction of incident radar energy reflected by a target, symbol \( Z \).

reflectometer Instrument for measuring transmission-line reflection coefficient.

reflector 1 Reflecting surface, usually copper gauze, so sited and shaped as to reflect radiation from primary radiator (eg of radar) in correct phase relationship to reinforce forward and reduce backward radiation; usually paraboloidal but flat in modern fighter radars.
2 Parasitic element located near primary radiator to reduce emission in all directions other than main lobe.
3 Repeller electrode of reflex klystron and similar tubes.
4 Material of high scattering cross-section surrounding core of nuclear reactor.

reflector sight Gunsight (rarely, for anti-tank missiles) in which reticle aiming mark(s) are projected as bright points on glass screen through which pilot or other aimer views target. Lead angle (aim-off) is assessed by gyro-electronics that measure rate of sightline spin and, in conjunction with range set by pilot, adjust aiming mark so that rounds should hit if reticle is superimposed on target.

reflex camber Shape of aerofoil in which mean line curves upwards towards trailing edge; eg to provide download well aft of c.g., increasing with airspeed, in tailless aircraft.

reflex ratio Measure of structural flexibility of propeller blade tested as cantilever beam (loaded in direction parallel to axis of rotation; US standard is that all blades of same propeller must exhibit tip movement uniform within 0.4 in [10 mm]). Test not applicable to certain blade types, eg hollow steel.

Reflex Detachments on ground alert [with NW] to overseas base[es] (SAC).


reflex sight ASCC term for reflector sight.

reflex trailing edge See reflex camber.

refly To make second test flight to clear snag [verb or noun].

REFRA Recent freezing rain.

refraction Change in direction of travel of supposed linear radiation, eg EM radiation or sound, due to variation in properties (eg refractive index, air temperature) of transmitting medium. Can be gradual over a distance or instantaneous at boundary between two media; for
refractive index radar
radio/radar important forms are atmospheric * (low-altitude temperature, pressure; also responsible for errors in apparent altitude of celestial bodies), coastal * (change in propagation path at land/sea boundary) and ionospheric * (change of direction in passage through ionized layer).

refractive index  Ratio of phase velocity of EM radiation in free space (vacuum) to phase velocity in medium considered; normally related to air, though in fact ** for air is not unity, common S/L value being 1.003. For radio normally refined to modified ** (n + h/a) where n is ** at height h and a is radius of Earth.

refractory  Resistant to high temperatures; normally implies ability to retain precise structural shape and bear appreciable stress at temperatures up to 2,200°C (4,000°F) without significant long-term change.

refresh rate  Rate at which data on electronic display, eg radar, are resupplied in order to maintain bright picture free from flicker; early radar had no refresh and picture was generated only once on each scan; today data are updated at each revolution but are refreshed 100 to 200 times between updates. Panel-instrument * is usually 40–80 Hz.

refrigerant  Working fluid pumped round closed circuit to extract heat, usually by repeated evaporation/condensation.

Refrigerant 12 Difluorochloromethane (DDM).

refrigerant injection  Water injection into gas turbine.

refrigeration capacity  Common unit is 'tons', normally a heat-extraction rate sufficient to convert one short ton of water at 0°C to ice every 24 h, equivalent to 3.517 kW = 4,715 hp.

refrigeration  Casing by sudden drop in temperature of airflow, notably by depression in choke tube and/or evaporation of fuel.

refrigeration tunnel  Wind tunnel used for icing tests.

REFS  Reconfigurable engineering flight simulator.

refusal speed  That at which a takeoff can no longer be aborted, equivalent to V1 (RAF).

REG  1 Registration, registered.
  2 Regular.
  3 Regulation.

Rega, REGA  Swiss air ambulance association. Not an acronym, but French and Italian counterparts GASS are.

Regal  Range and elevation guidance for approach and landing (FAA test 1960).

regard  Total solid angle of 'vision' of a sensor trainable to point in different directions; FOV may be much less.

regeneration  1 Introduction of closed-circuit operation in gas-turbine plant in which by various methods part of exhaust heat is extracted and used to increase temperature of incoming airflow; hence regenerative gas turbine. Essentially synonymous with use of heat exchanger.

  2 Increase in radio detector sensitivity by positive feedback.

  3 Favourable heat transfer between rocket thrust chamber nozzle and propellant (see regenerative cooling).

regenerative cooling  Use of a cool incoming liquid, eg rocket-engine propellant, to remove heat from hot hardware, eg rocket nozzle skirt and exit cone. Essential feature is that heat transfer is beneficial to both cooled item and coolant.

regenerator  See heat exchanger.

RegFD  Regulation fair disclosure (US Securities and Exchange Commission).

regime  One defined mode of operation, clearly distinguished from other types of operation of same device; eg USAF fighter flight-suit pressure regulator has lo * maintaining 3 lb/sq in and hi * maintaining 6.5.

region  See flight information region.

regional airport  One serving a number of (usually modest-sized) local communities.

Regional augmentation  Navsat transponders broadcast ground-derived GPS integrity assurance and accuracy enhancement.

regional carrier  Civil operator whose route network covers only a minor part of a large country, and not over 500 nm sectors; often same as third-level. In the US, a traditional definition included "an operator whose aircraft do not exceed 70 seats."

regional QNH  See QNH.

register  Small array of bistable circuits storing one EDP (1) word.

registering balloon  Small free balloon carrying recording meteorological instruments; ballonsonde.

registration  Entry of civil aircraft into records of national certification authority, with allocation of letter/number code displayed on aircraft [Appendix 9] and * certificate which in most countries must be displayed inside aircraft.

REG  Regional.

REGR  Recent hail.

regression  Precession of nodes; eg Moon completes revolution in 18.6 years.

regression rate  Linear rate at which solid-propellant grain burns, measured normal to local surface; in 1970 typically 0.25 mm/s, in 2002 over 5 mm/s.

regressive burning  Solid-motor combustion in which burn surface area and hence chamber pressure and thrust all fall throughout period of burn.

regressive orbit  See retrograde.

regroup airfield  Military or civil airfield at which post-H-hour, aircraft would reassemble for rearming, refuelling and resumption of armed alert, overseas deployment or further combat missions (DoD, IADB).

REGS  Regulations.

regular airport  One which may be listed in flight plan as intended destination.

regular airfield  That at which scheduled service calls (UK usage).

regulated take-off weight  See WAT-limited.

REH  Rapid-erect hangar.

reheat  Original [UK] term for afterburning.

REHM  Recording engine health monitor.

REI  Repair engineering instruction.

2 Reusable external insulation

Reid vapour pressure  Absolute pressure of liquid [usually hydrocarbon fuel] in enclosed volume at given temperature, usually 100°F (37.5C).

REIL  Runway-end identification or identifier lights (FAA); S adds system.

reinforced carbon/carbon  Composite material comprising high-strength carbon fibres bonded in matrix of pyrolytic carbon; or can be thought of as pyrolytic carbon reinforced with CF.
reingestion stall

reingestion stall Gas-turbine compressor stall induced by reingestion of hot gas during reverse-thrust mode.

Reins Radar-equipped inertial navigation system (Autonetics 1956).

reject To dump heat out of system into supposed sink, eg atmosphere.

rejert One aborted after it has begun, ie between brakes-release and decision point.

inductor Inductance/capacitance in parallel to reject one resonant frequency.

rejection Soil-barrier protection for painted surfaces.

rejoining aircraft One returned to service after [for whatever reason] having been parked for long period.

RKE Radio-equipped keypad.

REL Relative direction.

2 Runway edge light[s], lighting.

rel Relative.

relateral tell Relay of air-defence information between facilities via third; appropriate between automated centres in degraded communications environment.

relative altitude See vertical separation.

relative bearing Normally means bearing of surface feature or other aircraft relative to current heading.

relative-bearing indicator, RBI Shows bearing of tuned fixed station related to aircraft longitudinal axis; unlike RMI, does not show heading.

relative density $\rho$ Density at height in atmosphere related to that at S/L, $\rho_0$, symbol $\sigma$.

2 Specific gravity.

relative efficiency of biplane Ratio of wing loadings of upper and lower wings.

relative humidity Water content of unit volume of atmosphere expressed as percentage of saturation water content at same temperature.

relative inclinometer Flight instrument indicating attitude with respect to apparent gravity (resultant of gravity and applied acceleration).

relative permittivity See permittivity.

relative scatter intensity Ratio of radiant intensity scattered in given direction to that in direction of incident beam; symbol $F(\phi)$, relative scattering function.

relative target altitude Vertical difference between altitudes of interceptor and target.

relative wind Velocity of free-stream air measured with respect to body in flight, in case of aircraft normally same as true airspeed but seldom exactly aligned with longitudinal axis.

relaxation time $\tau$ Elapsed time between removal of disturbance and restoration of equilibrium conditions among molecules of fluid (eg air), operative parts of system or other dynamic components of system.

2 Time for exponentially decaying quantity to decrease in amplitude by $1/e \approx 0.36788$.

relaxed static stability CCV-derived manoeuvre enhancement for air-combat fighter, involving rear c.g., longer nose, smaller fin etc, with artificial stability imparted by AFCS.

relay Device in which small control signal, usually electrical, is made not only to operate at a distance but also to control large and possibly high-power devices; most serve switching functions or to protect devices against supply faults.

relay time Elapsed time between instant message is completely received and that when it is completely transmitted.

release Clearance of aircraft for line service, eg after original development or overhaul.

release altitude Altitude of aircraft AGL at actual time of release of ordnance, tow target etc (DoD).

release blade That selected in FBO test.

released 1 Of aircraft to unit, clearance for inventory service.

2 Of drawing, approval for transmission to manufacturing or production department.

3 Of air-defence unit, crews and/or weapons no longer needed at readiness; when * they will be informed when state of readiness will be resumed (NESN).

released, available Ready at 20 min. notice (FAA).

release point Point on ground directly above which first paratroop or cargo item is air-dropped (NATO).

release time Departure time issued by ATC to avoid conflicts.

reliability Probability that hardware will operate without failure for specified time; in practice also a result of operations already accomplished (see despatch *, MTBF).

reliability coefficient Percentage probability that aircraft can fly route on particular day with x% load factor and y% likelihood of diversion. Note: not a measure of hardware reliability.

relief hole Drilled in metal sheet to allow intersecting bends to be made to that point without buckling.

relief on station Two UAVs simultaneously worked by same ground control station.

relief tube Personal urinary pipe normally discharging overboard.

relief valve Fluid system valve which releases pressure at preset value.

relight 1 To restart combustion in gas turbine after mid-air flameout.

2 To use ridge lift to prolong glide of sailplane.

relight envelope Published diagram of permissible limits of TAS and height outside which engine relight should be attempted only in emergency. ** forms part of flight manual of civil gas turbine aircraft, and for military aircraft is given for main combustion and afterburner.

relighting altitude That up to which safe and reliable restarting of power unit (gas turbine is implied) is possible (CAA).

reluctance Opposition to magnetic flux, property of magnetic circuit akin to resistance in electric circuit which limits value of flux for given MMF; symbol $R$ or $S$, numerically $= l/\mu A$ where $l$ is length of magnetic path, $\mu$ is permeability and $A$ cross-sectional area.

Relvel Relative velocity.

REM 1 Rocket engine module.

2 Remaining.

rem Quantity of ionizing radiation which, when absorbed by body, produces same physiological effect as 1 roentgen of X-ray or gamma radiation; from roentgen-equivalent man.

remanence Flux density remaining (residual) in material after removal of magnetizing force. Also called retentivity.

remanufactured Aircraft completely stripped and inspected, usually by original builder, and with new structure added where necessary before reassembly and
Remap
delivery with clearance for specified long life free from fatigue. Usually opportunity is taken to update systems and equipment also.
Remap Research maximization and prioritization (NASA).
Rembass Remotely monitored battlefield-area surveillance (or sensor) system.
Remco Reference Materials Committee (ISO).
Remdeg Reliability military data exchange guide.
Remis Reliability and maintainability information system[s].
remanent In assessment of handling, an arbitrary value inserted to bridge the difference between model values and human-pilot results.
Remo Remote monitoring and control.
remote aerial refuelling operation With boom-equipped aircraft, using CCTV from flight deck instead of boom-operator station.
remote augmented lift system Arrangement for providing enhanced jet lift for V/STOL on demand in which large airflow bled from engine(s) is piped to auxiliary combustion chamber, usually near nose of aircraft, to provide additional high-energy lift jet. Latter may have means for modulation and linked vectoring, and RALS always requires large pilot-controlled diverter valve(s).
remote augmentor Remote nozzle.
remote communications outlet Remotely controlled unmanned air/ground com. station providing UHF and VHF transmit-and-receive capability to extend range of FSS (FAA).
remote fan Mechanically independent fan driven by tip-driven turbine blades fed by hot gas from main engines via switch-in deflectors; used to provide jet lift for V/STOL or, rarely, to increase thrust at low speeds.
remote frequency display Shows details and status of all on-board radios.
remote indicating compass Magnetic compass whose sensing element is installed in extremity of aircraft where deviation is minimal, with transmitter system serving repeater dial(s) facing crew.
remote interface units These collect data and feed it to the VMS computers.
remotely piloted vehicle, RPV Aerodyne usually of aeroplane type whose pilot does not fly with it but controls it from another aircraft or from station on surface. Authority of remote pilot is usually absolute, though to ease pilot workload some RPVs have choice of preselected auto pilot/computer programs for at least part of each mission.
remote magnetic indicator Principal panel instrument of a VOR.
remote mass balance Connected by linkage to surface where * cannot be accommodated.
remote nozzle Substantially vertical nozzle in RALS fed with air from main-engine fan and burning fuel to generate about 45% of total lift thrust.
remote receiving station Friendly station remote from UAV or RPV control station at which its transmission (eg reconnaissance information) can be received.
remote-source lighting Use of [possibly very long] fibre optics.
remoting Transmission of ATC, SSR or air defence radar display by landline, microwave link or other means to distant centre.
remous Air turbulence (F, commonly used by English-speaking aviators pre-WW1).
removables All items flight crew must remove from outside of aircraft before take-off.
REMP Replacement and modernization program[me].
Remo Remote radar operator.
REMIS Remote sensor.
REMISA Requirements for emergency and safety airborne equipment, training and procedures (ECAC).
Remo Remote-control secure-voice system.
rendering Th acceptance by a Contracting State of another’s C of A or licence.
rendezvous Meeting of two aircraft or spacecraft at preplanned place and time. For aircraft can include air-refuelling hook-up but for spacecraft physical connection is docking.
rendezvous orbit insertion Establishment by one spacecraft of orbit almost identical to that of another before actual rendezvous.
rendezvous radar Esp. in spacecraft, small ranging and range-rate radar carried to facilitate rendezvous and subsequent docking.
René alloys Family of American high-temperature alloys with Ni base plus Cr, Mo, Co, Ti, Fe, Al, and small amounts of C, B, N.
reneg To go back on previous agreement (US, colloq.).
renegotiation Procedure not uncommon in US where manufacturer is required (usually by government) to renegotiate an existing active contract; usual cause is allegation of excessive profit.
renewal Procedure, usually annual, for inspection of civil aircraft for certification * and of civil pilot * of certificate or licence. Hence * rate, total of fees payable, and * inspection, by authority-approved organization.
RENLI Runway-end lights [normally red].
R/EO Radar/electro-optical.
REP Reporting point (ICAO).
REMIS Meeting of two aircraft or spacecraft at rendezvous.
REMSA Requirements for emergency and safety airborne equipment, training and procedures (ECAC).
REMSS Remote-control secure-voice system.
repair-cycle aircraft Those in active inventory in or awaiting depot maintenance (DoD).
repairman certificate Issued by FAA to skilled tradesman engaged in repair or maintenance of aircraft or parts.
Repairnet Reconstitution post-attack interoperable radio network.
repeater jammer ECM receiver and transmitter which receives hostile signals and amplifies, multiplies and retransmits them for purposes of deception or jamming. Basic deception mode is to give false indication of range, azimuth or number of targets.
repetition rate 1 In radar, number of pulses per second. 2 In automatic gun, cyclic rate.
repetitive chime clacker Gives aural warning indicating fault in aircraft configuration.
repetitive flight plan Kept on file for frequent [eg. scheduled] identical flights.

558
Repìn (G)

Repìn (G) Replacement inertial navigation unit with GPS added.

RePLACE Reconfigurable processor for legacy avionics code execution.

replaceable panel Aircraft maintenance access panel which has to be replaced; not an interchangeable panel, which can be opened in about one-tenth the time.

replacement factor Estimated percentage of hardware items that over given period will need replacing from all causes except accidents.

replenishing Refilling of aircraft with consumables such as fuel, oil, liquid oxygen and compressed gases to authorized pressure; rearming is excluded (NATO).

replenishing phase Part of operating cycle of pulsejet in which depression in duct induces fresh charge.

reply code That repeated series of pulses transmitted by SSR transponder in aircraft when interrogated; typically up to 12 information pulses between two framing pulses 20.3 μs apart.

reply-code evaluator Automatic avionic subsystem which reads reply code and determines if valid, what identifier and in case of military IFF whether friendly or hostile.

reply efficiency A transponder’s valid responses as percentage of interrogations.

reporting point Geographical point in relation to which aircraft position is reported.

repositioning Moving aerobatic aircraft from end of one manoeuvre to start of next, at correct height/speed.

repressurant Material, eg compressed air, oxygen and water vapour, stored in spacecraft outside pressurized volume and fed into refit interior after depressurization operations.

req, REQ On request.

REQMT Requirement.

request for proposals Document sent by central government to one or more industrial contractors outlining future requirement stated by armed force(s) and inviting suggestions on how this should best be met; RFP calls for analysis of problem by manufacturer and for submission of general scheme for hardware which in case of aircraft and most other equipment includes three-view drawing, basic description, estimated weights and performance, timescale and costs.

required flightpath That necessary to satisfy immediate task of pilot; not a recognised performance parameter but general objective weighed against projected flightpath.

required navigation performance Measure of accuracy of a particular segment or block of airspace.

required track Path aircraft commander wishes to follow; refers always to future intention. Often a ruled line joining two waypoints.

requirement 1 Predicted future need spelt out by armed forces; usually after long process of refinement and assessment of alternatives.

2 An ingredient necessary for a successful design. See next.

requirements capture The rigorously structured procedure whereby, in parallel with established analytical procedures [FHA, then PSSA], all the elements required for a functioning device or system are gathered, with nothing overlooked. There are two totally dissimilar methods. In top-down the design team start with the overall basic requirement, quantified in every detail and work downwards until they are studying cable sizes and case materials. In bottom-up the designers begin the fine detail and work their way up through sub-modules and subsystems to reach the final product.

RER / Reconnaissance exploitation report.

2 Radar electrical rack.

3 Residual error rate.

REPA Recent rain.

RERP Reliability enhancement and re-engineering program.

REUTE Re-route.

RES / Radio emission surveillance.

2 Reserved.

4 Reservoir.

5 Remote, or reprogrammable, emitter simulator.

Resa, RESA / Research, evaluation and systems analysis.

2 Runway-end safety area.

3 Rotating electronically scanned array.

Rescap Rescue combat air patrol.

rescue basket Lowered from helicopter to rescue person unconscious or incapacitated.

rescue co-ordination centre Initiates, manages and terminates rescue efforts within particular area by all branches offering help.

research and development Generalized term covering process of development of specific items of hardware; research involved is usually minimal and always applied, main effort being directed at solving engineering problems which are invariably unpredictable and occasionally require new fundamental knowledge; abb. R&D, but US favours RDT&E, which is unnecessarily clumsy.

research coupling Disseminating research results to maximize early and widespread use.

research octane number Usual scale of measurement for anti-knock value of automotive fuels. On this basis unleaded gasolines are 95–97 RON, while leaded might have rich-mixture RON of 130. Aeronautical gasolines are commonly MON-rated.

research rocket Usually unguided ballistic rocket whose purpose is to lift scientific payload to high altitude for free-fall or parachute descent. Very occasionally purpose is to advance technology of rockets.

research vehicle Atmospheric or space vehicle, manned or otherwise, whose purpose is to provide answers to research problems; not normally prototype of production article but often associated with specific programme.

research / Group of met. stations operating under common direction; hence international.

2 Grid of fine parallel lines used in image analysis.

Réseau du Sport de l’Air Association of homebuilders (F).

reserve aircraft Those accumulated in excess of immediate needs for active aircraft and retained in inventory against possible future needs (DoD).

reserve buoyancy Additional mass or applied force needed to immerse completely floats or hull of seaplane or flying boat already at specified (usually MTOW) weight.

reserve factor Ratio of actual strength of structure to minimum required for a specified condition.

reserve fuel See reserves.
**residuals**

Net propulsive force minus residual magnetism remains in atmosphere after NW detonation. Confused with half-life (not to be confused with half-life) radioactive material, eg fallout, remains in either gas-turbine combustor or afterburner. Various patented (eg Avco, Marquardt) Resistojet space thrusters using liquid ammonia or other working fluid, including biowastes, accelerated by solar-powered electrothermal chamber with de Laval nozzle.

**resistor**

Electrical device offering accurately specified resistance.

**reslams**

Repeated throttle slams for engine test.

**RESM**

Radar electronic support measures.

**RESN**

Recent snow.

**resojet**

Usually means resonant pulsejet.

**resolution**

1 Measure of ability of optical system, radar, video/TV or other EO system, photographic film or other scene-reproducing method to reveal two closely spaced objects as separate bodies; normally defined in terms of angle at receiver subtended by two objects which can just be distinguished as separate.

2 Ability of device, as in (1), to render barely distinguishable pattern of black/white lines; expressed in number of lines per mm which can just be distinguished from flat grey tone. Both (1) and (2) also called resolving power.

3 Measure of response of gyro to small change at input; minimum change that will cause detectable change in output for inputs greater than threshold, expressed as % of half input range.

4 Separation of vector quantity into vertical/horizontal components.

**resolution advisory**

Verbal or display indication recommending increased vertical separation relative to an intruding aircraft.

**resolver**

Subsystem in spacecraft INS which measures changes of attitude, esp. rotation about longitudinal axis, and informs guidance computers. In general a rotary digitiser converting small angular movements to digital signals.

**resolving power**

1 See resolution (1, 2).

2 Ability of radar set or camera to form distinguishable images (ASCC); term unhelpful and indistinguishable in practice from resolution (1, 2).

3 Reciprocal of unidirectional aerial beamwidth measured in degrees (not synonymous with resolution [1], which is affected by other factors).

**resonance**

1 Condition in which oscillating system such as free wave or aircraft structure oscillates under forcing input at natural frequency, such that any change in frequency of impressed excitation causes decrease in response.

2 Condition of AC circuit when, at given frequency, inductive and capacitive reactances are equal.

3 In specific case of rotary-wing aircraft, particularly helicopter, condition in which natural frequency of landing gear corresponds with main-rotor rpm.

**resonance test**

Structural exploration of natural frequencies by excitation over slowly varying wide range of frequencies.

**resonant duct**

See resonant pulsejet.

**resonant pulsejet**

Pulsejet in which intermittent operation occurs at natural frequency of operating air/fuel-burning duct system, without need for one-way flap valves.

**resonating cavity**

Closed hollow space of precise geometry having electrically conductive walls in which microwaves are generated when excited by EM field or electron beam; examples are magnetron, klystron, rhumbatron; also called resonant cavity.
Resound

2 Magnetostriuctive ferromagnetic rod excited to respond at several distinct frequencies.
3 Lecher wire.
4 Piezoelectric crystal.
5 Acoustic enclosure having single-frequency response.

Resp Receiver/exciter/synchronizer processor.
Responder Receiving unit in transponder.
Responsible Electronic device used to receive electronic challenge and display a reply thereto (DoD).

Rescue Radar emission, or environmental, simulator system.
Resource “Sudden cabbage following a dive” [i.e., pull out]: between the wars it was held there was no English equivalent.
RES Rest, Rest. Radar electronic scan technique; spherical/planar lens array aerial, RF angle-error sampling circuits, auto search/detection/confirmation, and display/recording.
2 Re-entry environmental and systems technology.
Rest angle Angular position of hinged surface when not in use. May correctly incorporate slight offset, droop or other departure from housed or neutral.
Restart Start of burn after previous cutoff.
Rest in Time between completion of adjustment of tunnel model and taking first readings.
Rest-EVA period Scheduled period in manned space mission when in absence of assigned duties person may rest or conduct EVA.
Restitution Determination of true planimetric position from reconnaissance photographs (NATO).
Rest mass Mass of body when at rest (absolute in cosmological term); other masses \( m = m_0 \sqrt{1 - (v^2/c^2)} \) where \( m_0 \) is **, \( v \) is velocity and \( c \) is speed of light.
Restoring couple Couple producing restoring moment.
Restoring moment Moment generated by upset, i.e., rotary excursion from original or desired condition, which tends to restore original condition.
Rest period Time on duty or ground during which flight crew is relieved of all duties.
Restif Radar electronic scanning technique.
Restrict Restrict[en].
Restrained aircraft One undergoing dynamic structural test or analysis, e.g., flutter, with one or more parts anchored.
Restrain 1 Standard series of tiedowns, webbing and nylon-cord nets to prevent movement of bulk cargo.
2 Process of binding, lashing and wedging items into one unit on to or into transport to ensure immobility during transit (DoD, NATO).
1 Mechanical latching of container, pallet or otherULD.
Restricted airspace See restricted area.
Restricted area Airspace above surface area of published dimensions within which flight of aircraft is subject to restrictions caused, e.g., by “unusual and often invisible hazards” such as AAA or SAM activity; in US published in FAR 73, in UK by CAA and in all Notams, charts and commercial publications. Denoted by R followed by an identifying number, invariably in force SL to 2743 m (9,000 ft).
2 Area where restrictions are in force to minimise interference between friendly forces.
Restricted burning See restricted propellant.
Restricted data Those pertaining to design, manufacture or use of NW, or special nuclear material.
Restricted fire plan Safety measure for friendly aircraft which establishes airspace “reasonably safe from friendly surface-delivered non-nuclear fires” (DoD).
Restricted propellant Solid-propellant grain whose surface is only partly available for ignition, remainder being protected by restricter.
Restrictor Layer of solid-propellant fuel containing no oxidant (oxidizer) or of non-combustible material bonded firmly to inner surface of grain to prevent that part being ignited except by flame travelling within propellant under *.
Restructurable Able to be rapidly modified [redesigned] in flight to overcome dangerous problem, such as hard-over runway (flight-control system).
Sync Resynchronize, resynchronizing.
RET Rapid-exit taxiway.
2 Retired.
Reliability evaluation test.
Ret NASA code for time between routine events.
Retard To cause piston engine ignition to occur later in each cycle (normally still before TDC).
2 AT/SC mode in which throttles bleed off at programmed rate during landing flare.
3 Displayed instruction to chop power to Flight Idle.
Retard block [on forward movement of throttle lever(s)].
Retardant Tailored additive to water dropped by fire-bomber [several trade names].
Retarad probe Tapering rod thrust into hydraulic aperture to offer increasingly great resistance to carrier arrester-wire pull-out.
Retarded bomb Free-fall bomb with airbrakes, drogue, parachute or other high-drag device deployed automatically on release.
Retarder parachute Small auxiliary parachute to pull main-parachute rigging lines out in advance of canopy.
Retention Maintenance of full design performance over long period of service.
Retention area Highly loaded parts of turbine or compressor disc around blade roots.
Reticle Any kind of mark, such as black ring, illuminated cross or ring of bright diamonds (to give three examples) used to assist any form of optical aiming, e.g., aerial gunnery, spacecraft docking or airdrop on marker.
2 In photogrammetry, cross or system of lines in image plane of viewing apparatus used singly as reference mark in monocular instruments or in pair to form floating mark in certain stereoscopes (ASCC).
Retraded Having form of fine network; hence * plastic or * foam are 3-D volumes of low-density fire-resistant foam which can be foamed in place inside or outside fuel tanks and other items to prevent build-up of fuel/air mix and, even in presence of severe combat damage or post-crash rupture, prohibit explosion or swift spread of fire.
Retils Rapid-exit taxiway indicator lighting system.
Retimet

**Retimet**  Patented (Dunlop) reticulated metal, low-density 3-D mesh of various metal strips or filaments.

**Retinal scanning display**  Mounted on pilot’s head and projects pixels [of flight data] into pilot’s eye, focused at infinity.

**Retirement**  Withdrawal of serviceable aircraft on grounds of age, see next.

**Retirement life**  Aggregate of running time of engine or other device at which decision is taken, usually by operator but sometimes suggested by manufacturer, that further overhauls are uneconomic; main reasons are obsolescence of design or onset of fatigue problems.

**Retrace**  American term for flyback.

**Retractable**  Capable of being withdrawn into aircraft so that it no longer protrudes, or protrudes only partially; applies to many devices which are * into all parts of aircraft, such as landing gear, inlet spikes, hooks, MAD gear, Fowler flaps, spoilers, sensor pods, radars and, formerly, gun turrets.

**Retractable ejector duct**  Two-position jet-engine reverser for use in flight.

**Retration lock**  Mechanical device to prevent inadvertent retraction of landing gear; today is removable but backed up by second lock actuated by compression of undercarriage oleos.

**Retrocrew**  Military flight crew returned to OCU after tour of combat duty.

**Retrofiring**  That on side of a lifting rotor, eg on helicopter, moving relative to aircraft in same sense as slipstream; thus its airspeed is difference between its own speed and true airspeed, which is normally positive at tip, zero at a particular part-span radius and negative near root. Inboard of zero-airspeed radius, airflow is from trailing to leading edge.

**Retrofiring bladder**  Stall of retreating blade at high helicopter forward speeds, when angle of attack of retreating blade is excessive, especially towards tip; exceeding flight-manual forward speed causes stall over near-rectangular area of disc whose centre is behind c.g. and thus effect is to cause nose-up roll towards retreating side.

**Retieval**  Mid-air snatch of parachuted load, eg spacecraft.

**Retrieve**  Task of following sailplane on cross-country to goal, dismantling it and bringing it back in trailer.

**Retriever**  Controller workstations in Comfile ATC system which pass data and radar from Ethernet to operator consoles.

**Retiming**  Adjustment of flight-control trim for different flight condition [major error on takeoff can be catastrophic].  

2. Adjustment of engine trim to allow for deterioration caused by deposits, erosion, birdstrikes and other factors.

**Retro**  Usually means retrofit or retrorocket.

**Retrofire**  To fire retrorocket.

**Retroflect**  Modification, esp. involving addition of new or improved equipment, to item already in service; hence * action, * mod.

**Retrograde**  Orbit in direction different from normal; eg of a planet apparently moving westward against fixed stars.

2. Orbit in direction opposite to rotation of primary body, eg Triton around Neptune or Earth satellite launched at inclination from 180° through 270° to 360/000°.

3. In traffic direction opposite to normal, eg cargo of military logistic type moving towards United States, or military command away from enemy.

**Retroreflection**  Reflection, eg of EM radiation, parallel to incident rays; hence retroreflector, device for accomplishing same, eg corner reflector, Luneberg lens.

**Retrorocket**  Rocket fitted to vehicle to oppose forward motion, eg to bring satellite out of orbit and back to Earth. Loosely used to mean what are more precisely called separation or staging motors or, on aircraft, braking rocket.

**Retrosequence**  Event sequence before, during and after retrofire.

**Retrothrust**  Thrust opposing motion; can be used for aircraft reverse thrust.

**Rets, RETS** 1. Remote target system, or remote-equipment target system.

2. Recent thunderstorm(s).

3. Radar extractor and tracking system.

**Return**  Echo (radar), esp. that due to clutter sources; often plural.

**Return-flow**  Combustor in which incoming air and issuing gas travel parallel in opposite directions; also called reverse-flow.

**Return-flow tunnel**  Wind tunnel in which air is contained in enclosed circuit.

**Return grab**  Returns shuttle of catapult (deck accelerator) to start position.

**Return line** 1. That traced on CRT by flyback.

2. Fluid pipe bringing fluid back from device to pump.

**Return load** 1. That transmitted to aircraft by stopping forward motion of action in gun, in direction opposite to recoil.

2. Personnel and/or cargo to be transported by returning carrier (DoD); ‘carrier’ means any vehicle, not aircraft carrier.

**Return oil**  Scavenge oil; hence instrument showing * temperature.

**Returns**  See return.

**Return to base**  Code: proceed to point indicated by displayed information which is being used as point from which aircraft can return to place where they can land; command heading, speed and altitude may be used (DoD).

**REV**  Remote electronic[s] unit.

**Reusability**  Extent to which space hardware can be used for repeated launches, especially if recovery is made from desert or ocean.

**REV**  Revision message.

**Rev. counter**  Tachometer.

**Reveal**  Real-time electronic video enhancement at long range.

**Reven**  Reverser/variable exhaust nozzle.

**Revenue**  Air-carrier income from traffic sales.

**Revenue yield**  Rate per unit of traffic, eg cents per ton-mile.

**Reverberation**  Persistence of sound in enclosed space as result of continued multiple reflections, with or without continued emission by source.

**Reverberation time**  Time between cut-off of source and diminution of sound, measured as time-average of acoustic energy density, to fall to 10− 1 of original.
reversal

reversal 1 Half a cycle of oscillating applied load, ie from maximum load in one direction to maximum load in opposite direction.

2 Control reversal (see reversed controls).

Difference in direction exceeding 90° between surface wind and that in upper air.

reversal parameter Sign (±) of partial derivative of pitch-loop bandwidth to pilot’s pitch control gain, considered in design of carrier aircraft.

reversal speed Lowest EAS at which control reversal is manifest.

reversal temperature That at which characteristic spectral lines of incandescent gas disappear against black-body spectrum.

reversal zone Zone within ILS glideslope or course sector in which slope of sector characteristic curve is negative.

reverse bias That which reduces current.

reverse blindness Obstruction of flight-deck vision by snow or other material in reverse-thrust mode.

reverse breakdown voltage That at which reverse current across p/n junction increases rapidly with little increase in reverse voltage.

reversed bootstrap ECS in which the rain-cooled air passes through an air-cycle turbine before returning through the heat exchanger and compressor.

reversed controls Flight-control axis about which, in particular severe conditions, application of pilot input demand causes aircraft response in opposite sense, normally due to aeroelastic distortion of structure. Usual axis is roll, where under very high EAS (ideally not within limits of flight manual) large aileron deflection causes opposite twist of wing which more than neutralizes rolling moment due to aileron; in effect aileron acts as tab and wing as aileron.

reverse dihedral Destabilizing rolling moment in sideslip at high AOA when slipstream increases lift of leeward (trailing) wing. Also called negative dihedral.

reversed lobsterback A Phase II combustor heat shield [Rolls-Royce, superseded by Phase-V].

reversed rolling moment That due to reversed control in rolling plane; also called roll reversed.

reverse engineering Process of studying a finished product [precise geometry, materials and surface finish] so that it can be copied. Classic case is Tupolev’s * of B-29 to create Tu-4.

reverse-flow combustor One in which air enters at front, travels to rear-mounted fuel burners and then returns as hot gas within flame tube to leave radially inward from front; also called folded combustor, return-flow.

reverse-flow engine Gas turbine incorporating axial compressor which draws in air around rear end and compresses it in forwards direction, before turning flow radially outwards (often by added centrifugal stage) to flow back to rear through combustor(s).

reverse-flow region 1 Quasi-circular region near hub of helicopter main rotor disc, on retracting side, within which relative airflow is from trailing to leading edge, ie helicopter airspeed is greater than blade speed due to rotation.

2 Any region in turbulent boundary layer in which there is a majority-flow reversal.

reverse idle Power-lever setting at which engine is at idle (usually flight-idle because prior to touchdown on committed landing) with reverser buckets in reverse-thrust mode.

reverse launch In direction opposing Earth’s rotation.

reverse localized Back course.

reversion See reverse turn.

reverse origami Unfolding of spacecraft, or its aerial[s].

reverse pitch Special ground-only setting available on some propellers and ducted propulsors, including several variable-pitch turbofans, in which blades accelerate air forwards, creating retrothrust proportional to engine power without change in direction of rotation.

reverser Device for deflecting some or all of efflux from jet engine to give reverse thrust (retrothrust); can take form of pivoting clamshell buckets, blocker doors and peripheral cascades, or other forms, and may include turbofan core or fan exit only. Angle through which jet is turned seldom exceeds 135°.

reverse sweep Forward sweep.

reverse thrust Operating mode for jet engine equipped with reverser, obtainable only by overcoming gate or detent which may be locked until weight is on oleos for specified period, eg 1.5 s; normally obtained by moving power levers past idle down to ** mode, further movement in this direction opening throttle to full power to give maximum retrothrust.

reverse torque Any situation in which the driven member [e.g., propeller] drives the prime mover. Could be dangerous, as in a Viscount which was dived at high IAS when one propeller ran away fully fine.

reverse turn Opposite of Immelmann: half-roll followed by half-loop. Also called reversion.

reverse-velocity rotor Main lifting rotor of compound or hybrid helicopter which behaves as an aeroplane in cruising flight, with a large portion in high-speed reversed relative airflow.

reversible propeller One in which reverse pitch may be selected.

reversing layer Thin lower part of Sun’s atmosphere; cooler than photosphere and source of Fraunhofer lines.

reversion Change of operating mode (eg, but not exclusively, of flight-control system from normal powered to a degraded or manual mode).

reversionary Available following failure of primary system.

reversionary facility Facility for changing operating mode, either automatically or upon human command, esp. one following failure or degradation of existing channel or subsystem.

reversionary lane Back-up or standby channel.

reversionary mode Normally means advanced integrated flight system is available for pilot input of selected navigation mode from choice of several unrelated systems, eg INS, local R-Nav, Doppler, VOR/DME or Omega.

reverted rubber Rubber heated beyond critical point at which it loses basic mechanical properties, esp. elasticity, and becomes sticky and permanently deformable. In one of the three aquaplaning modes, lack of anti-skid system causes locked wheel(s), reverted rubber in contact with runway covered in standing water, rapid steam generation and aquaplaning on steam layer above water.

reversion Area protected on three sides by blast-resistant wall of concrete, sandbags, compacted earth or other material, either to protect occupants and parked...
combat aircraft or other stores against external attack or to protect occupants, eg launch crew, against hazardous rocket or similar tests.

Revi Reflexvisier, reflector sight (G).

Review Research vehicle for in-flight submunition ejection.

reval Restart of spacecraft systems after period of rest or shutdown, eg after long mid-course en route to planet when * is commanded by characteristic telecom signal.

rev/min SI abb. for revolutions per minute.

revolution 1 In engineering terms, one rotation of shaft or rotary system.

2 In spaceflight, motion of body about axis remote from itself, eg of planet around Sun.

3 One complete orbit starting and finishing at same point. In practice this is unattainable concept because of rotation of Earth, Earth’s revolution (2) around Sun, Sun’s motion through local galaxy, etc. Time for Earth-satellite revolution, as distinct from period (see sidereal and synodic orbit), is of meaning only in specific case where inclination is 0° or 270° along Equator when, because of Earth rotation, time is shortened or extended by 6 min. over orbital period. At all other inclinations satellite follows fresh track on each orbit and never makes * in this sense.

Revolutionary Turbine Accelerator Unconventional scheme for turbofan for flight Mach No of 4.25 (NASA).

revolution indicator Tachometer.

Revolution in Military Affairs Owning the sky and space over the battlespace; giving unchallengeable command and control.

revolver cannon One whose ammunition is fed to chamber via rotary cylinder driven by main action and in whose several chambers successive rounds pass through complete firing sequence, in one position being fired down a single fixed barrel. See rotary cannon.

revPAR Revenue per available room.

revolutions, especially r.p.m., i.e., engine speed (collog.).

REVS, Revs Radar-enhanced vision system (BAE Systems).

REW Radio-electronic warfare.

Reward Reporting working and reliability data.

REWTS Responsive electronic-warfare training system.

Reynolds number Most important dimensionless coefficient used as indication of scale of fluid flow, and fundamental to all viscous fluids; \( R = \rho Vl/\mu \) where \( \rho \) is density, \( V \) velocity, \( l \) a characteristic length (eg chord of wing) and \( \mu \) viscosity = \( Vl/\nu \) where \( \nu \) is kinematic viscosity. Expression is ratio of inertia to viscous forces. It shows, eg, that for dimensional similarity model tests in tunnels should be run at pressures greater than atmospheric.

Reynolds stress 1 Shear stress in laminar boundary layer in viscous fluid (see skin friction).

2 Term(s) representing momentum transfer due to turbulence.

RF 1 Radio frequency, or facility.

2 Aircraft designation prefix, reconnaissance/fighter (DoD).

3 Regional forces.

4 Royal Flight; thus, issue of an * Notam.

5 Route to a fix.

RFA 1 Request for alteration.

2 Royal Fleet Auxiliary; ship usually with helicopter pad.

3 Regulatory Flexibility Act [1980–] (FAA).

RFACA Royal Federation of Aero Clubs of Australia [office, Melbourne].

RFAS Russian Federation and Associated States.

2 Reaction Force Air Staff (NATO).

RF-ATE RF (1) auto test equipment.

RFC 1 Reinforced fibre composite.

2 RF choke or communication[s].

3 Royal Flying Corps [13 May 1912 (until 1 July 1914 with a Naval Wing) to 1 April 1918, when renamed RAF] (UK).

4 Request for change, or comments.

5 Retirement for cause (USAF).

6 Radio facilities chart.


RFCM RF countermeasures.

RFCP RF Costs Panel (ICAO).

RFCS RF com. set.

RFD 1 Remote frequency display.

2 Regulatory flexibility determination (FAA).

RFDU RF/digital interface unit.

RFDS Royal Flying Doctor Service of Australia [office, Sydney].

RFDU RF distribution unit.

RFEG RF environment generator, to test whole aircraft.

RFF 1 Research Flight Facility (NOAA).

2 Rescue and firefighting.

RFFE RF front end.

RFPP Rescue and Fire Fighting Panel (ICAO).

RFFS Rescue and firefighting service (CAA).

RFGS RF generation subsystem (ECM).

RFI 1 Request for information.

2 RF interference, or radar-frequency interferometer.

3 Resin-film insulation, or infusion.

RFID, RF/ID Radio-frequency identification, or RF identification device, initially of passenger or baggage, now of any item requiring maintenance.

RFIS Receiver fire-control computer-interface software.

RFJ, RFJ RF jammer.

RFL 1 Restricted flammable liquid (cargo).

2 Rocket flare launcher.

RFLG Refuelling.

RFM RF module.

RF-Mems RF microelectronic/mechanical system[s].

RFNA Red fuming nitric acid.

RFP 1 Request for proposals[s].

2 Remote front panel.

RFPP Reserve Forces Policy Board (DoD).

RFPI Rapid force projection initiative.

RFPU Recorder/film-processor unit.

RFQ 1 Request for quote/quotation[s].

2 Request for qualifications [airports].

RFR 1 Request for revision.

2 Restriction of Flying Regulation[s].

RFS 1 Reserve Flying School (UK).

2 RF surveillance; /ECM adds and ECM.

3 Restricted flammable solids (cargo).

4 Regardless of feature size.

RFSC Rubberized friction and seal coat (runway).

RFSP Replacement flight-strip printer.
RFSS

RFSS  1 RF surveillance system.
2 Remote flight-service station.
RF surveillance Maintaining continuous monitor and record of all hostile RFs.
RFT  1 Ready for training (US).
2 Request for tender.
3 Right first time.
RFTDL Rangefinder target-designator laser.
RFTR Request for technical proposal(s).
RFTS 1 Robot flexible transfer system.
2 Reserve Flying School.
RFU Radar, or radio, frequency unit.
RFV Request for visit [by accredited foreign staff, eg attaché].
RFY Reduced fission yield.
RG 1 Retractable gear.
2 Range (lights, ICAO).
3 Reconnaissance group.
4 Recombinant gas (accumulator).
5 Rotocraft/gyroplane.
6 Regular General Aviation use.
RGc Glide ratio.
RGB 1 Reduction-gearbox module.
2 Red/green/blue (systems identification and colour TV tube).
3 Jail garrison bazing.
RGCS Radar graphics computer.
RGC Review of the general concepts of separation (ATC); P adds panel.
RGD Ragged.
RGF Range-gate filter.
RGL Runway guard light(s).
RGM US designation prefix: ship-launched surface-attack missile, also Ra (AIDU).
RGN Region (ICAO), also Rn (AIDU).
RGO Royal Greenwich Observatory.
RGP/RGPO Random combination of RGPO and range-gate pull-in; ECM technique calling for predictive gate but effective against manual operator. Essentially Rangap.
RGPO Range gate pull-off.
RGPS Relative GPS.
RGS Recovery guidance system.
RGSI Radial groundspeed indicator (DME).
RGSN Homing radar system or beacon (R).
RGT 1 Remote ground terminal.
2 Reliability growth test.
rgt Right.
RGV Rotating guide vane.
RGWS Radar-guided weapon system.
RH, rh, r.h. 1 Right-hand.
2 Relative humidity.
3 Reheat.
4 Rotocraft, helicopter.
5 Radio handler.
6 Rolled homogenous, see next.
RHA 1 Rolled homogenous armour.
2 Recording-head assembly.
RHAG Rotary hydraulic arresting gear.
RHAW Radar homing and warning; S adds system.
RHC Right-hand circuit.
Rhea, RHEA Role of the human in the evolution of ATM (7) systems (Euret).
ribbon heater

other aerofoil essentially in chordwise direction; in highly swept wing axis may occasionally be aligned more with aircraft longitudinal axis but essential feature is that * joins leading and trailing edges and maintains correct section profile.

2 Light peripheral member not part of primary structure whose purpose is to maintain profile of aerofoil and support fabric or thin wood covering (see compression *, noise *).

ribbon heater Electrothermal tape coated around pipe to prevent freezing; sections joined by approved connectors.

ribbon microphone Comprises thin corrugated strip of aluminum alloy suspended between poles of permanent magnet; output is signals generated by strip vibrating perpendicularly to field.

ribbon parachute One whose canopy is formed from rings (rarely, spiral) of ribbon, giving high porosity but reduced opening shock and good stability.

ribbons Medals.

ribbon spray Water flung sideways by planing bottom at high speed; caused by first contact of hull or float with water and leaves at high speed at shallow angle; also called velocity spray.

riblet 1 Portion of rib, eg extending only from front spar to LE.

2 Carefully profiled microgroove, no larger than fine scratch, which, repeated millions of times to cover entire non-laminar part of aircraft skin, can reduce drag up to c 3 per cent.

RIBS Readiness in base services.

RIC 1 Reconnaissance Intelligence Centre (RAF Marham).

2 Reconnaissance interpretation center.

rich Having excess of fuel (well above stoichiometric) for given flow of air or other oxidant. Hence * mixture.

Richardson effect See thermonic emission.

Richardson number Ri, non-dimensional quality in study of vertical shear in atmosphere.

rich cut Sudden loss of piston engine power caused by over-rich mixture, notably caused by flooding of float chamber carburettor under negative g.

rich extinction Failure of combustion caused by excessively rich mixture.

rich mixture Piston engine fuel/air mixtures significantly above stoichiometric, among other things reducing combustion temperature and enabling higher boost pressure to be used without detonation. Thus 100-octane Avgas has an RMO rating of 130.

RICS Rubber-impregnated chopped strands.

RIDE, Ride Radio communications intercept and D/F equipment.

ride control Automatically commanded aerodynamic control system which reduces, and attempts to eliminate, vertical accelerations caused by flight through gusts, esp. by penetrating aircraft at high (possibly transonic) speed at lo level. Typically includes sensitive g-sensors, computer and foreplanes (possibly augmented by fore-rudder or section of main rudder) to minimize vertical acceleration of crew compartment. In B-1 called LARC, later SMCS.

ridge Narrow extended portion of anticyclone or other high.

ridge girder Structural member forming part of stiff-joined main transverse frame of airship, usually qualified as inner or outer and separated by main radial struts. Each ** links two longitudinals.

ridge lift Provided by air on upwind side of ridge.

ridge lines Bright lines overlaid on HUD along summits, ridges and edges.

riding lights Those displayed by marine aircraft moored or at anchor.

riding the controls Not definable, but tendency of pilot to keep making small unnecessary control movements.

RIDR Runway-incursion detection radar.

RIDS, Rids 1 Radio information distribution system (digital airborne CNI systems).

2 Ramp-information display system.

RIE Rapid improvement event.

RIF Rapid improvement force (military); hence, personnel can be riffed (USAF).

2 Reappearance in flight.

RIG, Rig Rate integrating gyro.

rig 1 To adjust wing angular setting, wash-in wash-out, dihedral, control-surface neutral positions and other aerodynamic shape determinants to obtain desired flight characteristics; normally applied only to light GA aircraft, in which it is possible to * by adjusting tensions of bracing wires and even alter shape of fuselage.

2 To prepare a load for airdrop (NATO).

3 Purpose-designed test installation for development of jet-lift V/STOL aircraft (in which case * may fly) or complete aircraft system, eg fuel, hydraulics, environmental, landing gear or propulsion. Usually full-scale and non-flying and often incorporating flight-quality hardware; eg fuel-system * can test entire aircraft fuel system in extreme attitudes and under abnormal environmental conditions.

3 Purpose-designed test installation for development of jet-lift V/STOL aircraft (in which case * may fly) or complete aircraft system, even in modern powered system, so that all surfaces have exactly correct rest angles and system responses.

3 Complete system of wires, cables and cords by which aerostat (esp. kite balloon or other moored type) is secured to main cable(s) or handling guys, and by which crew operate valves etc.

3 Equipment for dusting (dry *) or spraying (wet *) on ag-aircraft.

rigging angle of incidence See angle of incidence.

rigging band Strong tape band around kite balloon or other moored aerostat envelope to which all rigging (2) and payload are attached.

rigging lines Those connecting parachute canopy to load.

rigging load Pre-loading in tension of control cable to ensure demand P is transmitted in both legs and reduce load deformation; symbol R, thus tensions in legs are $R \pm \frac{P}{2}$.

rigging patch Patch connecting rigging (2) to aerostat, in place of rigging band.

rigging position Aircraft attitude in which lateral axis and an arbitrary longitudinal axis (possibly actual longitudinal axis) are both horizontal.

rigging tab Ground-adjustable tab.
right ascension

right ascension Angular distance measured E from vernal equinox; arc of celestial equator, or angle at celestial pole, of given celestial body measured in hours (h) or degrees (*).

right-hand circuit Circuit (1) with turns to right, clockwise seen from above (unusual).

right-hand rotation Clockwise; in case of engine/propeller, seen from behind. No ruling exists for pusher engines, one school claiming that ** engine is unchanged when installed as pusher and another claiming that ** means seen from direction in which propeller is beyond engine.

righting moment Restoring moment.

right wind One blowing on aircraft from right, causing drift to left (suggest arch.).

rigid frame One having rigid framework or envelope to maintain desired shape at all times.

rigidity Property of gyroscope of maintaining axis pointing in fixed direction; also called gyroscopic inertia.

rigid rotor Rotor of helicopter (in theory also autogyro) whose blades have no lead/lag [drag] or flapping hinges but can rotate to change pitch.

2 Bearingless helicopter lifting rotor, in which all control input is reacted by root attachment flexible in bending and torsion.

RIGV Respaced inlet guide vanes.

RII Required inspection item [must be certified independently].

RIIA Required inspection item [must be certified independently].

RIMS Replacement inertial measurement system [or set].

2 Ranging and integrity monitoring station [navsats].


RIFS Runway-incursion monitoring and conflict-alert subsystem.

rim cavities Peripheral spaces either directly surrounding the blades of an axial turbine rotor, or connected thereto.

rim centric circles, caused by local pressure or impact.

rim gauge Hand gauge for checking outside diameter of circular work, in some cases threaded; can be go/no-go type [US = gage].

rim rolling Forming rings, eg for engine, by rolling on specially set-up machine which produces required radius.

ring Black/white stripes on cuffs or shoulders denoting rank [RAF].

ring-slot parachute Family of parachutes with basic ring construction with concentric slots, merging into ribbon form.

ring spring Spring assembled from stack of steel rings with mating chamfered edges whose friction on compression reduces rebound.

Ringstone Ceramic or jewel pivot for instrument arbor (shaft).

ring topology Linkage of terminals by two fibreoptic rings, one sending unidirectional messages or data clockwise, the other anticlockwise. The ring continues to function following the failure of any terminal.

ringworm Cracked dope on fabric, especially in concentric circles, caused by local pressure or impact.

Rinst Radiation intelligence.

RIO Radar intercept officer (USN aircrew).

RIO/RIO Remote input/output.

riometer Relative ionospheric opacity meter.

RIP 1 Resin impregnation, or resin-impregnated plastics.

2 Remote instrument package.

ripcord 1 Cord which deploys parachute, pulled by wearer, static line or automatic (eg barostat control) system.
RIPP

- 2 Cord, usually manually pulled, for tearing open aerostat rip panel.

RIPP Radar-information processing post.

rip panel, ripping panel Panel or patch on aerostat envelope, usually near top, which for emergency deflation can be ripped open; parachute ** right round, sealable in flight; velcro ** 1/4 way round, not resealable in flight.

R Cover over item which is normally required only in emergency, e.g. first-aid box.

ripple To fire large battery of rockets in timed sequence, interval typically 0.01 s.

- 2 Residual small alternating component superimposed on DC output.

RIPS Rotor ice protection system.

rip-stop Structural design technique prohibiting unchecked growth of crack, eg by making part in parallel sections. Extends throughout airframe and also systems, eg to prevent single crack from affecting two hydraulic systems.

RIR Range instrumentation radar.

RIRP Retractable in-flight refuelling probe.

RIS Range information system (ECM).

- 2 Range instrumentation system.

R Reconnaissance interface system.

Radar information service.

RISA Reduced instruction set architecture.

RISC Reduced instruction-set computer (or computing), 10,000-plus active devices on single GaAs chip.

riser Quasi-vertical channel in casting mould either for admitting poured metal or for escape of air.

- 2 VTOL aircraft, esp. aerodyne (colloq.).

- 3 Main duct conveying ECS fresh air to top of cabin or flight-deck.

rise time Time taken for a pulse, waveform or other repeated phenomenon to increase from a minimum to a maximum (usually measured from 10 to 90 per cent of peak value).

- 2 Time taken for flare to reach 90 per cent peak radiant power, usually measured from start of emission.

- 3 Time for large abrupt demand in pitch [e.g., stick back] to reach peak rotation rate; effective * subtracts effective time delay [intersection of maximum-slope tangent with origin].

Rising-sun magnetron One in which resonators for two frequencies are arranged alternately for mode separation.

RISLS Receiver interrogation sidelobe suppression.

RISS Real-time IR/EO scene simulator [or simulation].

Rista Reconnaissance intelligence [rarely, IR] surveillance and target acquisition.

RIT Rotor inlet temperature.

- 2 Remote interactive terminal, plural RITs.

- 3 Radio interface terminal.

- 4 Remote image transceiver.

RITA Rita Rapid imagery transmission to aircraft.

- 2 RF thruster assembly.

- 3 Réseau intégral de transmission automatique (F).

- 4 Rotorcraft Industry Technical Association (US).

RITE Right, direction of turn (ICAO).

RITU Radio, or remote, interface unit.

RIV Rapid-intervention vehicle.

- 2 Right interconnector valve.

Rivet Essential feature is deformation of shank or surrounding collar to make permanent joint, but even this no longer true of some complex types, a few of which can be reused. Definition needed.

Rivet gun Simple hand tool, usually pneumatic, with cup-ended striker which closes rivet by repeated blows.

Rivet hammer Plain hand hammer with small flat steel face.

Riveting machine Numerous forms of machine tool, most of which are fixed and through which work is fed; most close rivet between powered tool and anvil and some can drill, dimple/countersink and insert rivet, close it and then mill head.

Rivet mandrel Rod passing through tubular rivet closed on withdrawal.

Rivet rash Paint refuses to adhere to rivet heads because of coating of lubricant required for interference fit.

Rivet set Hand tool having female shape which forms correct head as rivet is closed.

Rivet snap See rivet act.

Rivet squeeze(y) Hand tool which holds solid rivets by single quiet deformation, usually by mechanical leverage from operator.

Rivnut Patented (B.F. Goodrich) tubular blind rivet with threaded shank which, after closure, acts as nut (eg for panel fasteners).

RIW Repairable, or required, in works.

- 2 Reliability interim (or improvement) warranty.

- 3 Recovery initiation window.

RJ Ramjet.

- 2 Regional jet (aircraft class).

RJAA Royal Jordanian Air Academy [11134 Amman] (Jordan).

RJ-5 Conventional-type jet fuel for US expendable engines; high energy per unit volume.

RJT Technical rejection message (ICAO).

- 2 Ground Self-Defence Forces (J).

RK Range known.

- 2 Russian meanings include variable-area wing and reconnaissance/artillery correction.

- 3 Runge-Kutta, a series of methods of solving non-linear state equations.

RKA Russian space agency Rosaviakosmos.

RKIIIGA Riga [now Latvia] Red-banne institute of civil-aviation engineers (USSR).

RL Rhumb line.

- 2 Runway edge lights.

- 3 Report when leaving.

- 4 Rocket launcher.

- 5 Radioluminescence.

R/L Redline.

RLA Repair level analysis.

- 2 Relay to.

- 3 Railway (not railroad) Labor Act; formerly governed negotiations of air-carrier unions in US.

RLB Reversed lobsterback (Rolls-Royce).

RLC Request level (FL) change; E adds en-route.

RLCD Reflective liquid-crystal display.

RLD Reference landing distance.

- 2 Reference link establishment.

RLE Robotic Lunar Exploration Program, became LPRP.
RLG

RLG 1 Ring laser gyro.
2 Relief landing ground.

RLGM Remote loop group multiplexer.

RLI Repayable launch investment [hard-to-get government funding] (UK).

RLLS Runway lead-in lighting system.

RLM Reichsluftfahrtministerium (German air ministry to 1945).

RLNA Requested [flight] level not available.

RLP Recognised land picture.

RLPCR Air-navigation services of the Czech Republic.

RLS 1 Reservoir level sensor.
2 Raster-line structure.
3 Radius of landing site (lunar).
4 Reliable link source.
5 Remote light sensor.

RLT Rolling liquid transporter, eg Dracone.

RLV Recoverable, or reusable, launch vehicle.

RLW 1 Regie der Luchtwegen (CAA, Belgium, see RVL).
2 Raising/lowering winch.

RLY Relay.

RM 1 Reference materials in calibration of R&D measures.
2 Radio maintenance.
3 Reflected memory.
4 Reeling machine.
5 Risk management.
6 Research memorandum.
7 Remarks.
8 Raksha Mantri (MoD, India).
9 Rescue Module.

RMA 1 Reliability, maintainability and availability.
2 Royal Mail Aircraft (followed by individual name of UK airliner, now obs).
3 Rear maintenance area.
4 Revolution in military affairs (US).
5 See RMAS.

RMAF 1 Royal Malaysian Air Force.
2 Royal Moroccan Air Force.

RMAA Reliability, maintainability and availability.

RM&T Reliability, maintainability and testability.

RAMAS Royal Military Academy Sandhurst [previously RMA] (UK).

Rmax Maximum range, especially of weapon system or radar.

RMCB Remote-control circuit-breaker.

RMCC Remote monitoring and control console.

RMCDE Radio-message conversion and distribution equipment.

RMCS 1 Remote monitoring and control system (LADGPS).
2 Royal Military College of Science [Shrivenham, SN6 8LA] (UK).

RMD Radar monitoring display.

RMDI Radio (or remote) magnetic direction indicator.

RMEE 1 Rocket Motor Executive (UK, PERME).
2 Resonant multiphoton excitation.

RMEF Reconnaissance mobile exploitation facility.

RMetS Royal Meteorological Society [1850, Royal 1866-1].

RMF Reconfigurable modular family.

RMFC Reformatted-methanol fuel cell.

RMG Resource Management Group (USAF).

RMHK Re-engine modification hardware kit.

RM 1 Remote, or radio, magnetic indicator.
2 Radio magnetic interference.

RMIT Royal Melbourne Institute of Technology (Australia).

RMK[s] Remark(s).

RM L 1 Radar microwave link.
2 Recirculating memory loop.

RMML Reeling machine/launcher.

RMM 1 Read-mostly memory.
2 Remote maintenance monitor, or remote monitoring and maintenance.
3 Removable, or remote, memory module.

RMMC 1 Remote maintenance and monitoring configuration.
2 Remote maintenance monitoring and control.

RMMR Remote maintenance-monitoring system, or status.

RMM 1 Radio-magnetic management system.

RMM Remain.

RMNDR Remainder.

RMOC Rich-mixture octane [rating].

RMOS Refractory MOS.

RMP 1 Root mean power.
2 Range mean pairs.
3 Reprogrammable microprocessor.
4 Raw data management panel.
5 Remote maintenance panel.
6 Risk miniaturization program.

RMPA Replacement maritime-patrol aircraft.

RMR Remote map-reader.

RMS 1 Root mean square.
2 Route, or reconnaissance, or rocket, or radio, management system.
3 Range measurement system.
4 Remote manipulator system (Shuttle).
5 Roof-mounted sight.
6 Reusable multipurpose spacecraft.
7 Rotary mirror scanner.
8 Recurring manufacturing support.
9 Remote monitoring system.
10 Radiation meteoroid satellite.
11 Royal Meteorological Society [Reading RG1 7LJ] (UK).
12 Remote mine-hunting system (USN).

RMSE Root-mean-square error.

RMT Reliability, maintainability, testability.

RMT&E Risk mitigation test and evaluation.

RMU Radio management unit.

RMV Remotely manned (or managed, or manipulated) vehicle.

RMV Removal.

RMVP Reliability maintenance and validation programme(s).

RMW Reactive-material warhead, which see.

RMWS Ramp-mounted weapon[s] system [helicopter].

RN Recovery net (RPV).

Rn, R Reynolds number, if for any reason R is unavailable.

RNA Royal Naval Airship [1912-18].

RNAC Reinforced North Atlantic Council.

RNARY Royal Naval Aircraft Repair Yard.

RNAS 1 Royal Naval Air Station; shore airbase, also
R-Nav, RNAV, R-nav

known by ship name (prefaced HMS), usually name of seabird.

2 Royal Naval Air Service [1 July 1914–1 April 1918, when amalgamated with RFC].

R-Nav, RNAV, R-nav Area navigation, can have RNP added.

RNAY Royal Naval Aircraft Yard.

RNDZ Rendezvous.

RNEFTS Royal Navy Elementary Flying Training Squadron.

RNFC Robust nuclear earth penetrator (DoD).

RNF Radio navigation facilities.

RNG Radio range (ICAO, FAA).

RNGA Range arc.

RNGS Royal Naval Gliding and Soaring Association.

RNHF Royal Navy Historic Flight.

RNI Russian research institute, IKP adds space-instrument making.

RNI Reaction-engine scientific research institute (USSR, J).

RNF Radio-navigation tuning panel.

RNSFC Royal Naval School of Fighter Control.

RNSF Royal Navy School of Flying.

RNSP Royal Navy School of Pilotage.

RNTP Radio-navigation tuning panel.

RNY Runway.

RNZAC Royal New Zealand Aero Club [office, Wellington].

RO 1 Range-only memory.
2 Radio, or radar, operator.
3 Royal Ordnance (UK).
4 Rollout.
5 Report when over runway.
6 Routine organization.
7 Receive only.

RO Radio officer.

ROA 1 Return on assets.
2 Remotely-operated aircraft.
3 Recognised operating agency.
4 Rocker box, enclosing valve gear.

ROB 1 Right outboard.
2 Radar order of battle.

rob See next entry, derived verb.

robbery action Procedure whereby serviceable part is taken from aircraft or assembly in order to get the latter back in service (not cannibalization because * is temporary).

Robe, ROBE Roll-on beyond line-of-sight enhancement, or extension.

Robex Regional Opnet bulletin exchange.

Robin Radar observation of bird intensity.

Robinson anemometer


Robex Regional Opnet bulletin exchange.

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Robo Regional Opnet bulletin exchange.
rocket ammunition

monopropellants (eg HTP) and pressurized boiling water (eg Pohwaro).

2 Verbal or written reprimand (UK, colloq.).

rocket ammunition Rocket-powered projectiles of relatively small size fired from aircraft or other platform, mobile or stationary (USAF). Unguided, normally finned and/or spin-stabilized.

rocket artillery Artillery in which projectiles are propelled by rocket power but given guidance only during launch by amount of thrust and direction of take-off (USAF). This definition is meant to cover tube-type airborne launchers.

rocket-assisted take-off Take-off in which horizontal acceleration, and usually vertical component of thrust, are augmented by one or more rockets which may form part of aircraft or be jettisoned when spent. Ambiguously given US term JATO.

rocket/athodyd Given US term JATO.

rocket cluster Large group of parallel rockets normally all fired together.

rocket engine Term best reserved for rocket using liquid propellants, esp. with pump feed and control system.

rocket fuel Ambiguous; can mean fuel as distinct from oxidant, or a solid propellant.

rocket igniter Device for starting combustion in any form of rocket; usually an electrically fired pyrotechnic, but many contrasting varieties.

rocket launcher Anything for launching rockets, specif. aircraft pod, pylon or rail from which rocket ammunition is fired.

rocket loop Flight manoeuvre in which loop is made with excess initial speed, traded in loop for height.

rocket motor Term preferred for all solid-propellant rockets, of any size, together with hybrids of modest complexity.

rocket on rotor Method of temporarily greatly boosting helicopter lifting power by switching on tip-drive jets fed with HTTP from tank above hub.

rocket power See rocket propulsion.

rocket propulsion Propulsion of vehicle by rocket, excluding rocket drive of gyro wheels, turbopumps and other shaft-output devices.

rocketry Technology of rockets (colloq.).

rocket sled Sled guided by straight track and propelled by rocket(s) to high (often supersonic) speed for use as test platform.

rocketsonde Launched by rocket, operates on parachute descent.

rocket thrust Measured either for sea-level or vacuum conditions, latter being about 20% greater.

rocking Uncommanded lateral and directional oscillation, chiefly in roll.

rockoon Sounding rocket fired from helium balloon.

rockover Nose-down rotation on landing, normally by tailwheel aircraft, in extreme case by 180°.

Rockwell number Measure of hardness, esp. of metals, derived by impressing tool (for soft metals Type B, 3/8 in./1.5875 mm steel ball, result being R_B number; for very hard Type C, 120° diamond cone, result R_C number)

first with 10 kg load and then with 90 or 140 kg, and measuring change in indent area.

Rococa Rate of change of cabin altitude.

ROD 1 Rate of descent.

2 Repair on demand.

rod Photoreceptor in retina for scotopic (night) vision and detection of movement.

rod aerial Aerial in form of rigid tube or bar conductor.

Rodor Helicopter rotor-blade radar (Ferranti).

Rodeo Code name for sweep over enemy territory by fighters, on preplanned and opportunity targets (RAF, WW2).

Rodnet Reliable on-board data network.

Rods, RODS 1 Robust optical data system.

2 Ruggedized optical-disk system.

ROE, Role 1 Rules of engagement.

2 Return on equity.

ROIA Read-only, electrically alterable memory.

roentgen Unit of exposure to ionizing radiation, quantity producing 1 e.s.u. in 1 cm³ dry air at 0°C; non-SI, = 2.53 × 10⁻⁴ C/kg (C = coulombs).

roentgen equivalent man See rem.

ROF 1 Royal Ordnance Factories (UK, at one time various locations).

2 Rate of fire.

3 Rollover force, imposed by aircraft wheel.

Rofor, ROFOR Route forecast.

Rogallo Originator of patented family of flexible-wing aircraft characterized by delta wing plan with three rigid members in form of arrow-head joined by flexible fabric which inflates upwards to arch under flight loads; originally paragliders with poor L/D, later developed to include powered aircraft.

Roger Voice code: “I have received and understood all of your last transmission”.

rogue Aircraft which displays flight characteristics and/or performance markedly inferior to others of same type or, in particularly dangerous specimens, which is unpredictable.

rogue state Country considered by the USA/UK to pose a possible NW threat.

Rohacell Low-density cellular plastics material of thermosetting type used to stabilize sandwich structures, usually with CFRP skins.

Rohrbond Patent metal adhesive bonding, especially for noise-absorbent sandwich.

ROI Return on investment.

Ronk See Ronk (USN).

ROL See Rol.

Roll on-landing.

Rolamat Proprietary series of floor roller panels to facilitate loading and para-dropping of cargo.

Role, ROLE Receive only link eleven (Link 11, US/NATO).

role-change package Removable equipment fit (eg flight-refuelling probe installation) stored available for use when required; does not necessarily change role.

role equipment Equipment attached to or carried in aircraft for particular duties or mission(s) which can be removed subsequently; eg helicopter can offload ASW gear or anti-tank weapon/sight system and take on winch, buoyancy bags and furnishing for rescues.

roleur Non-flying taxi trainer (F, suggest obs.).

roll 1 Rotation about longitudinal (OX) axis; one of the five classical modes of aeroplane motion.
roll-angle steering

2 To move across surface on takeoff or landing.
3 The length of \( * \) (2).

roll-angle steering Autopilot mode based on CAS6 giving automatic correct bank at fixed altitude.

rollback 1 Pushback.
2 Engine rundown or spookdown.

roll bar, roll cage See roll pylons.

roll cloud See rotor cloud.

roll coupling See inertia coupling.

roll damper Flight-control damper operating on ailerons or differential spoilers, either to preclude Dutch roll or because aircraft is difficult to hold wings-level in turbulence.

roll electrodes Freely rotating mating discs used for resistance-welding continuous seams or evenly spaced spots.

roller 1 Landing by tailwheel aircraft with fuselage substantially level, eg because three-pointer is difficult or risks severe bounce, or because of gusty conditions.
2 Touch-and-go (RAF).

roller/ball transfer Movement of container[s] or pallet[s] over ballmats.

roller bearing Shaft bearing providing precise diametral (radial) location only.

roller-blind instrument Panel instrument whose display makes use, usually as backdrop, of roller blind (eg giving black/white sky/Earth indication of horizon). Not synonymous with tape instrument, which is analog linear scale.

roller cloud See rotor cloud.

roller drive Patented (TRW) reduction or stepup gear in which gear teeth and most bearings are eliminated, allowing for deflection (function of aircraft weight, speed and tyre inflation pressure).

roller blind instrument Panel instrument whose display makes use, usually as backdrop, of roller blind (eg giving black/white sky/Earth indication of horizon). Not synonymous with tape instrument, which is analog linear scale.

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roller map display Navigation display based on moving map (usually air topographic printed on film at reduced scale) projected by optics on circular screen on which heading appears as vertical central line (usually with present position as small ring near 6 o'clock position). In advanced forms, eg Ferrari Comed, combined with electronic displays and information readouts.

rolleronand-off landing Helicopter landing with substantial forward speed, eg following loss of tail rotor.

roller on top Half loop followed by 360° roll followed by remaining half of loop.

rollout 1 Ground roll after landing, esp. when continued to later turnoff to ease brake wear.
2 Emergence of new aircraft, especially first of new type, from factory, often carefully staged ceremony.
3 Termination of flight manoeuvre designed to place (normally combat-type) aircraft in optimal position for completion of intended activity (USAF).

rollout RVR Readout values from RVR equipment located nearest runway end (FAA).

rollover Apart from generalized meaning in business investment, replacement of airline line equipment by larger aircraft, in response to or anticipation of increased traffic.

roll-over stand Maintenance stand for engine [rarely, other items] providing hand-crank gearbox to rotate unit for all-round access.

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Rollopin Press-fit pin made of roll of spring steel, forming self-retaining bearing pivot, axle or hinge-pin.

roll post Strange US term for the reaction-control jets needed for lateral control on jet STOVL aircraft, esp. the F-35B. Each comprises a downward-pointing nozzle with an electrically powered valve controlling high-power bleed air from the main engine (maximum 6% of main-engine airflow per nozzle). The previously existing terms were puffer jet and RCJ.

roll pylon Strong structure on ag-aircraft to give protection to pilot's head in event of aircraft becoming inverted on ground.

roll ratcheting Uncommanded oscillation of lateral controls, typically at 2–3 Hz, caused by human neuro-
roll rate

muscular input [but emphatically not PIO], force-sensing stick gain and command prefiltering.

roll rate Measures of lateral-control power, notably instantaneous * and sustained *.

roll-rate gyro A single gyroscope used to measure rate of roll of its cage, or aircraft.

roll reversal Causes, apart from basic aerelastic reversal of control, include jack stall, spoiler blowback, adverse yaw and loss of lift of accelerated wing due to increased compressibility.

Rollspring Patented (Lockheed Georgia) mechanical drive using belt of thin spring steel.

roll-stabilized Prevented, eg by autopilot or vertical gyro, from rolling; common characteristic of cruciform-winged missiles as an alternative to deliberate roll at known rate.

roll whiskers Short diagonal lines showing bank-angle limits (HUD symbology).

rolometer Extra-sensitive bolometer (ASCC).

ROM Read-only memory.

Romag Extra-sensitive bolometer (ASCC).

Romant Remote map generator.

Rome Convention International laws governing liability for, and compensation for, damage to Earth surface, especially structures, caused by aircraft (1952).

RON Receive, receiving, only (ICAO).

ROMA Read-only memory.

roll section Profile of aerofoil at root; in both wings and propellers often significantly different from remainder of surface.

RPA Receiver-only, permanently woven memory.

ropy Or ropey, general critical/derogatory adjective and adverb (RAF WW2).

ropar Regional operators’ program for airframe reliability; co-operative effort by US carriers.

ropar Regional operators’ program for airframe reliability; co-operative effort by US carriers.

Rope Element of chaff consisting of long roll of metallic foil or wire designed for broad low-frequency response.

rope chaff Chaff which contains one or more rope elements (DoD).

ROPW Read-only, permanently woven memory.

Rossby number

root chord Chord of a wing or tail surface at the root or [and this must be made clear] on aircraft centreline.

root mean square Square root of arithmetic mean of squares of all possible values of given function.

roots One of many types of positive-displacement fluid compressors (eg superchargers, cabin blowers) in which two mating rotors are driven by external gears to revolve together inside casing; rotors in this case are identical and resemble fat figure-eights.

root section Profile of aerofoil at root; in both wings and propellers often significantly different from remainder of surface.

ROP Rotor overspeed protection.

ROR 1 Range-only radar.

2 Rocket on rotor.

3 Red on red.

Ro/Ro Roll-on roll-off, ship configured for transport of vehicles driven on or off under own power. See T-AKX.

Rorsat Radar ocean-reconnaissance satellite.

Rossby open-system architecture.

Rossby chart Basic diagram assisting in establishing character of air masses and in met. forecasting generally; energy diagram in which specific humidity is plotted against equivalent potential temperature, result being binned characteristic curve.

Rossby number Ratio of inertial forces to Coriolis forces in a rotating fluid.
Rosto, ROSTO  Paramilitary sports and technical society (R).

ROT  Reserve officer training.

Rotachute  Patented (Hafner/ML Aviation) free-running personal rotor used WW2 instead of parachute for accurate paratroop descent.

rotaglider  Generalized term for gliders with free-running rotary wing in place of fixed wing.

rotaplane  Flying machine whose support in flight is derived from reaction of air on one or more rotors which normally rotate freely on substantially vertical axes (BSI); today called autogyro, making this term redundant.

rotary atomizer  Rapidly spinning drum or disk from which fuel enters gas-turbine combustion chamber, notably on Turbo湘ja engines.

rotary bombdoor  Door to aircraft internal weapon bay made as single stress-bearing beam pivoted at extremities and itself loaded with ordnance or, alternatively, fuel tank or reconnaissance sensors; to drop ordnance, door is rotated 180°, thereafter normally reversing direction to close.

rotary cannon  Gun with several (eg six) barrels which in operation rotate at high speed around the gun centreline, at any moment each barrel being in a different point in the operating cycle. In many respects similar to Gatling at any moment each barrel being in a different point in the rotation rotate at high speed around the gun centreline, thereafter normally reversing direction to close.

rotary converter  A.C. input drives generator for d.c. output.

rotary derivatives  Stability derivatives expressing variation in forces and moments resulting from changes in aircraft rate of rotation about all axes.

rotary distributor  See spreader 2.

rotary engine  1 Historically, piston engine (usually Otto but occasionally two-stroke) with radial cylinders which drive themselves round a fixed crankshaft; propeller is thus attached to crankcase.

2 Today, an RC (1) engine.

rotary loads  The aerodynamic loads corresponding to rotation about the three axes, roll/pitch/yaw.

rotary scan  See scan.

rotary shears  Hand or power tool used for slitting sheet along straight lines or curves of variable radius.

rotary variable differential transformer  Pickoff sensing the precise angular position of a shaft, giving servocontrol feedback.

rotary-wing aircraft  See rotocraft.

rotate  1 Voice command, usually P2 to P1, at Vn.

2 To cycle personnel, especially military, through repetitive tour of duty.

3 See rotation.

rotated out  Removed from combat duty after tour.

rotating beacon  1 Bright aircraft-mounted light steady or flashing while rotating continuously in azimuth, usually synonymous with strobe; today tends to be illuminated whenever engine run on ground.

2 Ground transmitter having directional radiation pattern rotated continuously at predetermined rate (BSI); suggested arch. term overtaken by more precise names, eg VOR.

rotating-combustion engine  IC engine of positive-displacement type in which main moving parts are not reciprocating but rotary; usually based on Otto cycle. According to best-known worker in this field, Felix Wankel, 864 possible configurations divided into single-rotation machines (SIM), planetary-rotation machines (PLM), SIM-type rotating-piston machines (SROM) and PLM-type rotating-piston machines (PROM). Unfortunately acronyms confuse with equally important EDP (1) meaning of PROM etc.

rotating-cylinder flap  High-lift wing flap in which circulation is assisted by high-speed rotary cylinder mounted along flap leading edge (Coanda and Flettner relevant), eg in NASA YON-10A.

rotating guide vane  Curved inner leading edge of centrifugal (rarely, other types) of compressor or impeller rotor, main purpose of which is to smooth change of direction of flow from axial to radial.

rotating oil separator  See centrifugal breather.

rotating stall  There is no brief single form describing stall in axial compressors and other rotating-blade machines.

rotating-wing aircraft  See rotocraft.

rotation  1 Positive, ie nose-up, rotation of aeroplane about lateral (pitch) axis immediately before becoming airborne; in transports commanded at Vn.

2 One round trip to destination, especially by scheduled transport aircraft.

rotational speed  Number of rotations in unit time, measured as rpm (per minute) or rps (per second) or radians per second; 1 rpm = 0.104720 rad/s; 1 rad/s = 9.54927 rpm.

rotator  Hand turning gear.

ROTC  Reserve Officers’ Training Corps (USAF).

Rotaplane  Windmill fuel pump (1914–c35).

ROTHR  Relocatable over-the-horizon radar; -B adds backscatter.

Rot Lt  Rotating light.

rotochute  Free-rotor airbrake fitted to certain air-dropped sonobuoys.

rotodome  Slowly rotating radome of discus shape used to fair in antenna of AWACS-type aircraft, usually housing main and IFF/link antennas across diameter, back-to-back.

rotor  1 System of rotating aerofoils (ASCC); this includes propeller, so should be qualified by adding ‘whose primary purpose is lift’.

2 Main rotating part of machine, eg gas-turbine engine, turbopump or alternator.

3 Local air mass rotating about substantially horizontal axis; when downstream of mountain ridge can be exceedingly dangerous.

rotor cloud  Unusual cloud usually of Ac type and often dangerously turbulent; found in rotor flow, normally in lee of mountain range or ridge. Also called roll cloud. rotocraft  Aerodynamic deriving lift from rotor(s).

rotocraft load  See slung load.

rotocraft pilot’s associate  Digital terrain map to assist plotting masked routes.

rotor damping  Damping of blades about any pivot axis in helicopter main rotor (see lag-plane, soft in plane).

rotor disc  1 Circular area swept by blades of helicopter or autogyro rotor.

2 Structural disc holding compressor or turbine rotor blades.

rotor flow  Large-scale rotary flow of atmosphere about substantially horizontal axis in lee of mountain or sharp ridge, which when wind very strong is turbulent to point
rotor force

of being dangerous, with vertical gusts of 30 m (100 ft)/s (see rotor streaming).

rotor force Resultant imparted by lifting rotor, analysed into lift and drag, or thrust (perpendicular to disc) and in-plane (H-) force.

rotor governing mode Control mode in which rotor (1) speed is held constant.

rotor head Complete assembly of rotating components at centre of lifting rotor of helicopter or autogyro, including hub, blade attachments and pivot bearings, if any, and complete control mechanism, as well as such adjuncts as anti-icing, electrics and pressurization instrument leads rotating with hub.

rotor hinge In a non-rigid [articulated] rotor, the drag and flapping hinges.

rotor hub Primary structure connecting blades of helicopter or autogyro rotor. Some authorities define hub to mean same as head, which is unhelpful.

rotor incidence Angle between plane normal to axis of rotation and relative wind (BSI).

rotor inlet temperature Assumed equal to SOT (gas turbine).

rotor kite Towed engineless autogyro.

rotor mast Pylon carrying rotor in small rotorcraft.

rotorplane See rotorcraft.

rotor power coefficient Symbol \( C_p = \frac{P}{\rho A \Omega^3} \).

rotor slap Noise, often almost explosive, caused by interaction between each helicopter main rotor blade and the vortex from its predecessor.

rotor streaming Shedding of turbulent rotors (3) downstream, often near ground and very dangerous to aircraft.

rotor tip drive, tip jet Tip jet.

rotor torque That imparted to airframe by helicopter rotor, esp. main lifting rotor of hub-driven type, which has to be countered by tail rotor or use of two main rotors.

ROTR Rate of temperature rise.

Rotte Fighter aircraft in loose pair (G).

rough-air speed Recommended speed for flight in turbulence, \( V_{BA} \) (hence rough-air Mach, \( M_{BA} \)); lies between \( V_A \) and \( V_B \); and usually near \( V_B \).

rough field Defined by standard categories of surface profile, including post-attack damage repair: A, single blister up to 1.5 in (height) over aircraft-travel distance of 80 ft; B, H up to 3 in; C/D, two 3 in blisters within 80 ft; E, two up to 4.5 in; 2E, two up to 9 in.

roughness Criterion affecting surface finish: irregularities that are closely spaced (see next entry).

roughness factor Rayleigh criterion \( \Delta = \lambda W \) where \( \lambda \) wavelength and \( W \) angle of incidence.

roughness width cutoff Maximum width of surface irregularities to be included in measure of surface height; in Imperial measure usually 0.03 in, but occasionally 0.003, 0.010 or 0.10.

roulement 1 Rotation of aircraft through front-line squadrons (RAF).

2 Short tours of duty, typically split into six four-month cycles (UK Army).

rouleur Ground trainer with wing too small for flight (F).

round 1 Single munition, missile or device to be loaded on or in delivery platform (USAF).

2 Parachute with circular canopy [smokejumper term].

round-down Rear terminator of aircraft carrier flight deck, usually normal to landing direction (term derives from older ships where deck fell away over stern in large-radius curve).

rounded trailing edge Aerofoil designed for flow attachment by Coanda-effect blowing to give very high (10+) lift coefficients.

roundel National marking for military aircraft in form of concentric rings.

round-head rivet Usual rivet for thin sheet where countersinking is not required; head OD larger than button-head.

round-trip time For radar, see ranging time.

route 1 Defined path, consisting of one or more courses, which aircraft traverses in horizontal plane over surface of Earth (FAA).

2 Published route linking traffic points of air carrier and used in traffic and rights negotiations.

3 Path followed by channel of AFTN network.

route flight 1 One from A to B.

2 Military mission, usually transport, over established route.

route package Geographical division of enemy land-mass for purposes of air-strike targeting.

router Rhyming with doubter, machine tool having high-speed cutter, usually rotating about vertical axis, capable of being positioned anywhere over horizontal work; cutter can be side or end-cutting and in large machines may be NC.

route Pronounced rotor, seamlessly connects wireless networks on land/sea/air [cellular [Wi Fi] satellite systems.

route sector Route (1) between two traffic points.

route segment Route (1) between two way-points or [ICAO] consecutive significant points.

route speed En route speed, usually synonymous with block speed.

route stage Stage (4).

routine 1 Series of step-by-step EDP (1) instructions forming part of program; hence portions of same are subroutines.

2 Complete sequence of aerobatic manoeuvres planned by competitor or airshow participant.

routing Itinerary followed by message in AFTN.

routing list That showing AFTN centre which outgoing circuit to use for each addressee.

ROV Remotely operated vehicle.

Rover 1 Armed reconnaissance, usually against shipping (RAF, WW2).

2 Remote operations, or operated, video enhanced receiver [ground-to-air).

rover Self-propelled explorer of planetary or lunar surface.

roving Traditional meaning was slightly twisted hank of textile fibre; modern meaning in aerospace is continuous fibre (eg carbon, graphite, boron, glass) for filament winding, or continuous raw material for ECM chaff to be cut to required response length in dispenser.

roving aerodynamic test system System for measuring flow quality and other parameters at various points (eg vane sets) in wind tunnel.

ROW 1 Rest of world.

2 Right of way.

row Group of cylinders of radial engine in one plane, all driving one crankpin (strictly, not a row but planar array); hence two-* engine has two planes one behind the other.
row section

**row section** Group of consecutive seat rows called to board at the same time.

**Rowdyazide** Hot-isostatic-pressed zirconide.

**Royal Flight** Single mission notified by Notam of flight carrying at least one of certain nominated members of the Royal Family [v. rarely, other VIP (UK)].

**Royal Naval Aircraft Yard** Major maintenance facility for RN aircraft.

**Royal Observer Corps** Civilian body established to keep watch on sky [and surface if necessary] and report occurrences [22 September 1925, prefix Royal 9 April 1943] (UK).

**ROZ** RON (G).

**RP** 1 Reporting point, or post.
   2 Rocket projectile.
   3 Rocket propellant (fuel designation prefix).
   4 Route package.
   5 Rapid prototyping.
   6 Report [when you are] passing.
   7 Reticulated polyurethane.
   8 Routing protocol.
   9 Radar processor.

**R/P** 1 Rocket projectile (WW2 usage).

**R/P** 1 Rocket projectile (WW2 usage).

**R/P** 2 Receiver processor.

**R/P** Reserve to production ratio [petroleum].

**RP-1** Common kerosene fuel for rockets and ramjets.

**RP** 1 One-minute racetrack pattern for holding.

**RPA** 1 Remotely piloted aircraft.

**RPA** 2 Recreational pilot, airplane.

**RPA** 3 Rotocraft pilot’s associate.

**RPAR** Revenue per available room.

**RPB** Retarded practice bomb.

**RPC** 1 Recreational Pilot’s Certificate (FAA).

**RPC** 2 Remote procedure call[s].

**RPCC** Rotating-parts cycle count.

**RPCM** 1 Reply processing and channel management.

**RPDC** Remote power-control module (ISS-4).

**RPD** 1 Rapid, or rapid inertial alignment.

**R/PD** 2 Random pulse discrimination.

**RPDE** Reliability and performance in demonstrator engine[s].

**RPDL** Receiver pilot director light.

**RPDLY** Rapidly.

**RPDU** Remote power-distribution unit.

**RPE** Rocket Propulsion Establishment (Westcott, UK).

**RPEH** Rate per engine hour.

**RPF** Reticulated-plastics foam.

**RFFS** Radio position-fixing system.

**RFFT** Rapid pulker factor take-off.

**RPG** 1 Rounds [of ammunition] per gun.

**RPG** 2 Regional Planning Group (ICAO).

**RPG** 3 Radar product generator.

**RPG** 4 Receiver/processor group.

**RPG** 5 Recreational pilot, gyroplane.

**RPGT** Radar procedure[s] ground trainer.

**RPH** 1 Remotely piloted helicopter.

**RPH** 2 Recreational pilot, helicopter.

**RPI** 1 Runway point of intersection.

**RPI** 2 Rapid process improvement.

**RPI** 3 Retail price index [various suffixes].

**RPK** 1 Revenue passenger-kilometres.

**RPK** 2 Fragmentation bomblet (as well as a series of Kalashnikov LMGs) (USSR, R).

**RPL** 1 Radiophotoluminescence.

**RPL** 2 Rated power level (electronic).

**RPL** 3 Runway planning length.

**RPL** 4 Repetitive flight plan; $ adds system.

**RPL** 5 Regional Plans (ICAO Standing Group).

**RPL** 6 Recreational Pilot licence/license.

**RPLC** Replaced[d].

**RPM** 1 Revenue passenger-mile[s].

**RPM** 2 Rounds per minute (often rds/min or rpm).

**RPM** 3 Reliability prediction manual.

**RPM** 4 Research and program(me) management.

**RPM** 5 Remotely piloted munition.

**RPM** 6 Radar performance monitor.

**RPM** 7 Rendezvous pitch manoeuvre.

**rpm, r.p.m.** Revolutions per minute; SI dictates rev/min.

**RPMB** Remotely piloted mini-blimp.

**RPMD** Repeater projected map display.

**RPO** 1 Rotorcraft program office.

**RPO** 2 Resident project officer.

**RPOA** Recognised private-operation agency (CCITT).

**RPOADS** Remotely piloted observation aircraft designer system (USA).

**RPOS** Relative power, one-way (SSR and other radars).

**RPP** Reversible-pitch propeller.

**RPPG** Radar Planning and Policy Group (ICAO).

**RPPL** Recreational Private Pilot’s Licence [likely to be valid to AUW <2,000 kg] (AOPA).

**RPRT** Report.

**RPVR** Remotely piloted research vehicle.

**RPS** 1 Radar position symbol.

**RPS** 2 Regional pressure setting.

**RPSC** Robot passive sonar.

**RPS/CC** Recording and playback system [voice/radar/LAN].

**RPS, rps** 1 Radians per second (contrary to SI and confusing, see next).

**RPS** 2 Revolutions per second.

**RPSTL** Repair parts and special tool list.

**RPV** 1 Receiver processor Unit.

**RPV** 2 Radar planning unit.

**RPV** 3 Remote processing unit.

**RPV** Remotely piloted vehicle, term normally confined to “fixed-wing” aerodynes; US preference for UAV is making * unfashionable.

**RPX** Radar-data processing executive.

**RPY** Roll, pitch and yaw.

**RQ** Designation prefixes for Roncz aerofoil.

**RQ** 1 Preface: request (ICAO).

**RQ** 2 Request for quotation.

**RQ** 3 Role designation prefix: surveillance UAV (US).

**RQ** 4 Designation prefix for Roncz aerofoils.

**RQD** Required.

**RQL** Rich burn, quick quench, lean burn.

**RQMNT[S]** Requirement[s].

**RQP** Request, flight plan.

**RQRT** Required.

**RQS** 1 Request, supplementary flight plan.

**RQS** 2 Rescue Squadron (USAF).

**RR** 1 LF or MF radio range (FAA).

**RR** 2 Rendezvous radar.
R/R

J Rain-repellant liquid.
# Rain area.
5 Radiometric resolution.
7 Rising rapidly.
8 Receiver ready.
R/R Remove and replace.
RRH Roll-rate gyro.
See R.R.58
RRF Ready Reserve Force[s] (US).
RRR, R3 Ready-reinforcement personnel section.
RRPS RRPS
RRP 1
RRM Risk-reduction measures.
RRL 1
RRTN Mentation (ATN).
Router [pronounced rooter] reference implement-
RRI
RRTS
1
RRTES
Roll-demand suddenly applied.
1
RRW 1
Remote readout unit.
RRU 1
RRW 1 Robot rotary [-winged] wingman.
2 Reece [reconnaissance] report workstation, for
creating and disseminating reports in various formats.
3 Reliability, or reliable, replacement warhead for
NW (NNSA).
RRWD 1
Radar remote weather display; S adds system.
RRZ 1
RRWD Radar remote weather display; S adds system.
RRZ 1
RRZD Radar regulation zone.
RS 1
RS 1 Radar real-time simulator.
2 Reserve Squadron (RFC).
3 Re-entry system.
RSM 1 Runway surface and markings.
4 Rear spar.
5 Rapidly solidified; MMC adds metal-matrix
composite.
6 Regular use by scheduled carriers.
7 Remain well over to right side of runway.
8 Radio set.
9 Receiver segment.
10 Record Special, ground observation of Sigmet.
11 Ring-slot [parachute]; HV adds high-velocity.
12 Remote sensing.
13 Raman-shifted.
14 Recommended Standard [Electronic Industries
Assoc.].
15 Readiness State.
Rt Specific range.
RSA 1 Rate sensor assembly.
2 Réseau du Sport de l’Air (F).
3 Range standardization and automation.
4 Runway safety area.
5 Reference-station antenna (GPS + datalink).
6 Radar service area.
7 Risk-sharing agreement.
RSAF 1 Royal Small Arms Factories (UK, defunct).
2 Royal Singapore Air Force.
3 Royal Swedish air force [UK usage].
RSAOC Region/sector air operations center[s].
RSB 1 Recovery speed brake.
2 Rescue/security boat.
RV Vertical load on landing gear at spring-back.
RS 1 Reserve sub-centre (ICAO).
2 Radar-scattering camouflage, or centre.
3 Runway surface condition.
4 Remote switching control.
5 Radar scan converter.
6 Reflective star copier.
7 Registration Standards Committee (EC, based UK).
RSCA, Rscaal Remote-sensing chemical-agent alarm.
RSCD RSCD (3).
RSCU Ramp spill control unit.
RSD 1 1 Radar real-time simulator.
2 Receiver real-time simulator.
3 Radar real-time simulator.
RSDU 1 1 Radar remote weather display; S adds system.
2 Remote-source lighting.
RSG, rsg Rising.
RSH Reservoirs souuples héliportables (F).
RSI 1 Reusable surface insulation.
2 Rationalization, standardization, interoperability
(NATO).
3 Remote status indicator.
RSIP Radar sensitivity [or system] improvement
program[me].
RSIS Rotorcraft systems integration simulator
(NASA).
RSITA Regulations, SITA.
RSIU Radar interferometer unit.
2 Remote-reinforcement plan.
3 Remote-reinforcement plan.
RSL 1 Range-safety launch (RAF).
2 Remote-source lighting.
3 Resource specification language.
RSLS Receiver side-lobe suppression.
RSM 1 Runway surface and markings.
RSU
used in aviation.
RS232, RS422
Commercial radio standard databuses
RSTR
Reynolds-stress transport model.
RSTE
Reynolds-stress transport equation[s].
RSTD, rstd
Rapid solidification rate; P adds process.
RSSP
Radar Systems Specialist Panel (ICAO).
Radar Systems Officer, or operator.
RSO
1
RST
1
RSSP
Radar Systems Specialist Panel (ICAO).
2
RSU
1
Runway supervisory unit.
Runway Supervisory Officer.
RSP
1
1
Radar start point.
2 Responder beacon, or response (ICAO).
3 Radar signal processor.
4 Revenue-sharing participant.
5 Risk-sharing partner.
6 Reversion Select Panel.
7 Required surveillance performance.
8 Responsive space program (AFRL).
9 Replenishment spare parts.
RSTD
Rapid-solidification plasma deposition.
RSPL
Recommended spare-parts list.
RSPT
Report [when] starting procedure turn.
2 Radar service request.
3 Rapid solidification rate; P adds process.
RSRA
Radar-systems research aircraft.
RS-RDX
Reduced-sensitivity RDX.
RTA
1
1
1
Real, or required, time of arrival.
2 Real-time acquisition.
3 Rotation target altitude.
4 Receiver/transmitter antenna.
5 Research and Technology Agency, supports RTO(6) (NATO).
6 Revolutionary Turbine Accelerator.
7 Rudder-trim actuator.
8 Rapid-theater attack.
RTAF
Royal Thai air force [UK usage].
RT&BTL
Radar tracking and beacon tracking level (ARTS).
RTAP
Rapid technology application program.
RTB
1
1
Return, or returned, to base.
2 Research and Technology Board, decides policy (NATO).
3 Rocket [ICBM] repair technical base, each numbered (R).
3
1
RT&D
R
t&d
Real-time battle-damage assessment.
RTC
1
1
Real-time control; AF adds autonomous flight.
2 Rotorcraft.
3 Resident Training Center (USAF).
4 Real-time clock.
5 Reduced temperature configuration.
RTCA
RTD
1
1
Radar-target designator control.
2 Delayed, or routine time delayed.
3 Real-Time display.
4 Research and technology development.
5 Routed.
6 Resistance temperature detector, these have variable resistance.
RTDC
Real-time damage computation.
RTDF
Radial temperature distribution factor.
RTDS
Real-time dissemination shelter.
RTF
1
1
Radio/telephone, or telephony, or telecommunications.
2 Receiver/transmitter (beacon).
3 Receiver/transmitter (beacon).
4 Remote communications.
5 Remote communications.
6 Repair & Transport Flight (RAF).

\[
R_{\text{muc}}
\]
2 Response surface model[s], or modelling, or methodology.
\[
R_{\text{muc}}
\]
Random-access channel for air/ground signals.
\[
\text{RSMMC}
\]
Rapidly solidified metal-matrix composite.
\[
\text{RSN}
\]
Regional subnetwork.
\[
\text{RSO}
\]
1
2
Regional Safety Officer.
1 Runway Supervisory Officer.
2 Responder beacon, or response (ICAO).
3 Radar signal processor.
4 Revenue-sharing participant.
5 Risk-sharing partner.
6 Reversion Select Panel.
7 Required surveillance performance.
8 Responsive space program (AFRL).
9 Replenishment spare parts.
\[
\text{RSPP}
\]
Rapid solidification plasma deposition.
\[
\text{RSPL}
\]
Recommended spare-parts list.
\[
\text{RSPT}
\]
Report [when] starting procedure turn.
2 Radar service request.
3 Rapid solidification rate; P adds process.
\[
\text{RSRA}
\]
Radar-systems research aircraft.
\[
\text{RS-RDX}
\]
Reduced-sensitivity RDX.
\[
\text{RST}
\]
1
1
1
Runway Supervisory Officer.
2 Radar start point.
3 Radar signal processor.
4 Revenue-sharing participant.
5 Risk-sharing partner.
6 Reversion Select Panel.
7 Required surveillance performance.
8 Responsive space program (AFRL).
9 Replenishment spare parts.
\[
\text{RSTD}
\]
Rapid solidification plasma deposition.
\[
\text{RST}
\]
1
1
1
Runway Supervisory Officer.
2 Radar start point.
3 Radar signal processor.
4 Revenue-sharing participant.
5 Risk-sharing partner.
6 Reversion Select Panel.
7 Required surveillance performance.
8 Responsive space program (AFRL).
9 Replenishment spare parts.
\[
\text{RST}
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Runway Supervisory Officer.
2 Radar start point.
3 Radar signal processor.
4 Revenue-sharing participant.
5 Risk-sharing partner.
6 Reversion Select Panel.
7 Required surveillance performance.
8 Responsive space program (AFRL).
9 Replenishment spare parts.
\[
\text{RSU}
\]
1
1
Runway supervisory unit.
2 Rate sensor unit.
3 Remote sampling unit.
4 Relay switching unit.
5 Repair and salvage unit.
6 Vertical load on landing-gear leg during wheel spin-up.

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**RTG**

RTG 1 Radiotelegraphy.
2 Real target gate.
3 Radiosotope thermoelectric generator.
4 RA Radius of throat at inlet to gas-turbine jet engine.
R-θ, R-theta Radio navaid family giving distance and bearing from fixed station.
RTN Runway threshold lights [normally green].
RTI 1 Radar-target interrogator, or indicator.
2 Real-time interrogate.
3 Real-time infrastructure.
RTIC 1 Real time in the cockpit.
2 Real-time information in the cockpit.
RTIL Runway-threshold identification light[s].
RTIP, R-tip Radar-technology insertion program.
RTIR Real-time IR linescan.
RTK Revenue tonne-kilometres.
RTL Rudder-travel limiter.
RTLS Return to launch site.
RTM 1 Resin transfer moulding.
2 Revenue ton-mile.
3 Remote telemetry, or radio-transmission, module.
RTMM Removable transportable media module.
RTMR Real-time mission radius.
RTN, RTNG Return[ing], returned.
RTO 1 Rejected take-off.
2 Resident Technical Officer, of government in manufacturer’s plant (UK).
3 Responsible test organization.
4 Range training officer (ACMI).
5 Runway turnoff lights.
6 Research and Technology Organization (NATO).
RTOAA Rejected take-off area available.
RTOC Real time out of the cockpit, often preceded by RTIC (1).
RTOD Real-time optical display.
RTODA Rejected take-off distance available; H adds helicopter.
RTOG Regulated take-off graph, plot on which actual weight is assessed against T*; wind etc.
RTOL Reduced (or, sometimes, restricted) take-off and landing, conventional transport with field length from 900 m (3,000 ft) to 1,500 m (5,000 ft).
RTOS Real- or run-time operating system[s].
RTOT Regulated take-off table.
RTOW Regulated takeoff weight.
RTP 1 Reporting and turn point.
2 Routine technical publication.
3 Radio tuning panel.
4 Reliability test plan.
5 Research and technology projects.
6 Receiver/transmitter/processor.
7 Research Technology Programme (Agard).
RTD Real-time perspective.
RTGA Room-temperature parametric amplifier.
RTPT Real-time precision-targeting radar.
RTQC Real-time quality control.
RTR 1 Real-time reconnaissance.
2 Reserve thrust rating.
3 Remote transmitter/receiver site.
4 Radar termination range.
RTRCDS Real-time reconnaissance cockpit display system.
RTRD Retard.

**rubbing seal**

**rubber boot** See pneumatic deicing.

**rubberdraulics** Rubber presswork technology, especially when flexible medium flows like liquid.

**rubber fuel** Colloquial term for HTPB, PBAN and similar propellants.

**rubber powered** Model aircraft whose energy is derived from twisted loops of rubber elastic.

**rubber press** Press for forming sheet-metal parts by forcing thick pad of rubber down under high pressure on to cut-out flat parts (or, if blanking strips added, uncut sheet) arranged above male dies against which parts are forced with minimal wrinkling, rubber acting sideways as well as downwards.

**rubber slick** Stripe of rubber melted off tyre at touchdown and adhering to runway. Resulting blackened region shows touchdown zone preferred by actual traffic.
rubbing strip
members actually in contact; usually at least one mating face is carbon.
rubbing strip Numerous non-structural parts whose purpose is to accept impact from doors, ground equipment (eg steps and vehicles) and abrasion by inlet blanking plates or rescue winch cable.
rub indicator Sensor giving cockpit indication of eccentric running of rotating assembly, eg engine shaft.
rub rail Mount and launch rail for missile shipped and launched from canister; sometimes four, each locating a wingtip.
RUC Rapid update cycle (weather).
rudder Primary control surface in yaw; when nose-mounted, prefaced by nose- or fore-. Term also includes fixed fin of kite balloon, usually ventral, providing weathercock stability.
rudder bar Centre-pivoted bar providing pilot rudder input in simplest ultralights and historic aircraft. Traditional term for rudder input even when linear pedals are fitted.
rudder-bias strut Simple engine-out device comprising piston in rudder circuit with engine-bleed air piped to each side; failure of either engine causes immediate application of rudder.
rudder lock Potentially dangerous flight condition with rudder locked at maximum deflection. Caused by reversal of aerodynamic moment at large sideslip angle [suggest simple manual rudder only].
rudder pedal Left/right pedals for pilot’s feet acting as manual input to rudder, and in modern aircraft to wheel-brakes.
rudder post Traditional (suggested arch.) term for leading-edge member of rudder carrying hinges; with modern inset hinges place taken by internal spar.
rudder reversal Roll reversal using rudder only, usually in maximum-performance high-alpha air-combat manoeuvres.
rudder roll Unwanted roll produced solely by coarse use of rudder.
rudder torque Twisting moment exerted by rudder on rear fuselage.
ruddervator Movable flight-control surface of butterfly tail, combining duties of rudder and elevator. It may or may not be downstream of a fixed surface. Sometimes ‘ruddervator’.
ruddervon Control surface, usually of traditional trailing-edge form, able to serve as rudder, aileron or elevator on so-called tailless aircraft. In most applications, outboard of elevon(s).
RUF Rough.
ruling dimension Basic measure, almost impossible to alter, e.g. diameter of fuselage.
ruling material That used for most of airframe structure.
RUM Ship-launched anti-submarine missile (USN code).
rumble 1 Rocket combustion instability audibly obvious from low growl or *. 2 Unstable pulsing at low frequency [300–700 Hz] in jet engine or afterburner. 3 Prolonged flat landing approach under power, to * in.
rumble seat Occasional seat, eg for flight-deck observer or for stewardess on landing/take-off.
run 1 Ground or distance traversed by wheels, or water by floats/hull, on takeoff and landing. 2 Number of production articles built to common type, or elapsed time to produce same. 3 Single flight over target (also called pass) for assessment, release of ordnance or operation of reconnaissance sensors. 4 Single flight past designated point(s), eg in attempt on speed record.
rundown 1 Fall off to zero rpm after normal closure of shut-off valve or HP cocks, or flameout or engine failure (also called spool-down). 2 Decay in production rate due to falling demand or imminent termination.
rundown time Time for engine to come to rest, giving rough indication of internal rubbing.
runt flat tyre Various aircraft tyres, pioneered by Goodrich, designed for high-speed landings after deflation caused by take-off blowout, fire or combat damage.
Runge-Kutta Possibly the most widely used integration routine in digital flight control.
runtime fit Slight clearance between mating parts allowing rotation or other relative motion.
runtime fix Approximate fix obtained by taking a bearing of fixed station, or in any other way obtaining PL, then obtaining second PL and adjusting to common time.
runtime in Act of running newly built or completely overhauled engine or other machine to ensure parts run together under controlled gentle operating conditions.
runtime landing 1 Helicopter landing made into wind with groundspeed and/or translational lift at touchdown; with skid gear demands careful collective after touchdown to avoid abrupt stop. 2 Jet V/STOL landing with significant forward speed.
runtime mate New transport aircraft type, usually smaller, to accompany trunk-route type already in service and offering same advanced-technology appeal.
runtime order Traditional condition for measuring mass of piston engine: including radiator, coolant, internal oil, external pipes and controls, but excluding fuel, oil, tanks, reserve coolant, exhaust tailpipes and instruments.
runtime running Rigging for kite balloon or other aerial object which by system of vee-lines and pulleys automatically adjusts to direction of pull.
runtime take-off 1 Started without lineup and hold, speed never slackening on arrival at runway in use. 2 By helicopter or other VTO aircraft making preliminary ground run.
runtime area Strip or pad beside runway where arrivals can clear quickly for following traffic (also run-off, run off).
runtime landing Roll-on landing.
runtime run 1 Distance travelled by carrier aircraft between engaging hook and coming to stop, also called pull-out. 2 Distance travelled by aircraft after encountering runway barrier, drag wire, decelerating bed [such as EMAS] or other arresting system. 3 Distance travelled by gun or barrel, on recoil stroke.
run-up

A composite tolerance specified for a part of basically circular form; circular * detects variations in circularity and coaxial misregistration, total * adds [e.g.] straightness, taper and position.

run-up 1 To accelerate engine under own power.
2 Portion of flight immediately preceding target run.
3 To test piston engine, briefly at high power and to check dual ignition, before takeoff.

run-up area Portion of airfield near taxiway designated for run-up (3).

run-up drag 1 Drag caused by windmilling propeller in air-start.
2 Drag caused by need to accelerate landing wheels on touchdown.

runway Paved surface, usually rectangular and of defined extent, available and suitable for aeroplane take-off and landing. Equipped * includes stopway, clearway, surface markings and designators. All-weather * includes lighting. Instrument * adds electronic aid, eg ILS, MLS. Unpaved * = airstrip.

runway alignment Direction of runway centreline, published as first two digits, in both directions, eg 13/31; also called direction number. See runway designator.

runway alert system Passively monitors ASDE and other sources to detect potential RWI.

runway alignment factor Maximum angular departure from alignment admissible for straight-in approach, normally 30°.

runway alignment indicator Group of flush lights offering directional guidance on takeoff (to some degree on landing) in bad visibility.

runway basic length That length selected for aerodrome planning purposes required for takeoff or landing in ISA for zero wind, elevation and slope.

runway capacity Frequency of landings and/or takeoffs, or mixture, possible or permissible with minimal approach spacing, published for IFR and VFR. In complete airport varies greatly with number and arrangement of runways, and conflicts of crossing traffic.

runway condition Numerical output from braking [dcelerometer] tests.

runway controller ATC controller stationed, usually in caravan with checkerboard markings, close beside downwind end of runway in use; equipped with signal pistol, Aldis and telephone to tower (rare since WW2).

runway designator Numerical alignment plus qualifier left/right if necessary; thus New York JFK offers 4R/22L, 4L/22R, 13R/31L and 13L/31R.

runway direction numbers Numerical values of alignment.

runway-edge lights White lights grouped according to intensity: fixed-intensity LIRL (low-intensity runway lights) and variable MIRL and HIRL. Designed to withstand flying stones.

runway end End of runway in use, identified by markings; beyond may be similar-surfaced blast pad, overrun (RESA) or stopway and (unpaved) clearway.

runway-end lights, REIL Often pair of flashing white lights, at major airport continuous transverse row of bi-directional lights showing green towards approach and red towards runway.

runway-end safety area UK term for overrun area; area adjoining runway in use, symmetrical about extended centreline, intended to minimize damage to undershoot or overrun aircraft.

runway floodlight Appears incorrectly in some dictionaries; does not exist.

runway gradient Not used; correct word is slope.

runway guard Flashing yellow lights where taxiway meets runway.

runway incursion Crossing runway in use, or taxiing beyond takeoff holding point, without ATC clearance. Abb. RWL.

runway localizer See localizer.

runway markings Basic, 2-digit direction number and centreline; Instrument adds threshold; All-weather (precision) adds side strips and zones.

runway occupancy Elapsed time particular aircraft is on runway, on arrival or departure.

runway profile descent Published procedure for complete IFR controlled arrival from en-route to glide-path.

runway separation Time and distance intervals between arrivals and/or departures on one runway. Distance between parallel runways is spacing.

runway spacing Perpendicular distance between centrelines of parallel runways at same airport.

runway strip Defined area including runway and stopway intended to reduce risk of damage to aircraft that run off runway in any direction and to protect aircraft flying over it during takeoff or landing.

runway threshold Threshold (1).

runway turnoff lights Fixed wide-beam white lights on each side of the forward fuselage giving lateral illumination.

runway visibility value, RVV Determined for particular runway by transmissometer with readout in tower; generally being replaced by RVR.

runway visual range, RVR Value representing horizontal distance pilot will see centreline or edge lights or runway markings down runway from approach end. Once recorded by an observer 76 m from centreline, now by RVR system.

RUB Ship-launched anti-submarine rocket (USN code).

RUSA Roll-up solar array.

RUSI Royal United Services Institute for Defence Studies [London SW1A 2ET] (UK).

Ruslick Anti-corrosive coating for bright metal in saline (ocean) environment.

Rustilo Proprietary anti-corrosive inhibiting oil.

RUT Standard regional route transmitting frequencies (ICAO).

Ruticon Family of photoconductive/liquid-crystal devices used in large-screen projection, typically with potential across photoconductor and elastomer with mirror surface for readout, scanned on opposite face by CRT input.

RV 1 Radar vector.
2 Re-entry vehicle.
3 Residual value.
4 Rescue vessel (RAF, ICAO).
5 Rescue vehicle.
6 Rendezvous.
7 Radius of vortex-release point along helicopter rotor blade.

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RVA

RVA 1 Radar vectoring area.
2 Régie des Voies Aériennes (Belgium, see RLW).
RvA National accreditation body (Netherlands).
RVC Radar video corridor.
RVD 1 Radar video.
2 Rear-view display.
3 See next.
RVD/B Rendezvous and docking/berthing of spacecraft.
RVDP Radar video data processor.
RVDT 1 Rotary, or rotating, variable, or voltage, differential transformer, or transducer.
2 Rotating voltage-displacement transformer.
R/VGPO Synchronized range and velocity deception, see RGPO, VGPO.
RVL Rolling vertical landing.
RVO Runway visibility by observer.
RVP 1 Reid vapour pressure.
2 Ramp void pressure.
RY-PVO Radiotekhnicheski-Voiska PVO, radio-technical air-defence troops (R).
RVR 1 Runway visual range; C adds centre, R rollout, T touchdown area.
2 Rear-view radar.
3 Reverse-velocity rotor.
RVR system Various electro-optical instruments for measuring RVR without subjective interpretation, usually by calibrated light source and transmissometer receiver separated by distance great enough to avoid too much error from local smoke.
RVS Reduced vertical separation[s]; M adds minima [US often minimums], MK minima kit.
RVSD Revised.
RVSM Reduced vertical-separation minima, or minimum.
RVSN Strategic rocket forces (USSR).
RVSP Radar video signal processor.
RVT Remote video terminal.
RVV Runway visibility value.
R/VWH Re-entry vehicle/warhead.
RW 1 Radiological weapon(s).
2 Retractable wheel (sailplanes).
3 Rigged wet, ie for spraying (ag-aircraft).
4 Reconnaissance wing.
5 Rain shower.
6 Runway.
RW 1 Marine aircraft on water total resistance divided by weight, equivalent to an L/D ratio.
2 Runway.
3 Read/write.
RWA 1 Reaction wheel assembly.
2 Rhomboid-wing aircraft.
3 Rotating-Wing Aviation, RU adds Research Unit (USA).
RWB Rotating warning beacon.
RWD Rigged wet and dry, ie for both spraying and dusting (ag-aircraft).
RWE Radar warning equipment.
RG Rotorcraft Working Group (UK/US).
RWI Runway incursion.
RWIS Runway weather information system.
RWM 1 Code for SAR helicopter (ICAO).
2 Read-only wire (or composite-wire) memory.
3 Read/write memory.
RWR 1 Rear-warning radar.
2 Radar warning receiver.
RWRT Real world, real time.
RWS 1 Radar warning system.
2 Range while search.
3 Remote workstation.
RWS+S Rigged wet plus spreader (ag-aircraft).
RWT Radar warning trainer.
RWTS Rotary-Wing Training School (RAF, WW2).
RWU Rain shower, intensity unknown.
Rwy, rwy Runway (ICAO); -TDZ adds touchdown zone.
RX 1 Report [when you are] crossing [specified point].
2 Receive.
Rx Receiver, or reception only.
R/X Range extension.
R(X) Correlation function.
Ryton A trade-name for PPS (4), with high opacity to EMI(1) (Phillips Petroleum).
RZ 1 Recovery zone.
2 Reconnaissance zone.
3 Return to zero.
RZI Real-zero interpolation.
S 1 Generalized symbol for area, eg gross wing area or reference area [also S{eq}a{eq}].
2 Entropy (not UK and some other countries).
3 US piston engines, supercharged (hence, TS = turbocharged).
4 Aircraft category, scout (USN 1922-46), sonic test (USAAF 1946-47), ASW (USN from 1946).
5 Aircraft modified mission, ASW (USN pre-1962 suffix, post-1962 prefix).
6 Aircraft category, strike (RAF, RN).
7 Siemens, normally written siemens.
8 JETDS code, special, or detection / range-bearing / search.
9 South, south pole, southern latitudes (ICAO).
10 Section modulus (alternatively Z).
11 Surface, common missile code for both launch location and target.
12 Single [especially single wheel on each landing-gear leg, and runway bearing capacity for such wheel].
13 Distance between contact areas of dual wheels.
14 Serviceable (CAA).
15 Secondary [and secondary airport].
16 Saturated [especially traffic between city pair].
17 VLA (BCAR section).
18 Supplementary [frequency].
19 Snow, or squalls.
20 Strobe(s).
21 Signal or radar power, or energy.
22 Scheduled flight.
23 Superior (warm air mass).
24 Suffix, light-alloys = wrought.
25 Strouhal number [St is preferred].
26 Reluctance.
27 S-Stoff
28 Sulphur.
29 Now used, with several suffixes, as take-off distances (US).
30 Landing-gear side load.
31 FAI category: space model.
32 Sears’ function, referred to mid-chord.
33 Slavx [Loran station].
34 Strobe.
S1 Second[s] (time).
S2 Stress.
S3 Generalized symbol for linear measure, length, distance; esp. used for aerofoil semi-span (b{eq}2{eq}). Also, with suffixes, various take-off and landing distances, and penetration distance into a gust.
# Starboard.
$ Square (eq in rms).
6 Spherical (eq in scp).
7 Static [not total] pressure.
8 Laplace variable.
9 Specific entropy.
S’ Sears’ function, referred to leading edge.
S Composite symbol, integrated signal energy, = E {eq}H{eq}, unit Wm{eq}1{eq}.
S0, S{eq}z{eq} Segment zero.
S1 Segment 1.
S2S Sensor-to-shooter.
S3 S-cubed, stick-shaker speed.
S4 Step stress screening.
S5 Special-services switching system.
S6 Former common-use radar band originally 19.33-5.77 cm, 1.55-5.2 GHz, later rationalized to 15-7.5 cm, 2-4 GHz; now occupied by E and F.
S-code 1IFR flightplan code aircraft has 64-code transponder and approved R-Nav.
S-duct Curved duct supplying air to centre engine in trijets, and to turboprops with offset gearbox.
S-gear Full supercharge.
S-ing Series of S-turns, especially in taxiing.
S-manoeuvre To weave in horizontal plane.
S-mode Aircraft transponder provides data-link capability, e.g. altitude, bearing, range.
S-pattern Wavy track resulting from S-ing.
S-Stuff Rocket fuel: 90-97% RFNA, 10-3% sulphuric acid (G).
S-turn To describe S in horizontal plane.
SA 1 Situational awareness.
2 Sand or dust storm (ICAO).
3 Standby altimeter.
4 Shaft angle.
5 Surface-to-air.
6 Submerged-arc (weld).
7 Spin axis.
8 Single-aisle (passenger transport aircraft internal layout).
9 Structural audit.
10 Structured analysis (software).
11 Stand-alone.
12 Safety altitude.
13 Standard Atmosphere.
14 Safety action (FAA).
15 Société Anonyme (F), and Sociedad Anónimo (Spain).
16 Special access [black].
17 Selective availability, of GPS.
18 Simple approach [runway lighting].
19 Arsine, CW agent.
20 Scientific Advisor (UK).
21 Ship’s Airplane (USN 1917-19).
22 Surface aviation scheduled weather report.
23 Search/attack (USN).
24 Sensitivity analysis.
25 Synthetic aperture.
SAA 1 Society of Airline Analysts (US).
2 Safety and arming.
3 Swiss Aerobatic Association.
4 Systems application architecture.
5 Service access area.
6 Supersonic adversary aircraft [also SSA] (USN).
7 Cargo container for main deck (code).
8 Sulphuric-acid anodized [surface finish].
9 School of Army Aviation (UK).
10 South Atlantic anomaly.
11 Seaplane Association of Australia [office, Greenwich, NSW].
SAAA  
J2 Swiss Astronautics Association [CH-4702 Oensingen] (Switzerland).
SAAA Sport Aircraft Association of Australia [office, Clifton Hill, Vic.].
SAAAFA South Atlantic, Africa, Asia and Far East (ICAO).
SAAAR Special aircrew and aircraft authorisation required [RNP] (FAA).
SAAATS, SAATTS South African advanced ATC system.
SAC 1 Simulator for air-to-air combat.
  2 Society of Amateur Aircraft Constructors (Ireland, 1978–).
SAAF 1 Small austere airflow.
  2 South African Air Force; A adds Association [office, Johannesburg].
SAAFI South African Association of Flying Instructors [office, Rand Airport].
SAAH Stability-augmentation/attitude-hold system.
SAALC San Antonio Air Logistics Center (Kelly AFB).
SAAM 1 Special-assignment airlift mission.
  2 Surface [or sol (F)]-air anti-missile.
SAAPA South African Airways Pilots’ Association [office, Jan Smuts Airport].
SAARU Secondary attitude and air-data reference unit.
SAAS, SAAS Selectively available [or selective-availability] anti-spoofing; M adds module (GPS).
Saaty Versatile methodology for blending multiple source or data elements into hierarchial ranking [Dr Thomas L. Saaty].
SAB 1 Scientific Advisory Board (USAF).
  2 Self-aligning bearing.
SABA, Saba Often pronounced ‘Sabre’, small agile battlefield aircraft.
SABAR Sense (or search) and destroy armour.
Sabatier 1 Reversal phenomenon in photo processing occurring when developed image is exposed to diffuse light and redeveloped (not encountered with X-rays).
  2 Fully developed reaction process for recovery of pure oxygen from human exhalation/excretion with by-products such as methane and carbon dioxide.
Sabot 1 Annular driving mechanism to enable subcalibre projectile to be fired at very high muzzle velocity from gun; usually has form of drum open at one end to receive projectile and divided radially to separate into sections beyond muzzle.
Sabre Support, amphibious and battlefield rotorcraft (RAF/RN).
Sabrs Space atmospheric burst reporting system (MDA).
SAC 1 Strategic Air Command, formed 1946 by USAAF, principal ‘deterrence’ of USAF until formation of Air Combat Command in 1992.
  2 Space Applications Centre (India).
  3 Space Activities Commission (Japan).

SADM

Soaring Association of Canada [Ottawa, not normally abb.].
  5 Supplemental air carrier.
  6 Subsecretaria de Aviación Civil (Spain).
  7 Standing advisory committee.
  8 Standard arbitration clause.
  9 Sectional aeronautical chart.
 10 Single annular combustor.
 11 Stealthy affordable capsule.
 12 Surface-analysis chart (weather).
 13 Scene-of-action commander.
 14 Senate Appropriations Committee (US).
 15 Space Analysis Center (AFSPC).
 16 Strategic airlift capability.
SACSA Service Administrative de la Commissariat de l’Air (F).
SACCS Scottish Advisory Council for Civil Aviation.
SACCSS SAC (1) automated command and control system.
SADIC SAC digital information network (USAF).
SACME Supreme Allied Commander, Europe.
SACTNET SAC intelligence network (from 1990).
SACL Strobe anti-collision light.
SACLE Standing Advisory Committee for Licensed Aircraft Mechanical Engineers (UK CAA).
SACLNT Supreme Allied Commander, Atlantic.
SACLOS Semi-automatic command to line of sight.
Sacm Samarium cobalt (magnet material).
SACP 1 Surface/air courté portée; short-range SAM (F).
  2 Standing Advisory Committee on Pilot licensing (CAA, UK).
sacrificial corrosion Metal is protected against corrosion by being coated with metal less noble than itself, which is attacked preferentially.
Sacru Semi-automatic cargo release unit.
SACS 1 Secondary attitude and compass system.
  2 Speed/attitude control system (takeoff).
  3 Small air-capable ship.
  4 Secure-access control system.
SACT 1 Signal acquisition conditioning team, or terminal.
  2 Supreme Allied Command Transformation (NATO, Norfolk Va).
SACU Stand-alone communications unit.
SAD 1 Submarine anomaly detector.
  2 Spares advanced data.
  3 Self-adhesive decal.
  4 Solar-array drive.
  5 Situational-awareness display.
  6 Surface-to-air defence.
  7 Standard advanced Dewar [A adds assembly, D display].
SADA Semi-automatic air-defence system (Spain).
Sadarm Sense [or search] and destroy armour (USA/Aerojet).
SADC Secondary air-data computer.
saddle Shaped wooden former on which keel of marine aircraft rests during manufacture.
Sadis Sense of scene-of-action commander.
SADDL Special atomic demolition munition.
safety advisory | Issued by ATC to aircraft under its control to warn of (1) terrain obstruction and (2) aircraft conflict, in the judgement of the controller (FAA).
safety altitude | Loosely, one at which collision with surface is unlikely at approximate location; not accepted term (see DH, MDA, etc.).
safety analysis | Investigation of likely consequences of all failures [of an item] likely to occur.
safety area | Designated area around helicopter, ICAO = 0.25 overall length [minimum 3 m] and must be load bearing, FAA = 0.33 main-rotor diameter [minimum 6 m], need not be load bearing (downwash only).
safety barrier | Emergency arresting barrier across carrier flight deck (US often barricade net).
safety belt | For passenger, normally called seat belt or lap strap; for flight (occasional cabin) crew, seat harness.
safetycom | Radio frequency [135.475 MHz] where no specific v.h.f. frequency is notified [CAA, from Nov. 2004] (UK).
safety disc | Disc of accurately known strength sealing fluid system, eg cartridge-operated, serving as safety valve.
safety equipment | Vast range of personal items, of which the most obvious is a parachute, others being helmet, goggles, armour, whistle, dinghy (with fluorescein dye), Sarbe (or similar) beacon, torch, mirror, pocket GPS, Very pistol and in some circumstances anti-NW flash protection or a handgun. Does not include normal flying clothing, oxygen mask or microphone, but does also include aircraft equipment, such as seat harness, axe, fire extinguisher and escape slide.
safety equippers | Specialized ground staff charged with maintenance of safety equipment.
safety factor | See factor of safety.
safety harness | Ambiguous, see safety belt, seat harness.
safety height | Not accepted term (see DH, MDA, etc.). One authority: lowest at which safe to fly on instruments.
safety imagination | Ability to extrapolate from a real near-accident to hypothetical accident.
safetying | 1 Rendering explosive or pyrotechnic device safe by positive means. See safing.
2 Installing locking wire or other device which prevents an attachment from becoming loose.
safety net | One designed to catch flying object with minimal damage, eg ejection seat on test model in tunnel (flight time) is published in flight manual and relevant loads and configurations (test rig). One present in cockpit to prevent accident, eg to radio-controlled aircraft or RPV, or with pupil on instrument practice.
safety pins | Those inserted to disarm ejection seat except in flight.
safety plug | Blow-out plug serving as safety valve in case of excess pressure (eg JATO bottle) or excess temperature (eg tire after prolonged braking).
safety speed | That above which aircraft is safe to fly with given load and configuration; formerly several, eg FUS, but most important today is Vc.
safety thread | That connecting D-ring (ripcord) to parachute pack.
safety wire | Locking wire passed through holes in nuts, turnbuckle barrels and other fasteners in such a way that they cannot loosen subsequently.
safety zone | Area reserved for non-combat operations by friendly forces (DoD).
Safeway

Safeway | Proprietary deciers: * SD is a solid, * KA liquid.

Safeway Pneumatic | Guidance installation for nose-in parking; pavement pressure pads sense nosewheel(s) and illuminate progress lights facing flight deck while arrows, lights and other displays give guidance.

Safire | Synthetic-aperture fully focused imaging radar equipment.

SAFI | Semi-automatic flight inspection (FAA, from 1962); S adds system, = Safis.

saflng | Process of rendering potentially dangerous device or system inoperative; eg complex procedure in Space Shuttle Orbiter post-landing.

SAfere | Scanning airborne filter radiometer.

SAFO | Safety alert for operators (FAA).

SAFOC | Semi-automatic flight operations centre.

SAF/OI | Secretary of the Air Force/Office of Information (USAF).

SAF/P | Slotted-array flat plate; A adds antenna.

SAF/PFA | As above, Public Affairs.

SAFRe | Schweizerische Arbeitsgemeinschaft für Raumfahrt (previously Raketechnik) (Switzerland).

SAFU | Safety, arming and fuzing (sometimes functioning) unit.

SAG | 1 Support air group (Royal Navy).

SAIG | Scientific advisory group (US).

SAJ | Surface action group (USN, concerned with ship targets).

SAIL | Survivability analysis group (DoD).

SAK | Semi-active guidance.

saig | See saflng.

SAGA | 1 Studies Analysis and Gaming Agency (DoD).

SAK/SA | System of azimuth guidance for approach; simple optical ILS.

SAG | Semi-automatic Ground Environment; pioneer computer-controlled radar and communications system for defence of large airspace and management of interceptors and SAMs. [1953–63] (US).

SAK/SAFOC | Stratospheric aerosol and gas experiment.

SAG | System for assessing aviation’s global emissions (FAA).

sagging | 1 Distortion of airship (any kind) caused by upward loads near ends or lack of lift at centre.

SAG | 2 Bending stress on seaplane float or flying-boat hull caused by water support concentrated near ends due to swell or waves.

SAGr | Maritime reconnaissance group (G. WW2).

Sags | Semi-active gravity-gradient stabilization.

SAGW | Surface-to-air guided weapon (UK usage).

SAH | 1 Semi-active homing.

SAH | 2 Sample and hold (EDP [1]).

SAH | 3 Select and hold.

SAH | 4 School of Aircraft Handling.

SAHA | Shoreham Airport Historical Association (UK).

SAHS, Sahis | Standby attitude, heading and rate of turn indicating system.

SAHR | Semi-active homing radar (SAHRG adds ‘guidance’).

SAHRS | Standby, or standard, or secondary, or supplemental, attitude/heading reference system.

SAI | 1 Standby airspeed indicator.

SAI | 2 Spherical attitude indicator.

SAI | 3 Single-aperture interferometer [or interferometry].

Salisbury screen

Salisbury screen | 1 System architecture and interface.

SAIA | Swedish Aerospace Industries Association.

SAIAE | South African Institute of Aeronautical Engineers [office, Johannesburg].

SAIF | Standard avionics integrated fuzing (sets dispenser payload fuzes milliseconds before release).

SAIG | 1 Single-axis integrated gyro.

SAIG | 2 Swiss Aeronautical Industries Group [22 companies] (January 2005–).

SAIL | Shuttle Aviation Integration Laboratories.

sail | 1 Flat surface pointed towards Sun or other celestial object and attached to spacecraft, eg carrying solar cells.

SAIL | Very large lightweight reflective surface proposed for space propulsion by pressure of sunlight. Potential for $6\times10^3$ km/h (380,000 mph).

sail | 2 To navigate seaplane (see sailing [2]).

sailing | 1 Undesired rotation of helicopter rotors or aeroplane propeller in high wind.

sailing | 2 Navigation of seaplane on water, esp. in conditions of wind and current.

sailplane | Glider designed for soaring.

sail | See sail (5).

sailing | Aerodynamic whose wing assumes lifting (near-aerofoil) profile only in presence of suitable relative wind; class includes parawings but normally has flexible surface(s) restrained by rigid periphery.

sailing | 1 Surveillance, acquisition, identification, notification and tracking.

sailing | 2 Satellite inspection technique.

sailing | 3 Satellite active imagery [or imaging] national testbed.

Saint Elmo’s fire | Brush discharge caused by build-up of electrostatic potential, notably on propeller blades; luminous and often audible.

Saint-Verant’s principle | In any two-dimensional region the stresses and strains produced at a point remote from a series of applied loads do not differ significantly from those resulting from any other set of loads having the same resultant force and moment.

SAIP | Semi-automated imagery [or Imint] processing [or processor].

SAIRS, Sairs | Standardized advanced IR sender [or system] (Martin Marietta).

SAIRST | Situational awareness IR search and track.

SAKh | Written CAX, mean aerodynamic chord (R).

SAL | 1 Strategic arms limitation.

SAL | 2 Security access level.

SAL | 3 Selected altitude layer decoder.

SAL | 4 Semi-active laser.

Salbei | See SV-stoff.

SALC | Sacramento Air Logistics Center (McLellan AFB).

Salis | Strategic airpower interim solution.

Salisbury screen | Oldest and simplest RAM (2), comprising resonant absorber created by placing resistive sheet on spacer of low dielectric constant in front of metal plate (eg aircraft skin).
Salomon damper  Dynamic damper for crankshaft
balance weights to remove oscillatory loads.

SALR  Saturated adiabatic lapse-rate.

SALTS  Short approach-lighting system; F adds with
flashing lights, R with runway alignment indicator lights
(FAA).

SALT  Strategic Arms Limitation Treaty (* 1 May

salted weapon  NW which has, in addition to normal
components, extra elements or isotopes which capture
neutrons at time of explosion and produce additional
radioactive products; generally, opposite to clean NW.

Salthorse  Commander of a carrier despite being a non-
aviator (RN, colloq.).

Salto di Quirra  NATO air firing range, including AAA
and SAMs, in Sardinia.

salvo  1 Simultaneous group of ECM bursts, esp. from
dispensed payloads; not necessarily all of same species, eg
could be two chaff, one IR, one jammer.

2 In close air support/interdiction, method of delivery
in which all weapons of specific type are released or fired
simultaneously (DoD).

3 See salvo.

salvos  Air-intercept code: “I am about to open fire”; can
add further word specifying weapon(s), eg “mushroom” =
“I am about to fire special weapon”, ie Genie (DoD).

SAM  1 Surface-to-air missile.

2 School of Aerospace Medicine (USAF).

3 Sound-absorbing material(s).

4 Standard (or standardized) assembly module.

5 Société Aérostatique et Météorologique, 1865 (F).

6 Special Air Missions squadron (USAF).

7 Standard avionics module.

8 Structural analysis and maintenance.

9 South American region; / SAT adds South Atlantic
(ICAO).

10 Situational-awareness mode.

11 Structural-anomaly mapping.

SAMA  1 Small Aircraft Manufacturers’ Association
(US).

2 Systema aeronautico modulare anti-cendio (I).

3 Semi-automated manoeuvre analysis.

Samar, SAMAR  Search and maritime rescue
samarium  Sm, rare-earth metal, density 7.52, MPt
1,077°C, alloying element in magnets.

SAMD  Stratospheric aerosol measurement device.

SAMF  Société Aérostatique et Météorologique de
France [1852, in 1863 merged with SdA to form SFNA] (F).

SAMI  System-acquisition management inspection.

Samir  Système d’alerte missile IR (F).

SAMM  1 English form of VSMI, SSCM.

2 Surface-area movement management (TCAS).

Samoan  Système aérotransportable mobile pour les
opérations aériennes (F).

Samoc  SAM operations center.

Samos, SAMOS  Stacked-gate avalanche-injection
MOS.

2 Satellite and missile observation system.

SAMP  Sol-air [or système d’autodéfense] moyenne
portée [short-range SAM]; / N adds navale, T terrestre
[land] (F).

Sampe, SAMPE  Originally Society of Aerospace
Material and Process Engineers, now Society for the
Advancement of Material and Process Engineering

sampled recording  Automatic switching so that many
(<10⁶) parameters can be measured each second.

sample length  Lenth of specimen studied in examination
of variable, eg surface finish.

sample rate  Rate per unit time for flight-test programme
or other variable.

Sampras  SAM position ranking and analysis system.

Sams, SAMS  1 Six-axis motion system (simulator).

2 Software automated management support.

3 Spare assembly, maintenance and servicing (space-
craft).

SAMSO  Space and Missile Systems Organization, Air
Force Systems Command (USAF).

Samson  / Structural-anomaly mapping.

Samson  Strategic automatic message-switching oper-
ational network (Burroughs).

2 Special avionics mission strap-on, now a self-powered
FLIR pod (Lockheed).

SAMT  Simulated aircraft maintenance trainer.

2 State-of-the-art medium terminal (Satcom).

SAMTEC  Space and Missile Test Center (DoD).

SAN  1 Satellite access node(s); / AP adds air-portable.

2 Sanitary.

3 Storage area network.

SAND  Simultaneous analysis and design.

S&A  Safety and arming.

sand and spinach  Green/brown camouflage (colloq.).

sandbag  Passenger carried free by airline to make up
necessary ballast.

sandbag bumper  American term for hand-shaping
sheet metal by hammering against tough sandbag.

sandbag line  Rope joining sandbag loops to prevent
wear.

sandbag loops  Cord loops over aerostat (esp. kite
balloon) envelope carrying sandbag at each end; also
called sandbag bridle.

sandbag ring  Cable or rope round balloon basket from
which sandbags are (suggest were) hung, forming easily
jettisoned load.

sandblasting  Scouring material surface with high-
velocity jet of sand or other abrasive for various purposes;
not common in modern aerospace, replaced by tailored
steel shot or glass beads.

sand casting  Casting metal parts in sand mould.

S&E  Scientists and engineers.

S&I

S&I Safety and initiating.

Sanding coat Heavy-bodied paint or dope coat which fills irregularities in surface, leaving smooth base for top coats.

S&M Supply and movements (RAF).

Sandow cord See bungee.

Sand pillar Dust devil.

S&S Sensors and shooters.

Sandstorm Wind densely laden with sand and dust,

S&TI Scientific and technical intelligence.

S&R Search and rescue.

SANDT bringing surface visibility close to zero.

Sandstorm Wind densely laden with sand and dust,

S&S Sensors and shooters.

SAR Search and rescue.

S&I Scientific and technical intelligence.

S&I Sartaf

Saraf

Saphyre Swerve aero-propulsion hypersonic research experiment (NASA).

SAPM Synchronized air-power management (USAF).

SAPO Standby arrangement for peacekeeper operations (UN).

Sapoc, SAPDC Special-access program oversight committee.

SAR 1 Search and rescue.

2 Synthetic-aperture [or array] radar; FTI adds fixed-target indication.

3 Selected acquisition report (US one each FY).

4 Stand-alone radar.

5 Semi-active radar.

6 Signal-acquisition remote.

7 Special access required.

8 Starter-assisted relight.

Sara 1 Selective-adhesion release agent.

2 Ship approach recovery aid(s).

Sarah Search and rescue and homing; personal radio beacon (Ultra).

Sarbe Search and rescue beacon equipment; military/civil (Burndene).

SARC Systems Acquisition Review Council (USA).

Sarcap, SarCAP SAR (1) combat air patrol.

Sarda State and regional defense airlift (US).

Sardam Sonar-array remote detection of aircraft and management, enables submerged submarine to detect and track distant aircraft.

SARG Semi-active radar guidance.

Sarge Surveillance and reconnaissance ground equipment.

SARH 1 Semi-active radar homing.

2 Society of Air Racing Historians [Berea, OH-44017, US] (Int.).

Sarie Semi-automatic radar identification equipment; part of Abbey Hill (UK).

Sarin Toxic nerve gas.

Saric Synthetic-aperture radar interpretation system.

2 Semi-active radar imaging seeker.

SARJ Solar alpha rotary joint.

SARLupe Radar surveillance satellites (G).

SARO Supply aero-engine record office (UK).

Sarcap, SarCAP SAR (1) combat air patrol.

Sarps, SARPS Search and rescue operations.

Sarps, SARPS Search and rescue for Open Skies.

SARP, sarp 1 Semi-automatic radar plotting.

2 Signal auto radar-processing system.

3 See Sarps.

Sarpal, SAPpal Search and rescue portable air-launchable.

Sarps, SARPS Standards and recommended practices (ICAO).

SARS 1 Support and restraint system.

Sarpal, SARPpal Search and rescue portable air-launchable.

2 Static automatic reporting system.

3 Severe acute respiratory syndrome.

Sarsat 1 Search and rescue satellite.

2 Search and rescue satellite-aided tracking.

SART, Sarp 1 Semi-active [artificial] radar target.

2 Search and rescue transponder.

3 Structural airframe repair technician.

4 Self-activating reactive target.

Sartaf SAR (1) task force.
Sartor, SARTOR

Sartor, SARTOR Standards and routes to registration (EC-UK).
Sartu Search and Rescue Training Unit (RAF Valley).
SAS 1 Stability-augmentation system.
  2 Satellite Applications Section (NOAA).
  3 Small-angle scattering.
  4 Stall-avoidance subsystem.
  5 Staring-array seeker.
  6 Single audio system.
  7 Special Air Service (UK).
  8 Survival avionics system.
  9 Sensors and Avionic Systems (UK Qinetiq).
 10 Signature augmentation subsystem.
 11 Support analysis software.
 12 Société par Actions Simplifiée (F, joint stock co).
 13 Station address set.
 14 School of Aviation Safety (USN, USMC).
 15 Small Astronomy Satellite[s].
 16 Standard altimeter setting [1,013.2 mb].
SASC Senate Armed Services Committee (US).
SASCSS SAS (1) plus control-stick steering.
SASE Semi-automatic support equipment.
Sashlite Illuminated under bomber at instant of bomb release and plotted on camera obscura (RAF training, 1930-45).
SASE Small-aperture SSR.
SASE Semi-automatic support equipment.
Sass Strategic airborne, or small aerostat, surveillance system.
SASSA, Sassa Self-awareness space situational awareness (USAF).
SASSR Small-aperture SSR.
SAST 1 Strategic analyses in science and technology.
  2 Shanghai Academy of Spaceflight Technology.
SAT 1 Software audit team.
  2 Static air temperature.
  3 Situational-awareness technology.
  4 Strategic action team (FAA).
  5 System acceptance test.
SATC, Sata Small-aperture telescope augmentation.
Satf Site-activation task force.
Satair Sea acceptance trials, air.
Satca Swedish Air Traffic Controllers Association [office, Angelholm].
SATCC Southern African Transportation Coordinating Commission.
Satco, SATCO Senior air traffic control officer.
satcom[s] Generalized term for satellite communications.
Satcom Satellite Communications Agency (US).
SATCP Sol-air très courte portée (F).
satellite 1 Body revolving in equilibrium orbit around primary, natural or man-made.
  2 Man-made device intended to become * (1).
  3 Military airfield auxiliary to nearby main airfield and relying on latter for admin. and most services.
  4 Sub-terminal at airport to disperse processing and bring passengers nearer relevant gates.
satellite landing system Based on a DGPS ground station, currently provides Cat.1 to equipped aircraft [DGNSSU plus interfaces] to all runways within 30 nm [56 km]; later growth to Cat.III.
satellite/pier layout Airport terminal is connected to some satellites (4) and some piers.
satellite telephone intermediate unit Cabin interface between satcom and terrestrial telephone [or telecommunication] avionics with CTU (2).
satellloid Satellite whose orbit is within planetary atmosphere and thus requires continuous or intermittent thrust.
SATF 1 Strike and terrain-following (radar).
  2 Shuttle activation task force (also rendered Sataf).
Satin 1 SAC automated total-information network (USAF).
  2 Survivability augmentation for transport installation-now (Lockheed-Georgia ECM).
Satka Surveillance, acquisition, tracking and kill assessment.
Satnav Satellite navigation, ie satellite-assisted.
Satnet Satellite network.
SATO Scheduled airlines ticket office.
satphone Satellite telephone, especially in aircraft.
Sattrack Satellite tracking, first GPS system.
SATXS 1 Small airfield for tactical support (USMC).
  2 Small-arms target system.
  3 Shuttle avionics test set.
  4 Small-aircraft technology [changed from transport] system, to relieve pressure on hubs (NASA).
SATSAR Satellite-aided SAR study group (ICAO).
Satcom[ ] communications avionics with CTU (2).
SATT Small-aircraft training target.
saturable reactor Soft-core inductor control for pulsed radars and magnetic amplifiers.
saturated adiabatic lapse-rate Rate of decrease of temperature with height for parcel of saturated air.
saturated air Air containing greatest possible density of water vapour, such that in any given period number of molecular break-ups equals number of recombinations; RH (2) = 100%.
saturated beacon Ground transponder beacon, eg DME, interrogated by so many aircraft (usually 100 simultaneously is limit) that its AGC cuts out replies except to 100 strongest interrogators.
saturation Measure of airport traffic: current movements [usually per hour] = maximum allowable.
saturation diving Undersea submergence at depths in order of 300 m for prolonged period when blood is saturated with oxygen breathing mixture.
saturation vapour pressure Vapour pressure of particular substance, variable with temperature, which at given temperature is in equilibrium with plane surface of same substance in liquid or solid phase.
Saturn 1 Second-generation anti-jam tactical uhf radios for NATO.
  2 The interoperable waveform for (1).
SAU 1 Safety/arming unit.
  2 Signal acquisition unit.
  3 Surface-attack unit.
  4 Splitter amplifier unit.
saucepan Circular remote dispersal for single heavy bomber (colloq. WW2).
saunter

saunter Air-intercept code: “Fly for best endurance”.

sawtooth nozzle Propulsive nozzle of jet engine, and near-vertical descents.

Sawtooth appearance of saw edge with series of linear-rate climbs

SAWSS Shipboard aircraft weight subsystem.

SAWS Satellite, or silent, attack warning system.

SAWRS Supplementary, or supplemental, aviation

SAWOS Save-list item

SAVR Strapdown altitude/velocity reference.

SAW Surface acoustic wave; / CAD adds chemical-agent detection.

SAW: Society of Aviation Writers (several countries).

SAW: Submerged-arc welding.

SAW: Special Air Warfare (USAF).

SAW: Chordwise slot in leading edge of aerofoil to promote chordwise flow, energize boundary layer or serve other aerodynamic function.

SAWE Society of Allied [previously Aeronautical] Weight Engineers [office, Los Angeles, CA90060] (US). 1 Simulated area-weapons effects; can have suffixes NBC or RF.

SAWJHQ Shape alternative war HQ.

SAWOS Semi-automatic weather observation system.

SAWRSS Supplementary, or supplemental, aviation weather-reporting station (NOAA).

SAWS Satellite, or silent, attack warning system.

SAWSS Shipboard aircraft weight subsystem.

sawtoothing Voltage or timebase which when plotted has appearance of saw edge with series of linear-rate climbs and near-vertical descents.

SAW: See dogtooth.

SAW: Flight profile of motor-glider.

SAW: Drive control for airframe.

sawtooth nozzle Propulsive nozzle of jet engine, especially turbofan fan duct and/or core, terminating in a zig-zag edge. This typically gives c3 dB reduction in takeoff noise. Also called sawtooth mixer.

say again Please repeat last bit of message.

Saybolt Standard tests for viscosity of liquid, esp. lubricating oil, in which sample heated to known temperature is poured through calibrated orifice and time in seconds recorded for 60 ml (cm³); hence SUS.

SB Service bulletin.

SB Sideband.

SB Sideband(s).

B Sideband(s).

SB: See B.

SBM Space battle management.

SBM: Space based radar.

SBM: Signal-to-background ratio.

SBM: Smart bomb release assembly.

SB: Spot beam.

SB: Side of body (casting).

SB: Stabilize/.

SB: Stand-by.

SB: Standard beam approach, pioneer electronic

landing aid providing lateral (azimuth) and distance (marker-beacon) guidance; led to ILS.

SB: Spot-beam antenna.

SB: Serial-bus analyser.

SB: Space-based assets.

SB: Strategic brigade airdrop.


SBAMS Sea-based air master study.

SBB Single-beam blanking.

SBT Senate Budget Committee (US).

SBT Single-bell twin-tandem.

SBT Two-bell tandem.

SBTC Sino-British Trade Council.

SBTD Sea-based terminal-defence system (USN).
SBU  
SBU  Sensitive but unclassified.

SBUV  Solar backscatter UV.

SBW  1.  Search bubble window, giving view vertically downwards.

SBX  Sea-based X-band radar, crucial element in BMD system testbed.

SBY  shy  Standby.

   2.  Speed-control (system).
   3.  Short circuit (also s.c.).
   4.  Subgrade code (ICAO).
   5.  Service ceiling.
   7.  Statement of capability.
   8.  Structured coupling.
  10.  Special committee, or category.
  11.  Surface combatant, = warship.
  12.  Supercritical.

Sc  1.  Stratocumulus.
  2.  Schmidt number.

  4.  S.  Unit compressive stress.
  5.  SC-1  One engine inoperative.
  6.  SC-2  All engines operating.

   2.  Services de la Circulation Aérienne = ATC (F).
   3.  Simulation control area.
   4.  Supercritical compound aerofoil [or airfoil].
   5.  Short-circuit analysis.
   7.  Software communications architecture.
   8.  Strategic-capabilities assessment.

scab  External payload carried flush against pylon or aircraft skin; hence to *-on, scabbked.

SCAD, Scad  1.  Subsonic-cruise armed decoy.
   2.  Often ScAd, Scientific Advisor (NATO).
   4.  Stock control and distribution.

Scada  Supervisory control and data acquisition.

SCADC  Standard control (or, USAF, central) air-data computer.

Scade, SCADE  Safety-critical application development environment.

Scads  1.  Shipboard containerized air-defence system (BAe).
   2.  Simultaneous calibration of air-data systems.

SCAF  Supply, control and accounts flight (RAF).

scalar  Quantity having magnitude only, as distinct from vector.

scale  1.  To reproduce on different scale of size, esp. to produce gas-turbine engine larger or smaller than original but broadly similar aerodynamically.
   2.  Scale factor  Output for given input; eg for accelerometer** is output current in mA per unit of applied acceleration g.
   3.  Scale model  Model forming exact miniature of original.
   4.  Scaler  Electronic counter producing one output pulse for given number of inputs; thus binary * has scaling factor of 2 and decade * has SF of 10.
   5.  Scaling law  Mathematical equations permitting effects of NW explosion of given yield to be determined as function of distance from GZ provided that corresponding effect is known for reference explosion, eg 1 kt.
   6.  Scalloping  VOR bearing error due to distortion of propagation over uneven terrain; also called bends.

Scalp  Système de croisière conventionnel autonome à longue portée (F).

scalling  Rough-machining surface layers off ingot.

SCAM, Scam  Strike camera.

SCAMA, Scama  Switching, conferencing and monitoring arrangement (NASA).

SCAN, Scan  1.  Surface-condition analyser.
   2.  Simulated comprehensive air navigation.

scan  1.  Motion of electronic beam through space searching for target (see * types).
   2.  In EM or acoustics search, one rotation of sensor; this may determine a timebase (NATO).
   3.  Air intercept code: “Search sector indicated and report any contacts”.
   4.  In TV and other video systems, process of continuously translating scene into picture elements and thus varying electrical signal(s).
   5.  To make one complete cycle or sweep of eyes across either selected flight instruments or external scene ahead.

SC&D  Stock control and distribution.

scandium  Sc, silvery metal, density 3.0, MPt 1,541°C, could become important in aerospace.

scanner  1.  Device which scans (usually 1 or 4), including electron beams in image tubes and CRTs, TV cameras and many electronic display systems, but esp. including radar transmitter/receiver aerials (antennas) which are scanned mechanically or electronically.
   2.  Radio receiver add-on which trawls the airband.

scanner column  Vertical member carrying two or more superimposed radar aerials, eg in nose of C-5B.

scanning  1.  Process by which radar aerial scans, either by physical rotary movement (usually driven hydraulically) or by electronic scanning.
   2.  Process by which electron beam scans, accomplished by electrostatic or electromagnetic plates or coils.
   3.  Action of keeping eyes sweeping over external scene and/or flight instruments and other internals.
   4.  In particular, searching sky ahead visually, either front-to-side or side-to-side, to avoid a mid-air.
   5.  Use of scanner (2).

scanning-beam MLS  See MLS.

scanning DME  DME that scans stations and locks on to strongest signal without pilot action.

scanning field  Area, usually rectangular, scanned by...
scanning generator

electron beam in TV camera, image tube, CRT or electronic display.

scanning generator  Timebase controlling scanning (2).

scanning sonobuoy One whose acoustic sensors (either passive or active) scan to give directional information and/or to filter out noise from sources other than target.

scanning spot  Point of light where electron beam strikes face of CRT or other scanning field.

scan period  Time period of basic scan types other than conical and lobe-switching, or period of lowest repetitive cycle in more complex combinations; basic units in US are $\frac{720}{360}$, mils/s or s/cycle.

scan stealing  Appropriating a main scan for writing symbols and alphanumeric when interscan period is too brief; term not recommended.

scan transfer  Sudden switching of scanning (3) from external to internal scene or vice versa, esp. immediately before bad-visibility touchdown.

scan types  There are many varieties of radar scan (1) patterns. What follows is descriptive of motions of centre-line axis (boresight line) of main lobe only. Each * is associated with particular type(s) of display, to which aerial (antenna) az/el information is supplied by potentiometer or other servo system. Fixed-scan radar points in one direction only. Manually controlled, points where directed. Conical, traces out circular path forming small-angle cone with radar at apex; a variation, spiral, traces spiral path beginning and ending at centre of circle. Sector, scans through limited az angle (unidirectional, from L to R or R to L only, snapping back to start after each scan; bidirectional, L-R-L-R). Circular, rotates continuously in horizontal plane (common AWACS mode). Sector display is circular scan with long-persistence phosphor in one [important] sector. Helical, scans continuously in az while winding up and down elevation from $0^\circ$ to $90^\circ$ and back. Palmer is conical scan superimposed on another, eg Palmer-circular or Palmer-sector covers 360° periphery or arc respectively with conical scans. Raster is TV method of horizontal lines, usually interlaced; eg an air-intercept 6-bar raster might scan to R along line 1 (top), to R along 4, to R along 3, to L along 6, to R along 2, to L along 5 and back to start. Palmer-raster is another air-intercept scan with conical scan along two or more horizontal bars; thus 3-bar PR makes quick rings along top bar, next along middle and back along bottom, then back up middle to top. Track while scan (TWS) uses an az radar and an el radar simultaneously scanning in both planes.

SCAR, Scar 1 Strike control and reconnaissance, co-inmission (USAF).

2 Strike co-ordinating armed reconnaissance.

1 Sistema di Controllo di Armamento (I).

scarf 1 Inclination in vertical plane of cutoff from rod, tube or other section.

2 Inclination in vertical plane of engine inlet or nozzle, thus zero-* = vertical.

scarf cloud  Thin cirrus draping summit or anvil of Cb.

scarfed  Cut off at an oblique angle; hence * joint, inlet, nozzle etc.

Scarff ring  Standard British cockpit mount for hand-aimed machine gun 1917-40 with ring-mounted elevating U-frame.

scarf joint  Structural joint, invariably in wood, in which mating members are given flat taper to give large glued/pinned area.

carving  Increasing coefficient of friction of airfield surface by cutting shallow grooves, simultaneously removing rubber and other unwanted residues.

Scarlet  Solar concentrator array with refractive linear element technology.

Scared  Syndicat des Constructeurs d’Appareils Radio-récepteurs et Téléviseurs (F).

scar weight  Weight penalty remaining [from brackets, cables etc] when mission-specific features are removed.

SCAS  Stability and control augmentation system.

Scat, SCAT 1 Supersonic civil air transport.

2 Space communications and training.

3 Scout/attack helicopter.

4 Speed command of attitude and thrust.

5 Special-category [or single-contractor] aviation training.

6 Security control of air traffic; ANA adds and air navigation plan, ER adds and EM radiation (US DoD, 1952).

7 Satellite control of air traffic [oil rigs].

Scatana  Security control of air traffic and air-navigation aids; special provisions and instructions in time of defence emergency (FAA).

ScATCC  Scottish and Oceanic ATC Centre (Prestwick).

Scatha, SCATHA  Spacecraft charging at high altitude(s).

Scat-I  Special-category I, capability for Cat.I landings provided by SLS to all runways within radius of [usually] 30 nm, 56 km.

scatter 1 Distribution, either ordered or, more usually, random of measured values about mean point (eg of 1,000 measurements of wing span of similar type aircraft).

2 Distribution of impact points of projectiles aimed at same target.

3 See scattering.

scattered cloud  Seldom used; cloud amount reported only in octas, see SCT (1).

scattering 1 Diffusion of radiation in all directions caused by small particulate matter in atmosphere; effect varies according to ratio between wavelength and particle size; when this exceeds about 10 Rayleigh scattering occurs (see back-*; tropospheric -). 2 Trajectory changes of sub-atomic particles caused by collisions of various interactions; can be elastic or (if there is energy transfer) inelastic.

scattering loss  That part of transmission loss due to scattering (1) or to target’s rough surface.

scattering power  Ratio of total radar power scattered by target to total power received at target; also called scattering cross-section.

scatterometer  Carried by satellite or aircraft to measure light reflected from ocean surface to give information on local wind.

scatter point  Geographic point where race competitors cease to be constrained to narrow take-off corridor.

scatter propagation  See back-scatter, tropospheric scatter.

scatter tolerance  That allowed on dimensions of die forging, often measured at random locations.

scatter weapon  One releasing or dispensing many bomblets or mines.
**Spherical convergent flap nozzle.**

scheduled service

inspections and overhauls or timetabled civil flights.

1 schedule

scheduled speed

payload run to timetable.

SCDU

SCDL

Surveillance and control data-link.

SCDDS

Software cost-driver attribute.

SCDA

1

SCF

Elegant astronomical camera/telescope with objective in form of thin plate of glass and rear concave spherical mirror focusing on curved film. Objective plate has one surface figured (thicker and convex at centre, thin and concave around periphery) to correct mirror’s aberration, its own chromatic aberration being slight because of small thickness.

Schmidt duct

Pioneer flap-valve pulsejet.

Schmidt number

\[ Sc = \frac{\mu}{\rho D_1^2} \]

where \( \mu \) is viscosity, \( \rho \) is density and \( D_1 \) diffusion coefficient; ratio of viscous and mass diffusivity, or kinematic viscosity divided by mass diffusivity.

Schottky defect

Atom missing from crystal lattice.

Schottky diode

Barrier-layer device based on rectification properties of contact between metal and semiconductor due to formation of barrier layer at point of contact.

Schottky effect

Small variation in electron current of thermionic valve caused by variation in anode voltage affecting work done by electrons in escaping.

schläger Musik

Oblique music = jazz, code name for night-fighter armament of upward-firing cannon (G, WW2).

Schuler pendulum

One whose length equals radius of Earth, and thus when carried in vehicle moving near Earth’s surface always indicates local vertical. In practice any pendulum having same period of approximately 84 min., achieved at particular relationship between e.g. and pivot, such that centre of rotation of pendulum is always at centre of Earth. Used in stable platforms of INS.

Schuler tuning

Adjusting period of Schuler pendulum so that its centre of rotation exactly corresponds with centre of Earth.

Schultz-Grunow Standard treatment for turbulent flow in viscous fluid at R from \( 10^5 \) to \( 10^{10} \).

Schwarm

Two Rottes, fighters in two loose pairs (G) arguably = finger four.
SCI

SCI 1 Smoke curtain installation, for laying smoke-screen.
2 Switched collector impedance.
3 Secure [or sensitive] compartmented information (DoD).
4 Scalable coherent interface.
5 Serial communication interface.
SCIA Spacecraft checkout and integration area.
SCID Software configuration index drawing.
SCIDA System co-ordinating installation design authority.
SCIDM Single-cord improved data modem.

science pilot Experienced researcher in a scientific discipline subsequently qualified as pilot, eg of Space Shuttle (NASA).
Scimitar System for countering interdiction missiles and target-acquisition radar[s].
cimitar wing One whose planform is curved; usually means same as crescent wing but has been applied to early wings curved across whole span with ‘sweep’ at tips and zero sweep at root.
Scindu Scintillation network decision aid (USAF space command).

scintillation 1 See glint (radar).
2 Rapid and random variation in appearance of small light source viewed through atmosphere, esp. variation in luminance.
3 Brief light emission by single event (eg impingement on phosphor) (see * counter).

scintillation counter Instrument for measuring alpha, beta or gamma radiation by counting scintillations (3); also called scintillator or scintillating counter.

scintillation spectrometer Scintillation counter plus pulse-height analyser for radiation energy distribution.

scintimeter Photoelectric photometer for measurement of wind speed near tropopause by various Schlieren-type measures of stellar scintillation. Also called scintillation meter.

SCIP Secure communications interoperability protocol.

SCIRP Semiconductor IR photography.

SCISE Self-contained in-seat entertainment.

scissors Any flight manoeuvre made by coarse rudder at low airspeed. See scissors.

scissors lift Platform mounted on two pairs of pivoted arms giving true vertical motion without any tilt. Hence, scissors jack, scissors drive.

scissors Flight manoeuvre performed by two or more pairs of aircraft crossing at angle like two halves of *, basically a series of turn reversals intended to make following enemy overshoot.

scissors wing Wing made as single plane from tip to tip pivoted to fuselage at mid-point; usually synonymous with slew wing.

SCIU Code for radio-altitude indicator or reading.
SCJ Shaped-charge jet.

SCL Space-charge limited (C adds ‘current’).

sclerometer Hand instrument measuring hardness by load needed to make scratch of standard depth with diamond point rotated along arc.
scleroscope Hand instrument measuring hardness by rebound height of hard-tipped (steel or diamond depending on pattern) rod-hammer dropped inside tube from standard height on to surface. Common commercial model is Shore *.

SCM 1 Single-crystal material (or metal).
2 Single-chip microprocessor.
3 Software configuration management.
4 Spoiler control module.
5 Surface contamination module.
6 Silicon carbide monofilament.
7 Self-contained munition.
8 Supply-chain management.
9 Subsidies and countervailing measures.

SCMR 1 Surface-composition mapping radiometer.
2 Surface-combatant maritime rotorcraft (UK RN).

SCN 1 Specification change notice.
2 Satellite control network.
3 Self-contained navigation [S adds system, U adds unit].

SCNS See above.

SCO 1 Sub-carrier oscillator.
2 Scramble Cancellation Order.
3 Slow cook-off (ammunition).

SCONE Simple checkout program (language).

SCOPE Spacecraft operational-performance evaluation.

scope 1 Electronic display, esp. one supplying output of radar (colloq.).
2 Generalized term for optical viewing instrument, eg microscope, CRT, etc (colloq., vague).
3 According to Webster, distance within which missile carries; unknown in aerospace.

Scope Command From 2002 the replacement for all previous h.f. ground communications (USAF).

scopodromic Headed in direction of target.

Score 1 Signal communications by orbital relay experiment, or equipment.
2 Stratified-charge omnivorous [ie, multifuel] rotary engine.
3 Supplier cost-reduction effort.

Score defect Damage caused by movement of penetrative item across softer surface.

scoring Apart from normal use (eg in military exercises), the process by which a customer numerically evaluates bidders’ proposals.

SCORM Shareable content object reference model.

Scot Satellite-communications on-board (ship) terminal.

scotopic Vision with retinal rods associated with extremely low light intensity and detection of gross movement.

Scott Single-channel objective tactical terminal.

scout Single-seat aircraft, armed for air combat, operating in patrol or reconnaissance role (WW1).

SCP 1 Spherical candlepower.
2 System-concept paper.
3 Single-card processing.
4 Spacecraft control processor.
5 Supersonic camera pod (RAAF).
6 Security Co-operation Participant.

SCPC Single channel per carrier [or single carrier per channel] alternative to TDMA; mobile ISDN.

SCPI Supersonic-cruise propulsion integration.
SCPL

SCPL Senior commercial pilot’s licence (no longer issued).

SCPS Space communications protocol standard(s) (DoD, NASA).

SCR Suite central processing unit.

SCR J Silicon-controlled rectifier.

J Signal/clutter ratio.

J Stratified-charge rotary (engine).

J Single-channel radio.

SCR J Single-channel radio access.

2 See SCRJA.

Scramble Take off as quickly as possible (usually followed by course and altitude instructions) (DoD). Any urgent call for military (usually combat) aircraft to take off and leave vicinity of base, either as training manoeuvre or for sudden operational reason.

2 To attempt to provide telecom security by rendering transmission unintelligible to third parties (ie by scrambling), eg by speech inversion.

Scramble Cancellation Order Vital order countermanding an attack with NW.

scrambled egg Gilt rim round peak of Service-dress cap of group captain and Air Ranks (RAF, colloq.).

scramble pan Dispersal from which fighter can make immediate takeoff.

scramjet Supersonic-combustion ramjet; one in which flow through combustor itself is still supersonic.

Scram/Lace Supersonic combustion ramjet, liquid air cycle engine (NASA).

scrap 1 Workpiece containing defect, even trivial, sufficient to cause it to fail an inspection.

J Residue of (2) other than produce or salvaged items.

scaper ring Spring piston-ring with sharp-angled lower periphery for removing oil from cylinder wall.

J Middle ring on squadron-leader badge of rank (RAF, colloq.).

scrap view Small inset showing detail (eg item from different viewpoint or in different configuration) added where room permits on main drawing.

scratchbuilt Replica of historic aircraft containing no authentic parts.

SC/RC Stratified-charge rotating-combustion engine.

SCRE Syndicat des Constructeurs de Relais Electriques (F).

screaming Undefined term descriptive of high-frequency combustion instability in rocket characterized by high-pitched noise (see screecching).

screecching Undefined term describing high-frequency combustion instability in rocket or afterburner characterized by harsh, shrill noise more irregular than screaming.

screeding Levelling and smoothing resin adhesive in bonding operation; hence * tool.

screen 1 Imaginary obstruction having form of level-top wall normal to flightpath which aeroplane would just clear on takeoff or landing with landing gear extended and wings level.

J Arrangement of ships, submarines and aircraft for protection of ship(s) against attack (DoD).

J Wire-mesh gauze or sieve (ASCC).

Electrically conducting or magnetically permeable enclosure which shields either contents or exterior against unwanted magnetic/electrical fields.

5 Face of electronic display, eg CRT, TV, projection system, etc.

screen burn See ion burn.

screen captain Senior training or supervisory pilot in role of examiner. May be employee of certification authority.

screened Provided with screen (4), thus * ignition has enveloping earthed conductive covering to prevent escape of R/F interference.

screened born Balance surface entirely downstream of fixed surface.

screened pair Twin electric cable incorporating earthed screen (4).

screener Airport X-ray machine, or person assigned to probe baggage.

screen filter Fluid filter whose element is a fine metal mesh screen.

screen grid Screen (3) between anode and control grid in thermionic valve to reduce electrostatic influence of anode.

screen height Height above ground of top of screen (1), normally 35 ft (10.67 m), occasionally 10 m and rarely 50 ft, on takeoff; on landing usually 30 ft (often interpreted as 10 m). Depends upon aircraft performance group and particular case considered.

screening Meanings include: 1 Examining candidate as fit to handle classified information. 2 Airport security examination of passengers and baggage. 3 Screen (4).

screen navigator Carried in navigator training aircraft to ensure safe return despite pupil errors.

screen speed Speed at moment aeroplane passes over screen (see screen height), either assumed or as target value, on takeoff or landing. Does not have V-suffix abbreviation.

screw Generalized term for threaded connector rotated into workpiece and not held by nut; many quick-fasteners have *-thread and no sharp dividing line is possible.

screw gauge Hand instrument for measuring major diameter of screw, typically by graduated line scales forming small-angle notch.

screwjack Actuator having rotary input and linear output obtained by screwthread, often with interposed recirculating balls.

screw pitch gauge Hand instrument for checking thread on metalworking screw or bolt, usually with selection of blades each having one ‘threaded’ edge.

SCRIA Supply-chain relationships in aerospace.

scrieve board Portable board on which lofting lines are recorded either by scribing or some other undeformable method. Often used with locating blocks for actually assembling flight hardware, eg frames, thus becoming a jig. Becoming obsolete.

SCRJ Supersonic combustion ramjet.

scroll Any curved duct or guidance channel, especially leading air out of centrifugal compressor or cooling air across face of turbine disc.

SCRT Single-channel receiver/transponder.

scrub 1 To abandon project, esp. a planned flight or military mission.

2 To eliminate a pupil from course of instruction, following failure of * check.
scrubbing

scrubbing 1 Lateral sliding of landing-gear tyre on hard pavement, eg of inner bogie wheels in sharp turn.
2 Significant contact between tips of rotating members, esp. blades, in gas turbine and casing; also called rubbing.
3 Rapid wear in piston engine caused by detonation.

scrubbing torque limit Maximum permitted torque imposed on landing-gear leg by scrubbing (1), which usually determines limit of steering angle of nose gear, and hence minimum turn radius.

scrub check Last-chance assessment of pupil pilot by senior instructor (usually CFI).

SCS 1 Stabilization control system.
2 Speed control system.
3 Sea control ship.
4 Survivable control system.
5 Single-crystal sapphire (IR domes).
7 Signal Corps Set 51, original form of ILS.
8 Strategic conventional standoff capability.
9 Single-channel simplex.
10 Slaved compass system.
11 Space Control Squadron.
12 Software configuration set.

SCSC 1 Strategic conventional standoff capability.

SCS-51 1 Signal Corps Set 51.

SCSI 1 Small computer system[s] interface.
2 Simulation Computer Society International [AC adds Advisory Council].
3 Single-card serial interface.

SCT 1 Scattered cloud, also SCTD, CAA = 3 to 4 oktas, ICAO = 14 to 4, FAA = 0.1-0.5.
2 Scanning telescope (NASA).
3 Surface-charge transistor.
4 Single-channel transponder.
5 Staff continuation training (CAA).
6 Seat and canopy trainer.

SCSF 1 Standing Contingency Task Force (Canada 2006-).

SCTI 1 Service Centrale des Télécommunications et de l'Informatique (F).

SCTR 1 Sector.

SCTV/GDHS 1 Spacecraft TV ground data-handling system.

SC21 1 21st-century supply chain [numerous members] (UK).

SCU 1 Signal conditioning unit.
2 Signal converter unit (satcoms).
3 System[s], switching, stores, sensor, station, supplemental, or secondary control unit.
4 Satellite communications unit.

SCUC 1 Satellite Communications Users Conference (Int.).

Scud 1 Subsonic-cruise unarmed decoy.

scud 1 Shredded or fragmentary cloud, typically Fs, moving with apparent greater speed below solid layer of higher cloud.

scuff plate 1 Protects airframe against impacts from GSE.

scupper 1 Fuel-tight recess around gravity filler, usually with its own drain.

scuttle 1 Hatch in top of fuselage (US usage).

SCV 1 Sub-clutter visibility.

SDF 1 Single degree of freedom.
2 Standardized cross-validated; R adds residual.

seuzzy 1 Small computer system[s] interface [colloq.].

SCWA 1 Single-channel wire access.

SCWG 1 Satellite communications working group.

SD 1 Shaft delivery, ie rotary output.
2 Shipping document.
3 Structured design (software).
4 Service dress (RAF).
5 Specification detail.
6 System, or situation, display, or device.
7 Storm detection (NWS, ARTCC).
8 Side display.
9 Service deviation, or Standard deviation.
10 Self-destruct, or destroying.
11 Radar weather report (ICAO).
12 Surveillance drone.
13 Sympathetic detonation.

SD/D 1 Synchro to digital.

SDS 1 Distance between centres of ground-contact areas of diagonally-opposite wheels of a bogie.
2 Propeller [usually not helicopter rotor] dise area.

SDF 1 Source data automation system[s].
2 Satellite-data acquisition subsystem.

SDAT 1 Sector design and analysis tool (ATC).
2 Silicon-diode array target.

SDAU 1 Safety Data and Analysis Unit (CAA, UK).

SDB 1 Small-diameter bomb.
2 Small disadvantaged business.

SDBY 1 Standby (ICAO).

SDC 1 Synchro-to-digitizer converter.
2 Signal data converter, or computer.
3 Space Defense Center (Colorado Springs, USAF).
4 System data capture.
5 Shuttle Data Center.
6 Satellite data communications; S adds system.
7 Shaft-driven compressor.
8 Supersonic-dash capability.
9 Strategic Defense Command (USAF).
10 Situation-display console.

SDD 1 Standard disk drive.
2 System design and development.
3 System development and demonstration [now SD&D].

SDM 1 SecDef decision memorandum (US).

SDE 1 Spatial-database engine.
2 Software development environment[s].
3 Scatter detection enhancement.

SDF 1 Single degree of freedom.
2 Simplified directional facility (FAA).
3 Self-destruct fuze.
4 Stepdown fix.
5 Strategic deterrent forces [previously RVSN] (R).
**SDFOV**

- Special Duties Flight [unit] (RAF).
- SDFOV Simultaneous dual field of view.
- SDG Speed-decreasing gearbox.
- SDFI Strategic (sometimes rendered as Space) Defense Initiative (US); O adds Organization, P Program, PO Participation Office.
- SDFIR System discharge indicator.
- SDFIT Selective dissemination of information (telecommunications).
- SDJ Source destination identifier.
- SDK Strength deployment inventory.
- S-D&IF System development and integration facilities.
- SDI SDI Organization, or Office (US).
- SDIP SDI Program.
- SDIPO SDIP Office (UK).
- SDIS Small-diameter imaging seeker.
- SDL Software design laboratory.
- SDLCC Synchronous datalink controller.
- SDLF Shaft-driven lift fan.
- SDLLM Standard depot-level maintenance.
- SDL-PE Software design laboratory – protocol emulator.
- SDLV Shuttle-derivation launch vehicle.
- SDM Scatter-drop mine (or munition); helicopter weapon.
- SDMPJ System discharge information.
- SDMTE System discharge module.
- SDMTC System discharge terminal.
- SDMDI System discharge maintenance.
- SDMN System discharge monitoring.
- SDMS Strategic distribution management initiative (USTC/DLA).
- SDMS2 Software development maintenance system.
- SDMS3 Shipboard data-multiplex system.
- SDMS4 Support defense missile system.
- SDMS5 Sensor to decision-maker to shooter.
- SDNF System discrete note.
- SDNMI Strategic distribution management initiative.
- SDNRIU Sendirian Berhad (company constitution, Malaysia).
- SDNRU Secure digital net radio interface unit.
- SDO Service digital output.
- SDOE Standards Development Organization (SAE).
- SDFOF Single degree of freedom.
- SDFOM Six degrees of motion (simulator).
- SDFOP System-definition phase.
- SDFOS Service digital output.
- SDFP Surveillance data processing.
- SDFPS Surveillance data-processing and distribution system(s).
- SDPR Federal directorate of supply and procurement (Jugoslavia).
- SDPUS Sensor-data processor unit.
- SDR System design report, or review, or responsibility.
- SDRP Service difficulty report, or reporting.
- SDRR System design report.

**SEAD**

- SEAD Special drawing rights; assist airlines in inter-line fare transactions.
- SEAD System development requirement.
- SEAD Strategic Defence Review (UK).
- SEAD Supplier data requirements [L adds list].
- SEAD Software-defined radio.
- SEAD Signal-to-distortion ratio.
- SEAD Synchronous dynamic RAM.
- SEAD Subcontract, or supplier, data requirements list.
- SEAD Splash-detection radar system.
- SEAD Software development system.
- SEAD Satellite, or secondary, data system.
- SEAD Strategic defense system (US, SDI).
- SEAD Small digital switch.
- SEAD Short-distance sensor.
- SEAD Situation display, secondary.
- SEAD Self-defense surface missile system.
- SEAD System development tool.
- SEAD Shock/detonation transition.
- SEAD Systemé de drones tactiques intérieurs (F).
- SEAD Selective decode unit (SSR).
- SEAD Safety data unit (CAA).
- SEAD System design utility.
- SEAD Satellite, or satcom, or Service, data unit.
- SEAD Smart, or sensor, display unit.
- SEAD Signal [ATC] distribution unit.
- SEAD Secure-data unit (JTIDS).
- SEAD System demonstration validation program(me).
- SEAD Symmetrical double-wedge aerofoil.
- SEAD Support equipment.
- SEAD Systems, or safety, or sustaining, engineering.
- SEAD Servicing echelon.
- SEAD Snow ended.
- SEAD Storage element.
- SEAD Synthetic environment.
- SEAD Synthetic[ally] enhanced.
- SEAD Strip examination.
- SEAD Single-engine[d].
- SEAD Selenium.
- SEAD Software engineering environment.
- SEAD Single-engine asymmetry.
- SEAD Stored-energy actuator.
- SEAD Software engineering architecture.
- SEAD South-East Asia region (ICAO).
- SEAD Statistical energy analysis.
- SEAD Group trained and equipped for unconventional and paramilitary operations including surveillance/reconnaissance in and from restricted waters, rivers and coastal areas (DoD).
- SEAD Sea airborne lead line, UAVs for naval perimeter defence (USN).
- SEAD Anchor for marine aircraft in deep water, typically canvas or rubberized-fabric bucket or drogue trailed from stern.
- SEAD Construction Battalion (USN).
- SEAD See water bias.
- SEAD Onshore wind during day.
- SEAD Support-Equipment Advisory Committee (inter-airline).
- SEAD South-East Asia Command (WW2).
- SEAD Suppression of enemy air defence(s).
sea disturbance

Sea disturbance

Sea disturbance See sea state.

sea disturbance

Floating aerodrome for refuelling transoceanic aeroplanes [unrealised idea 1931–39].

Seaface Systems engineering avionics facility.

sea fog

Fog over sea usually caused by moist air over cold water.

SEAGA Selective employment of ground and air alert (SAC).

Seaigull EDP for flight simulators using distributed computers linked by reflective-memory bus (Rediffusion/ Gould).

SEAL Sea/air/land.

sea lane

Area of water with fixed markers showing its use by marine aircraft.

sealant

Material tailored to particular duty of ensuring fluid-tight [liquid or gas] seal between mating materials often applied as continuous layer, eg inside integral tank.

Sealdrum Portable, collapsible rubber container for POL, water and other liquids (US Royal).

sealed

Officially closed, eg by lock wire with lead seal, until completion of particular flight or test programme.

sealed-balance control

Flight-control surface whose gap between the leading edge [ahead of the hinge] and the fixed surface is made airtight by flexible strip.

sea level

1 Actual height of sea surface, used as local height reference.

2 More often, height corresponding to pressure of 1,013.25 mb.

3 In UK, referred to mean high-water at Newlyn, Cornwall.

sea-level corrections

See STP (1).

seam

1 Joint in fabric, eg overlap or three fell-types.

2 Unwanted flaw in deep-drawn metal tubing.

sea marker

Anything dropped on sea to provide visible indication of drift.

sea-motion corrector

See sea-surface correction.

seam weld

Continuous, hopefully pressure-tight, weld made by roll electrodes; in theory can be accomplished by close repeated spot welding or by hand process, but unusual.

SEANC South-East Asia Notam centre.

SE&I Systems engineering and integration.

Seacap Sea-activated parachute automatic crew release.

seaplane

1 Float seaplane, marine aircraft having one, two or [rarely] more separate floats and conventional fuselage (UK).

2 Marine aircraft of any fixed-wing powered type (US).

seaplane basin

1 See towing tank.

2 Some dictionaries define this as a place having sheltered water for seaplanes.

seaplane marker

Buoyant or bottom-fixed marker at marine aerodrome, also called taxi-channel marker.

seaplane rating

Endorsement on licence qualifying holder to fly or maintain seaplanes.

seaplane tank

See pitching tank, towing tank.

seaplane trim

Angle between mean water surface and aircraft longitudinal axis or other reference when parked on water.

sear

Generalized term for catch, pawl or other latching device which holds breechblock or bolt of gun at open position.

sea rating

See sea state.

search

1 Systematic reconnaissance of defined area such that all parts pass within visibility.

2 DME mode: emit interrogation pulse pair and scans whole operating area for reply.

search and rescue facility

One responsible for maintaining search and rescue service for persons and property in distress.

search jammer

Automatic jammer.

searchlight

Any powerful directional surface light for illumination of cloudbase or other aerial objects.

searchlight scanning

Sector scanning (see scan types).

search mission

Air reconnaissance to search for specific surface object(s).

search radar

Vague; generally means surveillance radar operating in search mode, and often applied to weather radar.

search rate

Reciprocal of average time to search one PN chip-width, ie chips/ (ECM).

sea return

See clutter.

Sears' function $S(k_\lambda)$, deals with a helicopter rotor traversing a sinusoidal gust field, encounter frequency $k_\lambda = \lambda \nu_0$, where $\lambda_0$ is gust wavelength.

Sears-Haack Profile of body having minimum supersonic drag, normally body of revolution having pointed ends and fineness ratio appropriate to Mach number; complicated by addition of aerfoils.

SEARW Single-engine advanced rotary wing.

seasat

Generalized name for oceanographic satellite.

sea smoke

See steaming fog.

sea state

Condition of sea surface as related to standard list of reference conditions, invariably Beaufort scale.

sea-surface correction

Electronically applied correction to Doppler output to remove false velocities due to motions of waves.

SEAT 1 Site-equipment acceptance test.

2 Status evaluation and test.

Seat Single-engine air tanker (USFS).

seat belt

Single quick-release belt across bottom of torso for passenger.

seat harness

Arrangement of four or five adjustable straps keeping occupant in place in violent manoeuvres [military or aerobatic aircraft].


seat pack

Parachute pack worn in such a way that it forms seat cushion.

seat selection

Offering customer for particular commercial flight right to select seat from those remaining, subsequently shown on boarding pass.

seat-type parachute

One with seat pack.

SEB 1 Staphylococcus enterotoxin B, BW agent.

2 System[s] electronics box.

Sebass Spatially enhanced broadband Army spectrographic system (USA).

SEBRW Single-engine basic rotary wing.

SEC 1 Secondary emission cathode.

2 Secondary-electron conduction.

3 Securities and Exchange Commission (US).

4 Secondary (NASA).

5 Spoiler and elevator computer.


7 Special-event charter.

8 Section, or sectional aeronautical chart.

9 Sector.

10 Survivable engine control.

11 Software-enabled control (AFRL-Darpa).
second segment

1. Second segment (contrary to SI but still ICAO).
2. Secondary.

Secondary controls See secondary flight controls.
Secondary display See secondary.
Secondary electron emission Flow of electrons from metal surface under bombardment by high-energy electrons or protons.
Secondary explosion Explosion at surface target caused by air attack but additional to explosions of air-dropped ordnance.
Secondary airflow Airflow through fan which does not pass through engine core.
Secondary flight controls Those used intermittently to change lift or speed but not trajectory; eg flaps, slats, Krügers, airbrakes, droops and, except in DLC, spoilers.
Secondary frequency Assigned to an aircraft as standby in air/ground.
Secondary front One formed within an air mass.
Secondary glider Not defined, but training glider more advanced than primary and with enclosed cockpit. Generally any glider intermediate between primary and Standard Class sailplane.
Secondary great circle See meridian.
Secondary heat-exchanger That which rejects heat to atmosphere from secondary circuit heated by primary heat-exchanger.
Secondary holes Those admitting secondary air to combustor.
Secondary instruments Those giving information unconnected with gross flight trajectory, ie not a primary flight instrument.
3. Those whose calibration is determined by comparison with an absolute instrument.
Secondary members See secondary structure.
Secondary modulus Modulus of elasticity for composite of other two-component material (esp. two-metal components) beyond point at which weaker material yields.
Secondary nozzle Annular nozzle surrounding primary nozzle of jet engine through which may pass cooling airflow, inlet excess and various other flows around engine.
Secondary power system Mechanical power system on board aircraft other than main engines, eg shaft-driven accessories, gearboxes, gas-turbine starter, APU, EPU or MPEU; inter-engine cross-shafting and major bleed ducting with air-turbine drives if fitted.
Secondary radar Radar in which interrogatory pulse is sent to distant transponder which is triggered to send back a different pulse code to originator. Examples are airborne DME triggering ground DME facility and ground SSR triggering airborne transponder.
Secondary radiation Usually synonymous with secondary emission.
Secondary stall Rotating stall [engine].
Secondary stress That resulting from deflection under load, eg of end-loaded column in bending.
Secondary structure Structural parts of airframe whose failure does not immediately imperil continued safe flight.
Secondary surveillance radar Ground radar which interrogates air traffic with identifiable codes of pulses, triggers distinctive response from each target, extracts plots and assigns identity to each, normally presented as flight number, altitude and other information beside target on radar display [Mode A provides coded target identity, C altitude and S selective interrogation]. Aerial normally slaved in azimuth to main surveillance (primary) radar and may be on-mounted.
Secondary winding That of transformer, magneto or other electrical device from which output is supplied.
Secondary buy See option (1); originally Lockheed term for option with paid deposit.
Secondary day In all-out war, assumption that enemy’s long-range air defences are destroyed.
Secondary dicky Co-pilot (UK, colloq.).
Secondary-line servicing That carried out over planned period when aircraft is out of line service, sometimes at special off-base facility.
Secondary moment of area Moment of inertia of a structural section whose mass is unity; SI m^2 = 115.86183 ft^4, cm^2 = 0.024025 in^4.
Secondary pilot 1. Person designated as second pilot in flight crew to assist PIC; in commercial crew usually has rank of First Officer. In ASCC definition: not necessarily qualified on type.
2. Unofficial term for passenger who has completed short [usually 8–10h] flying course to enable him or her to land light [\leq12,500lb] aircraft following incapacitation of pilot.
Secondary segment Second segment of normal takeoff for large or advanced aeroplanes beginning at gear retraction at V_2 and maintaining this speed in climb to top of climb at end of segment when aircraft is levelled out, or
second source
climbed less steeply, to accelerate to FUSS or for power cutback in noise-abatement procedure, which see.

second source Manufacturer assigned by government to augment output of major hardware item, eg aircraft or missile, with assistance of original design company, which remains in production as first source; no royalty is normally payable, and ** has no commercial rights to design, nor permission to sell to third party.

second strike Strategic attack with NW mounted after enemy's nuclear attack has taken place; objective of hardening is to confer a ** capability. DoD: 'The first counterblow of a war; generally associated with nuclear operations'.

second throat That downstream of working section and upstream of exhaust diffuser in simple blow-down supersonic tunnel. In operation traversed by weak normal shock.

second-trace return Caused by large echoing target outside range scale.

second-user aircraft Also called pre-owned or second-hand.

Secop Single-engine climb-out procedure.

Secor Sequential collation of range. Usually * /DME, which collates range with distance derived from DME. A basic technique in global mapping with geodesic satellites.

Secretress GA stewardess also serving as office secretary in flight.

SECS Sequential-events control system.

SECT, Sect Simulator for electronic-combat training.

Sect Sector.

section 1 Cross-section.

2 Major portion of airframe, eg nose*, tail*, but becomes dangerously ambiguous with wing*, body* when meaning normally (1).

3 Small subdivision of military air unit, normally (DoD) two combat aircraft; in 1915–18 four or five; US in Korea, four.

4 Raw material rolled or extruded to standard (often complex) cross-section, as distinct from sheet, billets or strip.

5 Major subdivision of missile or rocket vehicle, eg guidance*.

6 Subdivision into similar parts, eg six sections of slate.

sectional Noun, VFR navigation chart, equivalent to ICAO 'half-million' (US).

section modulus Moment of inertia of structural member divided by perpendicular distance from neutral axis to outermost surface of section, ie most highly stressed fibre.

sector 1 Subdivision of air-defence frontier.

2 Limited range of azimuth, eg through which radar may scan (see * under scan types).

3 Subdivision of airspace by radio range characterized by letter A or N, also called quadrant.

4 Portion of commercial route between two traffic points.

sector controller Air-defence controller in charge of sector (1).

sector display See scan types.

sector distance Length of air route sector (4).

sector fuel That allowed for in flightplan for one sector (4).

sector management tool Software providing a traffic-management unit with ability to maintain sector integrity through use of ground delays.

sector scan See scan types.

sector temperature/wind Those met values assumed in flight-planning one sector (4).

sector time In commercial operation, scheduled or actual time for sector (4).

sector visibility Within particular sector (2) of horizon seen from tower.

SECU Spoiler[s] electronic control unit.

secular Having a very long time period, eg a century or more.

secure Proof against interference by enemy and esp. against information content of signals being deciphered by enemy. Various shades of meaning, eg * air refuelling is one beyond enemy radar range in which all communication is by lamp.

Secure Flight Computerised passenger pre-screening system, replacing Capps II (TSA).

Security Over 20 terms relating this topic to aerospace all appear to be self-explanatory.

SED 1 Safe escape distance; minimum radius from airbase at which aircraft tail-on is assumed safe against hostile NW with GZ at airbase.

2 Scanning electron diffraction.

3 Sensor evolutionary development.

4 Systems engineering documentation.

5 Secondary Eicas display.

6 Society of Engineering Designers (UK).

7 Scramjet engine demonstrator.

8 Strategic economic development (US).

SEDF Surface-emitting distributed feedback.

SEDIS, Sedis Surface-emitter detection identification system (ESM).

Sedris Synthetic-environment data representation [and] interchange specification.

Seds Students for the Exploitation and Development of Space (Int.).

SEE 1 Society of Environmental Engineers (UK).

2 Secondary electron emission.

3 Single-event effect.

4 Software engineering environment.

see and avoid Basic onus on pilots in VMC to maintain lookout.

Seebeck effect Generation of EMF or current by dissimilar metals in circuit with junctions at different temperatures (see Peltier).

seeding 1 Aerial dispensing, at controlled rate per unit time or unit distance, of ECM payload such as chaff, flare pellets or other dispersed medium including aerosols. Hence * rate, * distance.

2 Aerial dispensing, at controlled rate per unit time, of condensation nuclei such as crystals of silver iodide or dry ice (solid CO2) to trigger precipitation in rainmaking.

seeing 1 Colloq. ually used to mean ability of radar to reach highly reflective part[s] of target.

2 Quality of observability (astronomy).

seeker Device able to sense radiation from target, lock-on and steer towards it, using radar (active or semi-active), optics (usually passive), laser or IR; rarely other methods. Normal sensor for terminal guidance of missiles and other guided ordnance.

Seem Side-emitting electronic manifold [radar].

Seenot Air/sea rescue, prefix to longer words (G).
see-saw rotor

See teetering.

Self-bias

Selected track In traditional US-style airways structure, link route off-airways authorized to particular flight equipped with R-nav. Where R-nav systems (eg Decca) in use for decades term has little meaning because commercial and IFR pilots are not confined to airways and VOR radials.

Selective address See selective interrogation.

Selective availability Management of the GPS by the US DoD so that civilian receivers cannot have access to the [22-m, 72-f] accuracy of P(Y).

Selective calling System enabling ground controller to call a single aircraft, usually long-haul oceanic airline or bizjet, without the crew having to listen out on that frequency or any other aircraft being bothered. Selcal code for each aircraft is four-letter code using letters A through M, triggering light or loudspeaker. Airborne decoder usually accepts inputs from VHF or HF. See Adsel, DABS.

Selective fading Distortion of signal caused by variation in ionospheric density which causes fading that varies with frequency.

Selective feathering Manual feathering using selector to pick out correct propeller.

Selective fit Non-standard and rare engineering fit selected by hand to achieve desired mating of parts.

Selective identification facility (or feature), SIF Airborne pulse-type transponder which provides automatic selective identification of aircraft in which installed (NATO); early form of selective interrogation used with Mk X ATCRBS.

Selective interrogation With automated ATC systems, once aircraft acquired by computer, interrogation necessary only as radar scans exact sector containing that aircraft; if each transponder has its own (discrete) address code, computer can order interrogation on that code in particular sector, so transponders reply only when selected, number of replies cut by perhaps 99% and interference negligible (saturation avoided); two current systems are Adsel (UK) and Dabs (US).

Selective loading Arranging cargo load to facilitate unloading in desired sequence.

Selective pitch Early term for variable pitch.

Selectivity Measure of ability of radio receiver to discriminate between wanted signal and interference signals on adjacent frequencies.

Selector Manual demand input offering choice, eg * may offer four or more fluid-flow positions, flap * may offer four or more settings, while landing-gear * normally offers only two.

Selenium Se, non-metallic crystalline element, density 4.8, MPt 217°C, high electrical resistance except when illuminated, thus used in photocells, resistance bridges and, with semiconductor properties, in rectifiers.

Seleno- Prefix, of the Moon: hence *-centric orbit, *-id (lunar satellite), *-logy (study of Moon).

Self Entry in a personal flying log book meaning the book’s owner; can be written in capitals.

Self-aligning bearing Ball (occasionally other forms) bearing with outer race having part-spheroidal track allowing variation in shaft attitude.

Self-bias See automatic grid bias.
**self-contained night attack**

**self-contained night attack** Capability of single aircraft navigating by night to acquire and strike designated point target and return to base (USAF omits word ‘point’).

**self-destruct** Ability of missile, RPV or similar air vehicle to explode into harmless fragments at particular time or geographical location.

**self-erecting** Of gyro, capable of erecting automatically after being toppled or started from rest.

**self-exiting** Generator’s own current supplies magnet coils.

**self-forging fragment** Warhead which punches through thin top armour of AFVs; transverse disc of explosive converts disc of dense metal ahead of it into streamlined globule moving at over 9,000 ft (2,750 m)/s, its impact energy exceeding shear strength of armour.

**self-generated multipath effect** Multipath radio/radar problems caused by change in aircraft configuration, eg carriage of large stores.

**self-guided missile** One guided by means other than command.

**self-indexing** Automatically moving to the next operating position; thus a * cartridge starter automatically readies the next cartridge.

**self-induced vibration** Caused by internal conversion of non-oscillatory to oscillatory excitation; also called self-excited vibration.

**self-induced wing rock** Sustained roll, with little or no yaw, in flight at high AOA by slender delta or aircraft with wing of low aspect ratio, caused by asymmetric shedding of LE vortices.

**self-inductance** Ratio of magnetic flux linking circuit to flux-producing current, ie m.f. fed in unit rate of change of current; symbol L, unit henry, also webers per ampere; analogous to inertia in mechanical system.

**self-maneuvering stand** Airport apron arranged so that gate parking and departure are accomplished by aircraft taxiing under own power. Normally nose-in parking avoided, and gate parking is accomplished with fuselage approximately parallel to adjacent wall of finger or terminal.

**self-noise** Internally generated noise within system, esp. within sonar.

**Selfoc** Sheet electric-light focusing; patented (Nippon). Each of three 120° coils driving central coil carrying indicator compass indication to cockpit; fluxvalve current fed to SEM-E.

**self-propulsion** Having inbuilt ability automatically to adjust itself to best possible condition (eg operative channels, gain, feedback, power management) following any malfunction or damage.

**self-rescue system** Patented (Bell Aerospace) jet-propelled foldable parawing to enable aircraft to eject and fly to friendly area.

**self-sealing tank** Fluid, esp. hydrocarbon fuel, tank constructed with layer of soft vulcanized synthetic rubber sandwiched between main structural layers so that combat damage causes leak, bringing fuel into contact with rubber, which swells swiftly to block hole.

**self stall** Self-induced stall brought about by inherent tendency when near stalling AOA to pitch-up, eg by stall

**semi-armour-piercing**

well outboard on swept wing with root still lifting strongly, thus progressively increasing nose-up tendency.

**self-sustaining speed** Gas-turbine rpm [typically 35% maximum] at which, during start cycle, external cranking is no longer needed.

**self-test** Sequential test program performed by equipment (usually electronic) upon itself to determine whether it is operating correctly and which subsystems or circuits are faulty. In advanced form pinpoints each fault to particular device or PCB and stops.

**selint** Selective interrogation; not a particular system but technique.

**SELR** Switchable eyesafe laser ranger [or rangefinder]; D adds designator.

**SELS** 1 Severe local storm(s).

2 Single-engine land and sea.

**selscan** Selective-call scanning.

**selsyn** From self-synchronous, patented (US General Electric) synchronization system for transmitting remote compass indication to cockpit; fluxvalve current fed to three 120° coils driving central coil carrying indicator needle.

**selvedge** Woven edge of fabric from mill, does not unravel (US = selvage).

**SEM** 1 Scanning electron microscope, microscopy. 2 Space environment monitoring (or monitor).

**SEM-E** 1 Service engineered [in UK, engineering] modification.

2 Standard electronic [or system equipment] module.

3 Superconducting electrical machine (or machinery).

4 Society for Experimental Mechanics (US).

5 System engineering management.

6 Simple evaluation model.

**SEMA** 1 Special electronics mission aircraft (USAF).

2 Station engineering management aid (RAF, computerized maintenance management).

3 Smart electro-mechanical actuator.

4 Syndicat des Equipements et Matériels Aéronautiques (Paris).

**semaphore TVC** Thrust-vector control using oscillating blades pivoted to move across propulsive jet transversely and by partial blocking of flow path cause angular deflection.

**SEMC** Standard electronic-memory cartridge.

**SEM-E** Standard electronic module Format E.

**semi-active homing** Homing on to radiation reflected or scattered by target illuminated by radar forming part of system but mounted on fighter or surface platform, ie, not carried by the homing vehicle.

**semi-active landing gear** One in which the damping forces are controlled in response to the aircraft motion.

**semi-active missile** Missile whose guidance system includes a receiver only, to home on a target illuminated by a radar, laser, or other emitter located elsewhere.

**semi-angled deck** Carrier deck whose axis is at maximum diagonal angle permitted by original hull and deck without addition of large overhanging portion.

**semi-annual wing** Wing whose front elevation forms lower half of circle centred on fuselage or on each of two engine nacelles.

**semi-armour-piercing** Important category of gun-launched projectiles with AP properties conferred by high muzzle velocity and choice of materials but not relying entirely upon KE for penetration and with internal explosive charge. Some have added incendiary or tracer.
semi-automatic gun

semi-automatic gun  One which ejects spent case and reloads but fires only upon command; same as repetition of single-shot.

semi-automatic machine tool  Usually, one that must be commanded to begin cycle of operations but thereafter runs through that cycle to completion, thereafter awaiting next start order.

semi-cantilever  Not defined; loose term often meaning a braced cantilever, as in many light-plane wings.

semiconductor  is Italy, which divides 090° – 269°/270° – 089°. + 5] while 180°–359° have those in between. An exception 000°–179° have one set of assigned FLs [such as odd 10s + 5] while 180°–359° have those in between. An exception

semi-circular separation  System of allocating cruise height in Airways and >24,500 ft (7468 m) amsl outside controlled airspace in IFR (outside UK, in most European countries VFR also). Typically magnetic tracks 000°–179° have one set of assigned FLs [such as odd 10s + 5] while 180°–359° have those in between. An exception

semi-conductor  Electronic conductor whose room-temperature resistivity lies between that of metals and insulators (say, in range 10^–10^–10 ohm/cm) and which compared with metals has very few charge carriers, energy bands being full or empty (except for a few electrons or holes excited by heat in intrinsic * or provided by impurity doped in extrinsic *): n-type * has free-electron (negative) charge carriers and p-type has free-hole (positive) charge carriers.

semi-controlled mosaic  One made up of photographs on approximately same scale so arranged that major ground features match geographical co-ordinates.

semi-hardened  Given some protection against nuclear attack, eg buried in ground but without concrete, or enclosed in concrete but not buried; aircraft shelters in NATO are an example at bottom end of hardening scale.

semi-levered bogie  One whose rear bogie beam can be locked to the front half before takeoff to increase tail clearance on rotation. Sensing

semi-sonic blading  Rotor blading (normally of axial compressor or fan) in which tips are just supersonic.

semi-transparent photocathode  remainder continues with attached lifting flow.

semi-sonic theory  Approximate treatment for elastic structure in which only finite number of degrees of freedom are allowed, each with one fixed mode.

semi-transparent photodetector  Radiation, eg light, on one side produces photovoltaic emission on other.

SEMMSS  Solar electric multimission spacecraft.

SEMP  System(s) engineering management plan.

Sentai

Sentex  Plastic explosive, PETN plus syrene-butanediene copolymer.


Sentap  Signal emulation of navigation and landing [translation from Czech].

Sender  Self-navigating drone, expendable/recoverable (USN).

SENEAM  CAA (1) Mexico.

Sencel  Single-event noise exposure level (see noise).

Sengap  Small [jet] engine advanced program (Darpa).

Sengo  SENG0 Senior Engineering Officer (RAF).

senior pilot  Second-in-command of RN air squadron (UK).

sense aerial  Fixed vertical receiver aerial with output same as maximum obtained from D/F or ADF loop and in phase with loop only over 180° to resolve 180° ambiguity of basic radio D/F method.

sense indicator  Direct-reading to/from readout on VOR/ILS and similar panel instruments.

sensitive atmosphere  That part offering measurable aerodynamic resistance.

sensitive horizon  Circle of celestial sphere formed by its intersection with plane through eye of observer and perpendicular to local vertical.

testing  Removing ambiguity by sense aerial.

sensitive altimeter  Pressure (aneroid) instrument more accurate than simple altimeter with aneroid stack, corrective adjustments and three-needle or counter-pointer readout; not as accurate as servo-assisted.

sensitivity  Generalized term for output divided by input, eg instrument or system response per unit stimulus.

sensitivity-level command  Instruction to TCAS [any type] to control threat volume.

sensitivity time control, STC  Automatically reduces gain of weather radar as aircraft approaches cloud to avoid near clouds appearing brilliant and distant clouds faint; normally operates within radius of 45 km/25 nm.

Sensor  Sensor operator aboard ASW aircraft.

sensor  According to DoD: ‘A technical means to extend man’s senses; equipment which detects and indicates terrain configuration, presence of military targets, and other man-made and natural objects and activities by means of energy emitted or reflected by such objects; energy may be nuclear, EM (visible and invisible portions of spectrum), chemical, biological, thermal or mechanical, including sound, blast and vibration”. Definition could be even broader; any transducer converting an input stimulus into a usable output. It is suggested there are three classes:

1 Input device for detecting and measuring vehicle motion and air data.

2 Device for graphically illustrating a remote object.

3 Device for detecting and precisely locating a target.

SensorCraft  Concepts for high-altitude unmanned sensor platforms (USAF).

sensor-enabled seat  Passenger seat sensitive to occupant behaviour and seat-belt status.

sensor fusion  Automatic combination of outputs from different types of sensor into a single display.

Sentac  Senso (tactical).

Sentai  1 Division or flotilla comprising aircraft of one or (usually) two carriers (Japanese Navy, WW2).
sentence

2 Basic combat unit equivalent to UK wing or US group (Japan).

sentence In a repair and overhaul cycle, the crucial decision on each part: serviceable; repair and pool; or scrap and replace.

SEO Station Engineering Officer (RAF).

SEOS Stabilized electro-optical system.

SEP 1 Specific excess power.

2 Single-engine performance, or piston.

3 Separate, separation.

4 Safety and emergency procedures.

5 Strategic equity partner.

6 Single-event phenomenon.

7 Spherical-error probability.

8 Secondary electric power.

9 Solar-electric propulsion.

Sepak Suspension of expendable penaiads by kite.

separated flow Flow no longer attached to surface of immersed body.

separated lift Vortex lift.

separation 1 Breakdown of attached fluid flow round body into gross turbulence, occuring at particular time (stall) or place (* point); possible to have sustained equilibrium with attached (laminar or turbulent) flow upstream and complete * downstream.

2 Authorized lateral, longitudinal and vertical clearances (distances) between aircraft under positive control.

3 Severing of links between rocket stages or other fall-away sections, also called staging.

4 Time when (3) occurs.

5 Distance, along any axis or direction, between intercepter and target.

6 Periphery of ground sheet, where it lifts from the surface.

separation distance A particular meaning is straight-line distance from aircraft to detonation of its free-fall NW.

separation manoeuvre Energy-gaining manoeuvre at low-alpha, high thrust, to close (reduce) or extend (increase) separation in air combat.

separation minima Minimum longitudinal, lateral or vertical distances by which aircraft are spaced through application of ATC (1) procedures (FAA).

separation motor Thruster to assist separation (3).

separation point In 2-D flow, point at which velocity of boundary layer relative to body becomes zero and flow separates from surface.

separation standards ICAO term for separation (2) minima.

separation test vehicle, STV Air vehicle for assisting development of separation (3), esp. of tandem or wrapround boost motors.

separator See breather.

SEPC Secondary electric-power contactor.

SEPD 1 Standard for the exchange of product data.

2 Secondary electric power distribution; b adds box, c center, s system.

Sepla, SEPLA Sindicato Español Pilotos Lineas Aéreas [office, Madrid] (Spain).

SEPM Scanning electric-potential microscope [differs from SEM].

SEPP Stress evaluation prediction program.

SEPS 1 Solar electric propulsion system (or stage).

2 Supplemental electric power system.

SEPTO Single-engine protected short takeoff.

SEPT Synthetic environmental procedures [or procedural] trainer.

SEQ Sequence.

sequenced doors Landing-gear doors close after gear has been extended.

sequenced ejection 1 Automatic small delays are built in between events, eg canopy, stick, calf garters, seat, drogue, harness release etc.

2 Ejection from multiseat aircraft in which crew members are fired in close-spaced series, captain or aircraft commander last.

sequence valve Fluid-flow controller scheduled to perform series of actions in sequence, each completion starting that following. Common US term: sequencer.

sequencing Assignment by ATC or radar controllers of strict order in which aircraft under control are to proceed, eg by selecting arrivals from holding points and, with path-stretching if necessary, achieving correct time/distance separation as they join localizer.

sequential collation of range, Secor Long-base-line system for determining vehicle trajectory by phase-comparison of responses of vehicle transponder to interrogation by three ground stations.

sequential computer Connected in series with other equipment, eg SSR or air-defence radars, eg to predict conflicts and advise on courses of action.

SER 1 Service, served, serving.

2 Stop [at] end of runway.

3 Serial number, or series.

4 Snap experimental reactor.

SERB 1 Selective Early-Retirement Board.

2 Space-Experiments Review Board.

SERC Science and Engineering Research Council (UK).

SERD Support-equipment recommended data.

SERF Survival, evasion, resistance [or rescue] and escape (US joint services).

SEREB, Sereb Société pour l’Etude et la Réalisation d’Engins Balistiques (F).

Serf Studies of the economics of route facilities (ICAO).

serial 1 Element or group of elements within series given numerical or alphabetical designation; also that designation (DoD, NATO).

2 Numerical identity of particular hardware item, eg aircraft.

Sequential number or series. In sequence as distinct from parallel; hence * data, * wiring.

serial number See serial (2).

serial rudders Rudder made in front and rear portions, latter hinged to former and deflecting through greater angle (eg on Dash 7). Also called serially hinged.

series 1 General term for subdivision or group within a larger related group, eg aircraft type Halifax II Series 1A, in this case corresponding to block number, modification state and other national terms.

2 In routine sequence as in manufacture of successive identical articles, eg * production, * aircraft; in this context often redundant word.
series burn

A mathematical expression with sequence of terms having form \( a_1 + a_2 + \ldots + a_n \).

- Connected in succession on same line, wire or channel and thus all carrying same signal, current or flow. Thus a turbine bearing, rotor disc and OGV may be cooled by a single airflow in a series burn.

series burn

Consecutive burns of single or multiple rocket motors, eg on Space Shuttle Orbiter.

series loading

Addition of inductance in series to increase electrical length of aerial and reduce natural frequency of system.

series modulation

Connection of modulator in series with amplifier.

series/parallel redundancy

Connection of fluid pipes or other lines to give particular item (eg control valves of LMAE) choice of series or parallel redundancy, either on command or automatic and switched by sensed failure.

series production

Manufacture of successive identical (or near-identical) articles.

series resonant circuit

One in which inductances and capacitances are connected in series.

series servo

Servo located in control system so that its output adds to that of a major input. Commonly used with SAS actuators to superimpose controls on primary commands without motion at major input.

series yaw damper

One connected into rudder circuit at PFCU, driving surface only but having no effect upstream and thus not felt at pedals; may be operative at all times, including takeoff and landing.

SERL

Services Electronics Research Laboratory (UK, MoD FST, Baldock).

SerneTel


SERN, Sern

Single-expansion ramp nozzle.

Serno

Serial number.

serpentine inlet

Shaped to prevent hostile radars from `seeing' the engine.

Serrate

Family of similar passive receivers carried by night intruders and giving bearing of hostile night-fighter radars (RAF, W2).

serrated skin joint

Having a sawtooth edge to minimize night intruders and giving bearing of hostile night-fighter radars (RAF, W2).

serving cord

Usually seven-strand machine cord, used for wrapping control-cable splices.

servo

Servomechanism, but now word in own right.

servocircuit

The actuator in a servomechanism.

servo-assisted altimeter

Pressure altimeter in which the capsule movement is measured by sensitive EM pick-off...
servo-assisted controls

whose output is amplified and used to drive motor geared to display.

**servo-assisted controls** See servocontrols.

**servocontrols** Not defined, and not recommended. BSI
definition: a control devised to reinforce pilot’s effort by a
relay. A US definition: a * is practically identical to a
trimming tab. Appears to be a general vague term for
primary flight controls (not mentioned in BSI) where
surface deflection is produced by force other than, or
to, that of muscles. Such added force may come
from PCFU or various types of tab (see servotab).

**Servodyne** Registered (Automotive Products/Lockheed
UK) family of pioneer PCFUs with mechanical signalling
and hydraulic output.

**servo** Operated by servo.

**servo link** See servo loop.

**servo loop** Control system in which human input is
amplified by servomechanism provided with feedback so
that, as desired output is attained, demand is cancelled.

**servomechanism** Force-amplifying mechanism such that
output accurately follows input, even when rapidly
varying, but has much greater power. Motions can be
rotary but usually linear, and can be controlled by input
only (open-loop) or by follow-up feedback (closed-loop)
forming servo loop. Essential feature is that * constantly
compares demand with output, any difference generating
an error signal which drives output in required direction
to reduce error to zero.

**servomotor** Rotary-output machine providing power
locally; not necessarily part of servomechanism.

**servo optical mechanical** sys
tem.

**servo optical mechanical** Modelling program for IR ray
tracing.

**servo rudder** Auxiliary rudder driven directly by pilot’s
pedals and moving main rudder by twin cantilever beams
attaching ** to trailing edge of main surface. Common
1922-38. Precursor of servo tab but not a servomechanism.

**servo system** Servomechanism with feedback.

**servotab** Tab in primary flight-control surface moved
directly by pilot to generate aerodynamic force moving
main surface.

**SES** 1 Surface-effect ship.

- **ETS** Shuttle engineering simulator.
- **JSIPS** Software exploitation segment (JSIPS).
- **ET** Single-event signal.
- **ES** Secure equipment system.
- **ET** Stored-energy system.
- **ET** Support-equipment summary.
- **ET** Single-engine seaplane.
- **ET** Single European Sky.
- **ET** Space environment simulator.
- **ET** Small-endy simulation.
- **ET** Space Exploration Squadron (USAF).

**SES** Society for Experimental Stress Analysis [office,
Westport, CT (US)].

**SES** Pronounced sessamy [from “Aladdin”], the
initial Single European Sky initiative, which explored the
possibility of redefining the airspace of the existing 35
ANSPs into a seamless whole; see next (EU, 2000-05).

**SES** Single European Sky ATM [air-traffic manage-
ment] research; new initiative of national governments,
ATM service providers [especially Eurocontrol], air oper-
ators and industry, first meeting Brussels 17 November

**SES** Special environmental sample container.

**SESMA** Special-event search and master analysis.

**SES** Space Experiment Support Program (USAF).

**SES** Support Equipment Systems Project Office.

**sesquiplane** Blipline whose lower wing has less than half
area of upper.

**SES** Space environmental support system.

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area of upper.
SEV

2 Stores ejector unit.
1 Single-event upset.
SEV 1 Surface-effect vehicle, usually synonymous with ACV.
2 Severe.
3 Synthetic[ally] enhanced vision.
SEval, SEVAL Sensor EW Tactical Evaluator (USN).
seven-bar format Standard format for presenting alphanumeric numerals in electronic displays, all numerals being created by illuminating some of four vertical and three horizontal bars (eg LEDs).
7 by 19 Standard high-strength steel cable made up of seven strands each of 19 twisted wires.
7 by 7 Standard steel cable made up of seven strands each of seven twisted wires.
seven flying Seven types of flight by dead reckoning, two plane (plane and traverse) and five spherical (composite, great circle, Mercator, middle-altitude and parallel) (US usage, arch.).
720° precision turn Standard US training manoeuvre; two complete circles flown at full power at as near as possible constant height at bank angle of 60°.
1760 Standard interface for air-launched stores and other external loads (DoD).
7500 International transponder code ‘I am being hijacked’.
Severe Weather Avoidance Plan Approved plan to minimize ATC disruption caused by occasional need to re-route traffic through impacted terminal and/or ARTCC areas (FAA).
SEVIRI, Seviri Spinning enhanced visible IR imager.
SEVVA Security Evaluation, Validation and Verification Agency (UK).
Sewaco Sensor weapon command and control system.
SEWS Satellite early-warning system.
SEWT Simulator for electronic-warfare training.
S, s Exposed wing area.
sexontant Optical instrument for measuring altitude of celestial bodies.
Seybolt Hand tester of aircraft fabric which measures force required to punch a controlled hole.
SEZ Selector engagement zone.
SF 1 Signal frequency (often s.f.).
2 Scheduled freight.
3 Stick force.
4 Secondary/final talkdown [S/F preferred].
5 Special Forces (USA).
6 Standard form.
7 Sampling frequency.
8 Shear force.
SF/ 1 Ratio of system operating time divided by flight hours.
2 Secondary final talkdown.
SFA 1 Société Française d’Astronautique (F).
2 Sous-direction de la Formation Aéronautique (F).
3 Sintered ferrite absorber (RAM).
4 Single-frequency approach.
SFACT Service de la Formation Aéronautique et du Contrôle Technique; responsible for civil aircraft and aircrew licensing (F).
SFC 1 Special Federal Aviation Regulation[s] (US).
2 Surface (ICAO).
3 Simulated flight cycle[s].
School of Fighter Control (RAF Boulmer).
sfc, s.f.c. Specific fuel consumption.
SFCA Service des Fabrications du Commissariat de l’Air (F).
SFCC 1 Side-facing crew cockpit, ie has flight engineer panel.
2 Slit/flip control computer[s].
SFCS 1 Survivable flight-control system, USAF/McDonnell FBW programme of 1968.
2 Safety flight-control system; protects aircraft (eg Concorde) against excessive AOA or jammed control column.
3 Secondary flight-control system.
4 Simplified fire-control system.
SFD 1 Simple formattable document, immediately ready for message transmission.
2 Special Forces Directorate (UK).
3 Squeeze-film damper.
SFDAS Société Française de Droit Aérien et Spatial (F).
SFD DB Superplastic forming and diffusion bonding; important manufacturing technique in which structure is welded from sheet into gas-tight envelope and then inflated in heated mould until diffusion-bonded into desired shape.
SFDCC Satellite Field Distribution Center (NMC).
SFDIF Subsystem fault-detection function.
SFDHO School of Flight Deck Operations (UK).
SFDTR Standard flight-data recorder.
SFDSD Secondary, or standby, flight-display, or flight-data, system.
SFE 1 Supplier, or seller-, furnished equipment.
2 Sensor front end; / GA adds gimbal assembly.
SFEA Survival and Flight Equipment Association (UK).
sferics Study of atmospheric radio interference, esp. from met. point of view; sometimes spelt sferics.
SFF 1 Self-forging, or forming, fragment.
2 Svensk Flughistorik Forereing (Sweden).
SFFL Standard foreign fare level (IATA).
SFG Standby flight group [display].
SFGp Stick force per g.
SFF Special flying instruction (CAA).
SFIIR Solid-fuel integrated rocket/ramjet.
SFK Aramid (spider-fibre) reinforced plastics composite (G).
SFL 1 Safe fatigue life.
2 Sequenced flashing light[s].
SLOC, SFloc Syoptic filing of location, of sources of atmospherics.
SFM 1 Sensor-fuzed munition.
2 Self-forging munition.
3 Surface feet per minute [maching].
SFMR Stepped-frequency microwave radiometer.
SFNA Société Français de Navigation Aérienne [formed 1863 by merger of Senama and S’d’A] (F).
SNP Stick-fixed neutral point.
SFO Simulated flameout.
SFOC Space flight operations center.
SFDC Single fibre optical communications system.
SFOF Space Flight Operations Facility, part of DSN.
SFOF Stabilization Force (NATO).
SFOV Sensor field of view.
SFPA

SFPA  Staring focal-plane array; hence SFPAS adds seeker.

SFPCA  Society for the Preservation of Commercial Aircraft (US).

SFPPD  Smart flat-panel display.

SFPMP  Surface feet per minute; linear speed measure for machining or grinding.

SFPMAC  Société Française de Physiologie et de Médecine Aéronautique et Cosmonautique [office, Paris 75996] (F).

SFQ  Structured full-text query language.

SF R  Stepped-frequency radar.

SFRJ  Solid-fuel ramjet.

SFRM  Total hours since factory remanufacture.

S fringe  Distance from brake-release to recognition and reaction to engine failure.

SFS  1 Side-force surface.

2 Simulator/fallback system.

SFSO  Station Flight-Safety Officer (RAF).

S FSS  Satellite field service station.

SFT  1 Satellite field terminal.

2 Standard food trolley (loaded, 136 kg, 300 lb).

3 Surface friction tester.

S FTE  Society of Flight Test Engineers; [office, Lancaster CA93539–4047, with a European chapter based at Boscombe Down, SP4 0JF; UK] (Int.).

SFTS  1 Service flying training school.

2 Spaceflight telecommunications system.

3 Synthetic flight training system.


SFU  Suitable for upgrade.

SFUV  Self-filtered ultra-violet.

SFW  Sensor-fuzed weapon(s).

SFWA  Smart fixed-wing aircraft.

SG  1 Specific gravity, or s.g.

2 Spheroidal-graphite (cast iron).

3 Screen grid.

4 Shell gun, = cannon.

5 Sortie generation, or sorties generated.

6 Schachtgeweber, close-support attack wing (G, WW2).

7 Symbol, or signal, generator.

8 Snow grains.

9 Study group.

10 Synchronization gap [Arinc 629].

S R  Ground roll in normal takeoff.

Sg  1 Specific gravity.

2 Shell [firing] gun.

SG  Silicon gate array.

SGAC  Secrétariat Général à l’Aviation Civile [C adds ‘Commerciale’] (F).

SGAD  Supersonic global attack demonstrator (US AFRL).

SGC  1 Symbol-generator computing.

2 Swept gain control.

3 Smoke-generator cartridge.

SGCAS  Study Group on Certification of Automatic Systems.

SGC1  SC cast iron.

SGD  1 Synthesized, or smart, graphic display[s].

2 Secretary-General for Defence; I adds Investment.

SGDF  Shaft- and gear-driven fan.

SGDN  Secrétariat Général de las Défense Nationale [Paris, F-75700] (F).

SGDP  Selected ground delay program(me); departures causing overload at congested arrival fix are manually assigned chosen later departure time.

SGDU  Smart graphic display unit.

SGE  USAF Support Group Europe (RAF Kemble).

SGEMP  System-generated electromagnetic pulse.

SGF  Second-generation Flir.

SGFNT  Significant.

SGI  Silicon graphics image [generator].

SGIT  Special-group inclusive tour.

SGL  1 Signal (ICAO).

2 Static ground line.

SGLS  Space ground link subsystem (USAF).

SGLV  Second-generation launch vehicle.

SGME  Self-generated multipath effect.

SGML  Standard generalized markup language.

SGN  Standing Group NATO.

SGP  Smart graphics processor.

SGR  Sortie-generation rate.

SG Rep  Standing Group Representative.

SGS  1 Surface guidance system.

2 Sub-grid scale.

3 Satellite ground system, or station.

SGSI  Stabilized glideslope indicator.

SGT  Satellite ground terminal.

SGU  Signal-generator unit.

SH  1 Showers (ICAO).

2 Support helicopter.

SH/H  Sample and hold; maintains present analog velocity until next sampling.

SHA  1 System hazard analysis.

2 Sidereal hour angle.

3 Swiss Helicopter Association.

4 Sea height anomaly.

shack  Verb, to score direct hit (colloq.).

shackle  1 Loosely used in conventional sense to mean link attaching dropped stores to carrier or rack; not recommended.

2 To swap places to enable a pair to exploit tactical situation.

Shade  Shared data environment.

Shadow  Subsonic hovering armament direction and observation window (UAV).

shadow  1 Wingman ordered to stick close to leader in all circumstances.

2 To duplicate all functions of a manufacturing plant to provide exact second source.

shadow box  Compartmented container for kit of parts (lean manufacturing).

shadow factor  Multiplication factor derived from Sun’s declination, target latitude and time in determining object heights from reconnaissance picture shadows; also called tan alt.

shadow factory  Manufacturing plant built and owned by government but managed by selected industrial company to duplicate production of urgently required weapon or product.

shadowgraph  Technique, or photograph made by it, in which point-source light is focused parallel through tunnel working section and on to film; density gradients are visible as changed tonal values, proportional to
shadowing
second derivative of refractive index (Schlieren = first derivative).
shadowing Interference with an LOS communications channel caused by parts of the aircraft.
shadow-mask tube Three-colour TV tube with three guns projecting red/green/blue beams through mask with about 500,000 holes.
shadow region Region where EM signals, eg radio or radar, are poorly received, usually because of LOS difficulties.
shadow shading Aircraft camouflage (UK, 1936-39).
shadow squadron Identity which a flying-training unit would assume in war or national emergency (RAF).
Shaef Supreme HQ Allied Expeditionary Force (NW Europe 1944-45).
Shaft Smart hard-target attack fuzing technology.
shaft Transmitter of torque joining two rotating assemblies, such as a turbine and compressor. In a 3-* engine the LP [fan] * passes down the engine centreline inside the IP *, which in turn is surrounded by part of its length for the HP *.
shaft horsepower Horsepower measured at an engine output shaft, ignoring potentially useful energy in the efflux. Also called torque hp and brake hp. Numerically 2nQ where n is rpm and Q drive torque.
shaft power Power available from rotating shaft, = torque × rpm.
shaft speed Rate of rotation, rpm or rad s⁻¹; see rotational speed.
shaft turbine Turboshaft engine, gas turbine providing power at an output shaft, in some cases driven by free turbine.
shaker 1 See vibration generator.
2 See stick*.
shaker speed IAS at which stick shaker is triggered.
shake-table test Any of various standard test schedules for delicate items conducted on vibration generator to simulate vibration in service (according to USAF "during launch of missile or other vehicle").
shale fuel Aviation jet fuel, notably JP-4, derived from oil-bearing shales.
shall Shipborne [or shipboard] helicopter approach and landing lighting.
Shamu BW wind bringing dust storms [Inaq].
Shanicle Radio guidance system of hyperbolic type used on TM-61B cruise missile 1954: name from short-range navigation vehicle.
shank Inner portion of some propeller blades where section is not aerofoil but circular.
Shape Supreme HQ Allied Powers Europe [Belgium B-7010] (Int.).
shape Appearance of electronic (eg radar) signal pulse when plotted in form of amplitude against time. This shape is not related to electronic phasing.
shaped beam Hollow charge; warhead whose target-facing surface has form of re-entrant cone to generate armour-piercing jet.
shaped-charge accelerator Propulsion system using a shaped-charge propellant, a near-explosive, to achieve highest possible speed of man-made object in atmosphere after prior acceleration by rockets.
shear rate

hull, showing half-sections as numerous transverse planes.

shear rate Vertical wind gradient, often measured in kt per 1,000 feet.

shear slide Free-sliding piston moved by pressurant along length of propellant tank to force liquid propellant into (usually rocket) engine.

shear spinning Method of forming solid rocket case from preformed thick tubular billet by rolling against rotating mandrel, using two rollers 180º apart, normally performed at room temperature.

shear strength Stress required to produce fracture in plane of cross-section by two opposed forces with small offset.

shear stress Component of any stress lying in plane of area where stress is measured; for fluid, equal to

\[ \tau_{xy} = \frac{dy}{dx} \]

(see Newton's laws). Existence of ** in fluid is evidence of viscosity. Integrated over an area = skin friction.

shear wave Wave in elastic medium causing any element of medium to change shape but not volume; in isotropic medium a transverse wave, mathematically one whose velocity field has zero divergence.

sheath 1 Metal tip, and often leading edge, to soft-blade propeller; also called tipping.

2 Envelope of plasma surrounding re-entry body.

sheathing See sheath (1).

SHEB Solid hydrogen, embedded boron.

shed Traditional term for shelter (hangar) for aerostats, esp. airship.

shelling 1 Action for removal of ice from aircraft in flight, rain from windshield (windscreen) and non-vaporised material separated from ablating surface on re-entry.

2 Rapidly repeated generation and release of vortices from alternate sides of an object in a fluid flow.

sheep dipping Process whereby CIA pilots were given fully documented false professional backgrounds.

sheer lines Outlines of vertical sections of fuselage [or, especially, hull or float] parallel to longitudinal axis.

sheet Standard form of raw material; in case of metal, uniform sheet not over \( \frac{1}{8} \) in (0.125 in, 3.175 mm) thick; thicker metal = plate.

sheet moulding compound 2-D fibre-reinforced plastics not needing complex laying-up procedure.

Shelk Super-hard, extremely low frequency; military communications system.

shelf 1 Figurative location where items are stored before use; thus * life, published maximum period during which item will not deteriorate in suitable storage; off-the-* standard commercial product already available.

2 Spanwise strip[s] hinged to leading edge of movable surface and to trailing edge of fixed structure [eg elevator/tailplane]; see compound *.

3 Longitudinal beams of raw material; in case of metal, uniform sheet not over \( \frac{1}{4} \) in (0.125 in, 3.175 mm) thick; thicker metal = plate.

sheet metal Unhardened reinforced-concrete structure accommodating (usually single) combat aircraft at dispersal and offering protection against conventional attack, eg Tab-Vee.

shift脑

1 Unhardened (generally recessed or underground) accommodation for civilians faced with air attack, in some cases attempting to offer some protection against nuclear attack (fallout *)

2 Unhardened reinforced-concrete structure accommodating (usually single) combat aircraft at dispersal and offering protection against conventional attack, eg Tab-Vee.

shelter marshal Officer in charge of security and movements within HAS, HPS or PBF.

Sherardizing Anti-corrosion treatment similar to case hardening but employing Zn dust.

Sheridan tool Family of large stretch-presses often able to apply double curvature to thick plate.

SHF Support helicopter force.

S.H.F. Super-high frequency (see Appendix 2).

SHFE Sustained hypersonic flight experiment (UK).

2 Small heavy-fuel engine.

SHFT Shift.

SHGR Hail shower.

SHGS Small hail or snow pellets.

SHI Standby horizon indicator.

Shi Experimental number, with numerical prefix for year of Emperor's reign; thus 16-* = 1941 (Japanese Navy, 1931-45).

shield See shielding (1).

shielded bearing Ball/roller/needle race with metal ring on each side to reduce ingress of dirt.

shielded cable See screened cable.

shielded configuration Aircraft deliberately designed so that parts of major structure, eg wing, are often interposed between sources (of noise or IR radiation) and ground observers or defences.

shielding 1 Material of suitable thickness and physical characteristics used to protect personnel from radiation during manufacture, handling and transport of radioactive and fissionable materials (DoD, NATO).

2 Obstructions which tend to protect personnel or materials from effects of NW (DoD).

3 Design philosophy of installing crucial parts of primary structure, whether damage-tolerant or otherwise, as far as possible behind others or in some other way geometrically protected from in-service damage.

4 See screen (4) (US usage).

5 Structural and other methods used to protect spacecraft from serious consequences of micrometeorite impact. Hence * factor, the ratio of shielded to unshielded construction.

shift Ability to move origin of radar P-type display away from centre of display; limit of * usually to periphery.

2 See fuel *.
shim Thin spacer, from piece of paper (usually unaccept-able) to large precision part tailored to specific application, to fill gap or adjust separation between parts; examples, to obtain exact rig (1) neutral and full-deflection settings of powered flight control surface, and to adjust separation of two ends of recirculating ball screwjack so that when bolted together balls have no play and no friction.

shim, shimming To remove small amount of material to improve fit between mating surfaces [opposite of previous].

shimless assembly Maintenance of such manufacturing accuracy as to eliminate need for shims [objective in V-22 programme].

shiny Rapid lateral angular oscillation of a trailing castoring wheel running over surface where coefficient of friction exceeds critical value, cured by twintread tyr or proper design of landing gear; usually affects unsteered nosewheel or tailwheel (or supermarket trolley).

shiny switch Cockpit button, or switch in constant use (colloq.).

shipboard aircraft Aircraft designed to operate from surface vessel or submarine, including marine aircraft and rotorcraft (eg rotor-kite). Some definitions equate term with land aeroplane based on carrier.

shipboard rolling vertical landing Arrival on carrier deck by STOVL aircraft with considerable airspeed [reduces propulsion-system stress and increases bring-back load].

shipborne aircraft landing system Tracks helicopter from ship, and cockpit display guides pilot in radio silence.

shipment Complete consignment of hardware (probably not conveyed by ship), eg from manufacturer to operator or logistic base to user unit.

shipplane Imprecise; most definitions restrict term to land aeroplane for operation from deck of carrier but USN includes catapulted seaplanes formerly used on carrier.

ship-set Complete inventory of particular items for one aircraft.

shirt-sleeve environment Popular and often true description of desired environment in high-flying aircraft and spacecraft in which human performance is improved if special clothing does not have to be worn.

SHK Space hit-to-kill (NMD).

SHLD Shaped-hole laser drilling.

SHLW Shallow.

SHM Simple harmonic motion.

SHNKUK Roman initials of Society of Japanese Aerospace Companies.

SHNMO Shape host-nation management office (NATO).

shoals Scanning hydrographic operational airborne lidar survey.

shock softening

Shoc Standoff high-speed option [or operation] for counterproliferation.

shock (1) Shockwave.

(2) Single large-energy pressure wave (see shock front (2)).

(3) Often used to mean impact, single large externally applied impulse causing acceleration.

shock-absorber Device for dissipating energy by resisting vertical movements between landing gear (wheels or floats) and aircraft when running across surface, usually with unidirectional quality to reduce rebound and bounce (see oleo); other methods include simple steel or composite leaf springs, steel ring springs, rubber blocks in compression and bungee in tension.

shock body Streamlined volume added (eg on rear of wing) to improve area-rule distribution; also called Whitcomb body, Küchemann carrot, speed bump, etc.

shock cloud Localized cloud caused by violent changes in flow conditions in close proximity to supersonic aircraft, notably in Prandtl-Meyer expansions, eg over wing and canopy.

shock compression Fluid flow compression occurring virtually instantaneously in passage through shockwave; for normal shock, ratio of pressures $p_1/p_2 = 7M^2/6-1/6$ where $M$ is initial Mach.

shock cord See bungee.

shock diamonds Approximately diamond-shaped reflections, brilliantly luminous in hot jet (eg from rocket or afterburner), caused by reflection of internal inclined shocks from edge of jet at boundary with atmosphere.

shock drag That drag associated with a shockwave (which always causes loss in total or static pressure), normally varying as fourth power of velocity or pressure amplitude.

shock excitation Generation of oscillations in circuit at natural frequency by external pulses, eg for sawtooth generation.

shock expansion Faulty operating condition of inlet to supersonic airbreathing engine in which, for various reasons, gross flow breakdown occurs and inlet shock system is expelled forwards; accompanying large and possibly dangerous increase in drag. Often used synonymously with inlet unstart.

shock front (1) See shockwave.

(2) Boundary between pressure disturbance created by explosion (in air, water or earth) and ambient surrounding medium.

shock isolator Device, usually mechanical and assembled from solid parts such as deformable rubbers/plastics or metal deflecting well within elastic limit, which absorbs input movements (eg to accommodate input vibration while keeping output still) or cushions large impacts (by permitting output to travel over a distance which absorbs energy within permitted limits of acceleration). Thus, some absorb vibration, usually of small amplitude, while others absorb shock, which in case of ICBM suspended in silo may require travel in order of 1 m.

shock loading Suddenly applied violent and abnormal mechanical stress, such as fan-blade-off.

shock mount Shock isolator on which delicate object is mounted.

shock softening Reduction of linear rate of pressure rise through shockwave, esp. in proximity to subsonic
shock spectrum  
boundary layer; ie increase in thickness of shock (1) from about 10^{-3} mm by several orders of magnitude.

shock spectrum  
Plot of peak amplitude of response of single-degree-of-freedom system to various single applied shocks (3).

shock stall  
Gross breakdown of flow behind shockwave on wing (esp. one of large t/c ratio or for any other reason causing large airflow acceleration) at about critical Mach number, causing symptoms of loss of lift and turbulent wake resembling stall, but at normal AOA.

shock strut  
Main energy-absorbing member of landing gear; may or may not be main structural member but (unlike shock absorber) is always part of structure.

shock tube  
Wind tunnel for hypersonic studies in which fluid at high pressures, usually involving rapid combustion to increase energy, is released by rupturing diaphragm and accelerates through evacuated working section containing model. Many varieties, most having stoichiometric gas mixture as driver and large-expansion-ratio (over 200) supersonic nozzle upstream of working section, giving M up to 30 and T around 18,000° K.

shock wave  
Surface of discontinuity between free-stream fluid and that affected by body moving at relative velocity greater than speed of sound in surrounding fluid. As fluid accelerates round body, if it eventually reaches local Mach 1 a weak shock forms perpendicular to flow, called a normal shock. Pressure difference (p_1 - p_0)/p_0 is zero and flow downstream is subsonic. As M increases, shock leans back, becoming an inclined shock, at angle \alpha = \sin^{-1}1/M, or \sqrt{1-M^2}, pressure ratio and velocity of propagation V_0 increase according to M and angle of deflection, a property of geometry of body; for 15° deflection (ie wedge or cone of 15° semi-angle) at Mach 3 static and (p_1/p_0)_{\text{sh}} and V_0/\sqrt{\gamma} = 2.1, ie * moves at twice speed of sound.

Continuous propagated pressure pulse formed by blast from explosion in air by air blast, underwater by water blast and underground by earth blast (DoD, NATO).

Shodop  
Short-range Doppler.

Shol, SHOL  
Ship/helicopter operational limit[s].

shock bolt  
Linear bolt type of panel latch.

shooter  
Aircraft detailed to attack a target, as distinct from one whose task is to mark or designate.

The catapult control officer.

shooting the breeze  
Engaging in casual shop talk (US).

short final[s]  
Last part of approach, usually defined as that commencing at inner marker.

2 Radio call made from aircraft 2 n.m. (3,706 m) from threshold, or on final approach from shortened circuit.

short-haul  
Several definitions, eg maximum-payload range (knee of graph) 1,609 km (1,000 statute miles) or less; see also short-range transport.

short hundredweight  
US unit of mass = 100 lb = 45.3592 kg.

short-life engine  
One designed for single flight or any other purpose not requiring prolonged use, and normally qualified for running time of 50 h.

short lift  
Use of STO to enable powered-lift aircraft to carry enhanced payload.

short period  
In assessment of factors such as lateral-control damping of fighters, usually means \leq1.5 s.

short-range attack missile  
ASM launched at range not exposing launch aircraft to terminal defences (USAF).

short-range ballistic missile  
Up to about 600 nm (1,112 km, 691 miles) (DoD).

short-range clearance  
Authorizes IFR departure to proceed to a fix short of destination pending further clearance.

short-range Doppler  
Trajectory measurement using Dovap plus Elsse.

short-range transport  
Range at normal cruising conditions not to exceed 1,200 nm (2,224 km, 1,382 miles).

short round  
Round of ammunition deficient in length (DoD ‘in which projectile has been seated too deeply’), causing stoppage.

short trail  
Towing position for sleeve (presumably other forms) of target in which target is immediately astern of towing aircraft.

short wave  
Not defined and rare in aerospace: traditional radio meaning is decametric (10-100 m) corresponding to 30-3 MHz; FAA meaning is frequencies 7.7–2.8 MHz; for IR means wavelength 1-2.5 \mu m; scientific is 0.4-1 \mu m wavelengths.

short stacks  
Briefest form of piston engine exhaust for cowled engine.

short takeoff and landing, STOL  
Usually defined as able to take off or land over 50 ft screen (note, not 35 ft) within total distance of 1,500 ft (457 m).

short ton  
US ton of 2,000 lb, = 907.185 kg.

short trail  
Towing position for sleeve (presumably other forms) of target in which target is immediately astern of towing aircraft.

short final[s]  
Last part of approach, usually defined as that commencing at inner marker.

short field  
Limiting field or runway demanding special takeoff procedure.

shore  
Line drawn straight across all inlets less than 55.6 km (30 nm) wide (ICAO).

short-distance navaid  
One usable within 320 km/200 miles (NATO).

shot  
Commercial lead * for shotguns, normally used as cheap variable mass.

shotcrete  
Single flight of unguided ballistic rocket, eg probe.

shotguns wind  
Appearing to come from all points of the compass.

shot-peening  
Bombarding metal surface with air-
shoulder
propelled shot (2), usually to harden and relieve internal stress.

shoulder 1 Area immediately beyond edge of pavement, such as a runway or parking apron, so prepared as to provide transition between pavement and adjacent surface.
2 Added paved area at taxiway corners and intersections to ensure outboard megajet engines do not operate over grass.

3 See season.

shoulder bolt Thread of smaller diameter than shank; for attaching plastics parts where over-tightening must be avoided.

shoulder cowl Usually means cowling panel(s) hinged upwards near top of sides.

shoulder flare That charged for period between standard and off-peak.

shoulder harness Seat harness including straps passing over shoulders to prevent body jack-knifing forward.

shoulder pylon Auxiliary pylons [usually for AIM-9 or similar missile] on sides of main pylon for tank or other heavy store.

shoulder season Intermediate demand between low and peak, or intermediate time of day, in determining passenger fare structure.

shoulder wing Wing attached between mid and high positions. Original German Schulterdecker implied wing depth more than half that of fuselage, with blended wing/body junction.

show Preplanned air operation, especially over hostile territory (RAF, WW2, colloq.).

shower(s) Precipitation from convective cloud characterized by sudden onset, rapid variation in intensity and sudden stop, with intervening periods of part-clear sky.

showerhead Liquid-propellant rocket injector in which numerous fuel and oxidant sprays are distributed (with various forms of impingement) over flat or curved surface.

show finish Glass-like finish (on homebuilts, usually) achieved by repeated doping and rubbing down.

shp Shaft horsepower [sometimes written SHP].

SHR 1 Shear (weather).
2 Superheterodyne receiver.

SHRA Heavy rain showers.

shrapnel Anti-personnel device comprising gun-launched projectile which near target explodes, projecting numerous lethal fragments and contained balls or cubes. No aerospace relevance, but included here because word has become commonly used to mean any damage caused by high-velocity splinters.

shrimpboat Small marker of clear plastic on which controller writes flight identity, FL and other information, subsequently moved by hand to remain adjacent to blip on display.

shrinkage Natural reduction in dimensions of most castings on cooling (see shrink rule).

shrink fit Force for interference fit between two metal parts obtained by heating outer, cooling inner, or both.

shrink rule Casting mould made ×0.010 (linear) oversize to allow for shrinkage.

shroud 1 Plate formed integrally with gas-turbine fan, compressor or turbine blade usually in plane perpendicular to blade major axis. In fan and upstream compressor blades usually as part-span, * being formed in halves on each side of blade and mating with those adjacent to damp vibration. In turbine rotor invariably on tip, serving as ring minimizing gas leakage around periphery.
2 Circular duct surrounding propeller or propulsive fan.
3 Heat-resistant aerodynamic fairing over space payload or any forward-facing projection on space launch vehicle, ICBM or other hypersonic vehicle.
4 Extensions of fixed surface of aerofoil (eg wing, tailplane) projecting behind hinge line of movable surface (eg flap, aileron) to reduce drag or improve flight control.
5 Main upper hinged flap at rear of augmentor CCW wing, downstream of intake; can have trailing tab.
6 Covering plate on face of centrifugal impeller enclosing flow passages and preventing leakage.

shroud coolant Refrigerant cooling volume in which cryogenic cooling takes place, eg LH₂ serves as ** surrounding liquefaction of helium.

shrouded balance Leading edge of control surface enclosed within trailing edge of fixed structure.

shrouded blade Blade fitted with shroud (1).

shrouded impeller Centrifugal impeller, eg of supercharger, enclosed by shroud (2).

shrouded insulator Radio aerial insulator (eg HF wire) fitted with overlying shroud (normal meaning of word) to prevent ice connection to metal structure.

shroud lines Main suspension cords of parachute connecting load to canopy.

SHRSS Stabilized horizon-reference system.

SHS Since hot section (inspection flight hours).

SHSS Short-haul system simulation.

Shud, S-HUD Smart HUD.

shunt connection Bypass circuit, usually taking most of current.

shunt excitation Feeding mast radiator (aerial) about 0.25 of way up, earthed at base.

Shup Silo-hardness upgrade program (USAF).

shutdown 1 For rocket engine, cut-off.
2 For conventional aircraft-propulsion engine, reducing power to zero and rendering inactive, eg by turning off HP cocks. If in flight becomes IFSD. Normally follows obvious or signalled failure.
3 Event in which (2) occurs.

shuttered fuze Inadvertent initiation of detonator will not initiate booster or burst charge.

shuttle 1 Generalized term for reusable space launch vehicle recovered by aeroplane-type flight.
2 High-frequency trunk-route service characterized by no-reservations, payment on board and, in some cases, aircraft always boarding, and departing if full before announced time.

3 Sliding drive member of flight-deck accelerator (catapult).

shuttle valve Fluid-flow valve of bistable type which passes flow from one line and isolates other or vice versa.

SHWR Shower.

ShyFE, Shyfe Sustained hypersonic flight experiment (UK).

SI 1 Système International d’Unités; standardized system of units adopted (but not yet fully implemented) by all industrialized nations.
2 Servicing instruction.
Si

. Straight-in (approach).
. Spark-ignited, or ignition.
. Single [or spark].
. Standby instrument[s].
. Supporting interrogator.
. Suomen Ilmailuliitto, aeronautical association (Finland).
. Selective interrogator.

Si 1 Silicon.
. On an oil analysis = dirt, foreign matter.
. Imposed stress in fatigue calculation.
. Silicon nitride.

SIA  1 Structural-integrity audit.
. Service de l'Information Aéronautique (F).
. Semiconductor Industry Association (US).
. Salons Internationaux de l'Aéronautique et de l'Espace (F).
. Salons Internationaux de l'Aviation Générale (F).
. Silicon-aluminium-oxinitride.

Siam Self-initiated anti-aircraft missile; carries out IFF interrogation and handles subsequent interception automatically.

Siamese To join two similar items into single paired unit or to bifurcate duct into two equal parts; hence siamesed, adj.

SIAP  1 Systems integration and assurance phase, of procurement process (UK).
. Standard instrument approach procedure.

Siap[s] Straight-in approach procedure[s].

SIAR Service de Surveillance Industrielle de l’Armement (F).

SIAT Service instructor aircrew training.

SIATI Society of Indian Aerospace Technologies and Industries (office, Bangalore 560 075) (India).

SIB  1 Special Investigation Branch (UK).
. Subject indicator box [message sent by signal].
. System isolation breaker.

Sibilant filter One removing hissing frequencies from speech on R/T.

SIC  1 Steady initial climb, ie V4.
. Standards Information Center (NBS).
. Service instruction circular.
. Second in command.

SiC silicon carbide.

Sicas SSR improvements and collision-avoidance system [P ads panel].

SICBM Small ICBM.

sick Faulty.

SICM Small intercontinental missile.

SID  1 Standard instrument departure.
. System integration demonstration.
. Spray-impingement drag (marine aircraft).
. Supplemental inspection document.
. Switch-in deflector.
. Situation information display.
. Sensor-image display.

SIDA Security identification display area.

SIDC Space Innovation and Development Center [Schriever AFB, Colorado] (USAF).

Si3N4 Silicon nitride.

Sida One-piece flying suit with numerous pockets and zips and high fur collar, widely used from 1919 including by RAF (from designer Sidney Cotton).

SIDE Suprathermal ion detector experiment.

side-arm controller Primary flight-control input in form of miniature control column at side of cockpit (of combat aircraft) on console incorporating armrest to facilitate accurate flight under conditions of large applied acceleration.

sideband Band of frequencies produced above and below carrier frequency by modulation; sum and difference products are called upper * and lower *.

side-by-side 1 Two-seat aircraft in which seats are in same transverse plane at same level.
. Piston engine in which connecting rods are both same, with big ends side-by-side on crankpin (thus, cylinders of opposed banks are not quite in line); constructional form of most modern light aircraft engines.

side car, sidecar 1 Airship car suspended away from centreline plane.
. A parallel emitter, notably an LWIR boresighted alongside a laser.

side direction Normal to plane of symmetry.

side elevation Portrayed as seen from side, in case of drawing as seen from infinite distance, ie orthographically.

side fences Fences above wing and/or flap of USB aircraft to restrain lateral spread of main engine jet.

side float Usually means swamp.

side force Force acting normal to plane of symmetry.

side-force control Aircraft flight-control system capable of exerting lateral [transverse] force, normally by vertical surfaces in front of as well as behind e.g. Aircraft with ** can almost instantly change track by flying diagonally, without need to roll or change fuselage axis; make immediate lateral corrections to line of fire of fixed gun; move laterally out of hostile gunfire without prior roll.

side-force surface One designed to generate transverse force acting almost through e.g., as on NASA TIFS C-131.

side frequencies Carrier plus or minus audio frequency.

sideline noise Measured beside takeoff run at distance from centreline of 450 m (ICAO Annex 16) or 0.35 nm (FAR 36 CAN 5, 4-engined aircraft) or 0.25 nm (2-, 3-engined). See noise.

sidelobe Lobes of aerial radiation propagated at angle to main lobe, normally unwanted and cause of clutter or false returns, eg obscuring actual location of sender.

sidelobe clutter Echoes caused by intersection of radar sidelobes with the ground.

sidelobe suppression Various techniques for eliminating not presence of sidelobes but their effects.

side-looking Scanning to either side of aircraft track; hence SLAR, radar whose output is detailed picture of terrain near track, either all on one side or equally on both sides, depending on aerial arrangement.

side marker board Display beside airport gate arranged for nose-in parking giving indicator marks, usually vertical white bars on black board; when aligned with captain’s left shoulder, airbridge is aligned with passenger door.

Sident Site identification.

sided number Bold three-digit Modex number (US Navy).
side oblique

side oblique  Photograph taken with camera oblique and perpendicular to axis of aircraft.

sideral  Pertaining to stars, but see following entries. Rhymes with material.

sideral day  Time for one rotation of Earth as defined by period between successive transits of vernal equinox (in ASCC wording, alternative name, First Point of Aries) over upper branch of any chosen meridian, equal to 24 h of mean sidereal time or 23 h 56 min 4.09054 s of mean solar time.

sideral hour angle  Angular distance west of vernal equinox, arc of celestial equator or angle at celestial pole between vernal equinox and hour circle of observer (see right ascension).

sideral month  Average period of revolution of Moon with respect to stars; 27 days 7 h 43 min 11.5 s.

sideral period  Time taken by planet to complete revolution around primary as seen from primary and referred to fixed stars.

2 Interval between two successive returns of Earth satellite to same geocentric right ascension.

sideral time  Time measured from rotation of Earth related to vernal equinox, called local time or Greenwich time depending on choice of meridian; when adjusted for nutation inaccuracy called mean time.

sideral year  Period of Earth’s rotation around Sun, related to stars; in 2002 equal to 365 days 6 h 9 min 9.55454 s and increasing at about 0.000095 s per year (see tropical year).

sideslip  Flight manoeuvre in which controls are deliberately crossed, eg to * to left aeroplane is banked to left while right rudder is applied; result is not much change in track but flight path inclined downwards, ie steady loss of height without significant change in airspeed and with longitudinal axis markedly displaced from flightpath. Angle of * is angle between plane of symmetry and direction of motion (flightpath, or relative wind), usual symbol β. Rate of * is component of velocity along lateral axis.

sidestep  Following an instrument approach, clearance to land on a parallel runway not more than 1,200 ft away laterally.

sidestick  Small control column on cockpit side panel, usually on R, often sensing input force with almost no noticeable movement.

sidetone  Reproduction of sound in a speaker or headset from speaker’s own transmitter, thus hearing own voice.

sidewalk  Chordwise walkway above wing root.

sidetracking skate  See skate.

sidewall treatment  Addition of sound-absorbent material along sides of passenger cabin.

sidewash  Sideways deflection of free stream behind wing in sideslip or yawed flight, dominated at tail by vortex flow.

sideways translational tendency  Characteristic of single-rotor helicopter to drift to L or R under thrust of anti-torque tail rotor, unless main rotor tip-path plane is tilted in opposition to neutralize this thrust.

SIDs  Standard instrument departures; SIDS, standard instrument departure system.

Siemens  Not Siemens, SI unit of conductance, reciprocal of ohm, S = 1/Ω; also SI unit of admittance and susceptance.

signals

SIF 1 Selective identification facility (or feature).

SIF 2 Standard interchange format.

SIF 3 System interrogation facility.

SIFB  British alloys of copper, silicon and zinc for low-temperature gas welding.

SIFC  Successor IFF.

SIFCH  Standard industry fare level (US).

SIFCT  Società Italiana Fotogrammetria e Topografia [office, I-20121 Milan] (Italy).

SIFTA  Sistema Interamericano de Telecommunicaciones para las Fuerzas Aereas (Int.).

SIFV  Sensor instantaneous field of view.

SIG 1 Signature (DoD, ICAO).

SIG 2 Significant (ICAO).

SIFTA  Special industry group.

SIGHT  Optical device for measuring (eg drift *) or aiming (gun *), often incorporating magnification or combined with HUD (Hud *).

SIGHT  To take observation with sextant.

sight gauge  Graduated vertical window in fluid container indicating level of contents; alternative to dipstick.

sightline  Visual contact; does not include other forms of contact, eg radar, sonar.

sightline  Angle between LOS to aiming point and local vertical; at time of bomb release, same as dropping angle (ASC).

sight line  LOS from a computing gunsight reticle image to target.

SIGI  Space integrated GPS/INS.

Sigint  See signal intelligence.

Sigma  Scale of statistically measuring products and services by counting rate of defects; thus 4σ is average and 6σ near-perfect.

Sigmet  Weather advisory service to warn of potentially hazardous (significant) extreme meteorological conditions dangerous to most aircraft, eg extreme turbulence, severe icing, squall lines, dense fog.

signal  Anything conveying information, eg by visible, audible or tactile means.

SIGR  Spares investment forecast.

SIGR  System interrogation facility.

SIGT  Special industry group.

SIFRCA  Space integrated GPS/INS.

SIFV  Significant (ICAO).

SIFV  Stellar/inertial guidance.

SIFV  Simplified inertial guidance.

SIFV  Special industry group.

SIGW  Optical device for measuring (eg drift *) or aiming (gun *), often incorporating magnification or combined with HUD (Hud *).

SIFV  To take observation with sextant.

sightline  Reproduction of sound in a speaker or headset from speaker’s own transmitter, thus hearing own voice.

sightline  Visual contact; does not include other forms of contact, eg radar, sonar.

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signal  Anything conveying information, eg by visible, audible or tactile means.

SIGR  Spares investment forecast.

SIGR  System interrogation facility.

SIGT  Special industry group.
signal area

- Any electronic carrier of information, as distinct from noise.
- Standard visual symbols displayed on simple airfield.

signal area
Plot of ground at simple airfield, usually adjacent to tower, set aside and equipped for display of ground-to-air signals (5) for informing pilots of aircraft not equipped with radio, eg of circuit direction, local hazards, prohibitions, etc.

signal data
General term for eint output or for any recorded (if possible quantified) information on received signals (2).

signal flare
Flare pyrotechnic whose use conveys known meaning, eg two-star red.

signal frequency
Frequency of transmitted carrier as distinct from component parts, or received carrier as distinct from intermediate frequency to which it is converted.

signal generator
Versatile oscillator capable of outputting any desired RF or AF at any selected amplitude and with output modulated to simulate actual transmission.

signal intelligence
General term for communications intelligence plus electronic intelligence; art of detecting, recording, analysing and interpreting all unknown or hostile signals.

signalling lamp
Usually means hand-held lamp [e.g., Aldis] capable of sending Morse.

signalman
Authorized person using hands, wands and/or lights to marshal aircraft on apron or elsewhere on airport manoeuvring area.

signal pistol
Projector of pyrotechnics, eg Very pistol.

signal rocket
Pyrotechnic fired from launcher on ground.

signal star
Pyrotechnic of distinctive character emitted from cartridge or signal pistol.

signal-to-noise ratio
Ratio of amplitude of desired signal to amplitude of noise signals at a given point in time (DoD). Ratio, at selected point in circuit, of signal power to total circuit noise power (ASC). Number of dB by which level of fully modulated signal at maximum output exceeds noise level, all values being rms.

signature
Characteristic pattern of target displayed by detection and identification equipment (DoD, NATO etc). Like thumb-print, * analysed with sufficient accuracy can identify source as to type and even to specific example of emitter. Can be EM (radar, IR, optical), acoustic (eg SST boom *) or velocity (Doppler *).

significant obstacle
Posing potential threat to aircraft.

significant tracks
Tracks of aircraft or missiles which behave in an unusual manner which warrants attention and could pose a threat to a defended area (DoD, NATO).

significant turn
Change of heading large enough for explicit account to be taken operationally of reduction of climb gradient.

significant weather
Potentially dangerous to aviation.

SiIgsec
Signals security (USA).

SiGWX
Significant weather [also Sigwr].

SiIDAS
Sensor independent integrated defensive aids suite.

SiIS
Skills interactive information system.

s(i,k)
Slope of sound pressure level; change between ½-octave SPLs at i-th band and k-th moment in time. Hence \( \Delta s(i,k) = \text{change in SPL} \); s(i,k) is adjusted slope between adjacent adjusted bands, and \( \text{average slope}(\text{see noise}) \).

SIIL
Suomen Ilmailu Litto (Finnish Aeronautical Society).

SI”
Site d’intégration lanceurs (F); launcher assembly site.

SI”
System[s] integration laboratory.

SI”
Service information letter.

SI”
Speed interference level.

Silane
Proprietary hypergolic liquid used to initiate combustion of fuel [usually LH].

Silastic
Proprietary range of silicone rubbers and sealants including many resistant to hydrocarbon fuels.

SilC
Space-object identification in living colour.

Silicon chip
Popular name for microcircuit fabricated in chip scribed from slice of single-crystal epitaxial silicon. Formerly each chip contained devices and subcircuits, today can be a complete equipment requiring only packaging and human interfaces.

silicone
Generalized term for polymeric organosiloxanes of form \( (R_2SiO)_n \), including elastomers, rubbers, plastics, water-repellants and finishes, eg resins, lacquers and paints.

silicone cork
Relatively cheap ablator and heat insulator, eg on Shuttle external tank.

silicon nitride
Refractory ceramic, Si3N4; increases strength slightly to 1,200°C, good thermal shock resistance because of small thermal expansion, and resists many forms of chemical attack.

Sill
Parachute (colloq.), hence hit the *, take to the *.

Sill
Strategic illuminator laser.

SilMU
Silicon micro-machined electromechanical system inertial measurement unit.

Sil
Silo
Missile shelter that consists of hardened vertical hole in ground with facilities either for lifting missile to a launch position or for direct launch from shelter. Normally closed by hardened lid and provided with shock-isolating missile supports.

Silver
Metallic element, Ag, density 10.5, MPt 962°C, important in electronics, photography, joining metals, cloud seeding and disposal of explosives and nerve gases.

Silver ball
Inceptor controlling Stovl engine nozzle[s] (colloq.).

Silver bullet
Procurement process for highly classified items (US).

Silver C
Intermediate certificate and badge for gliding.
silver cell

requiring flight of at least five hours, gain in height of at least 1,000 m (3,281 ft) and straight flight of at least 50 km (31 miles).

silver cell Silver/zinc.

Silver Flag Exercises training combat support forces to operate in a hostile bare/austere base environment.

silver iodide AgI, sprayed into clouds to promote rainfall [seeding].

silver plating This is often resorted to on the tooth faces of either one, or both mating gears. The soft skin provides a malleable surface on engine start-up before oil begins to flow.

silver solder Jointing alloy of silver, copper and nickel.

silver-strip indicator Inserted in fuel filter, detects any abnormal concentration of sulphur in fuel.

silver/tax Astronaut suit (US, colloq.).

silver/zinc Ag/Zn. elastic dry battery common in applications calling for single-shot high-power electric supply.

SIM 1 System improvement modification.

2 Security identification module.

3 Space interferometry mission.

4 Serial interface module [A629].

Sim Simulation, simulator.

SIMA Scientific Instruments Manufacturers Association of GB (UK).

Simaf Simulation and Analysis Facility (USAF).

SIMD Single instruction, multiple data stream.

simmer On-line flight-simulator player using home PC.

Simmonds-Corsey Mechanical remote-control system in which push/pull commands are transmitted by flexible cable in conduit on which are threaded mating tubes and ‘olives’ giving bidirectional control.

Simmons nut Pioneer stop nut incorporating tightly held fibre washer.

Simop Simultaneous operation of co-located radios.

Simos Simulator orthogonal system.

Simoun Violent hot, dry, sand-laden wind.

Simp Solid isotropic microstructure with penalization.

simple architecture for full electrical Landing-gear brake-by-wire system in which both main and alternate [alternative] systems are electric, mainly or wholly eliminating hydraulics.

simple flap Hinged wing trailing edge, with or without shroud (4) but without intervening slot.

simple harmonic motion Regular oscillation as exemplified by alternating current or drag-free swinging pendulum; projection on any axis in same plane of point moving round circle with constant angular velocity; expressed by \( y = a \cos (2\pi nt + b) \) where \( y \) is distance from origin (at centre) at time \( t \), \( n \) frequency and \( b \) a phase constant such that at \( t = 0 \), \( y = a \cos b \). A plot of \( \sin \) is a characteristic wavy line, passing through the origin (displacement zero) with peak velocity, rising to maximum displacement where velocity passes through zero and reverses, returning through the origin to describe a precise mirror-image terminating at the start of the next cycle. The sum of positive and negative displacements [peaks plus troughs] is called the amplitude, the time between successive passes through the same point in the cycle the period, and the reciprocal of the period [or number of cycles per unit time] the frequency.

simple stress Either pure tension, pure compression or pure shear.

simultaneous pitch control

simplex 1 With no provision for redundancy.

2 Communication on a single channel which is unidirectional in operation; thus, when receiving, cannot transmit.

simplex burner Simple gas-turbine fuel burner fed by single pipe leading to nozzle surrounded by air swirl vanes and with flow proportional to square root of supply pressure.

simplex communications Communications technique in which signals pass in one direction only at any one time; can be single or double channel and switched by press-to-speak, manual T/R switch or voice-operated.

simplified directional facility ILS localizer (108.1-111.9 MHz) with aerial offset from runway and emitting beam usually not exactly aligned with it nor providing G/S information.

simplified passenger travel Attempt from 1999 to streamline ‘repetitive identity checks at airports’. Since 11 September 2001 emphasis has included new identification measures (ICAO).

simply supported beam Pin-jointed at both ends.

SIMR Swalibard initial mission recovery.

Sims 1 Secondary-ion mass spectrometry.

2 Signal-identification mobile system.

SIM2 Use of three sets of axes (wind, tunnel stability and body) for force and moment equations (NASA 1990 onwards).

Simu Single-input multi-unit.

SIMUL Simultaneously (ICAO).

simulated forced landing Includes all actions except landing.

simulated-operations test Operational test needed to support statements of new requirements and support positions and programmes (USAF).

simulated attack profile Typically, lo mission in which pilot is tasked to find and attack several point targets.

simulator Dynamic device which attempts to reproduce behaviour of another dynamic device, eg aircraft or missile, under static and controlled conditions for research, engineering design, detail development or personnel training. Those used for research are similar in appearance to other large electronic items; those for training often incorporate a complete cockpit or flight deck carried on hydraulic rams giving motion about all three linear axes and three rotary axes (eg exactly reproducing asymmetric swing on take-off engine failure or buffet at approach to stall with correct fuselage pitch attitudes), and model-form or electronically generated external scene for flight in neighbourhood of particular selected airport(s).

simulator sickness Caused by conflict between sensations, control inputs and visual cues.

Simulink Versatile software tool for enabling systems engineer to explore function and performance (Parker Aerospace).

simultaneous approach Two aircraft land on parallel runways at the same place.

simultaneous dual field of view Split-screen system generated by two LOS telescopes focusing IR on single detector array, converted to formatted electronic picture, half wide FOV and half magnified narrow FOV (Hughes/Eltro).

simultaneous engagement Concurrent engagement of target by interceptors and SAMs (DoD).

simultaneous pitch control See collective.
single-configuration fleet Radio range which simultaneously broadcasts voice messages.
SIN Significant-item number.
Sindicato Nazionale Gente dell’Aria (I).
SINCgars, Single-channel ground and airborne, or ground/air, radio subsystem; SIP adds system-improvement programme and V adds vhf.
sine curve Obtained by plotting sine on linear axis, graphically identical to plot of SHM.
sine wave Wave of SHM form, eg EM radiation.
sine-wave flight Repeated SHM in vertical plane, especially spacecraft skipping in and out of sensible atmosphere.
sine-wave spar Structural member whose web has a sine-wave profile.
S-ing Performing succession of S-turns.
single A single-engine aircraft, term normally used for GA aeroplanes.
single-acting Actuator pushing in one direction only, with spring return; push-push.
single-aisle aircraft Narrow-body, having twin or triple seats on each side of one axial aisle.
single-axis autopilot One offering stability or control about one aircraft axis only, eg pitch, roll or yaw.
single-axis head Homing head whose sensor scans only in one plane.
single-base propellant Traditional term originating in so-called smokeless powders based on either Nc or Ng alone (see double-base).
single-bay Having only one set of interplane struts joining wings of biplane on each side of centreline.
single-channel simplex Same frequency in both directions.
single-configuration fleet Not only are all aircraft in airline fleet of same type but all have same build-standard, avionics, cockpit and furnishing.
single-crystal alloy Complete workpiece formed in piece of metal grown as single crystal, possibly containing occasional atomic imperfections but devoid of gross intercrystalline joints and as far as possible with lattice orientation selected to increase strength in direction of greatest applied stress.
single-curvature Curved only in one plane, as surface of regular cylinder.
single-direction route Self-explanatory, usually high-altitude IFR.
single-entry compressor Radial or centrifugal impeller with vanes on one side only.
Single European Sky Overdue plan for unified ATC, adopted by EC December 2002, still years from implementation.
single-expansion ramp nozzle One form of non-axisymmetric jet engine nozzle in which supersonic jet is accelerated along sloping wall (expansive flow) on one side only. Has attractions for SSTOVL.
single-face repair Repair to sandwich structure involving core and one face only.
single-flare joint End of rigid pipe flared out but not turned back on itself.
single-float seaplane Large central float and small stabilizing floats outboard.
single ignition One coil of magneto, feeding one plug per piston engine cylinder. Thus, there is no redundancy.
single-pass heat-exchanger Each fluid passes once through without turning.
single-pole electrical system The bonded airframe provides the return path for the current.
single-regime engine One designed to operate always under same conditions, eg jet VTOL.
single-rotation 1 Composed of one unit (propeller or propfan), as distinct from two equal units rotating in opposite directions.
2 Flap hinged about a single fixed axis well below the wing, and thus moving along a circular arc.
single-row engine Radial engine with all cylinders in same plane driving one crankpin.
single-shaft engine Gas turbine in which all compressor stages are connected to the same turbine. There may be an independent shaft linking a free turbine to a shaft output.
single-sideband Reduction of bandwidth by transmitting only one sideband and suppressing other (and usually carrier also); receiver heterodynes at original carrier frequency.
single-sideband suppressed carrier Band of audio-intelligence frequencies translated to radio frequencies with no distortion of signal.
single-sink flow Fluid flow capable of exact representation using a single sink.
Single Sky Wide range of measures intended to consolidate Upper Airspace throughout Europe by end of 2004 (EU).
single-spar wing Wing in which primary flight loads are borne by one spar (as distinct from a box), possibly made with two booms on at least one edge or having U or circular section. Does not preclude secondary spanwise member(s) for trailing-edge surface loads.
single-spring flexure Tunnel balance in which model is supported by single (usually vertical transverse) member locally thinned at one transverse point to serve as pivot sensitive to forces or couples about that axis only.
single-stage compressor Compressor achieving total overall pressure ratio in one operation, eg by centrifugal impeller or single row of axial blades.
single-stage turbine Turbine having only one set of axial rotor blades or inward radial vanes.
single-stage vehicle Aerospace vehicle (aircraft, RPV, missile, rocket) with only one propulsion system. It is hoped eventually to create a * to orbit, or to inter-planetary space.
single-surface rudder Normal leading edge back to spar [near maximum thickness], aft of which skin is on centreline with half-ribs on each side. Also called splitter-plate rudder or tadpole rudder.
single-supply wing Wing having upper [lifting] surface only, characteristic of pre-1914 aeroplanes and many hang gliders and microlights.
single-target track Traditional fighter radar tracking mode, usually with phase-comparison monopulse.
single-tipping Sheath (1) made in one piece.
single-up Competition in which winner takes all.
single-wedge aerofoil Cross-section has sharp leading edge, flat sides and blunt or square trailing edge, eg vertical tail of X-15. Extremely inefficient at low speeds.
single-wheel gear Main landing gear of large aircraft with one wheel on each shock strut.
single-wind construction Making an item, especially a large section of airframe, from a single continuous high-
sir

Super-integrated power unit, engine designed to SIPU (DoD).

Siprnet, Sipri possibly unwanted.

Siphoning Accidentes Aeronauticos (Brazil).

Serviço de Investigação e Prevenção de Sipaer (Brazil).

Sindicato Italiano Piloti Aviazione Civile (I).

Program.

SIP Single integrated operational, or operating, plan [use of NW] (UK, US).

SIOP Single integrated operational, or operating, plan [use of NW] (UK, US).

SIOU Serial input/output unit (threat warning).

SISO 2 Single input, single output.

SIT Test report for integrated systems.

SITR System-integration test report.

SITR System-integration test plan; /D adds description.

SITR System-integration test report.
SITREP, Sitrep

SITREP, Sitrep  Situation report.
SITS  Systems integrated test station.
situational awareness  A buzz-word in air-combat theory; unquantifiable ability of pilot to keep abreast of what is happening to all friends and all foes. Not related to experience.
SIU  1 Sensor, or server, or systems, or satellite, or Standard, or Sidewinder, or secure, interface unit.
  2 Supportability and infrastructure upgrade[s].
SIV  Separation integration vehicle.
Sivam  System for vigilance of the Amazon.
SIVSG  Silicon vibrating-structure gyro.
SIWB  Smart integrated weapon bay.
SIWL  Single isolated-wheel load.
SIWR  Self-induced wing rock.
six  Six-0’clock position, ie directly behind one’s own aircraft, hence ‘check ‘em!’
6 by 7 cable  Flexible aircraft cable with cotton core surrounded by six cables each twisted from seven wires.
six-component balance  Wind-tunnel balance that simultaneously measures forces and moments (couples) about all three axes.
Six Cs  A checklist for an emergency: confess (problem), climb, communicate, conserve, comply, consult.
6-DOF  Six degrees of freedom; two directions in each of three dimensions.
Six-sigma  Method of quantifying and measuring products and services to achieve ‘world class’ performance; common denominator is number of defects per unit or task.
666  IFR currency requirements: previous calendar months, number of approaches, hours.
16-g seat  Strength requirement of airline seat (current FAR).
sized fibre  Virgin carbon fibre sized with resin binder.
SJ  Ski-jump.
SJC  Semi-jetborne (jet VTOL).
SKC  Sky clear (ICAO = \(\leq 1\frac{1}{2}\) cloud).
SKD  Semi-knocked-down.
SKE  1 Station-keeping equipment.
  2 Secondary kinetic energy.
sked  Scheduled (ICAO).
skeg  1 Small fixed fin at rear of afterbody step of marine aircraft to improve stability when taxying.
  2 ACV sidewall.
  3 Ventral strip along seaplane afterbody serving as support on land.
skeg aileron  One whose hinge axis is markedly not parallel to transverse axis but diagonally across tip.
skeg angle  Angle between principal axes of fuselage and wing of oblique-wing aircraft.
skegged  Suspended in bottom of ACV by flexible support and cables to reduce drag or for control.
skein  Tidal or oceanic eddy.
skein diameter  1 Diameter of conical or circular skein formed by two or more wires or cables laid side by side.
  2 Diameter of string or rope.
skein length  Total length of string, rope, cable, or wire from fixed point to free end.
skein wrapped  (1) Coiled as skein; (2) Twisted in skein formation.
skein wind  Wire or cable wound in skein.
skein wind (1) 6 by 7 cable.
skein wind (2) Flexible aircraft cable with cotton core surrounded by six cables each twisted from seven wires.
skeiner  Ski jumper.
skein-y  Ski-jumper.
skein-yed  Ski jumping.
skein-yed  Ski jumped.
skein-yed  Skiing.
skein-yed  Ski-jumper.
skein-yed  Ski jumping.
skein-yed  Ski jump.
skein-yed  Ski-jump.
skein-yed  Ski-jumping.
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skein-yed  Ski-jumped.
skein-yed  Ski jumping.
skein-yed  Ski jump.

skin mill

skew compressor  Fluid compressor intermediate between centrifugal (radial) and axial.
skew sensor  Pickup detecting any asymmetry in movement of flaps, slats, lift dumpers or similar moveables.
SKF  Superkritischer Flügel; supercritical wing (G).
SKG  Schnellkampfgeschwader, fast bomber wing (G, WW2).
Skiatron  Dark-trace CRT or related display.
skidding  1 Sliding outward in turn because of insufficient bank or excess rudder, opposite of slip.
  2 Incorrect operation of ball or roller bearing in which sliding friction occurs instead of pure rolling, for various reasons.
Skiddometer  Towed runway-friction measurer with 17%-slip braked centre wheel.
skifin  Fixed fin mounted high above c.g., eg above upper wing of biplane, to reduce skidding (1).
skid landing gear  1 In early aeroplanes, rigid ski-shaped member projecting ahead of landing gear to prevent nosing-over.
  2 In helicopters, fixed tubular landing gear, often provided with small auxiliary wheels (eg winched down by hand) to confer ground mobility.
skid-out  See skidding (1).
skid transducer  Input sensor of anti-skid wheel brake system, able to sense any sudden variation in wheel rotational speed.
skiing glider  Skier also wearing lifting aerofoil or parafoil.
ski-jump  Take-off over a * ramp.
ski-jump ramp  Curved ramp terminating at (ideally) about 12° to horizontal providing large benefits to rolling take-off by vectored-thrust STOVL aircraft, including shorter run and/or greater weight of fuel/weapons, and increased safety (particularly off ship) in event of failure of engine or nozzles.
ski landing gear  Designed for ice or compacted snow, often with heating to prevent adhesion.
skimmer  1 Missile, eg anti-ship category, programmed to fly just above crests of waves.
  2 ACV (colloq.).
skin  1 Outer covering of air vehicle, ACV or spacecraft, except that in case of vehicle covered with ablative layer or thermal-insulating tiles * is underlying structural layer. Can be made of any material including fabric or Mylar.
  2 Outer component of sandwich.
skin Doppler  Determination of air-vehicle velocity by radar.
skin drag  See surface-friction drag.
skin echo  Popular term for object, especially aircraft, as seen on radar.
skin effect  Concentration of AC (electron flow) towards surface of conductor.
skin friction  See surface-friction drag.
skin-friction coefficient  Non-dimensional form of skin-friction drag on body immersed in a laminar, viscous, incompressible flow, \(\gamma = \frac{1}{\frac{1}{2} \rho U_m^2} \) where \(\tau_c\) is shearing stress at solid surface, \(\rho\) density and \(U_m\) mean flow velocity \(\left(= \frac{16}{R}\right)\) where \(R\) is Reynolds No.
skin mill  Large machine tool with revolving cutter(s) under which passes workpiece with linear motion; cutter
skin paint

axis can vary from horizontal to vertical. Often NC machine and able to sculpt complete wing skin.

skin paint 1 Radar indication caused by reflected radar signal from object (DoD); ie blip.
2 Fix obtained by ground radar on aerial target.

skin temperature Temperature of outer surface of body, esp. in sustained supersonic flight.

skin tracking Tracking of object by means of a skin paint (1) (DoD). Specifically, without assistance of a transponder.

skip See skip re-entry.

skip altitude Lowest point of a trough.

ski pad Large-area pad attached to helicopter landing gear for operations from snow, tundra, muskeg, swamp and sand.

skip bombing Method of aerial bombing in which bomb is released from such a low altitude that it slides or glances along surface of water or ground and strikes target at or above water or ground level (DoD).

skip distance Distance from transmitter at which first reflected sky wave can be received, increasing with frequency.

skip/glide See boost/glide.

skip it Air intercept code: “Do not attack, cease interception”.

skipping Sine-wave flight.

skip re-entry Atmospheric entry by lifting-body spacecraft in which energy is lost in penetrating atmosphere in curving trajectory reminiscent of stone skipping on pond, possible only with very accurate trajectory control if first skip is not to result in permanent departure from Earth (see lifting re-entry).

skirt 1 Lowest part of body of large ballistic vehicle surrounding rocket engine(s).
2 Lowest part of parachute canopy.
3 Lowest part of envelope of hot-air balloon.
4 Flexible structure surrounding and containing cushion of amorphibious and many other types of ACV enabling vehicle to run over waves or rough ground.

skirt fog Steam cloud during launch from wet pad.

ski-toe locus Imaginary object shaped like front of ski

slab tailplane Horizontal tail formed as single pivoted plane on various types of aircraft.

slab trailing edge Blunt trailing edge on aerofoil.

slab-sided Having essentially flat (usually near-vertical) sides.

slag refining

horizon with sky background, or to expose own aircraft in same way.


Sky Miles Free travel assigned by airline to frequent flyer, or offered as competition prize.

skyquake Sonic boom from large hypersonic aircraft.

sky screen Simple optical (camera obscura) device showing range safety officer if vehicle departs from safe trajectory; often one for track and another for vertical profile.

sky shouting Use of aircraft-borne loudspeaker; in most countries prohibited for private use.

sky wave That portion of a radiated wave that travels in space and is returned to Earth by refraction in ionosphere (ASCC). Several other authorities use word ‘reflection’. Also called ionospheric or indirect.

sky-wave correction Factor to be applied to some hyperbolic navaids, eg Loran, if sky waves are used instead of ground waves; varies with relative distances to master and slave(s).

sky writing Writing, if possible against blue-sky background, using oil added to exhaust or other system and forming characters by accurately flying along their outlines, or using tight formation to switch smoke under computer/radio control while flying straight along words.

SL 1 Sea level, also S/L.
2 Space-limited, or laucher.
3 Service letter.
4 Schützstellen für Luftfahrzeuge (G, Austria).
5 Short landing.
6 Sensitivity level.
7 Start line.
8 Standing lenticular.
9 Sound level.
10 Stereolithography.

S/L 1 Shoot/lock.
2 Sub-level.
3 Sea level.
4 Wing area outboard of fuselage, i.e. net area.

SLA 1 Small light aeroplane.
2 Self-launching aircraft.
3 Service-level agreement.
4 Spacecraft/Lunar-module adaptor.
5 Stage-length adjusted (CASM).
6 Super lightweight ablator.

Slab Sealed lead-acid battery.

slab-sided Having essentially flat (usually near-vertical) sides.

slab tailplane Horizontal tail formed as single pivoted surface and used as primary flight control; no fixed tailplane or hinged elevators (US: horizontal stabilizer). Called taileron when installed in left/right halves capable of being driven in opposite directions.

slab trailing edge Blunt trailing edge, esp. squared off normal to line of flight.

SLAE Now SLAET.

SLAE The Society of Licensed Aircraft Engineers Australia.

SLAET The Society of Licensed Aircraft Engineers & Technologists [formed 1943, reconstituted 1962, office Kingston-upon-Thames (UK)].

slag refining See electro-slag refining.
SLAM

SLAM 1 Supersonic low-altitude missile.
  2 Standoff land attack missile [ER adds extended range or expanded response].
  3 Scanning laser acoustic microscopy.
Slam 1 RAAM surface-launched advanced medium-range AAM, ie SL-Amraam. Suggest confusion with Slammer.
slam acceleration Most rapid possible acceleration of engine, esp. gas turbine, typified by violent forward movement of power lever to limit. Hence, slam deceleration.
Slammer 1 Amraam, or especially aircraft armed with live Amraams.
slamming Impact of front or rear wheels (depending on design geometry) of bogie on ground at vertical velocity greater than that of aircraft, caused by added velocity imparted by rotation of bogie beam.
Slamms Sideways-looking airborne multimission radar.
Slam-R Small lightweight airborne MTI-radar.
slant course line Intersection of course surface and plane of nominal ILS glidepath.
slanted deck Angled deck.
slant range LOS range between aircraft (aerial target) and fixed ground station; not same as range plotted on map, hence ** correction to radio navaid distances which is small until aircraft height is greater than 20% of **.
slant visual range SVR (1).
SLAP 1 Saboted light-armour penetrator.
  2 Slot-allocation procedure.
  3 Service-life, or structural life, assessment program.
slap See rotor *.
SLAR Sideways-looking airborne, or aircraft, or aperture, radar.
slash Radar beacon reply presented as a short line on display.
slash mark Oblique stroke /.
slash rating 1 For electric machines and other accessories, normally 150% of base load.
  2 More generally, any special increased rating of an engine or other machine, printed to right of a slash mark.
SLAT, Slat 1 Slow, low, airborne target.
  2 Supersonic low-altitude target.
  3 Ship-launched air [or aerial] target.
slat 1 Movable portion of leading edge of aerofoil, esp. wing, which in cruising flight is recessed against main surface and forms part of profile; at high angle of attack either lifts away under its own aerodynamic load or is driven under power to move forward and down and leave intervening slot.
  2 Fixed leading-edge portion of aerofoil, either wing or tailplane (in latter case often inverted, lying along underside), forming slot ahead of main surface. Both (1, 2) postpone flow breakaway at high AOA and thus delay stall.
Slate 1 Small lightweight altitude-transmitting equipment, beacon for GA (FAA 1361).
slatted Fitted with a slat (1, 2).
slave 1 See slaiving.
  2 See slave station.
  3 Adjective descriptive of any item installed in an aircraft purely to check the dimensions and interface connections; hence * engine, * APU, not intended to be operated.
Slave actuator Actuator, usually ballscrew, forming one of a number transmitting motion originating at a remote power source. Distributed along wing to move flaps, and around engine to move reverser blocker doors.
slave aerial Mechanically scanned aerial slaved to another, eg SSR slaved to surveillance radar but off-mounted.
slaved gyro One whose spin axis is maintained in alignment with an external direction, eg magnetic N or local vertical.
slave engine In a multi-engine aircraft with engines synchronized, all engines other than the master.
slave landing gear Temporary landing gear used in factory to move incomplete aircraft.
slave shaft Short shaft on which rotating item is temporarily mounted (possibly loosely) when perfecting balance.
slave station Radio station whose emissions are controlled in exact synchronization or phase with a master station at different geographical location.
Slavianoff System of arc welding using metal wire or rod as positive electrode.
slaving 1 To constrain a body to maintain an attitude in exact alignment with another.
  2 To key a transmitter to radiate in exact phase or synchronization with a master.
SL1 1 System link budget.
  2 Sidelobe blanking.
SLBM Submarine-, or sea-, launched ballistic missile.
SLC 1 Sidelobe clutter, or cancellation.
  2 Software life cycle.
  3 Space launch complex (pronounced slick).
  4 Submarine laser communications.
  5 Source lines of code.
  6 Sonobuoy launch container.
  7 Sensitivity-level command (TCAS).
  8 Synchronous-link control.
  9 Storage and launch container.
SLCM 1 Submarine- [or sea-, or ship-] launched cruise missile.
  2 Survivable low communications system.
SLD 1 Short lift, dry.
  2 Supercooled large droplets.
  3 Solid sky cover.
SL/DR Spoiler(s) and lift dumper(s).
Sleaford Tech Derogatory term for RAF College, Cranwell.
SLECR Software-loadable equipment configuration report.
sled Track-mounted wheeled vehicle accelerated to high [often supersonic] speed by rocket[s] on which test devices [such as fighter forward fuselage with ejection seat] can be mounted.
Sleeve Slender lifting-entry emergency craft.
sleet Precipitation of rain/snow mix or partially melted snow. Two special US usages: frozen rain in form of clear drops of ice, and glaze ice covering surface objects; both highly ambiguous.
sleeve 1 Sleeve target.
  2 Plastics cylinder used as colour-coded electrical cable marker.
  3 Valve mating with bore of sleeve-valve cylinder.
  4 Fabric tube for filling gas aerosol.
  5 Windsock [not common].
sleeve target Tapered tube of flexible fabric, open both
sleeve valve
ends and towed large-end first; can incorporate reflective prism, mesh, MDI or other enhancement.
sleeve valve Any of various techniques for piston-engine valve gear using one or two concentric sleeves between piston and cylinder with suitably shaped ports in walls lining up intermitently with inlet/exhaust connections on cylinder; usual is Burt-McCollum single sleeve.
slender body One of such large slenderness ratio that squares and higher powers of disturbances can be ignored.
slender delta Aeroplane whose wing has ogival delta plan with very low aspect ratio such that at Mach numbers exceeding 2 entire wing lies within conical shockwave from nose.
slenderness ratio Length/diameter of fuselage or other slender body. Generally, synonymous with fineness ratio.
slender wing Not defined: any wing of very low aspect ratio.
SLEP 1 Service-life extension programme.
2 Structural-life enhancement programme.
SLES Spacecraft life-extension system.
SLEW Single-tone link-11 waveform (Int.).
slew 1 To rotate in azimuth.
2 To offset centre of P-type or similar display laterally, eg to study air traffic or surface feature off edge.
J To rotate gyro spin axis by applied torque at 90°.
slewed flight Yawed, eg with applied rudder while holding height and with wings level.
slewing Slew; also defined as changing scale on radar display (not recommended).
slew-wing aeroplane One whose wing is pivoted as one unit about mid-point, thus as one tip moves forward opposite tip moves aft. In some forms there is no fuselage, and wing obliquity to airflow is determined solely by tip fin(s) and engine pod angles.
SLF Shuttle landing facility.
SLFCS Survivable LF communications system (SAC, USAF).
SLFP Suction-lift fuel pump.
SLG Satellite landing ground, ie auxiliary field.
SLGPS Small lightweight GPS.
SLGT Slight; CHC adds chance = <20% likelihood.
SLH System-level health.
SLI 1 Staatliche Luftfahrtinspektion (DDR).
2 Space launch initiative (NASA, 2000-).
J System-level interface.
SLIC Submarine-launched intercontinental missile.
Slice Internationally agreed subdivision of international funds, usually allocated in * groups or as 1-year * for infrastructure (NATO).
slice 1 Possibly violent uncontrolled departure in yaw, usually at extreme AOA.
2 Intended rapid yaw.
sliced(2) Maximum-performance hard nose-down turn, over 90° bank.
slice weight Maximum mass of bird material between consecutive fan blades.
slick Any streamlined free-fall store, especially GP bomb.
slick wing One with no provision for pylons or hard-points.
SLICS Safe-lane indicator computing system.
slide raft Escape slide which can be detached and used subsequently as fully equipped life raft.
slidewire Wire carrying transport trolley providing emergency escape from top of space-launch service tower.
sliding carpet Moving aircraft-carrier flight deck, never actually tested.
sliding window Figurative (electronic) window in SSR which looks into each range bin in turn, feeds any traffic or other reply found there to plot extractor and usually also defruits.
SLIM 1 Surface-launched interceptor missile (concept).
2 Software life-cycle management.
3 Simplified logistics and improved maintenance.
slime light External low-voltage strip light to facilitate night formation flying.
slim jet See single-aisle, narrow-body.
slinger ring Channel or pipe around propeller hub (inside spinner if fitted) to which controlled supply of deicing fluid can be fed for centrifugal distribution along blades.
slinging point Clearly indicated location on airframe or major assembly around which sling of crane can be passed as loop for hoisting.
slip 1 Sliding towards inside of turn as result of excessive bank.
2 Loosely, any yawed flight causing indication towards centre of turn or lower wing on turn* indicator, eg forward *, side-*; in particular, controlled flight of helicopter in direction not in line with fore/aft axis.
3 Measure of loss of propulsive power defined as difference between geometric and effective pitch, see propeller pitch.
4 Slurry composed of finely divided ceramic or glass suspended in liquid, eg for coating surfaces in precision casting techniques.
5 Difference between speed of induction motor under load and synchronized speed, expressed as percentage.
6 Crystalline defect characterized by (usually local) displacement of atoms in one plane by one atomic space.
7 Launch slipway for marine aircraft.
8 Shackle for bomb or other dropped store (becoming arch.).
9 To change flight crews at one stopping place on airline route.
Slipar Short light pulse alerting receiver [laser].
slip bands Microscopic parallel lines visible on polished metal stressed beyond yield point.
slip cover Fabric cover previously cut to shape and sewn, available from store tailored to aircraft type.
slip crew Airline flight or cabin crew who leave or join as operating crew at intermediate point in multi-sector flight. In some cases crew may continue on same aircraft but off-duty.
slip flow Flow in extremely rarefied fluid where mean free path is comparable with dimensions of body (see free-molecular flow, Newtonian flow).
slip function Basic propeller parameter, also called effective pitch ratio, see propeller pitch.
slip gauge Molecular flow gauge (see also defruits).
slip joint One permitting axial sliding, eg in exhaust manifold to allow for expansion.
slippage mark White rectangle painted on wheel/tyre to show relative rotation.
slipper Finger protection used by gymnasts.
slingshot toy Improvised weapon.
slinger Small object, eg golf ball, thrown with a sling.
smear 1 Slurry.
2 Deposit generated by a surface reaction.
smeared fan-shaped Also defruits.
slip pattern

slip pattern  Planned arrangement for slipping crews detailed on crew roster.

slipper  / Adjective describing drop tank or other air-dropped or externally carried store shaped to fit underside and leading edge of wing.

2 Generalized term for precision part designed to slide over another, eg in air or other fluid bearings, or in conrod big end which mates on periphery of master rod and held in place by rings, there being no ring-type big end but only a driving *. slipper

slippery  Having large momentum and little drag (colloq.).

slipping torque  Torque at which piston-engine starter clutch will slip.

slipping turn  Turn with slip (1).

slipring  Conducting ring rotating with rotor of electrical machine to transfer current without commutating.

slip speed  Supercharger rpm required to maintain given pressure differential between inlet and delivery manifold when no air is being delivered.

slipstream  / Airflow immediately surrounding aircraft; if behind propeller * is propwash. Velocities are measured relative to aircraft, propwash typically TAS × 1.2.

2 To follow direction of streamlines, eg in case of freely hinged nozzle tailfeathers or elevator.

3 To follow in wake of another aircraft. Note: (2, 3) are verbs.

slipstream factor  Usually means ratio of mean speed of propeller slipstream relative to aircraft divided by true airspeed.

slipstreaming  Slipstream (2, 3).

slip tank  A tank, eg fuel, water, oil, which can be jettisoned; used in airships and a few aeroplanes but now overtaken by drop tank.

slipway  Sloping ramp along which marine aircraft can enter or leave water.

SLIR  Sideways-looking IR.

SLIRBM  Submarine-launched IRBM (proposal, USN).

SL-ISA  Sea level, international standard atmosphere.

slitting shear  Hand or powered shears of lever type used (Plain shear) or with conrod (shear) or with hinged nozzle tailfeathers (for USN).

silver fraction  Volume of slivers remaining in case at web divided by total propellant volume, symbol \( \lambda \). slivers

slotted flap  Adjective describing drop tank or other air-dropped or externally carried store shaped to fit underside and leading edge of wing.

2 One incorporating a fixed slot (1); if slot results from motion of a slat correct adjective is slatted.

3 Of runway, mean inclination, \( \Delta \) expressed as percentage.

slope angle  Acute angle measured in vertical plane between flightpath and local horizontal.

slope line system  Approach-light system giving vertical guidance by appearance of ground lights (UK 1946-50).

slope of lift curve  Unit is increment of lift per radian change in AOA.

SLOF  Swept local-oscillator receiver.

SLOS  Star line of sight.

2 Stabilized long-range observation system, or optical sight.

sloshing  Gross oscillatory motion of liquid in tank sufficient to impose severe structural stress or affect vehicle trajectory; one cause of pogo effect; * is short-term, unlike fuel shift.

sloshing baffles  Transverse perforated bulkheads, usually part of tank structure, to curb sloshing; strictly anti-**.

Slot  Sequential logic tester.

slot 2 Suitable profiled gap between main aerofoil, eg wing or tailplane, and slat or other leading-edge portion through which airflow is accelerated at high AOA to prevent breakaway; usually curves up and back to direct air over upper surface but on tailplane often inverted.

2 Gap between wing and hinged trailing-edge surface, eg flap or aileron, through which air flows attached across noval surface.

3 Particular allotted time for using facility (eg gunnery range), for space launch (also called window) or for controlled aircraft departure or arrival, esp. at busy airport; hence to secure a *, to miss one’s *.

4 Physical aperture for * aerial.

5 Particular band of aircraft weight or flight performance.

6 Figurative situation or position, esp. a target situation, eg in the * = correctly set up for landing.

7 In carrier flying, to enter landing pattern by flying up ship’s starboard side followed by break downwind.

8 Amplifying (7), window in sky about 300 ft to right (stbd) of ship’s bows and 600 ft above sea.

slot aerial  Aerial (antenna), eg for DME, in form of slot cut in metal skin, often backed by reflective cavity and aerodynamically faired by dielectric; normally 0.5 wave-length long and 0.05 wide, with polarization usually 90° to plane of slot.

slot/spoiler control  Lateral, and alternatively multi-axis, flight control combining powered variable slot [or leading-edge flap] and upper-surface spoiler [also serving as airbrake when used symmetrically].

slotted aerofoil  One incorporating a fixed slot (1); if slot results from motion of a slat correct adjective is slatted.

slotted aileron  Aileron separated from wing by slot (2).

slotted flap  Flap, usually not translating but simply hinged, forming whole of local trailing edge and separated from wing by slot (2).

lottery  Allocation of capped number of slots (3) by lottery. Generally, supposed unfair allocation and horse-trading.

2 Arrangement of slots (1), especially when complex (colloq.).

slow-blow fuse  Cartridge designed to withstand brief overload (electrical).
slow-CAP

Combat air patrol to protect slow-flying aircraft.

slow roll

Precision flight manoeuvre in which aircraft, usually fixed-wing, is rolled through 360° by ailerons (using rudder as necessary) while keeping longitudinal axis sensibly constant on original heading; unlike barrel roll imparts -1 g in inverted attitude. Can be performed with longitudinal axis at any inclination in vertical plane. In US called aileron roll.

slow-running cut-out

Pilot-operated valve which stops piston engine by turning off supply of metered fuel (carburettor engine only).

slow-running jet

Fine carburettor jet which alone supplies fuel to piston engine mixture when throttle is at idling position.

SLP

Space-limited payload.

2 Survivor-locator package (USAF).

3 Sequential linear programming.

6 Slope; SLP sloping.

5 Sea-level pressure.

7 Speed-limiting point on procedural chart.

SLR

1 Side-, or sideways-, looking radar.

2 Slush on runway.

3 Standard lapse rate.

SLRR

Side-looking reconnaissance radar.

SLRS

Space lift range system.

SLT

1 Space lift range system.

2 Surviv."
small/medium enterprise

small/medium enterprise Less than £30m annual turnover, <= 250 employees, <= 25% owned by voting rights in another company (EU).

small perturbation One for which 2nd and higher-order terms are ignored.

smallsat Small satellite: FAA <= 2,000 lb; ESA <= 400 kg (882 lb), <= €1.5 million.

small-scale integration Usually 10 or fewer gates or other functions per IC.

SM&IE Semiconductor materials and equipment.

SMAP, Smap 1 Systems-management analysis project (AFSC).

2 Simultaneous MAP (10).

Smart 1 Secure mobile anti-jam reliable [tactical] terminal.

2 Scalable multiprocessor architecture for real time [U^* = ultra].

3 Spurt message alphanumeric radio terminal.

4 Small-firms merit award for research and technology (UK).

5 Supersonic military aerospace research track.

6 Situation-monitoring analysis and reporting tablet.

7 Smart munition advanced rocket.

8 Small missions for advanced research in, or and, technology (ESA).

9 Smart-material actuated rotor technology.

10 Simulated mission and rehearsal training.

smart 1 Capable of being guided, by self-homing or external command, to achieve direct hit on point target.

2 Generalized term for clever, eg smart jammer listens for hostile emission and then jams on correct wavelength.

smart actuator Containing an embedded processor.

smart bogey Formidable opponent in air combat.

smart display unit Combines functions of mission computer, colour-graphics processor and display/control panel.

smart electromechanical actuator Based on brushless motors using rare-earth magnets, with position feedback using Hall-effect sensors.

smart fixed-wing aircraft One whose shape, especially that of the wing, incorporates active technology to reduce drag, noise and gust response.

smart fuze Fuze incorporating linear accelerometer and processor chip to measure decelerations after first contact with target and detonate warhead at a predetermined point.

smart graphics processor Locally generates display imagery on which overlays merge external video.

Smart Label See TT12.

smartlet Smart bomblet.

smart-material actuated rotor Helicopter main rotor fitted with electrically controlled trailing-edge flaps which react to sensor signals to modify vibratory and acoustic signatures.

smart skin 1 External skin incorporating microstructures in micron range of size which can gang together like phased arrays to allow transmission, reception and processing of EM information in skin surface.

2 Loosely, any electrically conductive skin.

Smart-T Secure mobile anti-jam reliable tactical terminal.

Smash Southeast Asia multisensor armament system, helicopter.

SMEU

Smatcals Signature-managed ATC approach and landing system (USN).

Smaud Special materials aero urban decoy [IRCM decoy].

SMAU Stop-motion aim-point upgrade.

SMAW Shielded metal-arc welding.

SMB Side marker board, for airport parking guidance.

SMC 1 Standard mean chord.

2 Surface movement control (ICAO).

3 Space and Missile-systems Center (USAF, Los Angeles AFB).

4 System management and communication.

SmCo Samarium cobalt, chief rare-earth magnetic material accepting 20 to 30 times normal current for short overload periods.

SMCS 1 Spoiler mode control system.

2 Structural mode control system.

SMDC 1 Shielded mild detonating cord.

2 Space & Missile Defense Command (USA).

SMDI Smart-motion de-interlacing.

SMDP Standardized military drawing program, for microcircuits (US).

SMDPS Strategic-missile defense and planning system.

SMDS Switched multi-megabit data service.

SMDU Strapdown magnetic detector unit.

SME 1 Small/medium enterprise.

2 Special mission equipment.

3 System-management entity.

4 Solar mesosphere explorer.

5 Society of Manufacturing Engineers [office, Dearborn, MI] (US).

smear Degraded radio reception due to another transmission on same frequency or degraded TV picture due to ghost image closely following primary image.

smear camera See streak camera.

smearer Subcircuit to eliminate pulse-amplication overshoot.

smear metal Metal melted by high-speed machining or welding and deposited on workpiece.

SMEAT Skylab medical experiments altitude test.

SMEC Strategic Missiles Evaluation Committee (USAF, formerly).

smectic phase Liquid-crystal phase having layered structure with constant preferred direction; flow is abnormal and X-ray diffraction pattern is obtained from one direction only.

SMED Single-minute exchange of dies [to eliminate extended set-up times].

SMEI Solar mass ejection imager.

SMER Smart multiple ejector rack.

SMES 1 Strategic Missile Evaluation Squadron.

2 Superconducting magnetic-energy storage.

MET Simulated mission endurance testing.

SMEU Switchable main electronic unit.
SMF

SMF 1 Sintered metal fibre.
2 Surrogate management framework(s).
SMFA Service du Matériel de la formation Aéro-nautique (F).
SMFD Secondary multifunction display.
SMG 1 Sync/message/guard time-slot.
2 Spinning-mass gyro.
3 System Management Group (ICAO AAG).
SMGCS Surface-movement guidance and control system, pronounced smics.
SMHMS Standardized magnetic helmet-mounted sight (USN).
SMI 1 Structural merit index.
2 Standard message identifiers.
* San Marco Island.
SMILS Sonobuoy missile-impact location system.
$ S_{\text{min}} $ Minimum detectable signal power.
Smith-Barry Pioneer formalized system of flying training, 1914.
Smith diagram Standard plot for solving electrical transmission-line problems.
SMK Smoke.
SML Small.
SMLS 1 Interim standard MLS.
2 Seamless (pipe, tube).
SMLV Standard memory-load verification.
SMM 1 Space manufacturing module.
2 Solar maximum mission.
3 Service Météorologique Métropolitain (F).
SMMIC System maintenance monitoring console.
SMMR Scanning multi-frequency microwave radiometer.
SMO 1 Supplementary meteorological office.
2 Synchronized modulated oscillator.
3 Shelter management office.
smog Fog contaminated by liquid and/or solid industrial pollutants, particularly smoke.
SMOH Since major overhaul; suffixes LE, RE = left/right engine.
smoke angel The self-explanatory appearance of the visible after-effect of discharging IR decoy flares into trailing wingtip vortices.
smoke apparatus Aircraft installation for leaving either a smoke screen or, today more often, smoke trail of desired colour for display purposes.
smoke bomb Air-dropped pyrotechnic, able to float, for indicating wind velocity.
smoke box Container of slow-burning fuel for producing wind-indicating smoke trail.
smoke filamenet Any of many techniques for rendering airflow visible.
smoke float See smoke bomb.
smoke generator Pyrotechnic device for generating visible smoke, for laying smokescene or dropped on surface to facilitate wind measurement.
smokehood Light but fire-resistant transparent bag enveloping wearer’s head to offer short-term protection against smoke and toxic fumes; must withstand def-compression.
smokejumper Firefighter who parachutes, abseils, or [less often] is air-landed, on burning area.
smoke pot Remotely triggered device fired to indicate a hit on ground target.
smoke tunnel Not precisely defined; wind tunnel in which either general recirculating smoke or discrete streams give visible flow indication.
SMOLED Often pronounced smo-led, small-molecule organic LED.
SMP 1 Self-maintenance period (aircraft carrier).
2 System(s) management processor (1553B data bus).
3 Sintered metal powder.
4 System management and performance [testing].
5 Stores-management processor.
6 System main processor (SMGCS).
7 Service, or servicing, management plan.
SMPS Switched-mode power supply.
SMR 1 Surface-movement radar (ICAO).
2 Svenska Mekanisters Riksförening (Sweden).
3 Selective message routing.
4 Stores management and release; S adds system.
SMRD Spin motor detector (rate gyro).
SMRS Stores management and release system.
SMRT Soldier metabolic remote telemonitor (AFRL).
SMSS 1 Strategic Missile Squadron (USAF).
2 Stores-management set, or system.
3 Suspended manoeuvring system.
4 Supply and movements squadron (RAF).
5 Space mission simulator.
6 Sensor monitoring set.
7 Smart materials and structures.
8 Synchronous meteorological satellite.
9 Setting mini-station.
10 Signal-measurement system.
11 Short message, or messaging, service.
12 Spectrum monitoring system.
13 Safety management system (airline).
14 Stratosphere, or stratospheric, and mesosphere, or mesospheric, sounder.
15 Structural monitoring system; see SVM.
SMSC Space and Missile Systems Center [Colorado Springs] (USAF).
SMT 1 Shadow-mask tube.
2 Système modular thermique, IR common module (F).
3 Sector management tool.
4 Surface-mount[ed] technology.
5 Static/mobile[able].
6 Square-mesh track.
7 Servo-mount [elevator, or aileron/rudder].
8 Station management.
9 Standard-message text.
SMTC Space and Missiles Test Center (Vandenberg AFB, USAF).
SMTD Stol/manoeuvring technology demonstrator.
SMTH Smooth.
SMTI Selective, or surface, or spot moving-target indicator.
SMTQ Space & Missile Test Organization (AFSC).
SMTP Standard mail transfer protocol.
SMTS 1 Store (4) management test set.
2 Space and missile tracking system.
SMU System[s]-, or sensor, management unit.
SMUD Standoff munitions disrupter, for destroying unexploded anti-airfield munitions.
Smurf 1 Side-mounted under-root fin, small curved surface ahead of and below LE root of horizontal tail to eliminate pitch-down in low-airspeed manoeuvres.
2 SFMR [slang].
**SN II**

**SMV**

SMV Space maneuver vehicle (US).
SMW Strategic Missile Wing (USAF).
SMWHT Somewhat.
SMWP Standby master warning panel.
SN J Snow (ICAO).
2 Since new (often SN).
J Shipping notice.
J Scout trainer (USN aircraft category 1939-48).
J Secretary of the Navy (US).
J Strategic navigation.
J Subnetwork.
S/N J Stress against number of alternating load cycles to failure; S is normally ratio of alternating load to ultimate strength, so that for S = 1 N = 1, while for S = 0.8 N may be 10.
2 Serial number.
J Signal/noise ratio.
Sn Tin.
Sthène.
SNA J Sindicato Nacional dos Aeronautas [civil pilot trade union; office, Rio de Janeiro 20020] (Brazil).
2 System network analysis, or architecture.
J National aero club (Slovakia).
SNA HV Syndicat National des Agences et Bureaux de Voyages (F).
SNAKC Subnetwork access; P adds protocol.
SNAEC, Snaec Special notice to aircraft and engine contractors (UK, MoD).
Snag 1 Fault condition or impediment to progress (UK, colloq.), hence * list.
2 Dogtooth or other abrupt discontinuity in leading edge.
Snagla Syndicat National des Agents et Groupeurs de Fret [freight] Aérien (F).
Snake drill Hand drill with tool bit driven by flexible connection.
Snake mode Control mode in which pursuing aircraft flies preprogrammed weaving path to allow time to accomplish identification functions (DoD).
Snaketrack Weaving flight path, under pilot control or preprogrammed, in case of aerial target to provide greater challenge to defences.
Snaking Natural oscillation in yaw at approximately constant amplitude.
SNAP, Snap 1 Systems for, or supplementary, nuclear auxiliary power; former major program for space electric power generation using RTG and similar methods.
2 Synchronous numeric array processor, an add-on to enable small computers to act as simulators.
J Steerable null antenna processor.
Snapac Sindacarto Nazionale Autonomo Personale Aviazione Civile (I).
Snap in Of combat aircrew, to enter and connect up to aircraft prior to mission.
Snap report Preliminary report by aircrew of observations, prior to compilation of mission report (ASCC etc). Term not to be used (DoD).
Snap ring Sprung fastener which locks into peripheral groove on either inside or outside diameter.
Snap roll See flick roll.
Snap-shoot Traditionally, quickly aimed shot; in modern air combat, shooting with fixed gun without need for prior tracking using correctly interpreted HUD sight symbology, usually providing a tracer line.
Snapshot 'Photograph' of all input parameters recorded at particular points in time by HUM to log steady-state conditions for future long-term analysis.
Snap start Prelaunch AAM condition in which weapon is pre-tuned to guidance radar and then returned to passive mode but ready for instant launch.
Snap-up Rapid maximum-performance pull-up to engage target at higher altitude. US aerodynamicists have called the Cobra manoeuvre a snapup [one word].
Snap-up missile AAM capable of engaging and destroying target aircraft at much greater height than launch platform.
Snatch Pick up of a [large military] glider by a tug flying low overhead. Also called * launch.
Snatch load Suddenly applied load, very quickly reaching maximum value, as applied to shroud lines by a rapidly opened parachute.
SNAG Senior, or station, navigation officer (RAF).
SNAW School of Naval Air Warfare (St. Merryn, UK).
SNC 1 Standard navigation computer; small leg-strapped box giving continuous moving-map readout showing aircraft position.
2 Strategic Nuclear Command (India).
SNCO Senior NCO.
SNCR Subnetwork connection reference.
SNCTAA Syndicat National des Cadres et Techniciens de l’Aéronautique et de l’Astronautique (F).
SNDC Secondary navigation display.
SNDC Subnetwork dependent convergence; F adds function, P protocol.
SNDF Strategic nuclear delivery vehicle(s).
SNEA Sindacatio Nacional das Empresas Aeroviarias (Brazilian Air Transport Association).
Snell law Law of index of refraction, n, sin θ = n2 sin θ, where n are refractive indices of two media.
Sneta, SNETA Sindicato Nacional das Empresas de Taxi Aéreo [office, Rio de Janeiro, over 80 members] (Brazil).
SNF Short-range nuclear force(s).
SNFKL Snowflakes.
SNG Synthetic (or synthesized, or substitute) natural gas.
SNJ J Signal/noise index (Omega).
2 SNA network interconnection.
.7 Stand number indicator.
SNICF Subnetwork independent convergence function.
Sniffer(s) Small spin motors (often one motor with tangential nozzles) for small (eg anti-tank) missiles.
SNII Aeroplane scientific test institute of GVF (USSR, R).
**Snipag**

**Snipag** Syndicat National des Industriels et Professionnels de l’Aviation Générale [office, F-75009 Paris] (F).

**Snips** Hand shears for cutting sheet metal.

**Saurifag** Syndicat National des Industriels Réparateurs et Fourrussen de l’Aviation Générale (F).

**SNL** Sandia National Laboratory [NNSA] (US).

**SNLE** F Sous-marin nucléaire lanceur d’engins (missile-firing submarine, F).

**2 Subnetwork link establishment.**

**SNM** Special nuclear material.

**SNMP** Simple network management protocol.

**SNO** Snow.

**SNOE** Smart noise operation equipment (ECM).

**SNOINCR** Snow depth increase in past hour.

**Snomac** Syndicat National des Officiers Mécaniciens de l’Aviation Civile (F).

**Snorac** Syndicat National des Officiers Radios de l’Aviation Civile (F).

**snorl** Pipe through which a helitanker can refill its tank(s) while hovering over a source.

**Snort** Supersonic naval ordnance rocket track.

**snort** Submarine schnorkel pipe, esp. tip seen on radar above ocean.

**Snow** Snow on runway.

**snow** In a gas-turbine engine with one or more drum-like combustion chambers, the entrance for primary air upstream of the burner, also called primary-air scoop. Absent from annular chamber.

**snow** 1 Precipitation in form of feathery ice crystals (BSI); better definition is: small (under 1 mm) grains, granular *; long (2 + mm) grains, ice needles; large agglomeration in form of flakelets, *. Dry * is SG 0.2 to 0.35; wet * is 0.35 to 0.5.

2 Specified interference on electronic display.

3 Air-intercept code: sweep jamming (ie display looks like *).

**Snowdrop** Service Policeman (USAAF, from white helmet; RAF term was snoop).

**snow gauge** Combination of rain gauge and vertical measuring stick to determine snow moisture content.

**snow** Specially designed runway-edge lights which stand above level of any snow yet snap off if struck by aircraft.

**snow** Small white opaque pellets of water/ice, softer than hail.

**snowplough mode** Use of canards as airbrakes after landing.

**snow** Severe R/F interference caused by snow.

**Snowtame** Special-series Notam announcing presence or removal of hazardous conditions due to snow, ice, slush or standing water in association with these on movement area.

**SNPA** Subnetwork point of attachment.

**SNPC** National civil protection (rescue) service (I).

**SNPDU** Subnetwork protocol data unit.

**SNPL** Syndicat National des Pilotes de Ligne (F).

**SNPNAC** Syndicat National du Personnel Navigant de l’Aéronautique Civile; [F-75017 Paris] (F).

**SNPN Commerciale** Syndicat National des Officiers Mécaniciens de l’Aviation Civile (F).

**SNP** Syndicat National du Personnel Navigant de l’Aéronautique Civile; [F-75017 Paris] (F).

**SNP** Syndicat National des Pilotes de Ligne (F).

**SNP** Signal to noise ratio.

**SNR, S/NR** Signal to noise ratio.

**SNRS** Sunrise.

**SNS** Secure network server.

**SNSDU** Subnetwork service data unit.

**SNH** Snow showers.

**SNST** Sunset.

**SNTA** Syndicat National des Transports Aériens [office, Paris] (F).

**snubber** 1 Device which greatly increases stiffness of elastic system whenever deflection or travel exceeds given limiting value, eg rubber block to arrest travel of shock suspension and special features (often hydraulic) to arrest travel of actuator at full stroke.

2 Very loosely used to mean part-span shroud on fan blade.

**snubbed** Fitted with one or more snubbers.

**SNVQ** Scottish National Vocational Qualification.

**SNVS** Stabilized night-vision system.

**SNW** Snow.

**SNWEL** Snowfall.

**SNY** Spanish navy [UK usage].

**SNZF** Sintered nickel/zinc ferrite (RAM).

**SO** 1 Second Officer.

2 Scout observation (USN aircraft category 1934-46).

3 Special order.

**SOA** 1 Spectrometric oil analysis.

2 State of the art.

3 Special Operations aircraft.

4 Space-surveillance network optical augmentation.

5 Separate operating agency.

6 Service-oriented architecture.

7 Soft-object animation.

**SOACMS** Special-operations aircraft combat-mission simulator.

**SOAG** Special Operations Aviation Group (USA).

**SoAG** School of Air Gunnery.

**soakdown** Period after engine shutdown when heat is dissipated from engines and, especially, wheel brakes. Also called soaking.

**SOAP, Soap** 1 Spectrometric oil-analysis programme.

2 Simple object access protocol.

**SOAR** 1 Shuttle Orbiter applications and requirements.

2 Special Operations Aviation Regiment (USA).

**soar** To prolong sailplane flight by seeking upcurrents, especially thermals.

**Soarex** Sub-orbital aerodynamic re-entry experiment[s].

**SOAWS** Satellite on-board attack warning system.

**SOB** 1 Souls on board, traditional maritime count of everyone on board.

2 Stand-off bomb.

**SOC** 1 Struck off charge, no longer on unit strength.

2 Shut-off cock.

3 Sector Operations Centre (RAF).

4 Satellite, or systems, operations complex.

5 Start of climb.

6 Single overhead camshaft.

7 State of charge.

8 System on a chip.

9 See Socom.

**Soc** All-engines take-off distance (FAR).

**SOP** 1 Space Operations Center Centre.

2 Space Operations Control Center (NOAA, Suitland, MD).

**SOCJ** Standoff communications jammer.

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629
socked-in  Airfield closed by weather, especially by fog (colloq.).

Socom Special Operations Command (USA).

Socrates Sensor for optically characterizing remote [or ring-eddy] turbulence emanating sound (FAA), i.e. laser detection and plotting of turbulent wakes.

Sokus South Continental US Loran chain.

SOD Satellite Operations Directorate.

Soda Statement of demonstrated ability.

Sodals Simplified omnidirectional approach-light system.

Sodar Sonic detection and ranging, usually for wind velocity and turbulence.

sodium Na [natrium], silvery reactive metal, density 0.97, MP 98°C, vast range of compounds and used as heat-transfer medium in piston-engine exhaust valves.

sodium acetate Soluble solid used as solid or liquid deicer, principally for airfields.

sodium light Deep yellow, wavelength 589.6 nm, approach lighting loosely called sodiums, same wavelength for * line-reversal pyrometer.

SODP Start-of-deceleration point.

Sod's law If a particular mechanism can malfunction, sooner or later it will [see Murphy].

SOE 1 The Society of Engineers (UK, 1854–).

2 Supervised operator experience.

3 Solid oxide electrolyte [fuel cell].

SOF 1 Service Officiel Français (F).

2 Special Operations Force(s) (USAF, USA).

3 Stand-off flare (IRCM).

4 Strategic offensive forces.

5 Supervisor of flying.

6 Safety of flight [I adds issue].

7 Satellite Operations Facility (UK).

SOFA Status of forces agreement.

SOFAG Special-ops force assistance group (USAF).

Sofar Sound fixing and ranging, technique for fixing position at sea by time-difference measures of sound from explosion (eg of depth charge, usually at considerable depth) or impact of spacecraft on surface. Hence * bomb, special sound-producing bomb.

Sofats Special Operations Forces aircrew training system.

SoFC School of Flying Control.

SOFI 1 Sprayed-on foam insulation. 2 See SOF (6).

Sofia Stratmospheric observatory for IR astronomy.

Soflam Special operations forces laser marker.

Sofnet Solar observing and forecasting network (DoD, 1963-72).

Sofprop Special Operations Forces, planning, rehearsal and execution preparation.

S of S Secretary of State, = minister (UK).

SOFT Site operational functional test.

Soft See soft keys.

soft Not hardened against NW explosion.

soft blade propeller Made of wood, glass-fibre or other abradable material.

soft bomb Bomb dropped for purpose other than causing damage or casualties.

soft factor The proportion of announced orders [e.g., for commercial aircraft] which eventually lead to cancellations or deferrals.

soft failure 1 Usual interpretation is cessation of function without any incorrect function (eg no hardover signal).

2 In EDP, short-term transient failure followed by return to normal, believed caused by alpha particles.

soft flutter Flutter that is possibly severe but non-divergent, and confined within apparently safe amplitude limits.

soft hail See snow pellets.

soft-in-plane Semi-rigid helicopter main rotor of subcortical type, fundamental lag frequency being less than N1 (rotor rpm) at normal operating speed.

soft iron Iron containing little carbon, as distinct from steel; loses nearly all magnetism when external field is removed.

soft keys MFD keys which give direct pilot control of individual system of other hardware items via databus. Function of each is displayed by caption.

soft landing Gentle landing as distinct from hard (free fall); term applies to arrival on surfaces other than Earth.

soft life TBO or similar period decided by operator and varied according to own experience, instead of being mandated by manufacturer or other authority.

soft obstacle 1 Conceptual obstacle, eg 35 ft screen.

2 One physically present, eg ILS/localizer, but whose engineering design minimizes damage to colliding aircraft.

soft radiation Unable to penetrate more than 100 mm of lead.

soft ride Ride, esp. in lo-flying aircraft at high-subsonic speed, judged comfortable and in no way rough enough to impair crew functions. Normally defined as fewer than two 0.5 g bumps per minute (see LLDF). Occasionally selected mode in TFR system.

SOFTS Special Operations Force[s] training system (USA).

soft skin Composite structure which removes major loads from outer skin and concentrates stresses or underlying [usually under/over woven] fibre stiffeners.

soft target 1 Not hardened or armoured, such as house or merchant ship.

2 In air-to-air firing practice, a sleeve or banner.

soft tooling Tooling whose dimensions can be adjusted, normally within small limits (eg could not accommodate different 707 fin sizes, which required new tooling).

soft undocking One that does not influence subsequent trajectory, eg by not using separating thrusters.

soft valve Thermionic valve into which some air has leaked.

software 1 All programs and component parts of programs used in EDP (1), eg routines, assemblers, compilers and narrators. Divided into two parts. Basic *, usually provided by equipment manufacturer, is machine-oriented and is essential to permit or extend use of particular hardware; examples are diagnostic programs, compilers, I/O conversion routines and programs for file or data-management. Application * is normally user-oriented and often compiled by user or a subcontracted * house, to enable machine to handle specific tasks; may include GP packages, eg NC tool, payroll or airline booking, or locally created programs for highly specific tasks, eg exploring flight characteristics of unbuilt aircraft.

2 Ambiguously, also used for parachute or drogue
software-enabled control

packs, esp. those installed in aircraft. This usage is potentially misleading.

software-enabled control Systems giving intelligent UAVs ability to respond autonomously to external threats and internal faults.

Software Specification Review A parallel procedure to the hardware SDR, if anything running slightly later to incorporate upgrades or limitations resulting from refinement of the hardware design.

SOG 1 Special Operations Group (US).
2 Silicon-on-insulator (Monofet).
3 Solar orbit injection.
SOIA Simultaneous offset instrument approach.
SOIC Small outline integrated circuit.
SOICA The State Organization for Iraqi Civil Aviation.
SOIR Study Group, operations on parallel instrument runways.
SOIS 1 Silicon on insulating substrate.
2 Space-object identification system.
SOIT Satellite operational implementation team (FAA).
SOJ Stand-off jammer, or jamming.
SOLO Solenoid valve.
sol Sol 
1 Martian day, 39 min 35 s longer than Earth day.
2 Solenoid.
SOLAP Shop-order location and reporting.
Solar Shared on-line automated reservation system.
solar apex Point on celestial sphere towards which Sun is moving.
solar array Large assembly of solar cells, on rigid frame, folding, in roll-up sheet or other geometric form.
solar atmospheric tides Cyclic variations in atmospheric pressure ascribed to Sun’s gravitation, with primary 12-h component (about ± 1.5 mb at Equator, 0.5 in mid-latitudes) and much smaller 6-h and 8-h effects.
solar battery See solar cell.
solar cell Photovoltaic device converting sunlight directly into electricity, usually by liberating electrons and holes in silicon p-n junction.
solar chamber Test chamber in which is simulated solar radiation outside atmosphere.
solar constant Rate at which solar radiation is received outside atmosphere on unit area normal to solar radiation at Earth’s mean distance from Sun, about 1.38769 kW/m².
solar cycle Approx 11-year cycle in sunspot frequency.
solar day 1 Time between two successive solar transits of same meridian, ie time for Earth to rotate once on its axis with respect to Sun (mean or apparent), see sidereal year, solar year.
2 Time for Sun to rotate on its axis with respect to fixed stars.
solar electric Propulsion based on jet of ions accelerated magnetically, thrust measured in grams but specific impulse typically 1,500.
solar flare See flare (2).
Solar Happ Solar high-altitude powered platform.

solari board Usual type of large electromechanical display at airports indicating flight arrivals and departures.
solar noise Solar radiation at RF frequencies.
solar paddle Solar-cell array on fixed frame resembling paddle.
solar panel Any fixed planar solar array.
solar-particle alert network Global observation system to warn astronauts of solar flares.
solar propulsion Loose term sometimes used for rocket systems based on electric power, which can be derived from solar cells, but best restricted to solar sailing using a sail (2).
solar radiation Solar constant.
solar simulator Device for simulating solar radiation outside Earth’s atmosphere.
solar wind Plasma radiating from Sun, assumed equally in all directions, which in vicinity of Earth has T about 200,000°K, V about 400 km/s and density of 3.5 particles/cm³; grossly distorts terrestrial magnetic field, causing upstream shock front; another effect is to blow comet tails downstream from Sun.
Solas Safety of life at sea.
solar year 365 days 5 h 48 min 45.5 s.
solderless splice Joint made by crimping or machine-wrapping.
SOE 1 Start-of-life efficiency of thermoelectric module or other progressively degraded power-conversion device.
2 Society of Logistics Engineers (US).
solenoid 1 Range of simple electromagnetic devices in which current in a coil (usually of cylindrical form) moves iron core, eg to operate a switch.
2 Tube formed in space by intersection of two surfaces at which a particular quantity (eg pressure, temperature) is everywhere equal.
Solic Special-operations low-intensity combat.
solid Apparently immovable [flight controls, especially ailerons].
solid angle Portion of space viewed from given point and bounded by cone whose vertex is at that point, measured by area of sphere of unit radius centred at same point cut by bounding cone. SI unit is steradian.
solid fuel Preferably reserved for fuel not used as propellant but as energy source, eg for EPU. For rocket, see solid propellant.
solidification By 2003 a common word meaning the firming-up of a [initially USA] plan of action.
solidity 2 Ratio of total area (not projected area but integral of chord lengths across length of blade) of propeller or rotor to disc area. Basic measure of proportion of disc occupied by blades. See chord length ratio.
2 At standard radius, ratio of sum of blade chords to circumference, which is not same as (1) since blades of different rotors or propellers are not all same plan shape.
solid motor Rocket filled with solid propellant.
solid noise Term to distinguish aircraft noise with metal skin or radome from others of same aircraft type which are glazed (colloq.).
solid propellant Rocket propellant containing all ingredients for propulsive jet in solid form, either in cast, extruded or otherwise prepared grain or in granular,
solids

powder, multiple-rod or other form. Some definitions questionably exclude non-monolithic forms.

solids In ag-aviation, non-liquid chemicals, eg powders, dusts and granules.

solid-shaft engine Not free turbine.

solid-state bonding Joining [welding] in which no part of the workpiece is melted; see diffusion bonding, friction welding and inertia welding.

solid-state devices Electronic devices using properties of solids, especially semiconductors.

solid-state oxygen Alkali-metal chlorates which can readily be made to yield free oxygen.

solid surface RF reflector, esp. for very large aerial, whose reflective surface is not wire mesh but aluminium sheet.

solid target Not banner or drogue but towed aerodyne.

solid wire Single tinned or galvanised steel wire.

SOLL, Soll Special operations, lo-level.

solo According to some definitions, pilot flying unaccompanied by instructor, but this could admit passengers; invariably means pilot is only human occupant of aircraft.

solstice Either of two points on ecliptic furthest from celestial equator, direction of Sun’s centre at maximum declination; N hemisphere is summer *, about 22 June; S hemisphere is winter *, about 23 December.

solstitial colure Celestial great circle through poles and solstices.

solution heat treatment First stage of heat treatment of certain light alloys in which salt bath (often NaNO₃/KNO₃) is used for accurate heating followed by room-temperature cooling or quenching.

solvent extraction Various processes in which solvents, often hydrocarbons, eg propane, are used to separate lube-oil products from pipe-still distillates. Other mean-ings in processing of coal.

SOM 1 Stand-off missile.

2 Simulation object model.

3 Search on the move [sensor].

4 Servo optical mechanical.

5 System operator manual.

6 Side oblique mode.

somatic Affecting exposed individual only, as distinct from offsprings.

somatogravic Relating the human body to acceleration; "illusion is dangerous feeling that overshooting aircraft (especially jet) is entering steep climb when it is actually very close to ground.

Sommerfield matting Mass-produced airfield pavement in form of 75 ft (22.86 m) rolls of 13 SWG wire mesh reinforced at 8 in (203 mm) intervals by steel rod with hooked end linking to adjacent strip (UK, WW2).

SON 1 Statement of operational need; regarded as a statement of deficiency.

2 Silicon-on-nothing. Mosfet supported at edges only.

sonar From sound navigation and ranging. Use of word as method of communication under water, detection of surface or submerged targets and measurement of range, and in some cases bearing and relative speed. Analogous to radar, and similarly may be active (emitting high-frequency sound waves of tailored form, eg from * transducer) and working with reflections from all submerged objects, or passive, in which receivers listen for sounds emitted from targets.

SOFC

sonar capsule Device giving enhanced echoes to sonar to assist location of marine object, eg floating RV or space payload.

sonar transducer Translates electrical energy into high-intensity sound, normally used in multiple to form a sonar stave (typically radiating 500-1,000 W), which in turn is used in multiple to form 360° or directional array.

SoNC School of Naval Co-operation.

sonde Airborne telemetry system, to transmit meteorological or other atmospheric data.

sonic Primitive unit of perceived noise equal to that from simple 1 kHz tone 40 dB above listener's threshold. Subjective judgement of any sound enables it to be expressed in tones (0.001 * = millisone); useless for noise investigation (see noise).

sonic 7 Pertaining to local speed of sound.

2 Approximately at local speed of sound.

sonic bang Noise heard as shockwave(s) from supersonic object pass river or small object at close range generates shock or normal aircraft at close range one or more loud bangs (resembling close thunder) and distant SST dull boom(s) resembling distant thunder (see boom signature). Crack of a whip and natural thunder are both examples.

sonic barrier See sound barrier.

sonic boom See boom, sonic bang.

sonic drilling See ultrasonic machining.

sonic erosion See ultrasonic machining.

sonic fatigue Suffered by structure, especially thin sheet, subject to intense sound.

sonic line Curved surface above or below wing or other body which has accelerated flow beyond Mach 1, at which M = 1, enclosing region of supersonic flow terminated at rear by shockwave.

sonic 1 Aggregate of installed sonars, sonobuoys and displays in platform, eg in aircraft.

2 Technology of applying sound to functions other than those related to hearing.

sonic soldering See ultrasonic bonding.

sonic speed Local speed of sound, symbol a.

sonic venturi Venturi in which sonic speed is reached at throat, thereby automatically limiting maximum flow (eg in bleed systems).

Sonne Pioneer German long-range navaid, developed from radio range, became Consolan.

sonobuoy Discrete sonar devices immersed or dropped into water; can be active (emitting) or passive, directional or non-directional, and except when dunked by helicopter normally provide readout by radio, usually upon command.

sonodunking Action of dunking permanently attached sonobuoy.

Sons, SONS Self-organised nanostructure[s].

SOO Standard operations (or operational) orders.

SOON, Soon Solar-observatory optical network (USAF).

Sootie Fitter, Engines [c1955-90] (RAF colloq).

SOP 1 Standard operating, or operational, procedure, or platform, or practice.

2 Confusingly, special operating procedure[s].

SOPA Standard of preparation.

SOPC Shuttle Operations and Planning Complex (USAFA).
Sopamea
Société pour le Perfectionnement des Matériels et Equipements Aérospatiaux (F).

SOPGM Stand-off precision-guided munition.

SOPS Special-Operations parachute system.

SOR 1 Struck off records.

2 Specific, or statement of, operational requirement.

3 State of readiness.

# Specific Operational Requirement (USAF).

5 Station Operations Room (RAF).

# Strategic offensive reductions.

sorb To acquire gas by sorption; hence sorbent material.

Soreas Syndicat des Fabricants d’Organes et d’Equipements Aéronautiques et Spatiaux (F).

SORI Second-order reliability method.

SORO Scan on, receive only.

sorption Taking up of gas by absorption, adsorption, chemisorption or any combination of these.


SORT 1 Structures for orbiting radio telescopes.

2 Simulated optical range tester.

# Strategic offensive reductions treaty [24 May 2002] (Int.).

sortation Process of reading airline baggage bar code and online * messages and directing item accordingly; must handle airline’s own code, IATA 10-digit, Code 39 [old USPS] and Code 93 [new USPS].

sort.io An operational flight by one aircraft. It is generated when the aircraft takes off. Some authorities insist mission must be offensive against surface target. Thus an effective * crosses enemy frontier or front line, an accredited * places bomb[s] on target.

sortie capacity Maximum number of sorties mounted by unit or other airpower source (eg one airfield) in stated period, usually 24 h.

sortie generation Ability of combat unit to put its aircraft in air, especially around clock.

sortie number Reference identifying all images secured by all sensors on one air reconnaissance sortie.

sortie plot Map overlay representing area(s) covered by imagery during one sortie.

sortie rate Number of combat missions actually performed by unit (eg squadron or polk) in 24 h period.

sortie reference See sortie number.

SOS 1 International distress signal.

2 Silicon on sapphire.

# Special, or Space, Operations Squadron (USAF).

Sidewall overhead stowage in passenger airliner.

5 Stabilized optical sight.

6 Squadron Officer School (AU).

7 Systems of systems [A adds analysis] (SJFHQ).

Soscoe, SOSCOE System of systems common operating environment (NATO).

Sostar Stand-off surveillance and target acquisition radar (F, G, Spain, Netherlands).

Sous Sound surveillance system.

SOT 1 Stator outlet temperature.

2 Small outline transistor.

# Specific operational test.

# Stand-off tactical [countermeasures evaluation trainer].

5 Solar optical telescope.

6 Supply officer training; C adds course (RAF).

Sotar Stand-off target acquisition system.

SOTD Stabilized optical tracking device.

SOTI Sold outside, ticketed inside.

SOTO Sold outside, ticketed outside.

SoTT School of Technical Training.

SOTV Solar orbit transfer vehicle.

sound Longitudinal pressure waves transmitted through elastic medium. In atmosphere velocity is a =

\[
\sqrt{\frac{\gamma}{\gamma - 1}} = c_{332.2} \text{ms}^{-1} \text{at } 0^\circ \text{C and 344 at room temperature; in fresh water 1,410 ms}^{-1}, \text{in sea-water 1.540. Audible to ear at frequencies c20 Hz to 20 kHz. See noise.}
\]

sound attenuation Reduction in sound intensity, esp. through deliberate conversion to other energy forms, eg heat, in absorbent or other layers of material.

sound barrier Conceptual barrier to manned flight at supersonic speed when this was extremely difficult, ie before about 1952.

sound energy Measure of either total emitted energy (for brief sound, eg explosion) or sustained rate of energy transfer for prolonged sound, in latter case measured in watts.

sounding 1 Any penetration of natural environment for observation or measurement.

2 Complete set of measures taken in and of upper atmosphere for met or other purpose. Hence * balloon, unmanned free balloon carrying upper-atmosphere instruments; * rocket, stabilized but usually unguided rocket carrying upper-atmosphere instruments.

sound intensity Average sound power passing at given point through unit area normal to propagation, expressed either in W/cm² or as sound level.

sound level Ratio of sound power to a zero reference, expressed in dB (see noise).

sound locator Device for concentrating incident noise from aircraft, usually by one or more large exponential horns rotated in azimuth and elevation until intensity is maximum.

sound power Sound energy (rate for sustained sound) in watts.

sound pressure Total instantaneous pressure at point at given time minus static pressure; unit is N/m².

sound pressure level 20 log SPL/reference pressure (see noise).

sound probe Instrument responding to sound, eg sound pressure, without significantly altering sound field.

sound ranging Determining location of sound source by measuring times of arrival at different locations.

sound suppressor See suppressor.

sound wave Disturbance conveying sound in form of longitudinal alternate compressions/rarefactions through any medium. Frequency spread may be much greater than human aural range, and extreme-energy case is blast wave, which initially (like shockwave) travels faster than sound.

souped up Tuned to generate maximum possible power [engine of racing aircraft] (colloq.).

source 1 Contractor for entire article, eg aircraft or missile (see second *). More recently, a * of small items or material for restoration.

2 Origin of noise.

3 Origin of fluid in fluid flow, or of large uniform air mass in atmosphere. The counterpart of a sink.

4 Solid-state electrode connection corresponding to cathode.
source noise

5 Verb, to assign a * 1.
source noise Generated noise, that emitted by source in all directions as distinct from that received by observer.
source panel A planar source sheet [next].
source sheet Hypothetical 2-D sheet of infinite number of infinitesimally weak sources.
Sourdine Study of optimization procedures for decreasing the impact of noise around airports.
sours Inlet centrelbody shock-cone (F, literally ‘mouse’).
southerly burster Line squall [S and E Australia].
SOV 1 Shut-off valve.
2 Simulated operational vehicle.
3 Space operations [or operating, or observation] vehicle, part of MSP.
SOV-AB Replacement persistent Toxic-B lethal gas and dispenser system (USSR).
sovereignty ICAN Rule 1 decrees every state has “complete and exclusive * over the airspace above its territory.”
SOW 1 Stand-off weapon.
2 Statement of work.
3 Special Operations Wing.
SOWG Science Operations Working Group (JPL).
SOx Oxides of sulphur, SO2 and SO3.
SP 1 Stabilized platform.
2 Speed brake.
3 Scheduled passenger.
4 Staging post.
5 Self-propelled.
6 Single-phase.
7 Schedule planning.
8 Software protocol.
9 Solar-powered.
10 South Pacific ocean (ICAO).
11 Snow pellets.
12 Special, or special performance.
13 Self-protect (ARM mode).
14 Space.
15 Service provider.
SPD 1 Speed/power measurement point, ie 1 g, level flight, constant V.
2 Serial/parallel.
SPA 1 Solar-powered aircraft.
2 Seaplane Pilots Association [office, Frederick MD21701] (US).
3 Special-purpose aircraft, usually RPV.
4 Surplus Property Administration (US).
5 Schedules planning and analysis.
6 Special-Purpose Audit.
7 SkyTeam Pilot Alliance (Delta/Air France).
SPA Smart procurement, acquisition.
SpA Società per Azioni [company, I].
SPAG Self-propelled anti-aircraft gun.
Spadear Specialist Panel on Automatic Detection And Resolution (ICAO).
Space Software productivity and cost estimation.
space Various precise definitions, but loosely volume in which celestial bodies move and esp. local portion of solar system outside Earth’s atmosphere.
space age Conceptual period in which human beings first learned to operate in space, beginning 1957 (first artificial satellite) or 1961 (first manned space flight).
space/aerial vehicle See aerospace vehicle.

space biology See bioastronautics.
spaceborne Travelling through space; suggest unnecessary word.
space capsule Environmentally controlled container in which device or living organism flies in space; suggest not used for human occupation.
space charge Negative charge carried by cathode electrons which unless continuously accelerated away bar further emission.
space-charge region See depletion layer.
SpaceCom Space Command (USAF).
spacecraft Self-contained space vehicle, manned or unmanned.
spaced armour Fitted in layers with sufficient gaps to defeat HEAT or hollow-charge weapons.
spacediversity Radio communications technique which avoids fading by using three or more receiver aerials spaced 10 or more wavelengths apart, all feeding separate amplifying channels.
space defence All measures designed to destroy attacking enemy vehicles, including missiles, while in space, or to nullify or reduce effectiveness of such attack (DoD).
space equivalent Region in atmosphere where one particular parameter is similar to that in space.
space-erectable Capable of being assembled in space, eg radiation shield.
space fabrication Manufacturing or building operations in space.
spacefighter Aerospaceplane with sufficient endurance and manoeuvrability to survey and if necessary disable hostile satellites.
space-fixed reference 3-D cartesian co-ordinate system related to fixed stars.
spaceflight 1 Journey through space of man-made object.
2 The technology required for (1).
spaceframe 3-D framed structure assembled from simple tubes or girders with pinned or fixed joints, usually built up from succession of triangulated assemblies for rigidity. Note: may have nothing to do with space.
space gyro Gyro having complete freedom about all axes, as distinct from rate, tied or Earth gyros.
spaceclub Laboratory for operations in space; with capital S, ESA/NASA programme.
Space Launch Initiative Far-ranging study of Shuttle replacement options (NASA).
spacecraft Transport of material/materiel from Earth to locations in space.
space medicine Branch of aerospace medicine concerned with health of human beings before, during and after spaceflight.
Spacecenter Range of corrugated-core sandwich structures in stainless steels patented in 1957–60 by North American Aviation [initially for Navaho missile].
space operations vehicle Primary component of MSP, reusable launch vehicle [probably T’O] carrying various upper mission stages.
spaceport Site dedicated to launch and recovery of humans engaged in spaceflight as paying passengers.
space probe See probe (3).
space qualified Certificated for prolonged use in space environment, especially outside a satellite or space station.
space zones

wave or ionosphere-refracted wave.

SPADE, Spade

1 Single programmable access demand exchange, for small consns-users.

2 Space acqns defence experiment.

spade

1 Term for several detail features of aircraft, notably fixed or retractable blades projecting into propulsive jet in attempt to enlarge and break up periphery, promote mixing and reduce noise.

2 In particular, a small horizontal plate or aerofoil mounted on a miniature pylon under an aileron to give area ahead of hinge axis.

Stopword is used.

space segment

That in space forming part of large system with stations on Earth.

space simulator

Simulator wherein is reproduced one or more parameters of space environment; arguably impossible to simulate all.

space situational awareness

Continuously updated awareness of all human activity in space (US).

space station

Permanent structure, probably manned, established in space; probably in Earth orbit, and with routine crew replacement and import of materials.

spacesuit

Pressurized suit for EVA and other operations in space or on lunar surface.

Space tasking order

Describes the configuration of constellations required to support a specific mission (US).

space tourism

Self-explanatory; by 2006 plans included sub-orbital and orbited flights, and trips to the ISS and around the Moon. Hence space tourist, human paying for spaceflight.

Spacetrack

Global system of radar, optical and radio- metric sensors linked to computation/analysis centre at Norad for detection, tracking and cataloguing of all man-made objects in Earth orbit. USAF portion of Spadats (DoD).

space tug

Propulsion vehicle for attachment to space materials, capsules, payloads and laboratories delivered to local area by Shuttle for onward exact positioning.

Space wave

Combined direct wave and ground-reflected wave from transmitter to receiver, as distinct from surface wave or ionosphere-refracted wave.

space zones

Loose subdivision of local space into translunar (between or near Earth and Moon); interplanetary; interstellar.

SPAD

Signal processing and display (sonar).

Spadats

Space detection and tracking system; reports orbital parameters of all satellites and debris to central control facility (DoD).

SPADCCS

Space command and control system.

SPADE, Spade

1 Single programmable access demand exchange, for small consns-users.

2 Space acqns defence experiment.

span loader

Aeroplane (conceivably, glider) carrying payload distributed across most or all of span (1), normally in ISO containers fitting within wing profile.

span loading

Weight of aeroplane or glider divided by square of span (1). W/b².

Spanwar

See Spawar.

spanwise

In a lateral (transverse) direction, esp. along wing towards tip.

spanwise lift distribution

Plot in front elevation of actual wing lift for elemental chordwise sections of wing from tip to tip, normally (ie without active ailerons or DLC) having semi-elliptic form falling to zero at tips.

SPAR, Spar

1 Semi-permanent airfield runway.

2 Solid-state phased-array radar.

3 Special progressive aircraft rework.

4 Special problem areas report.

5 Super-precision approach radar.

6 Survivability planner associate re-router.

spar

1 Major structural member of slender form projecting out from one end (which may be pinned or fixed).

2 Specifically, main spanwise structural member(s) of wing or rotorcraft rotor. Wing may have one to many discrete *, or two may be made into single strong box-* (often integral tank) to which secondary leading and trailing structures added. D-* is box structure formed by thick leading edge and a * forming upright of D. Usually formed from web and two or more booms.

spare

Item certified as suitable to replace one that is faulty.

spareable

Item capable of being supplied, esp. from stock, as spare.

spare frame

Particularly strong frame or bulkhead to which a spar (2) is attached.

sparking

Solid-propellant advanced ramjet kinetic-energy missile.

spark discharge

Electrical discharge, usually brief,
spark erosion

resulting in very large electron flow linking points of high potential difference along narrow and brilliantly luminous path.

spark erosion See spark machining.

spark-ignition engine Piston engine, eg of Otto type, in which hot electrical spark is used to ignite mixture before each power stroke; thus, not diesel.

sparking plug Term (spark plug in N America) reserved for plugs for spark-ignition engine and those few jet engines where ordinary commercial plug is used; term for gas turbines generally is igniter plug.

spark machining Precision machining of extremely hard or otherwise difficult material by minute stream of HF sparks struck between anode tool (often of particular shape) and cathode workpiece; usually action is purely thermal.

spark photography 1 Simplest and oldest method of high-speed photography, in which shutter is left open and scene is illuminated by single point-source brilliant spark at exact time.

2 Various techniques, eg in tunnels, in which hot spark is used to create local airstream of contrasting refractive index.

sparks Wireless operator (UK traditional colloq.).

SPARP SPAR(2) program.

Spars Women’s arm of USCG (from semper paratus).

Sparta Special anti-missile research tests, Australia (US programme).

SPAS 1 Shuttle pallet satellite.

2 Safety performance analysis system (ATOS).

SPASM System planning and system control.

Spasm Self-propelled air-to-surface missile.

Spasur Space-surveillance system with mission of detecting and establishing orbital parameters of every man-made object in Earth orbit, using fan of CW, across Conus; US Navy portion of Spadats.

Spasyn Space synchro.

spat See spats.

Spate Special-purpose automatic test equipment.

spatial Relating to space, not in sense of cosmonautics but 3-D volume of any (possibly very small) size; thus, concerned with geometric position. Normal dictionary entries need revision.

spatial awareness Suggest same as situational awareness.

spatial disorientation Colloquially, not knowing which way is up; eg after losing control of aircraft in cloud.

spatial light modulator Hybrid optoelectronic module combining speed and parallelism of optics with integration of electronic chips.

spatial resolution Ability of sensor to distinguish between two very close distant objects; thus an angular measure (see resolution).

spatiography Mapping (‘geography’) of space.


spats Aerodynamic fairings over fixed landing wheels, but no other part of landing gear; purists do not allow term to encompass trousers.

Spawar Space and Naval Warfare Systems Command (USN).

Spawn Space protection and warning (Darpa).

SPB Seaplane base.

SPC 1 Synthetic particulate chaff.

2 Software productivity consortium.

J Special-purpose company.

special summary drawing

4 Statistical process control.

5 Stored-program control.

SPCD Space Communications Division (USAF).

SPCV Special-purpose corporate vehicle.

SPD 1 Spectral power distribution.

2 Speed.

3 System programme director.

4 Spoon positioning device (umbilical lock).

5 Surface-position display.

SPDA Secondary-power distribution assembly.

SPDM 1 Solid-propellant divert motor[s] (MKV).

2 Special-purpose dexterous manipulator.

SPDS System project definition study.

SPE 1 Solar-particle event.

2 Solid-polymer electrolyte.

3 Seller-purchased equipment.

Spear 1 Selectable precision effects at range (RAF).

2 Support programme for evaluation of activities in research.

3 Spontaneous protection enabling accelerated response.

4 Special emitter array.

Sears Screener performance evaluation and reporting system (FAA).

SPEC Standard for professional engineering competence (UK).

Spec Special meteorological report, pronounced speck.

spec Specification, pronounced speck.

SPECI Special, especially special Metar.

special access See SAO.

special air mission One conducted by 89 Military Airlift Wing, whether or not President is aboard (USAF).

special-assignment airlift Airlift which for any reason cannot be accommodated by channel airlift (DoD).

special cargo Item requiring unusual handling, eg detonators, precision instruments.

special flight One set up to move a specific load.

special flying instruction Warning issued to pilots regarding handling of particular aircraft type [usually temporary].

specialized undergraduate pilot training After division into FB or TTT (USAF).

special material Nuclear, esp. fissile, material not naturally occurring, eg Pu-239, U-235 or enriched uranium.

Special-Operations parachute system Semi-rigid lift/control system worn by Special-Operations personnel enabling them to travel silently up to 200 km (124 miles) after leaving high-altitude aircraft.

special pilot ratings Instrument rating and instructor rating (US).

special qualification Required, after special training, by pilots of US commercial aircraft on scheduled routes into airports likely to experience unusual turbulence or other hazards.

special reconnaissance Flight made covertly, ie without hostile detection.

special rules zone Protected airspace surrounding minor airfield which does not justify a control zone; extends from surface to published (usually low) FL.

Special Security Agreement Allows a non-US owner of a US company to employ security-cleared US citizens named and approved by US Government in order to bid for classified defense work.

special summary drawing Prepared for each production
special technical instruction

Aircraft in GA and certain other civil categories listing all equipment fits, avionic fits, furnishing fabrics/colours, seat types and similar customer choices.

special technical instruction Commands urgent non-recurrent action to remedy serious defect (UK military).

Special Traffic Management Program Reservation programme implemented to regulate arrivals and departures at airports serving special events attracting heavy traffic (FAA).

Special-use airspace Too numerous to define; includes any precisely defined area that either cannot be entered or cannot be entered except by special aircraft, or with prior permission.

Special VFR Particular weather minima below those for normal VFR but which permit VFR flight; hence "" operations = flight within control zone under Special VFR clearance.

specific air range See specific range.

specific consumption See specific fuel consumption.

specific energy Energy per unit mass, whether released by chemical combustion or degradation of KE, units (SI) J kg⁻¹.

specific enthalpy Enthalpy per unit mass or volume. Conversions include Btu/ft³ = 37.2589 kJ m⁻³; Btu/lb = 2.326 kJ kg⁻¹.

specific entropy Entropy per unit mass, see entropy.

specific excess power Propulsion power available over and above that needed to propel aircraft in level flight at given reference speed, and thus available for climb or manoeuvres at sustained high speed. With streamlined aeroplane (fighter) drag is small in relation to thrust at most reference speeds, so SEP is broadly governed by thrust/weight ratio T/W.

specific fuel consumption Symbol c¸, rate of consumption of fuel for unit power or thrust, and thus basic measure of efficiency of prime mover; term confined to air-breathing engines (equivalent for rocket is specific impulse). SI unit for jet engines (turbojet with/without afterburner, turbofan, ramjet or pulsejet) is µg/NS (milligrammes per Newton-second); traditional Imperial measure is lb/h/lb thrust, measure being for SI static ISA condition unless otherwise specified. For shaft engines (turboshaft, turboprop, piston) SI unit is µg/J (microgrammes per joule); traditional Imperial unit is lb/h/sp, hp being qualified for turboprop as shaft or equivalent. Conversions, jet engines, 1 mg/NS = 0.0035 lb/h/lb st; 1 lb/h/lb st = 28.325 mg/NS; 1 kg/h/kN = 0.0098 lb/h/lb st; 1 lb/h/lb st = 102.04 kg/h/kN; shaft engines, 1 µg/J = 0.000592 lb/h/sp; 1 lb/h/sp = 169.0 µg/J; 1 kg/h/ev = 2.2352 lb/h/sp; 1 lb/h/ev = 0.4474 kg/h/cv.

specific gravity, SG Density of material expressed as decimal fraction (less than or greater than unity) of density of water at 4°C.

specific heat Quantity of heat required to raise unit mass of material by unit temperature, usually from 0° to 1°C. Traditional measure is calories per gramme, the SI unit is kJ/kg K. = 0.238846 Btu/lb°F, CHU/lb°C, Cal/g°C. For gases thermodynamic process must be stated; Cp (**) at constant pressure and Cv (** at constant volume) are not same.

specific humidity Ratio of mass of water vapour to total mass of moist gas (dimensionless).

specific impulse Isp basic performance parameter of rocket, = thrust divided by rate of consumption of propellants in compatible units, = total impulse divided by total mass of propellants (see also motor **, = total impulse divided by total loaded mass of solid motor), in general = effective jet velocity divided by g; unit = s (seconds) derived from force × seconds divided by mass (strictly, in SI Newtons force cannot be divided by kilogrammes mass).

specific optical density Numerical scale of atmospheric opacity, on which dense smoke = 800.

specific power Not defined; often used for thrust/weight ratio of prime mover, esp. including electrical battery or fuel cell. For air-breathing engines see power/ or thrustweight ratio.

specific propellant consumption Reciprocal of Isp, mass flow of propellants or rate of burning to generate unit thrust in rocket.

specific range Air distance flown for unit consumption of fuel; traditional unit is nam/lb (NAMP), while SI would be air-km/kg. One rendition is Rs = Vy / Q.

specific search Reconnaissance of limited number of points for specific information.

specific speed Basic performance parameter of hydraulic turbine; trad. unit is rpm at which 1 hp is generated with head of 1 ft. SI unit needed for modern hydraulic motors and rocket turbopumps.

specific stiffness Stiffness (usually Young's modulus) divided by density, Es/p.

specific strength Ratio of ultimate (tensile/compressive/shear/bending) strength to density.

specific tasking Planning phase in which commanders designate actual units to fill force list of operation plan.

specific thrust Net thrust of jet engine divided by total inlet mass flow.

specific volume Volume per unit mass, reciprocal of density, 1 cm³/µg/ (or g/J) = 0.00768 in ³/lb.

specific weight Symbol ρ, engine mass divided by net thrust (air-breathing jet engines).

specific impulse g specific propellant consumption / specific range.
Spectra

right curved handlebars, suggest synonymsy with ram’s horn; yoke is generalized term for all configurations.

2 Figure-eight manoeuvre in the vertical plane.

Spectra High-modulus composite material for body armour to protect against explosions and mechanical impacts (trade name).

spectral line Indication of single frequency, or very narrow band, in continuous spectrum (2), denoting presence of identifiable atoms or molecules.

spectrograph Spectroscope with camera or other recorder.

spectroheliohraph Takes pictures of Sun in monochromatic light; spectrohelioscope is for direct viewing.

spectrometer Instrument for analysing spectrum to read out wavelengths and/or energies.

spectrometric analysis Usual method is to analyse spectrum of light as test substance is burned in electric arc.

spectrophotometer Photometer which measures variation of radiant intensity with wavelength.

spectropolarimeter Measures variation of intensity of direct solar radiation with wavelength.

spectroscopic See spectrophotometer.

spectroscopy Instrument for dispersing light into spectrum.

spectrum 1 Visual display, EDP (1) printout, photo record or other presentation of variation of radiation intensity (sometimes other parameters, eg sound pressure level, with wavelength/frequency or other variables).

2 Continuous range of electromagnetic wavelength/frequencies within which radiation forms common grouping, eg visible *, IR *.

3 Stylised colours of visible *.

4 Various specialized terms in maths, mechanics etc.

spectral line Spectral line.

specular Offering a smooth reflecting surface; rule-of-thumb demarcation from diffuse scattering surface is roughness factor. In low-level attack with radar/laser, thumb demarcation from diffuse scattering surface is specular.

speculon Shiny stick of film, usually coated with silver, for use in making microphotographs.

speed Damping derivative $C_{d_{LV}}$, due to compressibility effects, $= M(\delta C_d/\delta M)$.

speed generator See engine *.

speed jeans G-suit (colloq.).

speed lock Autopilot sub-mode in which TAS (in some systems G/S) is held constant.

speed of rotation Rotational speed.

speed of sound or light See sound, light.

speed/power See power/speed coefficient.

speed probe Basic sensor for rpm of shaft, with magnetic pole piece held close to teeth of existing gear or special toothed disc to generate emf whose frequency is transmitted. Has virtually replaced tachometer except in GA aircraft.

speed range Aircraft maximum level speed minus minimum speed, eg $V_{max}$.

speed reference system Chief meaning is subsystem on advanced transports (Airbus) which provides flight director visual guidance on how far pilot should haul back in wind shear without triggering stick shaker.

speed rotors Main input sensor of anti-skid brake, whose angular velocity is held against sudden reductions.

speed stability Condition such that aircraft tends to return to preset speed following any excursion, thrust remaining constant; condition not obtained below $V_{mg}$.

speed tape Commercially available thin aluminium tape, resembling stout foil, with adhesive backing revealed by peeling off skin; for rapid repair, which can be surveyed as permanent.

speed trend Additional protection against wind shear, shows what speed/AOA will be 10 s hence with no action by pilot.

speed Unusable bundles of short lengths of surplus reinforcing fibres.

spent fuel Fissile fuel whose allotted life has been consumed, though material still fissile.

SPER, Sper 1 Syndicat des Industries de Matériel Professionnel Electronique et Radio-Electrique (F). 2 Strategic-planning executive review.

SPERT, Sper Scheduled (or simplified) programmed evaluation and review technique.

SPET Solid-propellant electric thruster.

SPETC Solid-propellant electro-thermal-chemical (gun).

SPF Small-platform electronic warfare system.

SPews Self-protection electronic-warfare system.

SPF 1 Svensk Pilotförening (Sweden).

2 Superplastic forming.

SPFDB See SFDB.

SPGG Solid-propellant gas generator.

SPGR Special-purpose GPS receiver.

sphere of influence Volume around body in space within which small particle is attracted to body; in case of Earth not true sphere.

Spheres Synchronized position hold, engage and reorient experimental satellites.

Sphere System for protection of helicopters by radar and IR countermeasures.

spherical angle Angle between two great circles.
spherical convergent flap nozzle

spherical convergent flap nozzle  Propelling nozzle of augmented turbofan providing not only variable area and profile but also flow blocking and reversal and ±20° vectoring in any plane.
spherical data system  Long-range navigation system, eg for maritime patrol aircraft, related to spherical Earth surface.
spherical triangle  Formed by arcs of three great circles.
spheres  See sferics.
spherodizing  Hot soaking of irons and steels close to (usually just below) critical temperature followed by slow cooling.
spherometer  Instrument with three legs and central micrometer leg for measuring radius of convex or concave spherical surfaces.
SPHVM  Self-propelled high-velocity missile.
spheromonometer  Instrument for measuring blood pressure.
SPI  1 Surface position indicator.
  2 Short-pulse insertion (SSIR).
  3 Spike-position indicator.
  4 Scatter-plate interferometer.
  5 Special position identification (pulse).
  6 Smart procurement initiative.
  7 Symbolic pictorial indicator.
  8 Software process improvement.
  9 Surface-pressure integration.
Spice  Smart precise-impact cost/effective.
Spicsy  Standard protocols to support intra-centre communications between air-traffic management system components.
spicules  Long, bright filaments briefly extended from chromosphere.
spider  1 Structural heart of propeller or helicopter rotor in form of hub integral with radial members which bear all stresses from attached blades.
  2 Multi-finger plate securing structural members grouped at a common joint, each finger being aligned with and secured to one of members, all being in same plane.
spider beam  Spaceframe-type rocket interstage structure.
SPIE  1 Society of Photo-optical Instrumentation Engineers (US).
  2 Special insertion and extraction [of troops, usually by abseiling in, helo out].
spigot  See spray.
spike  1 Conical inlet centrepayload of supersonic airbreathing engine, usually designed to translate.
  2 Short-duration transient (in signal, current, radar display or any other oscillating variable) in which amplitude makes large excursion beyond normal.
  3 Centrepayload of * nozzle.
  4 As verb, to designate by laser.
  5 Long tapered tube ahead of nose of SLBM to generate conical shock and reduce drag of bluff nose during climb up through atmosphere.
  6 See pressure *.
Spiketbuoy  Tactical warfare sensor dropped from air to land on spike (eg in jungle), thereafter transmitting on command ground transmitters which can be attributed to human beings or vehicles.
spike inlet  2-D airbreathing inlet in form of body of revolution with central spike (1).
spike nozzle  Rocket nozzle in which gas escapes through ring around centrepayload in form of concave-profile cone.
spill  To cause spilling.
spillage  1 Amount by which mass flow into airbreathing inlet is less than datum flow (in UK called intake flow).
  2 The actual airflow [eg, split around nacelle] which fails to enter inlet.
  3 Flow of air from below wing to above at tip.
spillage drag  Difference between drag at given engine airflow and drag at datum flow.
spill burner  Gas-turbine burner in which fuel is supplied at constant high pressure, giving good swirl and atomization, excess over requirement being ‘spill’ back through second pipe for reuse.
spill door  Auxiliary door usually spring-loaded to open outwards, through which excess engine airflow (spillage) escapes with minimum drag, eg in high-speed cruise or on letdown.
spill effect  Loss of revenue, esp. pax, at certain times on highest-density routes because seats are not available; this offsets cost benefit of not using larger aircraft.
spilling  Escape of air at one part of parachute canopy periphery, either through instability or for directional control of trajectory.
spillover  Airflow deflected to pass outside airbreathing inlet in supersonic flight with detached shock.
spill valve  1 In early gas turbines, a manually opened valve to relieve pressure in the HP system.
  2 In modern engines, part of the FMU which enables fuel to recirculate after engine shutdown.
SPILS, Spils  Spin- [or stall-] prevention and incidence (AOA is meant) limiting system.
spin  1 Sustained spiral descent of fixed-wing aerodyne with AOA beyond stalling angle; in most cases a stable autorotation (see flat *, inverted *, upward *).
  2 To shape by spinning.
spin avoidance system  Seldom seen as a separate system, detects AOA and possibly other factors such as airspeed and emits aural or visual warning.
spin axis  Axis of rotation of gyro wheel.
spin back  Incorporation in old programme of new technology developed for a successor.
spin box  Primitive flight-test device comprising pen, paper-tape drive, altimeter and two stop-watches.
spin chute  Anti-spin parachute.
spin dimpling  Dimpling by coldworking tool (eg 60° cone) around hole for rivet or other fastener under pressure, without cutting.
spin dipindle  Generalized term for machining of wooden parts, esp. to effect particular desired uniform cross-section to spar, longeron or other structural member. * machine basically resembles spar mill or router.
spine  Non-structural fairing along dorsal centreline of aircraft or along outside of ballistic vehicle (occasionally in other locations but always parallel to longitudinal axis) covering pipes, controls or other services. In some cases merely drag-reducing fairing linking canopy to fin.
spine hood  Hinged or removable cover over equipment in spine.
spin forward  Incorporation in latest programme of technology already developed for predecessor.
spin in  To continue a spin until ground impact.
spin motor

spin motor  Rocket(s) imparting spin (rotation about longitudinal axis) to missile or other vehicle.

spinner  Streamlined fairing over propeller hub; not used for similar fairing over helicopter rotor hub.

spinning  To Sheet-metal shaping by forcing against spinning die of desired profile (suitable only for bodies of revolution).

spinning dive  To engage in spin (1).

spinning nose dive  Flight manoeuvre in which aeroplane or glider is rolled with ailerons while in steep unstalled dive (US usage).

spinning test  To explore spin characteristics of aircraft.

spinning tunnel  See spin tunnel.

spin-off  1 Predicted or unexpected advances in one technology caused by transfer of technical solutions from another. Also called fallout. 2 In particular, transfer from defence to civil.

spin-on  Technology transfer from civil to defence.

spin parachute  See anti-spin parachute.

spin-recovery parachute  See anti-spin parachute.

spin rocket  See spin motor.

spin stabilized  Given gyroscopic directional pointing stability by high-speed rotation about longitudinal axis.

spin table  Large disc on which objects, including human beings, can be rapidly rotated about vertical axis for various test and research purposes; in turn may be mounted on arm of centrifuge to give additional sustained unidirectional lateral acceleration.

spintronics  Technology of devices whose operation depends on electron or nuclear spin.

spin tunnel  Wind tunnel in which flow through working section is vertically upwards, thus free model supported by airflow can be examined for spinning characteristics.

SPIO  Signal processor input/output.

SPIP  Transponder identification pulse.

SPIR  Single-pilot instrument rating.

SP(IR)  Satellite picture, IR.

spiral  1 One of the five basic modes of aeroplane motion, slow divergence or convergence in level flight with gentle banks L/R persisting long enough for large heading changes. 2 Flight manoeuvre in which at least 360° change in heading is effected while in glide or shallow dive (chiefly US usage). 3 A new [2004] buzzword meaning subdivision or part (USA).

spiral aerial (antenna)  Aerial in form of single conductor wound as spiral on conical dielectric support; common as passive RWR receiver.

spiral angle  Angle between pitch cone generator of bevel gear and tangent to tooth trace; positive for right-hand gear.

spiral bevel gear  Crown gear has pitch curves inclined to pitch element and usually circular arcs.

spiral dive  Extremely dangerous flight manoeuvre in which aircraft, invariably fixed-wing aerodyne, is unwittingly in spiral descent with neither turn nor slip indicating and in absence of external cues few indications other than horizon instrument if fitted.

spiral divergence  Spiral dive with vertical acceleration ± 1 g.

spiral glide  Sustained gliding turn.

spiral instability  Faulty aeroplane flight characteristic in which there is an inherent tendency to depart from straight and level flight into oscillating sideslip and bank, latter always being too great for tendency to turn. (Long-established UK definition unrelated to Dutch roll, which is a high-subsonic phenomenon; suggest arch.).

spiral mode  An exponential manoeuvre mode involving pronounced roll and yaw, in some aircraft marginally unstable.

spiralok  Patented female thread in which base of normal 60° profile changes to 30°, forming tight clamp on all male crests.

spiral scan  See scan types.

spiral stability  Desired aeroplane characteristic in which, in co-ordinated turn, it automatically resumes straight and level flight on release of flight controls. Note that no slip is present to assist recovery, and that large fin (needed for other reasons) exerts adverse influence.

Spirit  Spectral IR rocket-borne interferometer telescope.

spirit  Spectral IR imaging technology testbed, also translated as spectral IR remote-imaging transit testbed.

spiroid gear  Patented gear in which conical worm engages with many teeth simultaneously of face-type gear, possibly with exceptionally large reduction ratio.

spit  See SSPTS.

spitting  Air intercept code: “I am about to lay sonobuoys and may be out of radio contact (because very low) for few minutes” (DoD).

SPJ  Self-protection jammer.

SPK  Synthetic paraffinic kerosene.

SPKL  Standard parts list(ing).

SPKR  Speaker.

SPL  1 Sound pressure level, see noise. 2 Standard parts list(ing).

split  1 Supplementary flightplan message. 2 Sun-pumped laser. 3 Signature and Propagation Laboratory (USA). 6 Special. 7 Student Pilot’s Licence [in UK replaced by CAA medical certificate].

splash  1 Code word sent to observer 5 s before estimated impact of weapon(s). 2 Target destruction verified by visual or radar means. 3 Generalized term for action of destroying aerial target.

splash code  Letter/number identity of navigation beacon (WW2).

splash cooling strip  Welded around interior of flame tube of annular chamber so that cooling air entering through perforations is converted into thin sheet moving across inner surface.

splash-detection radar  Pinpoints impact of vehicle with ocean to facilitate positive scoring and vehicle recovery (eg in Nike X ABM tests).

splashdown  End of space mission in which spacecraft, capsule or other recoverable object impacts ocean surface; defined as either a time or a location.

splashed  Air-intercept code: enemy aircraft shot down (followed by number and type) (DoD).
splash lubrication

splash lubrication Use of small lips or vanes on connecting rods or crankpins to splash oil inside crankcase; rare in aviation.

splatter 1 Adjacent-channel interference in pulsed transmissions, measured as amount of spectrum energy that can appear in adjacent channel; varies greatly with different pulse waveforms. 2 Cloud of canopy fragments after MDC detonation.

splice Structural joint made by plate overlapping both members, plus doubler.

spine 1 Axial groove in shaft for meshing with driven member; hence splined shaft has entire periphery formed into splines, invariably of involute or even rectangular section. 2 Flexible non-structural strip (various materials) bent to required curvature in construction of fairing.

splinter Fragment of casing from exploded bomb or h.e. shell.

split Verb. to divide an engine into modules, notably into fan and core, hence *engine shipping, etc.

split-altitude profile Flight-profile has two main flight levels.

split-compressor engine Gas turbine in which compressor is performed by two separate rotating assemblies running at different speeds; can be axial + centrifugal, or separate axial and radial-impeller.

split courses Multiple courses, each providing part of payload.

split-axle gear Landing gear on simple low-performance aircraft in which there is no axle or other linking transverse member. Also called divided gear.

split basing Division of tactical-aircraft unit’s resources between two operating bases.

split cameras Two or more cameras fixed so that imagery of one overlaps that of neighbour(s) by selected amount.

split charter Commercial flight flown on charter to two companies, each providing part of payload.

split-compressor engine Gas turbine in which compression is performed by two separate rotating assemblies running at different speeds; can be axial + centrifugal, while term two-spool suggests axial + axial.

split courses See multiple courses.

split distance Two friendly fighters fly apart for mutual interception practice, usually head-on.

split flap Flap formed from only underside of aerofoil, depressed with plain hinge leaving upper surface unaltered; gives high drag but little extra lift.

split-flow engine Turboprop in which fan air is diverted to blow wing or flaps and core jet is used for propulsion (and, if vectoring is added, for lift).

split gear Landing-gear trucks (B-52) attempt to steer some left and some right simultaneously.

split landing gear See split-axle gear.

split line Small flash-projecting ridge round surface of die forging.

split load Drop of firefighting retardant at two locations in same mission.

split mission Several meanings, including (1) profile part hi and part lo, (2) task includes recon and attack, (3) task includes two surface targets, (4) transport flight carries loads for two destinations, and (5) part subsonic and part supersonic dash.

split needles Various flight-instrument indications for aeroplane (eg dual engine-speed indicator with one engine at flight idle) or helicopter [eg, gross disharmony between speeds of engine and rotor system].

split pair See split vertical photography.

split patch Patch for reinforcing end of surface (eg fabric air inlet) at junction with airship envelope.

split-plane manoeuvring Air-combat manoeuvring for mutual support following a defensive split.

split-S Flight manoeuvre comprising half flick (snap) roll followed by second half of loop, resulting in loss of height and 180° change in heading.

split-surface control Powered flight-control surface subdivided into two or three portions, each of same area and each driven by its own independent power unit (thus, VC10 has four elevators and three rudders).

splitter 1 Fixed or laterally movable surface dividing fluid flow in duct, eg to feed two engines, or to divide each flow element in a centrifugal compressor or to pass into bypass duct and compressor in a turbofan. 2 Machine which divides or apportions signals, shaft power or other services among selected recipients.

splitter fairing The streamlined fairing over a shaft taking the drive from inside a gas turbine to a unit mounted externally or on a fan case.

splitter box Divides one rotary input among two outputs in variable proportions, eg to control either or both of two-roll-control or DLC spoilers.

splitter gearbox 1 Splitter box. 2 Gearbox dividing input along two channels, eg from reverser PDU (3) to left/right half-rings of slave actuators.

splitter panels Sound-absorbing panels, usually radial struts or concentric rings, to reduce noise from jet-engine inlet.

splitter plate On centreline of single-surface rudder.

split vertical photography Simultaneously triggered reconnaissance cameras, each tilted same angle to left or right of centreline, with small centreline overlap.

split-work blade Gas-turbine fan blade comprising inner (compressor supercharging) portion separated from outer (fan) portion by part-span shroud.

spoiler 1 Hinged or otherwise movable surface on upper rear surface of wing which when open reduces lift, and usually also increases drag. Most are essentially flat plates hinged at or beyond leading edge and power-driven to open upwards, either symmetrically to incline flight path downwards or differentially to command or augment roll. Supersonic combat aircraft often have no other roll
spoiler/elevator computer

control, while others use * only at low speeds or high speeds. * operation on commercial transports is invariably linked with position of speed brakes, response depending on whether differential or not. DLC * is primary flight control, esp. during landing. Many * used as lift-dumpers after touchdown.

2 Movable deflector used to kill most if not all residual thrust from engine or from turbofan core; much simpler and lighter than reverser.

3 Comb, flap or other device extended on command to break up local airstream, eg ahead of open weapons bay.

spoiler/elevator computer Multiple inputs control signals to provide roll and speedbrake control and, if fitted, gust-alleviation; following failure of pitch computer also provides back-up main and trim control in pitch.

spoiler initiation angle Rotary deflection of pilot’s roll control (spectacles, handwheel, etc) at which spoiler(s) start to open (from wings-level flight with speedbrake fully closed).

spoiler-mode control system Governs spoilers as DLC in flight and auto-dumper and speedbrake on touchdown.

spoileron Small spoiler either augmenting ailerons with large input, or serving as primary control in roll.

spoking 1 Regular or erratic flashing of rotating time-base on PPI or other radial display.

2 Any PPI display which radiates out from a central origin.

SPOL Solar-powered obstruction light(s).

sponginess, spongy Descriptive but vague term for flight controls where response appears unduly delayed or uncertain, usually due to cable stretch, play in pully supports and mechanical wear.

sponsos 1 Symmetric projections low on each side of flying-boat hull in form of short thick wings to provide stability on water in place of outer-wing floats.

2 Projections from helicopter fuselage in form of short thick wings to provide attachment for main landing gear (and in some cases retraction stowage space).

3 Short, thin wing-like structures projecting from aeroplane or helicopter fuselage to carry weapons, external tanks, guns and possibly other devices.

spontaneous ignition point Lowest temperature at which vapour spontaneously ignites without external ignition source [see auto-ignition].

spoof 1 To copy hostile IFF reply code.

2 See spoofing.

spooker Air-intercept code: context is employing electronic or tactical deception measures (DoD).

spoofing Acting the part of hostile forces, especially in EW.

spook Adjective or noun: aircraft, manned or unmanned, flying EW missions, especially clandestine.

spool 1 One complete axial compressor rotor, in case of multi-shaft engine forming LP, IP or HP portion of complete compressor. Some authorities include the drive-shaft and turbine.

2 Attachment anchor, usually one of L/R pair, for catapult bridle of carrier aircraft.

3 To open throttles (colloq.). Increasingly, spooling = ground running.

spool down To allow gas-turbine engine rpm to decay to zero, eg after closing shut-off valve or HP cocks; normally two words, or one as adjective, hence spooldown time. Also called rundown.

spool duct Joins engine to augmentor and UAA nozzle.

spool up To accelerate engine rpm, esp. to TO power or at least to much higher level than previously; normally turbofan or turbojet.

spool valve Fluid-flow control in which an external pressure-difference force moves an axially sliding valve in which two or more pistons close or open wall apertures [as in steam locomotive].

sporadic E Irregular radio-reception and disturbance caused by abnormal variation in E-layer.

sportplane No definition, but generally taken to mean small GA aircraft in which flight performance dominates other qualities.

SPOT 1 Spot wind (ICAO).

2 Speed, position, track.

3 Smart position-only tag.

spot 1 To form up aircraft in close ranks on carrier deck ready for free or catapult takeoffs.

2 Designated place on airfield where landing is to be made.

3 Bright region where electrons strike fluorescent tube face in CRT and many other displays or image converters.

4 To determine, by observation, deviations of ordnance from target for purpose of supplying necessary information for adjustment of fire (DoD).

5 To search from ground for hostile aircraft in own airspace (UK civilian usage, WW2; hence spotter, spotting).

6 Code, spot wind.

7 A hydraulic or pneumatic cylinder in a disc or plate-type wheel brake [thus, a nine-* brake].

spot annealing Annealing local area of hard steel, eg to drill and tap fixing hole.

spot beam Electromagnetic beam made as parallel as possible to maximize power at great distance.

spot elevation See spot height (US usage).

spot facing Local surface-machining round hole or other point, to improve surface finish, adjust dimensions or provide square-on surface for bolt head.

spot fuel Uplifted and paid for on the spot, as distinct from part of ongoing contract.

spot height Height of point, esp. mountain peak or other high point, marked on map or chart.

spot jamming Jamming of specific frequency or channel.

spot landing Aeroplane landing made from specified position and height AGL on to spot (2); form of accuracy landing.

spotlight 1 A DBS radar operating mode using very narrow beam with highest possible resolution, steered to dwell on targets of high interest so that numerous echoes can be integrated.

2 Strongly directional light aimed at area of interest, eg. part of airframe susceptible to icing.

spot net Com net used for spot (4) information.

spot report Sent from attack or reconnaissance aircraft stating passage overhead specific target.

spot size Diameter of spot (3).

spotter 1 Person assigned to task of watching for and identifying hostile aircraft; hence raid *; official respon-
spotting

sible for immediate warning of imminent attack to high-priority establishment whose personnel would remain at work throughout air raids (UK civilian usage, WW2).

spotting Act of arranging aircraft on flight deck (see spot [1]).

spotting factor Ease with which particular aircraft type can be spot (1) positioned on deck; not quantified but takes into account overall folded dimensions and turn radius and possibly stability and laden weight.

spot weld Local, usually circular, weld quickly made by electrical resistance jaws working on sheet; tool can be point or roll electrodes.

spot wind Wind measured at one geographical location.

spot wobble Technique for imposing small SHM wave-form on each line of TV or similar raster display to blur spot wind.

SPPO Short-period pitch oscillation.

spray Bar for spraying, esp. for ag purposes, arranged spanwise below trailing edge and usually freely swinging to knock upward on impact with obstruction.

spray dam Strip projecting along forebody chine of marine aircraft, as far as possible following streamline in cruising flight, to deflect water spray downward.

spray dome Mound of water thrown into atmosphere when shockwave from underwater NW reaches surface.

spray hood Head covering attached to life jacket.

Spraymat Patented (Napier, now Lucas) electrothermal anti-icing and de-icing mats featuring sprayed-on metallic layers.

spray strip See spray dam.

SPRD 1 Spread.

2 Solid-propellant rocket motor (R).

3 Smaller.

spreader 1 Agricultural aircraft rigged for solids.

2 Mechanical (usually centrifugal) dispenser of agricultural solids.

spreader bar 1 Horizontal member(s) separating and joining floats of twin-float seaplane.

2 Horizontal axle-like member joining left/right landing gears of early or light aircraft, other than true live axle.

spread spectrum Vast and growing technology forming complete division of electronics, esp. military and avionics, fundamental of which is use of PN, FH, TH or any combination of these to modulate signal whose bandwidth is much wider than that of plain message. Latter is conventional (eg biphase digital or PDM analog) and is merged digitally with ** modulation to generate emitted signal. Advantages are very great anti-jam capability, military security, multiple access, low detectability, Sikel capability and auto transmitter ident, multipath tolerance, and inherent precision-nav capability.

springback Angular distance through which metal bent to new shape springs back after bending force is removed; allowed for in making tooling or in hand operations.

spring bow Supports arrestor wire above carrier deck.

spring drive Coupling inserted between piston-engine crankshaft and supercharger [rarely, propeller or reduction gear] to prevent transmission of cyclic vibrations. See Bibby.

spring feel Simplest form of artificial feel, in which force is applied to pilot’s flight control (eg stick or yoke in pitch) by linear spring, thus within limits exactly proportional to deflection and unvarying with dynamic pressure.

spring sheet-holder Small lock in form of cylinder and spring-loaded rod with locking end inserted by pliers through holes in sheets to hold location during riveting.

spring strut Mechanical link imposing absolute limit on force transmitted.

spring tab Servo tab whose deflection relative to surface is resisted by spring, usually torsion bar, which is often preloaded so that at gentle inputs pilot moves surface and tab unaided; at higher input spring is overcome and tab deflected to assist.

springy tab Not same as previous entry, tab moved upwards only by spring, having powerful effect at low IAS, making pilot pull back on yoke giving stick-free stability. Also called Vee tab.

Sprite 1 Surveillance, patrol, reconnaissance, intelligence-gathering, target-designation and EW (UK).

2 Signal processing in the element.

sprites Transient visual phenomena, typically luminous streaks, seen in ionosphere above giant thunderstorms.

SPRL Spiral.

SPRO Semi-prepared runway operations.

sprog Totally inexperienced [noun and adjective] (RAF, WW2).

SPS 1 Secondary, or solar, power system.

2 Samples per second.

3 Blown flap (USSR, R).

4 Self-protection system, or subsystem.

5 Simplified processing station.

6 Service (module) propulsion system.

7 Standard position[ing] system, or service, part of GPS Navstar.

8 Signal, or sonobuoy, propulsion system.

9 Sensor processing subsystem.

10 Standard Procurement System (DoD).

11 Standard pressure setting.

SPSS Statistical package for social sciences (CAA).

SPT 1 Strategic Planning Team (FAA, NAS).

2 Shop processing time.

3 Simplified passenger travel.
SPT-B

4 Signal-processing tools.

SPT-B Selectable-performance target, ballistic.

SPU 1 Short power-up (SAAHS self-test).
2 Intercom (USSR, R).
3 Subsystem power unit.
4 Signal processing unit.
5 Stores power unit.

Spur Space-power unit reactor.

spur gear Gearwheel with straight teeth round periphery; many dictionaries add ‘parallel to axis of rotation’, not so, most aero-engines contain helical.*

Sputnik Russian word for ‘fellow traveller’, name of first artificial satellite, launched 4 October 1957; later colloq, for any satellite or even any spacecraft.

spattering Ejection of metal atoms from cold cathode by evaporation or ion bombardment, either as nuisance, to form fine coating on substrate or to form colloidal metal solution.

SPW 1 Self-protection weapon (tactical attack aircraft AAM, not necessarily fired in forwards direction).
2 Secondary power.

SQ 1 Squall (ICAO).
2 Software, or service, quality.
3 Squelch, squawk.
4 Super-quick [fuzes].
5 Square.

SQA 1 Software quality assurance; / CM adds configuration management.
2 Service quality agreement.

SQAL Squall.

SQAN Squall line.

SQB Service-quality billing; P adds processor.

SQC Statistical quality control.

SQD Service-quality data.

sq ft Square feet.

SQL Structured query language.

SQLN Squall line.

SQM 1 Software quality metrics, quantified measures of SQ.
2 Software quality management.

sq m Square metres, m² preferred.

Sqn, sqn Squadron.

SQP Sequential quadratic programming.

squadron Any of many types of military or naval unit, including common administrative unit of combat aircraft; according to many services ‘consisting of two or more flights’. Foreign-language equivalents include Staffel (G), escadron (F), escuadron (S), eskadrilya (USSR, R).

Squadron Uncle Senior officer [e.g., Wg Cdr] who stays behind when the unit is posted to an overseas conflict (RAF).

squall Strong but intermittent wind; gust whose effect lasts minutes rather than seconds and extends a kilometre/mile or more horizontally.

squall line Line of established or developing thunderstorms.

squarco Radar beam squinting plus area coverage.

square 1 See signal area.
2 Large square marked on remote part of airfield, to be accurately flown by pupil helicopter pilot, especially in presence of wind.
3 Of an aeroplane [airplane], having length equal to span.
4 Of a piston engine, having bore equal to stroke.

squawk normal

square bashing Drill, esp. on barrack square (UK).

square course Airfield circuit (US usage); does not mean literally square.

square/cube law Basic geometric law: areas of similar-shaped solid bodies are proportional to squares of linear dimensions, and volumes (i.e. for equal densities, masses) to cubes. Thus if two aeroplanes are of same shape but one has twice linear dimensions, it will have four times wing area and eight times weight, hence W/S is doubled.

square engine Piston engine whose bore equals stroke.

square foot 0.0929m², 92,903.04 mm².

square inch 645.16 mm².

square mile 2.58999 km².

square parachute One whose canopy is approximately square when laid out flat.

square search Various standard air/surface search patterns in form of overlapping rectangles (usually squares or near-squares) so that after a period aircraft has examined a large strip or rectangle with minimal duplication.

square stall Stall with wings level throughout.

square thread Thread with vertical faces (unlike Acme) used for transmitting power as linear thrust in either direction.

square wave EM or other periodic wave which alternates between steady positive and steady negative values in time extremely brief by comparison with steady periods.

square-wing biplane Upper and lower spans equal; according to some authorities, also without stagger.

squaring shears Hand or power shears for cutting sheet positioned on marked-out platform.

squash head Warhead for use against hard targets, esp. those with single thick metallic armour layer; basic principle is transmission of intense shockwave through armour, causing transverse acceleration high enough to spall pieces off inside face.

squatting Downward movement of marine aircraft e.g. (eg due to trough) in essentially level attitude while running on water.

squat switch Bistable switch triggered by sustained (usually 2.5 s) compression of main or nose landing-gear struts on touchdown, to operate lift dumpers, reversers and/or other devices. Term also applicable when input is rotation of MLG bogie beam.

squawk Generalized word for airborne transponder or IFF operation and keying; when used alone usually a ground-radar ATC command to switch to normal or to directed mode. Keying is usually a four-digit number. See following entries.

squawk alt Switch to active Mode C with auto altitude-reporting.

squawk Charlie See squawk alt.

squawk flash Operate IFF I/P switch.

squawk ident Engage ident feature; civil counterpart of flash.

squawking Air/ground code: showing IFF/transponder in mode/code indicated.

squawk low Switch to low sensitivity.

squawk Mayday Switch to emergency position; for civil transponder Mode A, Code 7700; for mil IFF Mode 3, Code 7700 plus emergency feature.

squawk mike Operate IFF MIC switch and key transmitter as directed.

squawk normal Switch to normal sensitivity.
squeak

squeak (number) Operate in Mode A/3 on designated code.
squeak (number) and ident Operate on specified code in Mode A/3 and engage ident (mil IFF/I/P).
squeak standby Switch to standby position.
squeak Green IV of friendly aircraft to warn of nearby balloon cables (WW2).
  Perfect touchdown, synchronous with greaser.
squeeze-film bearing Provided with small annular space between outer track and housing filled with pressure-feed lube oil which cushions dynamic radial loads, thus reducing engine vibration and possible fatigue. It enables a shaft system to rotate about its true centre of mass. The oil film is often called a squeeze-film damper.
squeeze riveting Rivet closure by single sustained force instead of blows.
squash 1 J Subcircuit in communications receiver which holds down volume to reduce output noise until a signal is received.
  Pilot control of volume or signal/noise ratio.
squib Any small pyrotechnic used as source of hot gas, eg to fire igniter of rocket or fuel in some (eg missile/RPV) gas turbines.
squib valve Ambiguous, has been used to mean (1) sole
  noid valve for controlling thrusters (Apollo RCS) or
  (2) squid-actuated valve.
squid Trade name, see (1) next.
  1 Superconducting quantum interference device; pair of Josephson junctions.
  2 Semi-stable part-opened regime of parachute canopy, normally encountered only at extreme airspeeds.
squidding Operation of parachute in squid position.
squint angle 1 Maximum angle away from missile axis at which homing head (IR, radar, EO, etc) can acquire and lock on to normal emitting point target at significant distance.
  2 Angle of squint.
squifiers Safety-equipment fitters (colloq.).
squirrel cage 1 Air-combat dogfight (colloq.).
  Induction motor whose rotor comprises axial bars joined to rings at each end, pulled round by rotating field.
squirt 1 Filler pulses transmitted by transponder between interrogations.
  2 Spontaneous transmission generated once per second, without interrogation.
  3 Random pulse pairs generated as fillers.
SQL Structured query language.
sql Squelch.
SOP Signal-quality parameter.
SR 1 Short-range.
  2 Search rate.
  3 Sunlight-readable.
  4 Special rules.
  5 Single rotation.
  6 Sortie rate.
SRG
  7 Strategic reconnaissance, role designator (US), originally transposition of RS (recon/strike).
  8 Sunrise.
  9 Service report, or request.
  10 Solid rocket.
  11 Slow-speed route (FAA).
  12 Switched reluctance (see SRMG, SRSG).
  13 Shear rate.
  14 Staff requirement ([A] adds Air).
  15 Stopped-rotor [adjective].
  16 Statistical reporting.
  17 Spherical radius.
s Steradian.
SRA 1 Special-rules area, or airspace.
  2 Shop-replaceable, or repair, assemblies.
  3 Surveillance radar approach (CAA).
  4 Spin reference axis.
  5 Specialized repair activity (DoD).
  6 Surveillance and reconnaissance aircraft.
  7 Strategic Research Agenda (Acare).
SRAA Short-range air-to-air, M adds missile, W warfare; but see next.
SRAA Short-range anti-armour weapon (UV).
SRAAD Software requirements and design description.
SRALT Short-range air-launch target (USN).
SRAM 1 Short-range attack missile.
  2 Static, or strategic, random-access memory.
SRARM Short-range anti-radiation (or radar) missile.
SRB Solid-rocket booster.
SRBM Short-range ballistic missile.
SROBC Super-rapid-blooming offboard chaff.
SRBS Skeletal reference baseline simulator (SDI).
SRC 1 Science Research Council.
  2 Secondary radar code.
  3 Sample return container, or capsule [spaceflight].
  4 Surveillance-radar computer.
  5 Spoiler ratio changer.
SRCC 1 Structures Research Consultative Committee (SRAC).
  2 Standard radar-control console (NATO).
SERC Secure remote-control unit.
SRD 1 Short-range diversion.
  2 Service-revealed difficulty.
  3 Systems requirements document.
SRDE 1 Signals Research Development Establishment (Chirstchurch, now closed) (UK).
  2 Search-radar data extractor.
SRDS Systems Research and Development Service (FAA).
SRE Surveillance radar element; portion of GCA.
Sref Reference area.
SRJE Selective reject.
SREM Software requirements engineering methodology.
SRF 1 State-rate feedback [IMF adds implicit mode following].
  2 Soft-copy reference folder.
SRFCS Self-repairing flight-control system.
SRFP Sunlight-readable flat panel; D adds display.
SRFW Schweizerische Rettungsflugwacht ( = GASS) (Switzerland).
SRG 1 Safety Regulation Group (UK CAA).
  2 Short-range.
SRHit, SRHIT

SRHit, SRHIT  Short-range homing intercept technology (SDI).

SRI  1  Short-range insert.
    2  Southwest Research Institute [San Antonio, TX78228-0510] (US).

SRIMU  Small re-entry inertial measurement unit.

SRINF  Short-range intermediate nuclear force[s].

SRL  Società Responsabilita LimitatA (I).

SRLD  Small rocket lift device.

SRM  1  Solid-rocket motor [U adds upgrade].
    2  Short-range missiles (HUD selection).
    3  System resource manager (software).
    4  Speech-recognition module.
    5  Structural repair manual.
    6  Selective-reject mode.

SRMG  Switched-reluctance motor-generator.

SR-30  30 minutes before sunrise.

SRO  1  Station routine orders.
    2  Senior ranking officer.
    3  Space Research Organization (India), usually called ISRO
    4  Sensitive reconnaissance operation[s].
    5  Superintendent of Range Operations.

SROR  Short-range omnidirectional beacon.

SRON  Space research organization [office, Utrecht]
      (Netherlands).

SRP  1  Steep rocket projectile (GGS selection, WW2).
    2  Software rapid prototyping.
    3  Slot [ATC] reference.
    4  Computer (R).
    5  Service resource planning.
    6  Stabilization reference package / PDS adds position-
      determining system.
    7  Sustained readiness program.
    8  Selected reference point.
    9  Shared reconnaissance pod.

SRPG  Strain-range pair counter.

SRR  1  Search/rescue region (ICAO).
    2  System[s] requirements, or release, review.
    3  Software requirements review.
    4  Short-range recovery.
    5  Strategic resources review (NASA).
    6  Satellite recognition receiver.

SRS  1  Sonobuoy reference system.
    2  Speed reference system.
    3  Survival radio set.
    4  Smoke-repellant system.
    5  Strategic Reconnaissance Squadron (USAF).

Srs  Series.

SRSG  Switched-reluctance starter-generator.

SRSK  Short-range station-keeping.

SBS  1  Space Radiation Shielding Program (MSFC).
    2  Sunrise to sunset.

SRSR  Sunrise to sunset.

SRST  Sunlight-readable see-through; HW adds head-
       wearable.

SRT  1  System readiness test[s].
    2  Syllabus for recurrent training.
    3  Standard remote terminal.
    4  Satellite receiver/transmitter.

SRTM  Shuttle-radar topography mission.

SRTOS  Supervisory Resident Technical Officer.

SRTS  Short-range thermal sight.

SRU  1  Shop-replaceable unit.
    2  Scanner receiver unit.

SRTV  1  Surveillance.
    2  Surrogate research vehicle.
    3  Schweizerische Raumfahrt-Vereinigung [astronautics
      federation; = ASA(12)] (Switzerland).

SRVL  Shipboard rolling vertical landing.

SRW  Strategic Reconnaissance Wing (USAF).

SRWB  Short-range wideband radio.

SRY  Secondary.

SRZ  1  Special-rules zero.
    2  Surveillance-radar zone.

SS  1  Sunset.
    2  Spread spectrum.
    3  Single-slot[ted].
    4  Surface-to-surface.
    5  Sunbeam (ICAO).
    6  System status.
    7  Sliding scale.
    8  Source-substantiation.
    9  System[s] simulation.
   10  Sector search (MTI).
   11  SAR (2) spotlight (radar mode).
   12  Subsystem.

SS  3  Sunset.

SSA  1  The Soaring Society of America, Inc. [office, Los
      Angeles, CA].
    2  Self-Soar Association (US).
    3  Static-stability augmentation.
    4  Stick sensor assembly.
    5  Supersonic adversary; A adds aircraft.
    7  Safe sector altitude.
    8  Soviet strategic aviation, transliteration of ADD.
    9  Solid-state amplifier.
   10  System safety analysis.
   11  Space situational awareness.

SSAC  1  Source-Selection Advisory Council.
      2  Solid-state aircooled.

SSADP  System station annunicator display panel.

SSAE  Society of Senior Aerospace Engineers (US).

SSAI  Solid-state attitude indicator.

SSAL  Simplified short approach lights; F adds sequence
      flashing lights, R adds RAIL, S system.

SSAN  Space sextant autonomous navigation and
      reference system.

SSAP  1  Survival stabilator actuation package.
      2  Strategic safety action plan. [Eurocontrol, now being
         replaced].

SSAR  Spotlight SAR.

SSAT  Subsonic subscale aerial target.

SSB  1  Single-sideband.
    2  Space Science Board (US, NAS).
    3  Split system breaker[s].
    4  Ballistic-missile-firing conventionally powered
       submarine.
    5  Supersonic bomber.
    6  Small smart bomb; REX adds range-extension.
    7  Shaped sonic boom. See next.

SSBD  Shaped sonic-boom demonstration, which see.

SSBE  Shaped sonic-boom experiment (NASA).

SSBJ  Supersonic business jet.

SSBN  Ship, submersible, ballistic [missile], nuclear
       [powered] (USN).

SSBS  Sol/sol balistique stratégique (=MRBM, F).
SSC

SSC 1 Short-service commission (RAF).
2 Sidestick controller.
3 Solid-state scanner, or scanning.
4 Stennis Space Center (NASA, St Louis, Mississippi).
5 Slot/spoiler control.
6 Strategic supply chain.
7 Small spacecraft.

SSCC Safety Standards Consultative Committee (EASA).

SSCM French form of VSML.

SSCVFDR Solid-state cockpit voice and flight-data recorder; SSCVDR omits flight-.

SSCP System services control point.

SSCM (EASA).

SSDC Space and Strategic Defense Command (USAF).
1 Solid-state data-carrier.
2 DDS Ship self-defence system against missiles.
3 SE Software support environment.
2 Site security enhancement.
3 Simulation/training equipment (ASW).

SSCVR Systems and Simulation Division (USAF).

SSCVP Station Services Flight (RAF).

SSRT Station to Shuttle power transfer system (Satellite solar power system [or station]).

SSRF Solid-state recording device.

SSRD Solid-state recording device.

SSRF Shafted replacement fabric.

SSRMS Space-station remote manipulator system.

SSRT Mobile detection and designation radar (USN, R).

SSR video Video (raw radar) signal processed in SSR computer to exclude unwanted information and leave graphical display of targets, data and other displayed information in correct display positions.

SSS 1 Space surveillance system (USN).
2 Small scientific satellite.
SSSAR

1. Strategic satellite system; also survivable strategic satellite.
2. Stick-shaker speed.
4. System support segment [JSIPS].
SS-TR Sunset to sunrise.
SST 1 Supersonic transport.
2 Static-strength test (ing).
3 Static storage tank.
4 Standard serviceability test.
5 Single-subscriber terminal.
6 Solid-state transmitter [also STX].
7 Sidestick transducer.
8 Stores systems tester.
SSTD Solid-state towed decoy.
SSTDMA Satellite system: DMA.
SSTI Stabilized steerable thermal imaging.
SSTO Single stage to orbit.
SSTOL Super short, or supersonic and short, takeoff and landing.
SSTS Space-based surveillance and tracking system, to acquire and track PBVs, RVs and ASATs (SDI).
SU 1 Signal summing unit.
2 Semiconductor storage unit.
3 Sensor surveying unit.
4 Subsequent signal unit.
SSULI Special sensor UV limb-imager.
SSUP Space station users panel (Int.).
SSUS Spinning solid upper stage.
SSUSI Special sensor UV spectrographic imager.
SSV Standard service volume (radio).
SSVT Satcom secure voice terminal.
SSW Swept square wave (ECM).
ST 1 Standard time.
2 Stairway (passenger, not powered).
3 Sharp-transition (VASI).
4 Single tandem [landing gear, eg C-130].
5 Strategic transport, air.
6 Static thrust; st is preferred.
7 Statistics.
S A Area of horizontal tail.
2 Distance between centres of contact areas of tandem wheels.
St 1 Stratus.
2 Stokes.
3 Stanton number.
4 Strouhal number (also S).
5 Static thrust.
Sl Unit tensile stress.
st 1 Static thrust.
2 Stone.
STA 1 Service des Transports Aériens (F).
2 Station (also Sta), eg cemetery STA 307.8.
3 Supersonic transport aircraft (duplicates SST).
4 Static test article.
5 Straight-in approach (ICAO).

Stability loop

6 Shuttle Training Aircraft, STA prefix for other acronyms.
7 Structural test airframe (or article).
8 Section Technique de l’Armée.
9 Scheduled time of arrival.
10 Surveillance and target acquisition.
11 Satcom terminal assemble.
12 Shuttle tile ablator; see *54.
Sta Station.
STAARTE Scientific training and access to aircraft for atmospheric research throughout Europe.
STAB Stabilizer.
Stab 1 Staff, especially staff flight of four aircraft (G).
2 Steered agile beam.

Stabbing Assembly process in which finished gas-turbine stator blade (IGV) is fired at high speed through unbroken ring to form tight-gripping joint.

Stability Generally, quality of resisting disturbance from existing condition and tendency to restore or return to that condition when disturbance is removed. For aircraft, meaning is confined to basic flight control and defined as tendency to resume original (normally straight/level but not necessarily) attitude after upset (rotation about any axis); qualified according to axis and whether stick-fixed or stick-free. See motion. For atmosphere, temperature distribution such that particle tends to stay at original level. For structure, ability to develop internal forces resisting those externally applied. For materials other than structural, usually ability to withstand harsh environment (eg high temperature) without even gradual physical or chemical change.

Stability augmentation Various species of auxiliary subsystem added to primary flight-control system (usually of helicopter, advanced aeroplane or spacecraft) to achieve desired vehicle characteristics by selection of variable gains in feedback loops from surfaces. In some forms surfaces are commanded, eg yaw damper. Modern fighters with relaxed longitudinal stability would be dangerously unstable without **. Usually has limited authority and does not move pilot’s controls.

Some authorities insist ** artificially improves stability while retaining control in the hands of the human pilot.
Stability axes Introduced c 1939 to simplify calculation, X-axis aligned with relative wind and remaining axes fixed relative to body throughout subsequent disturbance. Made redundant by computers.

Stability derivatives See derivatives.

Stability factor Ratio of change in transistor collector current to change in Ies (DC collector current for zero emitted current).

Stability lines Surge line.

Stability loop Plot of limits of gas-turbine combustion,
stability margin

one too fuel-rich and the other too weak, on ordinate air/fuel ratio and abscissa mass flow.

**stability margin** See static margin.

**stabilization** 1 Positive action to maintain stability, esp. of spacecraft or payload, when term invariably refers to attitude. Passive * is any method requiring no sensing, logic or power, eg gravity-gradient, spin and solar-wind/aerodynamic pressure. Semi-passive requires stored momentum, eg gravity-gradient plus CMG. Semi-active introduces limited thrust/orqueing, eg on one axis. Active features sensing, logic and control about all axes. Hybrid are systems with more than three degrees of freedom, eg to control despun/gimballed/indendent secondary devices such as aials or telescopes.

2 On starting engines of multi-engined aircraft, attainment of steady rpm, EGT and other parameters on all engines, usually prior to taxi.

**stabilized approach** On glidepath at correct airspeed, correctly configured, all checklists and paperwork complete.

**stabilized gyro** Usually means aligned with a desired direction, eg Earth centre, true N or magnetic meridian.

**stabilized platform** Invariably, platform maintained always horizontal at any place on or near Earth, ie perpendicular to local vertical.

**stabilizer** 1 Tailplane or slab horizontal tail (US).

2 Loosely, any fixed tail surface, including pressure-inflated fins of non-rigid airship or kite balloon Fin normally prefixed by ‘vertical’ (US).

3 Low-density core (eg foamed-in-place plastics, balsa, honeycomb) filling interior of secondary structure, control surface, flap, door or similar structure.

4 Additives to retard chemical reactions.

5 Gyro subsystem to stabilize pivoted or gimbaled device, eg radar aerial.

6 Flame *.

**stabilizing altitude** Altitude at which actual rate of climb is zero.

**stabilizing floats** Small seaplane-type floats mounted well outboard under wing of flying boat or three-float seaplane to provide roll stability when afloat.

**stabilizing gears** Small landing gear carried well outboard (eg near or at tips of wing) of landplane with centreline main gears to provide lateral stability on ground, esp. when turning. Also called outriggers.

**stabilizing parachute** Used to stabilize fall of otherwise unstable paradropped load.

**Stabimatic** Simple modular autopilot for GA, buildable from wing-leveller using vacuum aileron input to fully coupled 3-axis system capable of capturing desired FL.

**stable** An air force’s total front-line inventory of one aircraft type [rarely, entire available inventory of all types].

**stable aerofoil** Complete wing whose CP travel is very small.

**stable air** Air mass in which actual lapse rate is less than adiabatic lapse rate (dry or saturated, depending on humidity), in extreme cases becoming negative (ie inversion).

**stable-base film** Reconnaissance or scientific film of extremely high dimensional stability.

**stable equilibrium** Body returns to original location after being displaced.

**stable oscillation** 1 Oscillation whose amplitude is constant.

2 Oscillation whose amplitude decreases (BS).

**stable platform** See stabilized platform.

**stable spread** Standard attitude for minimum rate of descent in sport parachuting: face-down, arms and legs spread widely.

**Stabo** Anti-runway munition (G).

**STAC** Supersonic Transport Aircraft Committee (UK, 1956–62).

**stack** 1 Superimposed series of holding patterns, each at assigned FL.

2 To assign to hold in *.

3 Piston-engine exhaust pipe, of any length or configuration (US).

4 To assemble multi-stage launch vehicle (colloq.), and vehicle thus assembled.

**Staco** Standing Committee for the Study of principles of Standardization (ISO).

**STacSAR** Small tactical SAR (2).

**Stadan** Space tracking and data network. Previously called Minitrack, there are fixed linear aerials at College, AK; St John’s, Newfoundland; Goldstone, CA; E Grand Forks, MN; Blossom Pt, MD; Ft Myers, FL; Quito, Ecuador; Lima, Peru; Santiago, Chile; Winkfield, England; Johannesburg, S Africa; and Woomera, Australia. Large dishes are located at Fairbanks, AK; Rosman, NC; and Canberra, Australia.

**stadiametric aiming** Optical aiming using lead angle calculated from apparent size of target and aspect, using various methods including subjective judgement (suggest arch.).

**stadiametric ranging** Estimating target range from knowledge of its true size.

**stadiametric warning** Based on range-closure derived from apparent size of other body.

**S-Tadil-J** Satellite tactical digital intelligence link, joint.

**STAé** Service Technique Aéronautique (F).

**Staff, STAFF** 1 Smart target-activated fire-and-forget.

2 Spatio-temporal analysis of field fluctuation.

**Staffel** Squadron (G).

**Staff-Pak** Four interlinked laboratory modules designed for installation in transport (C-130) to provide electrically noise-free environment.

**staff pilot** Experienced military pilot assigned to special duties, ie not with operational or training unit.

**STA-54** Shuttle tile ablator, 54 lb/cu ft.

**Stag** Simultaneous telemetry and graphics.

**stag** Stagnation.

**stage** 1 One complete element of propulsion, jettisoned (staged) when propellants are consumed (normally applied to rocket). In a multi-* vehicle each * fires in sequence following separation of predecessor to reduce mass remaining.

2 One complete element of multi-* process, normally compression or expansion, through which fluid is passed. Passage through a single long diffuser, venturi or other tapering duct is not * but use of several in succession causes each to become one *.

3 One complete element of fluid-flow compresing or expanding (eg power-extracting) device; eg one planar assembly of compressor rotor blades and associated ring of stator blades.

4 Sector (4) or, military, portion of air route between
stage cost
two staging units; sometimes, for flight planning, one point on route.
  5 Various meanings in electronics, EDP (1) and other disciplines.
stage cost  Direct operating cost of flying one (mean, or one specific) stage (4).
stage count  Simple list of total number of stages of blading in fan, compressors and turbines, thus GP7200 * reads 1-5-9-2-6.
staged combustion  Or * combustor, fuel is supplied to groups of burners arranged in rings of different radius or in axially spaced rings or radial arms, ignited successively.
staged crew  Prepositioned at staging unit to take over incoming flight.
stage flight  One flight forming part of longer multi-stage journey.
stage fuel  Fuel burned in flying one stage (4); hence ** carpet, plot of variables for flight-planning purposes.
stage length  Air-route distance between two staging points; in commercial use normally synonymous with stage distance.
stage sheet  Completed for each stage of maintenance listing all configuration changes and parts replaced.
stage time  1 Planned or actual time at which stage (1) takes place.
  2 Sector time.
Stagg  Small turbine advanced gas-generator.
stagger  1 Distance measured parallel to aircraft longitudinal axis between biplane lower-wing leading edge and vertical projection on to lower-wing extended chord line of upper-wing leading edge at same spanwise station (UK). Negative when upper plane is aft of lower.
  2 Acute angle measured in vertical plane parallel to aircraft longitudinal axis between leading edges of lower and upper planes at same spanwise location (US). Negative when upper plane is aft of lower.
  3 PRF variation by various means involving inter-leaving trains separated by offset interval; alternative EW technique to PRF jitter.
stagger angle  1 In a biplane, the acute angle in plane parallel to aircraft longitudinal axis between line joining points equidistant from centreline on upper and lower LE (see stagger [1]) and local vertical.
  2 In a rotor blade of a gas-turbine axial compressor or turbine rotor, the angle between the principal chord at any radius and [usually] the plane through the axis of rotation; the chord line may be drawn as tangent to the LE/TE, or even through the front of the aerofoil only.
stagger tuning  Increasing pass-bandwidth of RF receiver by tuning different output stages (one meaning of stage [5]) slightly above or below central frequency.
stagger-wing  Biplane of any make with negative stagger.
stagger wire  Diagonal wire joining lower and upper wings of biplane and lying approximately in plane parallel to axis of symmetry. (US term; UK = incidence wire).
staging  1 Separation of one stage (1) from next.
  2 Time at which * (1) is scheduled or actually occurs.
  3 Flying by separate stages (4), with or without changes of crew.
staging area  Geographical area between mounting area of exercise and objective, esp. for airborne or amphibious operation.
staging base  Landing and takeoff area with minimum servicing, supply and shelter provided for temporary occupancy of military aircraft during course of movement from one location to another (DoD).
staging point, unit  Place or organization linking two stages (4).
stagnant  In fluid flow, locally at rest with respect to solid containment. Avoided in most aerodynamics, and especially in fuel flow in gas-turbine injectors.
stagnation line  Locus joining stagnation points, eg boundary between radial-wall jets under hovering VTOL.
stagnation point  Point on surface of body in viscous fluid flow (one facing upstream and one down) where fluid is at rest with respect to body, flow in boundary layer on each side of ** being in opposite directions.
stagnation pressure  Pressure at stagnation point, normally same as total head, total pressure or pitot pressure, = sum of local atmospheric plus dynamic pressures.
stagnation region  Region close to upstream stagnation point.
stagnation stall  Several related afflictions of after-burning turbofans normally occurring on afterburner light-up at high altitude at modest airspeed, in most cases with rapid pressure pulses (say, seven per second) in fan duct causing oscillating stall of fan and then core engine.
  2 In flight of aircraft, any stall that is not self-correcting.
stagnation streamline  That which in any representation of 2D flow passes through front and rear stagnation points on immersed body.
stagnation temperature  That at stagnation point, when all relative kinetic energy has been converted isentropically to heat.
stainless steel  Generally, steels with 12-20 per cent chromium. Most common is 18-8, these being % chromium and nickel.
Pstairs  Sensor technology for affordable IR systems.
stair-stepped  Jetpipe whose walls form a precisely calculated zigzag to minimise radar cross-section.
stair-stepping  Step cruising.
STAJ  Short-term anti-jam.
stake  Anvil-type bench tool for sheet.
stakeholder  A person or organization having a professional interest in a programme. Examples include: the customer, the customer’s advisors, and everyone concerned with the programme in the prime contractor and his suppliers and subcontractors.
stake out  To picket aircraft.
staking  Swaging terminal on to electrical conductor.
Stalag Luft  Prison camp for captured aircrew (G, WW2).
STALD  Standoff tactical air-launched decoy.
stale track  Shown on radar display at last known position, even though it has not appeared on subsequent updates.
stall  1 Gross change in fluid flow around aerofoil, usually occurring suddenly at any 2-D section aligned with flow, at AOA just beyond limit for attached flow (at which lift coefficient is maximum); characterized by complete separation of boundary layer from upper surface and large reduction in lift. Traditional wings normally * at AOA near 16°-18°, which can be attained at any airspeed depending on applied vertical acceleration. AOA for * is increased by slat, and some highly swept
stalled pressure

(variable-sweep at max. sweep) wings exhibit no * even at AOA beyond 60°.
2 Sudden breakdown in fluid flow previously attached to solid surface, caused by changed angle of either surface or flow, violent pressure pulse in flow (esp. travelling upstream) or other severe disturbance, eg flutter.
3 Point at which opposing linear force or torque overcomes that of driving member (eg PFCU, hydraulic motor, airbrake or tailplane actuator), causing a commanded movement to be arrested.
stalled pressure Delivery pressure at which delivery from variable-stroke fluid pump, centrifugal compressor or certain other pumps falls to zero; also called reacted pressure.
stall fence Fence whose purpose is primarily to improve behaviour at stall.
stalling angle AOA at which flow suddenly separates from upper surface; probably that at which $C_L$ is a maximum.
stalling flutter 1 Flutter in one or more degrees of freedom near angle of stall (1).
2 In particular, flutter of any stalled Aerofoil [eg, compressor blade] drawing energy from surrounding flow.
stalling speed Any speed at which stalling AOA is reached, esp. that at 1 g when ** is at lowest value (when depends on aircraft weight, aircraft configuration and air density, among other variables). Usually assumptions include SL ISA, gear/flaps down, power off.
stall-limit bank angle Maximum angle at which a co-ordinated turn can be sustained at maximum power, $\delta = \cos^{-1} \frac{M/C_{L_{max}}}{\sqrt{\rho \rho V^2}}$.
stall line Boundary between acceptable operating conditions for gas turbine and stall zone for any given altitude as plotted on compressor map.
stall margin Difference, normally expressed as available spread of rpm, between gas-turbine operating line (at any altitude and for transient slam accelerations, etc) and stall line.
stall out To stall as result of attempting too steep a climb or for any other reason, esp. when chasing opponent, thus leaving manoeuvre incomplete or failing to get into firing position.
stall protection system Aeroplane flight-control subsystem sensitive to AOA (sometimes sensed at points on either side of centreline to cater for rapid-roll AOAs) which at given value triggers positive action to prevent stall; obvious example is stick-pusher, but stick-shaker is sometimes considered for inclusion.
stall quality Pilot’s subjective opinion of behaviour of aircraft (normally fixed-wing aerodyne) at stall, assessed for all types of stall (eg accelerated) and configurations (eg dirty).
stall recovery Urgent action to restore normal airflow over the wings. The objective is to reduce angle of attack as rapidly as possible, with minimum loss of height. Astonishingly, different methods of Standard Stall Recovery have been taught. Many authorities still insist on: Stick – Power – Pedal – Rudder if required. Today’s RAF teach: Power – Stick – forget rudder.
stall strip Transverse ridge or other projection added to skin of aeroplane, usually in spanwise direction along leading edge, to serve as stall-promoter, create warning buffet and ensure stall (1) occurs first at that point.

standard atmosphere

stall tolerance Generally non-quantified quality of gas-turbine fan and/or compressor to accept distorted airflow or other disturbance (eg gun gas, ingested jet gas, birds, hail or pressure pulses moving upstream) without stalling.
stall turn Flight manoeuvre in which aircraft (aeroplane or glider) is pulled up into very steep climb, usually with engine cut well back, until on point of stall full rudder is applied to cause rapid rotation in yaw, with wings rotating in near-vertical plane; ends in dive and pullout on to desired heading (generally on to reciprocal). In US hammerhead stall (also see wingover).
stall warning Anything giving pilot warning of impending stall, eg natural buffet, inbuilt ** system sensing AOA and giving visible or aural warning, or stick-shaker with or without knocker.
stall warning and identification system SWIS, system commanded by AOA vane (12) whose signals are analysed for AOA and rate; because of natural lag or hysteresis in system, trigger is fired progressively earlier as rate is increased by building in a phase advance giving protection at all rates.
stall zone Region beyond stall line of gas turbine at any altitude where attempted pressure ratio is too great for rpm and airflow.
stable Stabilized local oscillator.
Staloc Self-tracking automatic lock-on circuit.
stamo Stabilized master oscillator.
Stamp 1 Small tactical aerial mobility platform (USMC).
2 Single-tube auto multipoint.
3 Also written STAMP, Strike Air Management Programme [RN] (UK).
4 Stabilized miniature payload (UAV).
STAN Sum total and nose gear.
Stanag, STANAG Standard NATO, or Standardization, agreement. There are hundreds, e.g., *3838 repeats MIL-STD-1553B.
stand 1 Place for parking one aircraft, especially at airport terminal.
2 Fixed or mobile mounting for item undergoing inspection, test, maintenance or repair.
stand-alone Generalized term meaning equipment, eg radar, is not integrated directly into existing system of radars or other sensors, computers and com. network. Increasingly being used for fixed-based weapon systems and even vehicle-mounted (eg airborne) equipments. Thus * ASW helicopter operates autonomously, without needing sensors or other platforms.
standard acceleration due to gravity See gravity.
standard aerodrome “An aerodrome suitable for the operation of regular day and night services” [BS.1940].
standard atmosphere Model atmosphere defined in terms of pressure, density and temperature for all heights, assuming perfect gas, devoid of any form of water or suspended matter; approximates to real atmosphere and taken as reference for aircraft performance and all other quantitative measures. First NACA 1925 (see model atmosphere), later refined 12 times, current 1980 ICAO Doc 7488. Physical constants; $P_0$, 1013.2 Pa; $T_0$
Standard Beam Approach

288.15°C; M₀ 2.89644 × 10⁻⁴ kg/mole; ρ₀ 1.2250 kg/m³; R * 8.31432 J·mol⁻¹ K⁻¹; temperature gradient from -5.000 m (5 km below SL) to altitude (11,000 m) at which T is -56.5°C is -0.0065°C per standard geopotential metre; from 11 to 20 km temperature gradient is zero; from 20 to 32 km temperature gradient is +0.0010°C per standard geopotential metre.

Standard Beam Approach  Pioneer landing aid providing lateral guidance and series of marker beacons.

standard body  Two (occasionally three) specifications for birds used as inert (sometimes frozen) bodies fired into gas turbine in ingestion testing.

standard Class  Sailplane competition class limiting span to 15 m and prohibiting high-lift flaps and certain other features.

standard conditions  Standard temperature and pressure.

standard data message  NATO message format for digital communications between national or international units or facilities; an example of a Stanag result.

Standard Day  At ISA pressure and temperature.

standard day of supply  Total amount of supplies needed for average day as defined by NATO Standing Group rates.

standard design memo, SDM  International standardized proforma for hard-copy communication of information affecting hardware design, often as computer printout.

standard deviation  Quantification of dispersion of data points about mean value: square root of average of all squares of variances (amount by which each point differs from mean); symbol σ.

standard DME arrival  Arrival routes based on DME distances.

standard electronic module  See ATR or MCU.

standard empty weight  No longer definable; most precise equivalent is APS.

standard gravity  See gravity.

standard industry fare level  Hypothetical revenue rate per mile invented by CAB as guide to IRS in taxing GA aircraft on non-company business (US).

standard instrument departure  Preplanned, coded ATC IFR departure routing, preprinted for pilot use in textual form often (at major traffic points) supplemented by graphics; abb. Std.

standardization  Objective of achieving interoperability through use of either uniform or at least compatible hardware; significant that definition of word by DoD, NATO, SEATO, CENTO and IADB is in each case different, while definition ‘standardization agreement’ differs for NATO, SEATO and CENTO.

standard product  One conforming to specifications resulting from same technical requirements (NATO, CENTO, IADB).

standard load  One preplanned as to dimensions, weight and balance, and designated by a number or other classification (NATO).

standard mean chord  Gross wing area divided by span; position defined by co-ordinates of quarter-chord point and an inclination found by integrating (three methods). Also called geometric mean chord, symbol C. Numerically equal to chord of rectangular wing of same span and gross area.

standby, stand-by

standard NPL tunnel  Closed-jet, no return flow.

standard of build  Precise description of which of various options were followed in construction and equipment of aircraft, esp. of prototype or development aircraft where *** changes between one aircraft and next.

standard of preparation  Defines list of equipment installed.

standard operating platform  An agreed build-standard for newly constructed airfields, mainly in Western Germany (NATO 1951-54).

standard option  Choice of build standard, engine, avionics, finish colours, furnishing or other variables offered to all customers (eg improved stopping on Advanced 727).

standard parallel  Parallel on map or chart along which scale is as stated.

standard pitch  See propeller *.

standard pressure  1 Standard SL atmospheric pressure of 10,132.5 Pa.

standard propagation  Assumes smooth spherical Earth of uniform dielectric constant and conductivity under standard atmospheric refraction decreasing uniformly with height.

standard radio atmosphere  One having excess modified refractive index (also see standard refraction).

standard-rate turn  Usually heading changes 3°/s or 2 min for 360°.

standard refraction  Idealized ratio refraction decreasing uniformly with height at 39 × 10⁻⁶ units per km; included in groundwave calculations by enlarging Earth radius to 8.5 × 10⁶ m.

standard stall recovery  Stall recovery.

standard structure  Not normally used in aerospace; elsewhere often structure whose dimensions are everywhere mid-way between tolerance limits.

standard temperature  Value upon which a temperature scale is based, in physics normally 273.15°C (0°C), but for practical (eg gas-turbine rating) purposes normally that at zero height in standard atmosphere, 288.15°C.

standard terminal arrival route  Preplanned coded ATC IFR arrival routing, preprinted for pilot use in textual form often (at major traffic points) supplemented by graphics; abb. Star.

standard time, ST  Universally adopted time for all countries, based on zone time but modified to suit country’s longitude span and if necessary zoned such that difference between ST and GMT is always divisible exactly by 0.5 h.

standard turn  See standard-rate turn.

standard weight  Term formerly used in FAA certification as being certificated gross weight.

Also used to mean assumed mass of such loads as adult passenger, parachute, and unit volumes (eg litre or US gal) of fluids.

standby, stand-by  1 Generalized term for being available at short notice, in some cases (eg redundant flight-control channel) instantaneous and in others (interceptor on *) at minutes.

2 R/T code: “I must pause for a few seconds”: if followed by “out” means pause may be much longer but channel must be kept clear for resumption, the meaning becoming “other stations please do not transmit on this frequency”.

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**standby item**

1 Able to board flight if seat available.

**standby item** One duplicating another in function and used following failure of that normally operative.

**standby lane** In a flight-control system, this remains “switched on” throughout flight, ready to take over instantly should a command lane fail.

**standby mode** One of several basic operating modes for equipment, eg radar, normally characterized by receivers shut down but transmitters warmed and ready for immediate power, or DME powered up but not transmitting.

**standby pilot** Not defined, but often used to describe second pilot 2.

**standby redundancy** System design such that redundant duplicative channels do not normally operate (as in parallel) but are switched on following failure of those normally operative.

**stand-down** 1 Particular aircraft, though serviceable, remains for long period on ground, for whatever reason.

2. Base or unit is deactivated.

**stand fix** Most accurate of all fixes, obtained with aircraft parked on surveyed location.

**standing detachment** Semi-permanent deployment (RAF).

**Standing Group** The permanent body of NATO.

**standing patrol** Patrol.

**standing water** Defined as mean depth exceeding 12.7 mm (0.5 in).

**standing wave** 1 Oscillatory motion in vertical plane of air downwind of steep hill or mountain face in which troughs and peaks (latter usually marked by cloud at various levels) remain roughly stationary; at lowest level cloud often rotor, high levels usually lenticular. Strong ** often associated with jetstream.

2. Stationary wave or wave-pattern formed in vibrating body, eg turbine disc, by reflection.

**standing wire** That length of cable consumed in making splice.

**stand-off** 1. Distance from target surface to reference point on hollow-charge warhead (usually apex of cone).

2 To remain outside airfield circuit or pattern, normally following command or positive decision to do so, eg following landing-gear failure or obstruction on runway.

3. To have to park too far from terminal to use airbridges.

4. To remain outside effective range of enemy defences, esp. when making an attack with * missile.

**stand-off ability** Capability of forcing, eg by out-gunning, similar enemy vehicles to remain beyond their own firing range.

**stand-off armour** Armour fixed on outside of existing armour with sufficient spacing to protect against hollow-charge piercing weapons. Unlike spaced armour, normally only two layers in all.

**stand-off bomb** ASM (1) launched beyond enemy defence perimeter. Odd UK term of 1950s usually synonymous with cruise missile.

**stand-off flare** 1 IRCM payload dispensed at sufficient distance to protect against enemy heat-homing missiles.

2. Rarely, illuminating flare dropped on parachute beside rather than over surface target, usually in helicopter ASV attack.

**stand-off missile** One which may be launched at a distance (from target) sufficient to allow attacking personnel to evade defensive fire from target area (USAF).

**stand-off steps** Passenger/crew stairways kept at terminal equipped with loading bridges at gates to cater for overflow traffic that has to stand-off (3).

**stand up** To become operational at commissioning ceremony of new squadron or other unit (US).

**Stansit** Standards, or standardization, evaluation.

**Stare** Ablative plastic armour.

**Staunton number** Non-dimensional number defining heat transfer through surface; $St = \frac{q}{\rho V C_p} dT$ where $q$ is total quantity of heat, $\rho$ is density of fluid (eg air), $V$ is relative velocity, $C_p$ is specific heat at constant pressure and $dT$ is recovery temperature minus wall temperature.

**Staryl** Trade name (DSM) for aliphatic polyamide nylon-type fluoropolymers.

**STAP** 1 Statistics panel (ICAO).

2. Space/time adaptive processor, or processing.

**STAPL** Ship-tethered aerial platform (Kaman).

**STAR, Star** 1 Standard terminal arrival [some authorities prefer approach] route(s).

2 Ship tactical airborne RPV.

3. Surface-to-air recovery (or, USAF, retrieval[s]).

4 Satellite de télécommunications, d’applications et de recherche (F) [see Star (2)].

5. Space thermionic advanced reactor.

6. Strategic and tactical airborne reconnaissance (Thomson-CSF), or recovery.

7. Star tracking using ambient radio.

8. Supersonic tailess-aircraft research.


10. Subsonic-transport acoustic research.

11. Studies, tests and applied research (Eurocontrol).


15. Surveillance and threat-alert radar.


**Star** 7 Starboard.

2. Satellite for telecom, applications and research.

3. Star-shaped empty space along centre of solid rocket propellant grain.

4. Formation formed all on same level by wrist-linked team of free-fall parachutists.

5. Helicopter main-rotor control radial arms, located under hub; one fixed, one rotating.


7. Staran Association processor in ARTS-II (FAR).

**starboard** Naval-derived term for right, right-hand or towards right, seen from behind. Thus, from front, * is on left.

**STAR-C** STAR (5)-compact.

**star-centred** Cast or extruded with star (1).

**stardust** Air-impingement haze in acrylic finish.

**staring focal-plane array** Important class of sensors
STAR-M

which operate like human eye, with focal plane of input optics covered with dense micro-mosaic of 2-D receptors which 'look' continuously, direction of target being determined from knowledge of which detector(s) see it.

STAR-M STAR (5)-mid range (over 30 kW).

starplates Upper and lower spiders each formed from one piece of composite material or metal (titanium) forging and forming structural basis of modern non-articulated helicopter rotor hub. Not to be confused with star (3).

Stars 1 Silent tactical-attack/reconnaissance system.

2 Plural of STAR, Star (1).

3 Standard terminal and arrival reporting system (CAA).

4 Small transportable (or tethered) aerostat relocatable system.

5 Surveillance and, or stand-off, target-attack radar system (USAF).

6 Standard terminal automation-replacement system (FAA, on-going).

7 Software technology for adaptable reliable system.

8 Space-based telemetry and range safety.

START Strategic Arms Reduction Treaty; *1, 31 July 1991; *2, 3 January 1993; *3, not yet ratified 2003; *4, being discussed.

Start 1 Spacecraft technology and advanced re-entry test.

2 Solid-state angular rate transducer.

3 Shl tri-band advanced range-extension terminal.

4 Special threat-awareness receiver/transmitter.

5 Device for cranking any prime mover of rotary type during starting: 14 basic species.

6 Overboard discharge of exhaust from starter of cartridge, monofuel, fuel/air, bipropellant or air-bleed types; potentially dangerous.

7 Box containing gear train through which starter cranks engine; may be reduction or step-up gears.

8 Single electrical machine, usually DC, serving both as electrical starter and electrical generator (see CS/SOS).

9 Various forms of magneto designed to provide powerful spark during start, eg hand-cranked, impulse starter and LT boosting energy transfer.

Startex Start of exercise (UK).

Starting chamber 1 Combustion chamber in multi-chamber (multi-can) gas turbine in which igniter is fitted, flame thereafter being carried round by inter-chamber pipes.

2 Liquid-rocket precombustion chamber.

Starting coil Auxiliary induction coil used as HT booster when starting piston engine; alternatively used as energy-transfer LT booster.

Starting envelope A plot of flight conditions within which a [usually gas-turbine] engine can be started, usually pressure altitude against dynamic pressure or Mach number.

Starting pressure Minimum rocket combustion pressure at which nozzle exit plane is shock-free.

Starting transients Temporary variations in pressures, flows, velocities and temperatures during complete start sequence of rocket.

Starting vortex Transverse vortex left by lifting wing at start of motion providing essential link behind subsequent vortices from wingtips (part theoretical concept, since at start wing may not be lifting and ** has zero strength, but necessary because trailing tip vortices cannot have free ends).

Star tracker Optical or opto-electronic sensor which automatically points on to preselected celestial body or bodies to provide input to astro or astro-inertial nav system.

Starts Strategic arms reduction treaties.

Startup Launch of new OEM.

Start-up airline 'Commonly taken to mean first six months' operations.

Start-up costs Those incurred in launching new type of aircraft. Precise definition lacking; general opinion is that it covers all costs up to certification, excluding related engine and systems.

Star-21 Strategic aerospace review for 21st Century (EU).

Star washer Hard steel washer with multiple twisted radial projections which bite into superimposed nut and prevent it becoming loose.

Star-21 Space transportation architecture studies.

STAT 1 Statistical.

2 Statute (US).

State 1 Readiness condition of combat aircraft, from cockpit-alert to unserviceable (different national subdivisions).

2 In connection with runway, condition of surface or traffic occupancy.

3 For rotorcraft main rotor, usually three subdivisions: propeller *, vortex ring * and windmill-brake *.

4 Amount of main propulsion fuel remaining, esp. when running low.

State chicken Air-intercept code: fuel state requires recovery, tanker or diversion (DoD).

State lamb Air-intercept code: "I do not have enough fuel for intercept plus reserve required for carrier recovery".

State of occurrence State in which an incident, such as an accident, takes place.

State of the art Level to which technology and science have at any designated cut-off time been developed in any given industry or group of industries (USAF).

State tiger Air-intercept code: “I have fuel for completion of mission”.

Statfor, STATFOR Panel on Statistics and Forecasts (Eurocontrol).

Static 1 At rest, or at rest relative to solid surface or local atmosphere [ram pressure zero].

2 Structural test with application of single increasing load.

3 Radio and other com. interference, esp. that due to discharge of * electricity.

Static air temperature Static temperature.

Static balance 1 Aircraft condition in which there is no resulting moment about any axis.

2 Control-surface condition in which in absence of any applied torque surface is freely balanced about hingel axis, either because c.g. lies on that axis or because mass balance has been added.

3 Propeller condition in which when supported on rod on knife-edge it rests in any position.

Static bomb Tube-mounted instrument outputting TAS.

Static cable Longitudinal cable supported at each end.
static ceiling

Along interior of transport to which parachute strops of troops and airdropped loads are attached. Also called strop line, anchor cable.

static ceiling Altitude at which airship in ISA (in some definitions, without forward speed) neither gains nor loses altitude after all ballast has been dumped.

static characteristic Basic plot of thermionic valve, grid volts against anode current.

static clash detection Use of detailed 3-D computer simulation in the design process to confirm that an assembly can actually be assembled without conflict.

static coefficients Those obtained from a static body, e.g., in a wind tunnel.

static conversion Conversion of energy from one form to another without use of moving parts; common example is solid-state AC/DC converter.

static discharger Device for harmless distribution of static electricity, static wick.

static electricity Electric charge built up on non-conductive surface or insulated body by deposition of electrons or positive charges, e.g. by friction between air and aircraft or between fuel and hose, ultimately reaching very large potential difference.

static firing Firing test of rocket motor, engine or vehicle while attached to test stand.

static flux Magnetic field through magneto frame and inductor with latter stationary.

static friction Force required to initiate relative movement between surfaces in contact.

static gearing ratio Ratio of angular deflection of vehicle (esp. missile or RPV) control surface to rotation of vehicle axis which caused surface to deflect.

static ground line Connection of aircraft earthing (grounding) system to earth.

static head Pitot head measuring ambient static pressure.

static instability Unlikely design fault in which aircraft, once disturbed from straight/level flight, suffers increasing upset in absence of aerodynamic inputs, e.g. due to high c.g.

static inverter Non-rotating device for converting a.c. to d.c.: two forms, either transistor or gas turbine [eg thratron].

static lift Difference in mass between gas contained in aerostat at rest and air displaced by whole aerostat.

static line 1 Links parachute with static cable so that as parachute leaves aircraft it is opened automatically. Hence ** jump.

2 Line of parked aircraft on static display at airshow.

static load Applied force is unidirectional, either held constant or increasing in programmed way from zero to maximum.

static longitudinal stability Static stability (1).

static margin Basic measure of aeroplane static stability (primarily in pitch), normally defined as distance of c.g. ahead of neutral point expressed as %MAC. Measured stick-fixed or stick-free; former is %MAC proportional to stick displacement with percentage change of speed from trimmed value, called positive when direction backward for lower speed; stick-free is %MAC proportional to rate of change of applied stick force with percentage change of speed from trimmed speed, positive when pull needed by lower speed. Often written $L_{1\text{sp}}$ or $L_{1\text{sp}},$ in US often $h_{1\text{sp}} - h_{2\text{m}}$. 

static temperature $T_s,$ temperature measured by
stationary front

HPT exit.

Pratt & Whitney uses AM [ambient] followed by group (esp. of aircraft and ships).

usually adjective only.

vertical distances is WL, waterlevel).

In inches, elsewhere in mm). Corresponding term for part, bolt hole, equipment item, door frame and every structural along wing normal to transverse axis. Every structural respectively at wingtips.

difference from two modified static heads mounted transversely at wingtips.

while fixed in one place.

static 3-D radar Large surface radar with fixed aerial scanned electronically.

Thrust of jet engine restrained against forward motion, especially measured under ISA sea-level conditions.

static load

That transmitting pressure from static head.

Carefully designed opening in plate aligned with skin of aircraft which under most flight conditions senses true static pressure.

static wedges Shallow eminence surrounding static vent to ensure that the hole is not in the boundary layer.

Device for discharging static electricity from fine (very small radius) tips of thousands of conductive wires, braid or graphite particles built into flexible wick projecting behind trailing edge.

Instrument for measuring static thrust.

Dimension measured from * origin locating all planes along fuselage normal to longitudinal axis, or along wing normal to transverse axis. Every structural part, bolt hole, equipment item, door frame and every other dimensional reference is in form of * number (in US inches, elsewhere in mm). Corresponding term for vertical distances is WL, waterlevel.

2 Fixed base for military, naval, air or research operations.

Airport (esp. staff, facilities and costs); airline usage, usually adjective only.

4 Planned or actual position of geostationary satellite.

Position relative to other vehicles of one vehicle in group (esp. of aircraft and ships).

Location of radio transmitter.

In gas turbine engine. There is no standard system. Pratt & Whitney uses AM [ambient] followed by 1 [entry to fan] leading to [eg] 4 for HPT inlet and 4.5 for HPT exit.

Front without significant motion over Earth’s surface.

See geostationary.

Altitude reservation over a fixed area.

Shockwave at rest relative to solid surface.

Human interface with intercom and/or remote radio transmitter/receiver, comprising jack socket, tuning and other controls; in large aircraft links up to 12 audio (crew) inputs to intercom and com. systems.

Maximum number of aircraft that can be handled simultaneously by radio (esp. DME) station.

Airline costs attributed to staff and facilities at airports.

Ident feature keyed into ILS localizer trans-
STECA
J Supplemental Type Certificate (US).
4 Satellite test centre.
5 Short-term conflict (A adds alert).
6 Strike Command (RAF).
STA J Short-term collision-avoidance.
2 Short-term conflict-alert.
STCICS Strike Command integrated communications system (RAF).
STCM Stabilizer-trim control module.
STCRA System test and checkout report.
STD J System technology demonstration, or description.
2 Scheduled time of departure.
7 Standard, as in next.
STD bus Traditional US-developed 8-bit bus for computers and related EDP.
STDY Standby (alternative).
STDMA Space, or synchronized, time-division multiple access.
STDN Space- [flight] tracking and data network.
STDY Steady.
STE J Sun-tracking error.
2 Synthetic training equipment.
4 Scheduled time en-route.
4 Send, then encrypt.
STEDES, Steades Safety trend evaluation analysis and data-exchange system (IATA).
Steadi Air-intercept code: “I am on prescribed heading”, or “Straighten out on present heading”.
steady flow See time-invariant flow.
steady-state condition One that is time-invariant, as applied to signal or flutter amplitude, physical or chemical properties or any other variable.
stealth Technology for making tangible objects, initially aircraft, as invisible and undetectable as possible. It covers all EM wavelengths as well as sound, and is increasingly essential for survival in defended airspace. Also adjective.
steam bombing Visual manual attack on target of opportunity using free-fall bombs, especially by advanced automated aircraft (colloq.).
steam catapult Catapult.
steam cooling Cooling piston engine by allowing slightly pressurized water to boil in cooling jackets, to be condensed in dragless double-skin radiator. Also called evaporative cooling.
steam gauge Traditional dial instrument, especially one in a modern cockpit (colloq.).
streaming fog Forms when supersaturated freezing air with inversion moves over warm water; also called Arctic smoke or sea smoke.
steard Stand-off tactical electronic airborne reconnaissance system.
STE bus New international standard 8-bit computer bus originally developed for Eurocars which has rendered STD obsolete.
STEP Solar/thermal energy conversion.
STED Space Test and Evaluation Directorate (USAF).
steel drill chutes Reverse (colloq.).
steep approach 1 That adopted by helicopter pilot descending into obstructed, eg urban, hillyport, begun at 9 m/200 ft above selected landing spot and made straight-in at close to 50° from downwind.
2 For aeroplanes with limited STOL capability, on an individual airport basis; usually 5.5°. To achieve this certification it is usually necessary to demonstrate 7.5°.
steepest-descent method Basic method of optimization in which all contour lines (each representing a plotted variable) are crossed perpendicularly.
steep gliding turn Steep turn performed in glide, if continued resulting in tight spiral (more common in US).
steep turn Various definitions with bank angles: over 50°; 45°-70°; over 60°.
steerable nosewheel(s) Self-explanatory, a nose landing gear which can be steered from the cockpit, as distinct from castoring.
Stefan-Boltzmann constant That in Stefan-Boltzmann law, \( \sigma = 5.66961 \times 10^{-8} \) W/m²K⁴ [some authorities cite 5.67051 \times 10^{-8} \) W/m²K⁴].
Stefan-Boltzmann law Basic law of thermal radiation: total radiation from black body is proportional to 4th power of absolute temperature, \( E = \sigma T^4 \).
STEI Service Technique de l’Electronique et de l’Informatique (F).
stellar guidance See astronavigation.
stellarinericial guidance Inertial navigation intermittently updated and refined by astro.
Stellite Large family of hard alloys of Co (30-80%), Cr (10-40%), W (0.25-14%) and Mo (0.1-5%), and in one case with 30% Ni and 5% Fe. Some cannot be machined; common use is piston-engine valve heads and seats.
St Elmo’s fire See corona discharge.
Stem 1 Shaped-tube electrolytic machining, see *drilling.
2 System (or spaceflight) trainer and exercise module.
3 Space-to-Earth missile concept.
stem Strong quasi-vertical member at bow of marine aircraft.
stem drilling Use of titanium tool [cathode] feeding 20% HNO₃ into workpiece; can produce holes ≥0.5 mm, 0.02 in, diameter and length 120 mm, 4.7 in, see capillary.
Step, STEP 1 Software test and evaluation project, concerned with entire software life cycle.
2 Standard equipment package.
3 MFD key which pages through all available formats, usually at 1 Hz.
4 Standard for the exchange of product model data.
step 1 Segment of climb from one FL to next, each normally begun either on ATC clearance or upon arriving at suitable gross weight from burning fuel.
2 Sharp or angled discontinuity in planing bottom (float or hull) to improve planing characteristics and ease takeoff.
3 Stage (1), latter being preferable.
step-aside gearbox One in which input and output shafts are not co-axial. In particular, a gearbox inserted on the compressor casing of a large turboshaft to transmit the drive from the 90° radial shaft inside the core diagonally to the external gearbox on the fan case.
step climb Gaining altitude in a series of steps, each accurately flown to minimize fuel burn and comply with ATC. Abb. STEPCLB.
step cruise Protracted stepped climb covering most of flight.
step pad Secondary structure built externally on top of fuselage, esp. of helicopter, for ground crew or other persons.
stepped climb

stepped climb  Climbing in series of steps (1), separated by slow (drift-up) climb or level flight.

stepped formation  One in which successive aircraft or elements are at higher or lower level.

stepped solvents  Solvents in liquid (eg aircraft finish) which evaporate at very different rates.

step taxi  To taxi marine aircraft fast enough to ride on step (2).

step-up gear  One in which output shaft speed is higher than input, torque being reduced in same ratio; opposite of reduction gear.

steradian  SI unit of solid angle, abb. sr: that solid angle which, having as its vertex centre of sphere, cuts off area equal to that of square whose sides are equal to radius of sphere.

stereogram  Stereoscopic set of graphics or imagery arranged for viewing.

stereographic  See polar stereographic.

stereographic coverage  Air reconnaissance cover by overlapping imagery to provide 3-D picture; 53% overlap is minimum and 60% normal.

stereoscopic cover  NATO term for stereographic cover.

stereoscopic pair  Two images for stereographic (stereo-scopic) viewing of same scene.

sterile areas  Parts of airfield between aircraft manoeuvring areas.

sterilization-proof  Solid rocket propellants (fuels and, esp., binders) are often degraded by sterilization (4) heating, and * binders have had to be developed.

sterilize  1 To mark off portion of runway as unusable, for any reason.

2 To blank off portion of instrument panel, eg for equipment not yet available.

3 To prohibit unauthorized access, esp. to entire airside of civil airport for security reasons.

4 Normal meaning for spacecraft either departing for or arriving from other planet.

5 To deactivate device, eg mine, eg after preset period.

6 To render unusable or unavailable; eg F-111 MLG * underside of fuselage for weapon carriage.

stern attack  Air-intercept attack which terminates with structural sag of rear end of airship.

stern attack  Structural sag of rear end of airship.

sternheaviness  Tailheaviness of airship.

sternpost  Single vertical member marking rear termination of fuselage, hull or float (BS adds 'not to be confused with rudder post', but often same member).

sternpost angle  Acute angle between horizontal (usually same as longitudinal axis or underside of keel ahead of step) and line joining top of step on centreline and after-body terminator, bottom of sternpost or raeastp (heel) of flying-boat hull.

stern wave  Formed at low speeds as swell ahead of stern of taxing marine aircraft.

stero route  Named and established, in most respects synonymous with Airway.

Stevenson screen  Standard Meteorological Office slatted box for ground instruments.

Stevi  Sperry turbine-engine vibration indicator.

STEW, Stew  1 Surface-threat electronic warfare [S adds system].

2 Stewardess [confusing, now rare].

Stex  Space technology experiment satellite.

STF  1 Self-test facility.

stick shaker  2 Special trials flight.

StF  Stratiform cloud.

StFra  Stratus fractus.

STFRCO  Squadron terrain-following-radar checking officer (RAF).

STFrn  Stratiform.

STFV  Sensor total field of view.

STG  1 Strong.

2 See stg.

3 Special tactics Group (USAF).

StG  Stukageschwader, dive-bomber group (US wing) [G, WW2].

stg  Stage.

STGR  Search, track and guidance radar.

sthéne  Non-SI unit of force formerly standard in French legal system, that giving 1 tonne acceleration of 1 m/s²; sn = 1,000 N = 1 kN.

STH  See SSSAR.

ST'I  See SSST (2).

STI  Standard (or technical) special instruction.

stick  1 Control column (colloq.).

2 Any primary pilot input in pitch, in fig. agony sense, eg *-free static stability.

3 Succession of missiles (ordnance items would be better) fired or released separately at predetermined intervals from single aircraft (ASCC).

4 Number of parachutists who jump from one aperture of aircraft during one run over DZ.

5 A pilot, especially fighter or aerobatic (colloq.).

stick and string  Generalized term for construction of pre-WW1 aeroplanes (colloq.).

stick-canceller  Electronic box in FCS whose output is a stick movement, eg in ASW hover.

sticker  Usually on windscreen, displays selling price [GA aircraft, usually used].

stick-fixed  With elevator or tailplane trimmed to hold level flight and thereafter held in this position. For * neutral point, see neutral point.

stick-fixed static stability  See static margin.

stick force per g  Pilot's applied force in direct fore/aft movement divided by vertical acceleration resulting.

stick-free  With elevator or tailplane trimmed to hold level flight and thereafter left free (not applicable with irreversible flight controls).

stick-free manoeuvre point  The c.g. position that results in stick force per g being zero.

stick-free neutral point  The location of the aerodynamic centre or e.g. position with the elevator free to float without friction.

sticking  Tendency of planing bottom of marine aircraft to adhere to water on takeoff.

stick knocker  Stall-warning device added to stick shaker to give loud knocking aural warning.

stick movement per g  Linear fore/aft movement measured at top of stick divided by resulting vertical acceleration.

stick pusher  Positive stall-prevention system which when triggered (by sensed AOA or AOA factored by a rate-of-increase term) forces stick forward, commanding aircraft to rotate from climb to shallow dive.

stick shaker  Stall-warning system which when triggered by AOA passing preset value (occasionally factored to allow for high rate of increase) applies large oscillating
stick-shaker speed

force which shakes stick (2) (normally a large yoke) rapidly through small angle in fore/aft plane.

**stick-shaker speed** SSS or S-cubed, really a misnomer as system is triggered by AOA, not a particular speed.

**stick spacing** Linear distance on ground between ordnance items dropped in a stick (3).

**stick time** Logged pilot time, esp. as PIC.

**stick travel** Total range of travel of stick in either fore/aft or side-to-side direction, normally measured not as angle but as linear distance.

**stick travel per g** See *stick movement per g*.

**sticktion** See *static friction*.

**stiffener** Normally a strip or beam attached to sheet to resist load normal to surface. An integral * is formed in skin itself, usually as pressed channel parallel to relative wind.

**stiffening bead** Integral stiffener (see above).

**stiffness** Ability of system to resist a prescribed deviation. In structural member within elastic limit, ratio of steady applied force to resulting displacement or ratio of applied torque to resulting angular deflection. For many dynamic systems such as servo-actuators there is static * and dynamic *. Static * is stiffness characteristic exhibited in steady-state condition, normally trying to approach infinity (discounting compliance within actuator and deflection of surrounding structure) up to stall thrust. Dynamic * is an apparent value dependent on ability of power flow of servo valve to hold output against oscillating load, up to critical frequency (varying with magnitude of applied load) at which servo contribution becomes negligible to give a degraded *infinite-magnitude of applied load* at which servo contribution becomes negligible to give a degraded *infinite-magnitude of applied load* at which servo contribution becomes negligible to give a degraded *infinite-magnitude of applied load* at which servo contribution becomes negligible to give a degraded *infinite-magnitude of applied load* at which servo contribution becomes negligible to give a degraded *infinite-magnitude of applied load* at which servo contribution becomes negligible to give a degraded *infinite-magnitude of applied load* at which servo contribution becomes negligible to give a degraded *infinite-magnitude of applied load* at which servo contribution becomes negligible to give a degraded *infinite-magnitude of applied load* at which servo contribution becomes negligible to give a degraded *infinite-magnitude of applied load* at which servo contribution becomes negligible to give a degraded *infinite-magnitude of applied load* at which servo contribution becomes negligible to give a degraded *infinite-magnitude of applied load* at which servo contribution becomes negligible to give a degraded.

**stiffness criterion** Relationship between stiffness and other properties of structure which when satisfied ensures prevention of flutter or other type of instability or loss of control (BS).

**stiff nut** Nut provided with means for gripping male thread to provide sustained torque resisting rotation once tightened.

**stiff pavement** One able to accept any input aircraft bending moment; stiffness measure is tonnes vertical load to produce 1 cm deflection under point of application.

**stiff wing** Fixed-wing, ie not helicopter (collrog.).

**stib** Non-Si unit of luminance, sb = 10⁴ cd/m²; plural stilbs, sb.

**stide** Sensor technologies integrated laboratory environment.

**Stiletto** Becoming generalized term for anti-radar D/F and passive-ranging systems.

**stiletto criterion** Basic design case for passenger floors: intensity of * heel loading of 100 kg/cm², or over 100 times limit for distributed heavy cargo.

**stiletto weld** One whose cross-section resembles exclamation mark without stop.

**stillage** A specific meaning in aerospace is small wheeled dolly for ground movement of external store, eg bomb. Usual meaning is static warehouse storage.

**still-air range** Not a normal performance or flight manual figure; in general a vague estimate of distance under ideal still-air cruise conditions aircraft could fly without air refuelling, ignoring ATC constraints, reserves or any other factor. Unlike ferry range, usually assumes some (occasionally maximum) payload.

**stilling chamber** Large volume in which fluid flow eddies and gross turbulence are brought to rest; generally synonymous with settling chamber.

**ST-IN** Straight in.

**Stinfo** Scientific and technical information (data management).

**sting** 1 Long cantilever tube projecting upstream in tunnel to which model is attached with minimum interference from mount.

2 Long cantilever tube projecting directly ahead of nose of aircraft to carry instrumentation with minimum interference from mount or following aircraft; also called probe, instrumentation boom.

**sting hook** Normal form of arrester hook in form of single strong tube (term introduced WW2 to distinguish from A-frame).

**Stings** Stellar-inertial guidance system.

**sting switch** Activated by springy rod projecting below RPV (or other aircraft), triggered on landing.

**Stir** 1 Surveillance target-indicating radar.

2 Separate tracking and illuminating radar[s].

**Stirs** Strapdown inertial reference system.

**Stirling cycle** Heat-engine cycle in which heat is added at CV followed by isothermal expansion with heat addition, heat is then rejected at CV followed by isothermal compression with heat rejection; very efficient, esp. with regenerator, but mechanical problems (Philips use patented Rollsock to seal reciprocating parts). So far used in aerospace mainly for space power generation or cryogenic cooling.

**STIS** 1 Stabilized thermal-imaging sight [S adds system].

2 Space telescope imaging spectrograph.

**STIU** Satellite telephone [or telecoms] intermediate unit.

**STLCS** Simulation training life-cycle support.

**STK** Satellite toolkit, for software analysis.

**STLO** Science and technology (or scientific and technical) liaison office.

1 Simulation and Training Liaison Officer (RAF).

**STM** 1 Short-term memory.

2 Supersonic tactical missile.

3 Significant technical milestone(s).

4 Storm.

5 Serial transition module.

**STMP** Special Traffic Management Program (NAS).

**STN, Stn** Station.

**STNA** Service Technique de la Navigation Aérienne (F).

**STLCs** Simulation training life-cycle support.

**Stn No** Stanton number (or St).

**STNPA** Système technique de neutralisation des pirates de l’air (F).

**STNR** Stationary.

**STO** 1 Short take-off.

2 System test objective.

3 Station telecom officer.

4 Council (Soviet) for labour and defence (USSR).

5 Science and technology objective.

6 Signature technology office (USAF).

7 Space tasking order.

8 Survive to operate (RAF Regiment).

**STO/TO** Search/track operator.

**STOAL** Short takeoff and arrested landing.

**Stobal** Short takeoff but arrested landing.
Stobar

Stobar  Short takeoff but arrested recovery.

STOC  Special Tactical Operations Center (US NMCC).

STOCC  Space Telescope Operations Control Center.

stochastic  Implied presence of unknown or random variable; thus, * process is ordered set of observations, each a sample from a probability distribution.

stock  1 Raw material preformed to standard dimensions as sheet, strip, tube etc.

2 Material surplus to a part’s finished dimensions, to be removed during manufacture.

stockpile/target sequence, STS  Order of events in removing NW from storage and assembling, testing, transporting and delivering to target (DoD).

stocks  Shaped supports on which flying-boat hull is built, but in no sense tooling.

stock template, ST  One developed by trial and error, esp. for parts undergoing severe deformation.

Stoddard  Common naphtha-like hydrocarbon solvent.

STOGW  Short takeoff gross weight.

STOH  Total time since top overhaul.

stochastic  Provided in exact proportions required for complete chemical combination, esp. of fuel/air mixtures.

stoke  Non-SI unit of kinematic viscosity, 1 St = 10⁻⁴ m²/s.

Stokes law  Terminal velocity of sphere [density ρ, radius r] falling through fluid [density ρo, dynamic viscosity η] is \[ V = \frac{2gr}{\eta (\rho - \rho_o)}. \]

Stokes litter  Litter [UK = stretcher] designed for helicopter recovery of injured casualty.

Stol, STOL  Short [rarely, slow] take-off and landing.

Stoland  Digital system permitting fully automatic landings into STOL airfield (NASA).

Stolport  Airport, esp. urban (metropolitan), configured and designated for Stol operations (FAA).

Stol runway  Runway, normally 900 m (2,000 ft), specifically designated and marked for Stol operations (FAA).

Letgers STOL at threshold and a TDAP.

STOM  Ship-to-objective manoeuvre.

stone  Non-SI unit of weight, usually applied to humans, \( = 14 \text{ lb} = 6.3503 \text{ kg} \).

stonedefineable  Various mesh screens or deflectors; undefinable.

Stoner Mango  Patented technique of coating integral tanks with rubbery sealant.

stunk  To destroy a surface target [verb or noun], (colloq.).

stooge  See circuit.

stooge  To fly aimlessly in order to stay in particular area (eg awaiting orders, or in hope of encountering enemy).

stooping  Atmospheric refractive phenomenon in which image (mirage) of distant object is vertically foreshortened.

STOP  Structural/thermal/optical program.

stop(s)  Mechanical, limiters) to permissible travel of flying-control or other mechanism.

stop alt squawk  Turn off altitude-reporting switch and continue Mode C framing pulses.

stop-and-go  See circuit.

stop countersink  Fitted with collar to limit penetration.

stop drill  1 See stop hole.

2 Drill with collar to limit penetration.

stop gap  A quick, temporary solution.

stop hole  Hole drilled in end of fatigue crack to provide larger radius and halt further spread.

stop nut  Nut which stops in place without further action (such as winding or bending up tabs).

stopover  1 Stop by pax at intermediate airport authorized by ticket for prescribed period.

2 One-night stay away from base by slip crew (civil or military).

stopped-rotor aircraft  See stowed rotor aircraft.

stopping  Loosely, sealer for cracks, esp. in pressurized riveted joint.

stop squawk  Switch off transponder, or a particular mode.

stopway  Defined rectangular area on ground at end of runway in direction of takeoff (ie beyond upwind end, symmetrical about extended CL) prepared as a suitable area in which aircraft can be stopped in case of abandoned takeoff (ICAO).

2 Area beyond takeoff runway, no less wide and centred upon extended CL, able to support aircraft during aborted takeoff without causing structural damage to it and thus designated for use (FAA).

stop weld, stop-weld  Material, usually in form of paint, which has so high a melting point that it is not fused by any conventional welding process. Inserted as applied layer along line followed in seam-welding, results in treated area remaining unwelded.

storage  Generalized term for any kind of memory in EDP (1), display technology, EW and similar disciplines.

Not normally used in aircraft for fuel or other consumables, ordnance and ammunition or cargo/baggage.

storage CRT  Various families able to write information into a storage surface by adding/ subtracting from an initial potential; most configurations have symmetrical layout with write gun at one end and read gun at other.

storage oil  Intended as corrosion preventative, for engines [especially piston engines], usually mineral or other oil plus corrosion inhibitor.

storage system  In electronics and displays, basically comprising direct-view storage tubes and those in which storage is entirely separate; invariably concerned with vector inputs, converted into analog (beam-deflection) signals and varying luminance.

storage tube  See storage CRT.

store  Satellite tracking of RV convoys.

store  1 Basic element of EDP (1) storage; normally a bistable device accommodating one bit.

2 Generalized adjective for storage, hence * address, etc.

3 To place information in memory for future reading.

4 Generalized term for any mission-related payload carried by combat aircraft in form of discrete streamlined device either carried externally or released from internal bay; anything that occupies a pylon or ERU, whether intended for air-dropping or not.

stores  Domestic supplies and consumables for large aircraft on long flight.

stores inventory display  Cockpit readout, often illuminated on command, showing locations and identities of all stores (4) remaining on board.

stores pylon  Pylon for carrying, and if necessary releasing, a store or stores (4).

Storm  1 Sensor tactical-operations range module[s].

2 Standard stores management [S adds system].
storm cell

storm cell Central region of most intense turbulence, indicated in cockpit radar display by black hole or red colour.

Stormfest Stormscale operational research meteorological fronts experimental systems test (FAA 1992).

Storms Stores management system.

storm scope Weather radar.

storm-warning radar See airborne weather radar.

Stosi Scientific, or science, technological, or technology, and operational, or operating, support information.

storepipe Ramjet (colloq.).

Stovic Pilot of Stovl aircraft (colloq.).

Stovl, STOVl Short take-off, vertical landing; common operating mode of Harrier family and F-35B.

STOW Synthetic theatre of war.

Stow System for takeoff weight and c.g., also called IWBS, with display readout driven by sensors on all landing gears.

stowed-rotor aircraft Rotorcraft, normally helicopter in vertical mode, whose lifting rotor(s) can be stopped and retracted in wingborne cruising flight. Not yet achieved.

stow position Travelling or inoperative azyal attitude of large radar or other storable aerial, normally pointing to zenith.

STP 1 Standard temperature and pressure.

2 Space-test Program (DoD).

3 Space Technology Program (Darpa).

4 Systems Technology Program (DoD).

5 Short-term planning.

6 Status test panel.

7 Sensor track processor.

8 Standard training package.

9 System-test package procedure.

10 Solar terrestrial probe(s), or physics.

STPaë Service Technique des Programmes Aéronautiques (F).

STPD Standard temperature and pressure, dry.

STPE Service Technique des Poudres et Explosifs (F).

STR 1 Service trials report.

2 Sidetone ranging modulation; EW (spread-spectrum) acquisition assistance technique.

3 Sustained turn rate (usually means maximum).

4 Software trouble report.

5 Systems technology radar.

6 Standard test rack.

7 Same type rating.

8 Sonar transmitter/receiver.

9 Satellite transceiver.

10 Solar terrestrial receiver.

STRA Simultaneous turnaround actions.

straddle-mounted Mounted at front and rear [applies particularly to multi-stage compressor].

Stradographe Runway friction measurement with braked or toed-in wheels and EDP (1) for nine variables.

strafe To rake with fire, eg from automatic guns; spelt as shown (not straff) and rhyming with chafe. US usage is in favour of ‘straff’, rhyming with chaff, and ‘straffing’ is becoming predominant.

straight Applied to fuel, lubricant, etc. = without additives.

straighteners Vanes, cascades, or, in tunnel, transverse flat-plate honeycomb, to remove swirl or turbulence from flow.

straight-flow Gas turbine of normal, ie not reverse-flow, layout.

straight-in approach In IFR, an instrument approach wherein final approach is begun without a prior procedure turn. In VFR, entry of traffic pattern by interception of extended runway CL without executing any other portion of traffic pattern (FAA).

straight leading edge Having no taper; likewise for trailing edge.

straight-pass attack One using on-board weapon-aiming system to hit point surface target without search or visual acquisition, thus in straight run at highest speed at lo level.

straight roller bearing Not tapered, thus no axial load expected.

straight-run Hydrocarbon distillate, eg from original crude, representing all products separating out between specified upper/lower temperature limits; not normally used as aviation fuel.

straight spur gear Straight teeth parallel to shaft.

straight stall One performed with minimal yaw, using rudder if necessary to hold heading.

straight-through duct Inlet duct to trijet centre engine in which flow from inlet to nozzle is essentially straight, as distinct from S-duct.

straight wing Of traditional planform, specif. not swept.

strain Deformation under stress expressed as a percentage of an original dimension; length, area or volume.

strained silicon Perfect lattice which permit electrons either to move faster or to travel with less power.

strain energy Elastic energy recovered from body by removing stress.

strang gauge Device for transducing strain into electrical signal, usually by extremely accurate measurement of change of resistance of conductor.

strain hardening Increase in hardness and reduction in ductility caused by strain, esp. by cold-working (eg rolling); the only way to harden some wrought light alloys. Introduces a strain exponent (expressed as n) into stress/strain equations.

strain rate Strain per unit time, normally under uniform stress and often synonymous with creep.

strain viewer Instrument giving pictorial strain pattern using polarized light.

strake Long but shallow surface normal to skin and aligned with local airflow; extremely low-aspect-ratio fin.

strain energy For example, pressure on surface.

strain gauge Strain gauge thinned random-array [founded on].

2 Fin(s) mounted on upper part of underwing engine pod, normal to surface, to generate vortex passing over wing.

3 One row from stem to stern of single plates cladding marine aircraft.

stranded conductor Electric cable containing numerous conductive wires twisted together within single insulating sheath.

Stranger Air-intercept code: unidentified target. Normally ground/air message followed by bearing, distance, altitude, in that order.

strangle General term meaning please switch off a particular emitter (military usage).

Strangle Parrot Ground/air code: switch off IFF.

Strap, STRAP 1 Sonobuoy thinned random-array project. Acoustic process or in aircraft correlates signals from 15 to 20 buoys, four of which emit low-power signals to fix precise position of each buoy.

2 Straight-through repeater antenna program, or performance.
strap

strap Usual term for a doubler strip or plate added as a modification at a place subject to high stress and possible fatigue damage.

strapdown Generalized adjective for device mounted so that its attitude changes with that of aircraft or spacecraft; specif., one not gimbaled about three axes.

strapdown INS Simplied INS using strapdown platform.

strapdown platform Platform for INS on which sensing gyro and accelerometers are fastened without relative motion; usually there are three mutually perpendicular gyro/accelerometer units, and in some cases an element of redundancy from a fourth mounted at 45° to all three others.

strap-on boost Rocket boost motors attached around sides of vehicle, jettisoned after burnout (suggest = wrap-round).

strapping 1 Interconnection of resonant chambers of cavity magnetron or related oscillator give one stable preferred mode.

2 Calibration of storage tank so that measurement of contents depth can be related to actual volume.

3 Metal or other straps, wire or other ties around palletized, igloo or other loose cargo.

Strata Simulated training research advanced testbed for avionics.

Stratcom Strategic Command (USAF).

Strategic Concerned with broad politico-military objectives and enemy's warmaking potential.

Strategic aeronautical evacuation Airlift of patients out of theatre of operations to main support area.

Strategic air bridge Semi-permanent service by troop-carrier aircraft between home base[s] and distant area of operations.

Strategic airlift In support of all arms between area commands or between home state and overseas area.

Strategic air transport According to DoD, one in accord with strategic plan; according to NATO, movement between theatres by scheduled service, special flight, air logistic support or medevac.

Strategic air warfare Air operations designed to effect progressive destruction and disintegration of enemy's warmaking capacity (NATO; DoD is much longer definition which adds nothing).

Strategic attack Aerospace attack on selected vital targets of enemy nation to destroy warmaking capacity or will to fight.

Strategic bomber Delivery-system aeroplane for strategic attack.

Strategic Defense Initiative Plan by Reagan administration to enhance US ability to conduct warfare in space, eg by using direct-impact missiles or super-power lasers to incapacitate satellites.

Strategic lateral offset provision[s] Dispensation on filed flight plan allowing a pilot to displace laterally in order to get out of wake turbulence.

Strategic plan Plan for overall conduct of war.

Strategic Planning Team Focal point for development of future NAS (FAA).

Strategic psywar Actions designed to undermine enemy’s will to fight.

Strategic transport Aircraft for transport between theatres.

Strategic UAV UK term for UCAV.

Strategic warning Notification that enemy-initiated hostilities may be imminent. Hence ** lead-time, time elapsing between ** receipt and beginning of hostilities. May include two action periods, ** predecision time and ** postdecision time in which national commander takes a decision to respond positively to **.

stratified-charge engine Piston engine in which mixture strength is varied in controlled manner during induction stroke, with minimum turbulence, if possible to leave layered charge in cylinder with highest density near source of ignition. Now especially important in RC (1) engines.

stratiform cloud Sheets in stable thin layers.

stratocumulus, Sc Layer of connected cloudlets at low-cloud level often arranged in aligned rows.

stratopause Atmospheric layer at top of stratosphere where inversion ceases at 270.65°K [though such accuracy is pointless].

stratosphere Atmospheric region between tropopause and stratopause within which temperature remains essentially constant and then, at upper level, rises with altitude.

stratus Uniform layer of low (usually grey) cloud, well clear of surface.

straw man Pilot of well below average competence.

straw qualities Possessed by aircraft safe enough to be routinely flown by straw man.

stray 1 Naturally occurring EM signals, eg static.

2 Errant marker or TI put in wrong place.

STRC Strategic training route complex.

streak 1 Horizontal smear, usually white, following moving image on TV or other raster display.

2 Long flame in airbreathing engine normally denoting abnormal combustion at one point.

streak camera Family of cameras for ultrafast photography in which changing scene is viewed through slit perpendicular to main image variation and optics sweep image along fixed arc of film. Basic type has rotating mirror, normally projecting through array of biconvex lenses.

streaking 1 Unwanted manifestation of streak (1).

2 Unwanted manifestation of streak (2) in gas turbine, usually resulting in reduced life or damage to NGVs.

stream 1 To release parachute retarding horizontal motion, eg braking parachute.

2 To dispense chaff as solid, at random intervals or as bursts (DoD).

3 Jet stream (colloq.).

4 Shower of meteoroids with similar orbits and timing.

5 Closely-spaced procession of strategic night bombers (RAF 1943–45).

streamer Anything that follows or indicates streamlines, in particular windsock.

streamercing 1 Visible brush discharge.

2 Unreefed parachute canopy opens but fails to deploy fully; hence streamered.

stream function Basic parameter of 2-D non-divergent fluid flow with value (symbol Φ) constant along each streamline related to velocities along each axis by u = d Φ/dy, v = d Φ/dx.

stream landing Landings by group of aircraft in quick succession.

streamline Line marking path of particle of fluid in homogenous flow; esp. in streamline flow; line whose tangent is everywhere parallel to instantaneous velocity at that point.
streamlined

streamlined 3-D body shaped such that fluid drag is a minimum.

streamline flow Fluid flow that is laminar and time-invariant, and in which each streamline is devoid of a closed curve or sudden change in direction.

streamline position That in which a hinged or pivoted body, eg control surface or pylon on a variable-sweep wing, is aligned with relative wind.

streamline wire One whose section is streamlined, though seldom optimum (usually two intersecting circular areas).

streams Surface-traffic enhancement and automation support system.

stream surface 2-D sheet made up of streamlines.

stream take-off Take-off by group of aircraft in quick succession with departure in trail formation.

stream thrust Total of pressure force and time rate of momentum flow across any cross-section in fluid flow, \( F = PA + pAV^2 \).

stream tube In a laminar fluid flow, volume of flow enclosed by streamlines passing through upstream and downstream closed loops (not necessarily circular) placed normal to flow. At any point velocity is inversely proportional to cross-section area.

streamwise tip Wingtip of high-subsonic or transonic aeroplane in which leading edge is curbed progressively back parallel to local airflow to eliminate outward sweep of isobars; one form is \( \text{K"uchenn} \text{m} \text{an} \text{tip} \).

street Regular procession of straightline vortices shed from the leading edge or lower body, eg naturally oscillating cylinder or wire, each vortex following same path as its neighbor. Normally if \( D \) is body diameter, two half-streets are separated by 1.2-D and spacing between vortices in each half-street is 4.3 D. Also called K"arm"an * or von K"arm"an *.

streetcar STCR (colloq.).

strength 1 Physical * is ability to withstand stress without rupture; normally subdivided into compressive, shear and tensile, the latter usually being stress at the yield point.

2 In radio and related fields, signal amplitude in W or dB.

3 Dielectric * is maximum potential gradient in V/mm.

strength deployment inventory Assesses individual's strengths/weaknesses when dealing with others (RAF).

strength test See static test.

strength/weight ratio For material, ultimate tensile strength/density; for a structural member, breaking stress/weight.

stress 1 Condition within elastic material caused by applied load, temperature gradient or any other force-producing mechanism, measured as force divided by area. Unit * is force per unit area normal to direction of force. It is this force that resists externally applied loads. Common units are MNm \(^{-2} \) = 0.06475 UK tons/in \(^2 \); kNm \(^{-2} \) = 0.14504 lb/in \(^2 \); kg mm \(^{-2} \) = 0.63497 UK tons/in \(^2 \).

2 Generalized term for psychological, physiological or mental load on organism, esp. human, which reduces proficiency.

3 Measure of resistance of viscous fluid to shear between adjacent layers (see viscosity, Newton's laws).

stress analysis Determination of all loads borne by all elements of structure in all flight conditions, external reaction points of application and direction, and allowable and actual stresses in each member.

stress-bearing Required to resist applied load(s).

stress concentration Localized region of increased stress caused by sudden changes in section, poor design and manufacturing imperfections, eg tooling marks (see stress raiser).

stress concentration factor Peak actual local stress divided by stress for member calculated by any standard method without presence of stress raisers, such as sharp-cornered apertures or external surfaces. Neutral-hole * is unity.

stress corrosion 1 Metal cracking due to residual stress from manufacturing processes or concentrated stresses caused by flight loads and/or poor design.

2 Exfoliation corrosion.

stress cycle Complete cycle of variation of stress with time, repeated more or less identically (very numerous for piston-engine conrod, less for wing LCF).

stress distribution Variation of stress across cross-section of member.

stressed skin Form of semi-monocoque construction in which skin, nearly always metal, bears significant proportion of flight loads, and makes principal contribution to stiffness.

stress-free stock Selection of stock material for primary structure in which presence of residual internal stress results in rejection or return for further treatment; important in heavy plate for wing skins, etc.

stressing Stress analysis of structural members, usually while altering their design to attain optimized structure.

Stresskin Patented metal (esp. stainless) sandwich panels requiring no supporting structure over surface.

stress raiser Local abrupt change in section resulting in stress concentration; severity varies inversely with radius, so that a single scratch (eg from emery particle) can over a period initiate a fatigue crack that will eventually prove catastrophic.

stress ratio Maximum to minimum ratio in one stress cycle.

stress-relief annealing Heating to beyond critical temperature, and slow cooling to relieve internal stress, eg after cold working or welding.

stress/strain curve Plot of strain resulting from all stresses from zero to yield point and on to rupture. Normally linear over most of plot to yield point (limit of proportionality where elastic deformation gives way to plastic).

stress wave Sonic pulse propagated through various devices, eg magnetostriuctive-tablet display; also called strain wave.

stress wrinkle Visible wrinkling of skin caused by applied load, esp. in secondary structure, eg sagging of rear fuselage of B-52.

stretch 1 Increase in capacity of transport by adding plugs to fuselage, normally both in front of and behind wing. Noun and verb.

2 To apply tensile stress exceeding elastic limit.

stretchability Potential for stretch (1).

stretching 1 Process of introducing a stretch (1).

stretchout Agreement, initiated by contractor or customer, to reduce rate of production without altering quantity to be built.

stretch point Fuselage station at which plug is to be added.
**stretch press**

for stretch (1). Possibly allowed for in original design for stretch planned far in future.

**stretch press** Any of several families of press, mainly hydraulic (eg Hufford, Sheridan), in which sheet is pulled beyond elastic limit over a 3-D die or tool of correct profile; invariably both ends are pulled equally over die at centre.

**stretch-wrap forming** Use of stretch press of various types (eg Hufford) in which, as rams operate, their axes simultaneously rotate to wrap workpiece around tool.

**Streuwaffen** Cluster bomblets or scatter weapons (G).

**strew** To lay down sonobuoys in prescribed sonar pattern.

**stricam** Structure-integrated camouflage.

**stricken** Subjected to strike (5). Normally applied to military aircraft which are reduced to produce.

**Strike** Simulation, Training and Instrumentation Command (USA).

**Strike** Structurally integrated inlet control technology, uses air jets to keep engine airflow attached to duct wall.

**Strida** Système de Traitement et de Représentations des Informations de Défense Aérienne (air-defence system, now II F).

**strike** 1 An attack designed to inflict damage on, seize or destroy an objective (DoD, NATO).

2 As (1) is suggestive of target within reach of surface forces, better definition is a tactical close-support or interdiction attack on surface target, with conventional or nuclear weapons.

3 Significant impact(s) with foreign objects, esp. with bird(s) while on takeoff run or airborne.

4 Verb, from above.

5 Verb, to remove aircraft from active inventory.

6 From 5, an aircraft thus removed, esp. because of BER damage.

7 Verb, to fold wings of carrier-based aircraft and move down to hangar [also down].

8 From 5, aircraft thus removed, esp. by commander during process of carrying out strike to record falls of ordnance and give preliminary indication of likely results.

**strike camera** Camera, usually optical wavelengths but can include radar and/or IR, operated automatically or on command during process of carrying out strike to record falls of ordnance and give preliminary indication of likely results.

**strike-CAP** Fighter role in which strike task is predominant; offensive ordnance is jettisoned only under direct attack.

**strike control and reconnaissance** Mission flown for primary purpose of acquiring and reporting air-interdiction targets and controlling air strikes against such targets (USAF).

**strike down** To fold aircraft on deck and transfer to hangar(s) aboard carrier; term comes from traditional verb to secure items so that they cannot move relative to deck.

**strike force** Composed of units capable of conducting strikes (1), attack or assault operations (DoD); not necessarily aviation.

**strike photography** Imagery secured during air strike.

**stricker** Various meanings in connection with firing ammunition and ordnance devices by impact on percussion cap, in some cases synonymous with firing pin, and in others a hammer for hitting firing pin or intermediate between pin and percussion device. Hence * pin.

**striking voltage** Critical potential difference across gas-discharge tube and certain other devices at which discharge occurs and current flows.

**string** 1 Generalized term for assembly of devices in essentially linear sequence through which signal or object passes.

2 Literally piece of string or wool used as crude indication of relative wind, esp. of yaw (probably obsolete).

3 In modern usage, operating channel in electronic device, such as autopilot.

**stringer** Longitudinal member (ie in fuselage more or less aligned with longitudinal axis and in wing and tail surfaces more or less perpendicular to this axis) which gives airframe its shape and provides basis for skin. In fuselage they link frames and in aeroframes they link ribs. Most existing definitions are obsolete, describing * as light auxiliary or fill-in member; modern transport fuselage has no other longitudinals apart from possible underfloor keel on centreline. Integral skin removes need for * except in some structures where integral stiffeners are used plus * at 90° different orientation.

**strip** 1 To dismantle, also called teardown.

2 See strip stock.

3 See stripping.

4 Farm strip, loosely, any private airfield.

**strip and digit** Instrument based on roller-blind tape (usually with variable indices) plus alphanumeric window.

**strip antenna** One or more laminate dipoles flush with skin surface.

**strip examination** Dismantling an item prior to inspection.

**Stripline** Microwave transmission line formed from two close strip conductors face-to-face or single strip close to conductive surface; also called Microstrip and other registered names.

**strip map** Various forms (eg folded paper or film for projection) of topographical map in strip form, either covering entire flightplan track or sector(s) between WPs or other intermediate points.

**stripper** 1 Regular user of unlicensed airfield, such as a farmer’s own land.

2 Material, usually liquid, used for stripping.

**stripping** One meaning is controlled removal of paint, transfers (decals) and other layers from aircraft skin. Wet * employs various solvents, which can combine with the removed materials. Dry * uses high-velocity blast from air at 0.5-5 bars to direct non-aggressive abrasive such as various plastics, starches or sodium bicarbonate; often a magnetic screen is used to collect ferrous dust and paint particles.

**strip plot** Portion of map or overlay upon which is delineated coverage of air-reconnaissance imagery without indicating outlines of individual prints.

**strip stock** Standard forms of metallic raw material in long, narrow strips, often coated; suggest term confined to flat sections, only.

**strobe** 1 Originally abbr. of stroboscope, high-intensity flashing light source.

2 Continuous high-intensity light source rotating about vertical axis to point repeatedly to each azimuth.

3 See strobe marker.

4 See strobe unit.
strobe marker

To select particular portion of waveform timebase or other time subdivision in cyclic phenomenon.

Strobescope.

Strobe marker Small bright spot, short gap or other discontinuity on radar timebase or other portion of cyclically scanned display to indicate portion receiving special attention.

Strobe pulse See strobe marker.

Strobe timebase Small section of timebase containing target blip, Loran signal or other object of interest which is extracted by strobe marker and expanded to fill original timebase width. In some cases process can be repeated, giving expanded **.

Strobe unit In missile guidance system, generates strobing pulses which search and lock-on to target reflections and supply target range and relative velocity to guidance computer.

Strobokerr Camera for ultrafast photography in which incoming scene passes through Kerr cell, which divides it into pulses of light so brief that clear non-smudged images are projected on to film revolving at high speed inside drum.

Stroboscope Instrument for apparently bringing rotating or oscillating objects to rest by intermittent phased illumination, eg for inspection of deflection under high-speed operation or to determine rpm or Hz.

Strobe Linear distance moved by piston of engine from TDC to BDC or vice versa.

1 One complete translation of piston from TDC to BDC or vice versa, performing particular operation; thus inlet or induction *, compression *, power * and exhaust *.

2 Linear or angular distance travelled by electron or other beam forming timebase or any other electronic display.

* Linear or angular distance travelled by output of actuator.

5 One major ‘flash’ making up flash of lightning, normally repeated every 38-45 ms until discharge complete.

6 Basic element of *-generated writing.

Stroke Total repertoire of alphanumerics possible with particular stroke-generated writing system.

Stroked-generated writing Major branch of alphanumerics for electronic displays in which each character is assembled from one or more straight-line strokes. Simplest format is 7-segment, also called DHW (double-hung window), all segments of which are used in figure 8 (this is common in LED and LCD displays for minimum cost, eg watches); another common system is 14 or 16-bit starburst, and best result is yielded by multi-stroke systems using five lengths and up to 40 orientations.

Stroking Correct cycling of pump plungers over full stroke, eg in variable-displacement pump with swash drive from one end.

Strongback Structural member added over large surface to provide rigidity in bending and torsion, eg across large rotodomes.

Strongpoint See hardpoint.

Strontium Sr, soft, reactive, silvery metal, many uses as element and compounds, Sr-90 dangerously radioactive. Density 2.5, MP 769°C.

Strop 1 Flexible loop connecting deck accelerator (catapult) to aircraft not fitted with nose towbar.

2 Length of webbing connecting static line of airborne load to anchor cable (DoD).

Strut 1 Externally mounted structural member intended to bear compressive loads, and usually of streamline section.

2 Ambiguously, stub wing or pylon * attaching engine pod to fuselage or wing (loads mainly tensile and bending).

3 Loosely, any major bracing member or portion of truss even if load is tensile (suggest incorrect usage), thus a lift * on braced highwing monoplane is a misnomer [it is a tie].

4 A structural member extending across the gas path of a gas-turbine engine to transmit loads from a shaft bearing without diverting the flow [see vane].

Strutjet RBCC engine using multiple struts in air inlet.
strut skin

Load-bearing additional skin, eg bonded reinforcement.

STRV Space technology research vehicle.
STS 1 Space transportation system; usually means Shuttle.
2 Space Tourism Society.
3 Stockpile to target sequence.
4 Stable time subfield.
5 Status.
6 Support and test station.
7 SAR (2) transit stripmap (radar mode).
8 Sensor to shooter (usually S2S).
sts Stones (non-SI unit of weight).
STSA Short-term strategic aircraft (UK).
STSC Sequentially triggered shaped charge [=BWA].
STSTM Service Technique des Systèmes de Missiles Tactiques (F).
STSP Solar Terrestrial Science Program(me) (NASA/ESA).
STSS Space tracking and surveillance system [formerly SBIRS-Low].
STSSS STTS.
STST 1 Strategic transportable satellite terminal.
2 Sensor-to-shooter time.
STT 1 Solution-treatment temperature.
2 Single-target tracking.
STA Service Technique des Télécommunications de l’Air (F).
STTE 1 Special-to-type test equipment.
2 Alternative to STTEA.
STTEA Service Technique des Télécommunications et des Equipements de l’Aéronautique (F).
STTEM Final tactical technical economical requirement, follows PTTEM and leads to series production (Sweden).
STTS Service Technique des Systèmes Stratégiques et Spatiaux (F).
STTI Single-target track and identification.
STU 1 Service trials unit (UK).
2 Sensor transmitter unit.
3 Satellite terminal unit.
4 Secure terminal, or telephone, unit.
5 Service transport unit.
stub 1 Portion of transmission line up to ¼-wavelength long connected in shunt with dipole feeder to match impedances. In particular the link between a data bus and a terminal.
2 Short straight exhaust stack carrying gas from one piston-engine cylinder direct to atmosphere just clear of cowling or any downstream structure.
3 Short projection from aircraft, though sponson has its own term.
stub antenna/aerial Stub (1), usually for DME, IFF and beacon transponders.
stub exhaust See stub (2).
stub float See sponson.
stub plane Short length of wing projecting from fuselage or hull to which main wings and/or main landing gear are attached (BS). See stub wing.
stub power Net power available for propulsion.
stub runway Short section of runway projecting on far side of an intersection which may be specifically designated for STOL takeoffs which avoid all conflicts with CTOLS on ground and in air. Not normally used for landings.

stub shaft 1 Projects from driving or driven item just far enough for gearwheel and bearing.
2 Short shaft running in its own bearings with bevel drive to an accessory [demanding longitudinal location] driven by splines [permitting axial movement by driver].
3 Short shaft attached to the end of another [eg., to the face of a rotor disc] to enable it to run in a bearing.
stub thrust Net thrust available for propulsion.
stub wing Short aerofoil projecting approximately horizontally from fuselage serving either as a structural bracing member (eg linking lift struts and main gears) or as a beam supporting external stores racks or other loads.
stub-wing stabilizer See sponson.
stud 1 Headless bolt threaded at both ends but not in mid-portion used for attaching items to threaded hole in casting or forging.
2 Projecting pin used as fulcrum, pivot, locating dowel or for other purpose.
3 Projecting push-button human interface.

STTU 1 Student pilot Person authorized and licensed to receive flying instruction from rated flight instructor but who has not yet attained any licence.
STTS Study Formal investigation, with or without research or any kind of testing, of possible solutions to a stated future requirement; hence * phase, * program, * contract.
STV 1 Structural, or systems, or supersonic, or separation, test vehicle.
2 Satellite transfer vehicle.
STVA Self-tuning vibration analyser.
STVF System test and validation facility.
STVS Small-tower voice switch.
STW Special-to-weapon equipment, eg in WAS.
STWA Short(est) trailing-wire antenna.
STW&ARS Satellite threat warning and attack reporting system (USAF).
STWL Stopway lights.
S2AT See SSAT second definition.
S2S Sensor to shooter.
STX Start of text.
STY Standby.

Styrofoam Most widely used of the styrene-based foams, used as sandwich structure filler.

Suave

Suave

Spin-up of wheels on touchdown, hence K_su.
SUA Special-use airspace.
SUA Small, or strategic, unmanned [or unit] air vehicle; E adds experiment.
Suave 1 Small UAV engine.
SUAVS

2 Strategic UAV experiment (UK).

SUAVS Small unmanned aerial vehicle system (USA).

sub Smaller contractor, partner chosen in teaming down; can be thought of as short for subordinate or subcontractor.

subassembly Assembly (eg structural, electronic or for some other system) forming part of a larger item.

subcarrier Subsidiary modulated carrier which in turn modulates primary RF.

subchannel Intermittent fraction of telemetry channel conveying one repeatedly sensed measurement.

sub-cloud car Car suspended below above-cloud aerostat giving view of ground.

subcommutation Commutation of additional telemetry channels, output of which is fed to primary commutator, called synchronous if commutation frequency is multiple of that of primary (which it usually is).

subcontract Agreement other than prime contract to perform work on same programme. Normally between subcontractor and prime contractor for work assisting latter to complete task. Does not necessarily confer design authority or responsibility.

subcritical mass Mass of fissile material inadequate in magnitude or configuration to sustain chain reaction.

subcritical rotor Rotor, esp. main lifting rotor of helicopter, whose fundamental flapping, lag-plane or other resonant frequency is less than normal operating frequency, latter being frequency with which one blade passes given angular position.

subcritical wing Wing designed not to exceed $M_{cr}$ at any point.

subgrade Soil underlying airport pavement.

subgrade code ICAO coding for strength of subgrade: A, 150 MN m$^{-2}$; B, 80; C, 40; D, 20.

subgravity Condition in which apparent vertical acceleration is between zero and + 1 g.

subharmonic SHM or other sinusoidal waveform whose frequency is exact multiple of related fundamental waveform.

sub-idle Operating speed or control selection below idling, occasionally provided with main engines for ground operation.

SUBJ Subject [to . . .].

subjective Dependent upon personal opinion; in such fields as aircraft noise and visible smoke unquantified * measures play a major role, usually as the result of seeking views of statistically significant population.

sub-kiloton weapon NW whose yield is below 1 kT.

sublimation Direct transition, in either direction, between solid and vapour state.

sublimator Solid material designed to reject waste heat by sublimation to space environment, usually a porous plate and in some cases not a true * but medium for evaporating liquid heat-transfer medium.

submarine Vehic. to slide down out of seat harness in violent deceleration [impossible with 5-point harness].

submarine missile Missile launched by submarine, eg against distant city target.

submarine rocket Submarine-launched rocket (Subroc) weapon for use against other submarines.

submarine striking force Force of submarines having guided or ballistic missile capabilities and formed to launch offensive nuclear strike (DoD).

suck-out AF power amplifier preceding main RF modulator.

submunition Self-contained warhead carried in multiple (tens or hundreds) inside single delivery vehicle, eg air/ground store.

subprogram See subroutine.

Subroc Submarine-launched [guided, nuclear-warhead] rocket.

subroutine Set of instructions necessary to enable EDP (1) computer to carry out well defined mathematical or logical operation, forming part of complete program; unit of routine for specific sub-task, usually written in relative or symbolic coding even if full routine is not, and in closed * entered by jump path from main routine and reverting to main routine at completion (one sequence of instructions can be * and at same time a main routine with respect to its own *).

subsatellite Satellite of Moon.

subsatellite point Point on Earth’s surface directly below Earth satellite, ie on local vertical through satellite at any time.

subscale prototyping Not defined. The A380 conceivably might be assisted by a balsa chuck-glider.

subsonic Faster than speed of sound in surrounding medium. According to one lexicographer, Mach numbers less than 0.7.

subsonic flow Flow whose velocity is less than speed of sound within it; in contracting duct accelerates and rarefies slightly and in expanding duct decelerates and compresses slightly.

substitutional Formal demonstration of compliance, eg with design fatigue-life requirement.

substrate In various kinds of planar technology, structural layer upon which operative layers and/or devices are formed; in most microelectronics has low resistance, while in solid-state circuitry and solar cells * is normally an insulator.

substratosphere Imprecise, generally taken to mean upper layer of troposphere.

subsystem There is no clear demarcation between system and * though it is simple to give examples of dynamic organized groupings of devices that can be seen to be one or other. It could be argued, eg. that because it is part of a flight-control system a stability-augmentation system is a subsystem. Again, a BITE can be considered an integral part of a system or as a *.

suck-down Downwards pull on jet-lift aircraft when hovering in ground effect, usually caused by upward flow around fuselage from fountain.

suck-in Traditional verbal command in hand-starting piston engine, meaning ‘Do not energize ignition (cylinders are being filled with mixture)’.suck-out Deliberate or undesired characteristic of some vertically translating airbrakes, esp. on sailplanes, of being pulled open by local depression under certain flight conditions.
**Sucedde**

Sucedde Successful user-centered systems engineering development and environment (software tools).

**suction** Withdrawal of fluid through a region of local depression.

**suction-cup gun** Spraygun using ejector effect to withdraw medium.

**suction face** That side of propeller blade, normally facing forward, formed from upper surface of its aerofoil. See suction surface.

**suction flap** Not normal term; in some cases means blown flap.

**suction gauge** Instrument measuring pressure below atmospheric, usually by aneroid or bourdon tube.

**suction gyro** Gyro whose rotor is driven by atmospheric air jets trying to fill evacuated case.

**suction line** The pipe upstream of a fluid-system pump.

**suction stroke** Induction or inlet stroke.

**suction surface** The convex face of a gas-turbine rotor blade or propeller.

**suction wing** One whose boundary layer is continually sucked away by powered suction system.

**sudden ionospheric disturbance** Abnormal behaviour of ionosphere following passage of radiation travelling at speed of light from source of solar flare, affecting Earth’s sunlit face. Gradual return over following hour or more.

**sudden tail-up** Basic stressing case in which severe positive g is applied by violent nose-up elevator command (US term).

**sudden stoppage** Inflight stoppage of piston engine apparently within about one turn of propeller, or of turbine within about one second; indicative of severe internal damage.

**Sudco** Supervisory digital electronic control, less authority than Fadec.

**SUEN** Spin-up and ejection mechanism (Mars lander).

**suite** Aggregate of all equipments, not necessarily integrated or forming a common system, of similar general type carried in vehicle. Especially favoured in connection with ECM, for which as many as 14 separate electronic equipments may be carried (and in theory operated simultaneously) though most are linked only through common power supplies and possibly cockpit displays. For GA avionics * is supplanting ‘fit’.

**SUL** Yaw-damper servo-actuator.

**sulfate** Salt or ester of sulfuric acid.

**sulfated** Condition of lead/acid battery after prolonged discharge; lead sulfate plates cannot be restored by charging.

**sulfidation corrosion** Accelerated metallic corrosion due to sea salts in atmosphere.

**sulfur** S, former UK names brimstone and then sulphur, important in many kinds of compound in several forms, commonest being yellow crystalline, density 2.1, MPt 117°C.

**SUM** 1 Surface-to-underwater missile. 2 Structural-usage monitor. 3 System user module. 4 Scheduled unit maintenance (DARA).

**superblock** Major section (20%) of CVF, each assigned to

**sumerian cobalt** One of many cobalt-steel materials used for permanent magnets.

**summer solstice** Point on ecliptic, or time thereof, at which Sun reaches maximum N declination; about 21 June.

**summing gear** Differential gears which add or subtract motions of two members.

**summing unit** Device whose output is sum of inputs; can be mechanical, fluid flow (including pneumatic logic) or electronic.

**sump** Low region of fluid (liquid) system where liquid tends to collect by gravity. In piston engine bottom of crankcase, which in wet-engine also serves as oil tank. In fuel tank lowest point with tank in normal attitude, where water collects and may be drained.

**sump jar** Container in vent line from battery box in which alkaline chemicals neutralize battery-charging gas.

**Sums** 1 Shallow undersea missile system. 2 Structural-usage monitoring system.

**SUMT** Sequential unconstrained minimization technique.

**Sun** Apparent diameter (optical) 13.92 × 106 m, mean density 1.41 g/cm³, mass c 1.99 × 10³² kg, surface gravity 274 ms⁻² (26.9g), rotational period c 25.4 days at Equator (33 at 75°N/S lat), radiating surface temperature 5,800K, chromosphere up to c 10⁸K, emits various corpuscular and EM radiation at total energy c 3.39 × 10²⁶ Js⁻¹; moving with solar system through interstellar medium in local arm of galaxy at c 20 km s⁻¹. See solar wind.

**Sun compass** Compass based on az/el of Sun, formerly used near magnetic poles where magnetic compass unreliable.

**Sundstrand drive** Infinitely variable hydraulic CSD.

**sun gear** Central gearwheel in planetary reduction gear.

**sunk costs** Costs incurred in development which are paid off in another programme.

**sunlight-readable** Readable in illumination (illuminance) of 10 lx; basic requirement of military cockpit warning panels and displays.

**SunRez** Proprietary resin activated [set hard] by UV light.

**sun synchronous** See heliosynchronous.

**SUO** 1 Small unit operations.

2 Aileron/elevator/rudder servoactuator.

**SUP** 1 Smart upgrade procurement. 2 Supplement to publication.

**Supaéro** Ecole National Supérieure de l’Aérospatiale et de l’Espace [Toulouse F-31055] (F).

Suparco Space and Upper-Atmosphere Research Commission (Pakistan).

**superadiabatic lapse rate** Greater than DALR, such that potential temperature decreases with height.

**superaerodynamics** Aerodynamics involving such high relative velocities and such low densities that body has passed before air molecules can collide with others and exchange energy, also called free-molecule flow and Newtonian aerodynamics, and akin to MHD flow.

**superalloy** Any alloy designed for extremely severe conditions, esp. at very high temperatures.

**superaugmentation** Either of two methods of achieving gains in flight performance by imparting artificially stable flight characteristics to aeroplanes that are inherently unstable.
superboom
different yard because of lack of national capability to construct large ship (UK).
superboom Boom from SST or other aircraft which, because of reflection and/or refraction in atmosphere, is heard up to 250 km from flight path.
supercharged core engine Turbofan in which fan is regarded as ‘supercharger’ for core; no need for this concept.
supercharged harness Pressurized harness to reduce igni-
tion arcing.
supercharged turboprop Powerful turboprop derated and matched with lower-capacity gearbox and propeller, thus giving same power at all airfield heights and temperatures; essentially synonymous with flat-rated.
supercharger Compressor driven by crankshaft step-up gears or by exhaust turbine which increases density of air or mixture supplied to cylinders of piston engine, either to boost power or, more often, to assist in maintaining power at high altitudes. Virtually all are single-stage centrifugal, in some cases with choice of gear ratios and formerly (WW2) with two consecutive stages and intercooler. Term also (suggest formerly) used for cabin blower.
supercirculation Increase of wing lift by increasing circulation by positive power-consuming means; secondary gains include postponement of stall, reduction of drag (both by improving flow and by enabling wing and other aerofoils to be smaller) and as means towards realizing laminar flow. Commonest form is blown flap, with more ambitious schemes discharging supersonic bleed air along upper part of leading edge or other places; used facing to rear to accelerate boundary layer and as by-product to impart thrust.
supercompression Piston engine with such a high compression ratio that it must not be operated at full throttle below a given height (today unusual).
supercritical looty, any flow involving regions where $M > 1$.
supercritical shaft A [normally high-speed] drive shaft whose ratio of length to diameter is so great that it would quickly fail from whirl; i.e. the whirl margin would be negative.
supercritical wing Aerofoil designed to cruise at above $M_{	ext{crit}}$, characterized by bluff leading edge, flattish top, bulged underside and downcurved trailing edge; by reducing peak suction maximum acceleration and shock formation are delayed and wing can be deeper, have less sweep, house more fuel and weigh less than conventional wing for same cruise $M$.
supercruise Sustained flight at supersonic speed with engine[s] in dry thrust, without afterburner.
supercruiser Aircraft designed to cruise at supersonic speed, usually Mach 1.5 to 2.
superheat $T$ Temperature difference between aerostat gas or hot air and surrounding atmosphere; called positive if gas is warmer than atmosphere.
supersonic dash capability
2 Heat energy added to gas or vapour after evaporation has been completed.
superheated vapour Vapour heated above its boiling point for given pressure.
superheterodyne Radio receiver in which received signal is mixed (heterodyned) with local oscillatory frequency to give intermediate frequency which is then amplified with various advantages.
superhigh frequency See frequency, radio.
superior planets Those further out than Earth, ie Mars to Pluto.
superluminal Velocity greater than that of light, by expansion/contraction of spacetime.
supermanoeuvrability Ability to perform controlled supermanoeuvres.
supermanoeuvrable fighter The accepted definition is ability to fly under sustained positive control at AOA of 70°, and of flying for brief periods at 100°–120° without departure.
supermanoeuvre I A sustained manoeuvre which increases AOA beyond the 1-g stall.
supermanoeuvre II A sustained manoeuvre which increases AOA beyond the actual accelerated stall.
supercritical $T$ Dynamic manoeuvre in which angular momentum in the pitching plane momentarily increases AOA to a peak beyond stall.
superplasticity Property of flowing like hot glass at elevated temperatures under modest applied pressures with no tendency to necking or fracture; possessed by many alloys, eg Prestal at 250°–260°C.
superposition $T$ Principle in stress analysis that aggregate of all strains caused by a load system may be considered to be the sum of all individual strains experienced by each member taken in isolation.
supersonic dash capability
2 Heat energy added to gas or vapour after evaporation has been completed.
supercritical $T$ Temperature difference between aerostat gas or hot air and surrounding atmosphere; called positive if gas is warmer than atmosphere.
supercritical $T$ Ability of subatomic particle [many] to exist in more than one place, or one state, at same time.
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supercritical $T$ Faster than speed of sound in surrounding medium. One lexicographer says Mach 1.2+ , 1.19 being deemed transonic.
supercritical $T$ Radar scans entire HUD field of view.
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supersonic diffuser

defences. Now it is seen as a possibility for Sonic Cruise type aircraft to exceed Mach 1 in recovering from upsets.

supersonic diffuser  Contracting duct (see supersonic flow).

supersonic flow  Flow which relative to immersed body or surrounding walls is supersonic. In contracting duct decelerates and compresses; in expanding duct accelerates and rarefies.

supersonic inlet  Air inlet designed for supersonic flow both past and through it for at least part of flight; ideally has centrebody or side wedge to create attached oblique shock and various forms of variable geometry and auxiliary doors.

supersonic jet 1 Propulsive jet from rocket, ramjet or afterburner whose velocity relative to source is supersonic.

2 Supersonic aeroplane (coloq.).

supersonic nozzle  Propulsive or wind-tunnel nozzle through which relative flow velocity is supersonic. Ideally of con/di form with variable profile and area.

supersonic propeller  Propeller whose blades are designed to operate with supersonic relative velocity over major portion of surface. Noise problem appears insoluble.

supersonic tunnel  Wind tunnel capable of supersonic speed in working section (either brief or sustained).

supersonic turbine  Turbine of any kind designed to operate with flow velocity relative to rotor blades supersonic (rare).

supercell  Progressive stall attainable by certain aeroplanes, eg T-tail with rear-mounted engines, in which (partly because at low speeds drag increases faster than lift when pilot pulls nose up) decay of speed and increasing AOA leads to stable condition in which aeroplane descends in approximately constant attitude (not far removed from level flight) but with decaying speed and AOA increasing continuously so that after long period it approaches 90°. Root cause is combination of nose-up pitching moment plus immersion of horizontal tail in wing wake, destroying effectiveness. If not recoverable, called locked-in stall.

supercritical propagation  Propagation with superrefraction.

superstructure 1 Secondary structure built above main fuselage or other part of aircraft (rare; eg not used for AWACS radar aerial).

2 Secondary fairing structure to streamline box-like truss.

supervised operator experience  Total of 25 hours flown with a type-rated pilot, required before a pilot can have SOE restriction removed from logbook and fly VLJ solo [intended FAA.JAA, 2005–].

SUPP  Supplemental.

supplemental carrier  US air carrier operating under supplemental certificate, normally authorizing services of various kinds other than scheduled.

Supplemental Type Certificate, STC  Authorizes alteration to aircraft, engine or other item operating under approved type certificate (US).

supplementary aerodrome  One designated for use by aircraft unable to reach its regular or alternate aerodrome (BS, suggest arch.).

supply balloon  Flexible container for storing gas at low pressure ready for aerostats; normally too heavy to fly even if free. Hence supply main, supply tube, links * with arostat needing supply of gas.

supply chain  The complete network of subcontractors to a major company or programme, especially arranged hierarchically.

support 1 All services and material needed or provided to assist operator after delivery (see * items).

2 Action taken to assist friendly unit in battle.

3 Part of force or unit held back at start of action as reserve.

4 Underpinning of new programme by R&D effort to ensure answers are available to technical problems.

supporting aircraft  All active aircraft other than unit aircraft (DoD).

supporting surfaces  Those aerofoil surfaces whose chief function is to provide lift for aerodyne; can be fixed or rotating.

support items  For support (1) typically publications, training, simulator and instructional rigs, auxiliary ground equipment, spare parts, testing, warranty provisions and field modification kits.

support zone  Designated surface area for airlanding or other operations in direct support of battle (no longer used DoD, NATO).

suppressant  Active ingredient for suppressing an action, normally fire, esp. one automatically released by sensitive pressure sensors in fuel tanks or similar regions; passive suppressing methods, eg reticulated foam, are not *.

suppressor 1  Jet-engine nozzle either configured for minimum noise or shielded by additional surrounding duct.

2 Emitter, especially engine(s), designed or installed to minimize emissions; for civil aircraft noise predominates, for military aircraft IR radiation.

suppressor  Intended to suppress hostile defensive fire by offensive action, eg direct attack with weapons and offensive ECM; hence * attack, * support, * weapons (eg ARMs).

suppressor pulse  Sent out to disable L-band [original meaning, 0.39-1.55 GHz] avionics during transmitting period of other equipment on similar wavelength, to prevent interference or damage.

SUPPS  Regional supplementary procedures.

Supra  Support for the use of presently unserved airspace (Euret).

supra-aural  Fitting over the ear.

Supral  Superplastic aluminium alloy marketed for SPFDB applications (British Alcan).

suprathermal ion detector  One of ALSEP experiments left on Moon; measures energetic ions impacting surface to determine solar-wind energies.

SUPT  Specialized undergraduate pilot training.

SURE, Sure  Sensor update and refurbishment effort (USN).

surf  Verb, see surfing.

surface 1 Aerofoil, esp. large, eg wing (not small rotating, eg compressor blade).

2 Exterior of aircraft, eg * friction drag.

3 2-D layer corresponding to particular pressure altitude.
surface acoustic wave

* 2-D layer in any plane corresponding to particular electronic radiation pattern or time difference.

5 Hinged or extendable area for flight control, lift augmentation or drag augmentation.

6 Generalized term for Earth's *, hence * target = one on land or water.

surface acoustic wave Travelling across polished piezoelectric substrate at controllable microwave frequencies.

surface actuator Device which physically moves a surface, eg control surface; need not embody any form of control function.

surface boundary layer Atmosphere in contact with Earth's surface, extending up to base of Ekman layer (anemometer level).

surface burning Combustion of fuel for propulsion on outside of aeroplane, proposed for variable-geometry aircraft for Mach numbers of about 5, using variable body profile for ramjet effect.

surface cooler See surface radiator.

surface corrosion Galvanic (non-mechanical) attack on surface, eg by salt spray, often under paint film.

surface discharge Most common type of gas-turbine igniter, in which semiconductor [usually SiC] permits leak from tungsten electrode to body, ionizing path for main high-energy flashover.

surface effect Effects on air-supported vehicle of close horizontal surface beneath (synonymous with helicopter ground effect), hence ** vehicle = air-cushion vehicle, ** ship (US usage in latter cases).

surface-friction drag Drag due to all forces tangential to surface, notably shearing of boundary layer; added to form drag makes profile drag; added to pressure drag makes total drag.

surface gauge Gauge (US, gage) in form of precision scribe for transfer of exact height measures, eg in marking out or in checking finished workpieces.

surface inversion Atmospheric inversion with base at Earth's surface.

surface loading Mean normal force per unit area carried by a particular aerofoil under specified aerodynamic conditions (BS); in case of wing term is wing loading; suggest few cases where ** needed.

surface management system Looks into near future to manage departures and avoid congestion or other problems.

surface movement One vehicle (eg aircraft, or even bicycle), in motion on airfield movement area. Hence ** indicator, usually a PPI radar.

surface of discontinuity Sloping demarcation between warm and cold air masses.

surface operations In the US civil community, any movement on airport/airfield surface.

surface plate Steel table with extremely flat and smooth surface.

surface power unit Surface actuator embodying control functions, eg control valves, feedback inputs, summing units and possibly redundancy provisions.

surface radiator Mounted to form integral part of external surface of vehicle, with no change in profile.

surface sampler Device for scooping up specimen of planetary or other surface for analysis or other study (eg to investigate for presence of life).

surface tape Pinked-edge strips of fabric doped over all seams, rib-stitching and edges of fabric covering. Also called finishing tape.

surface target One on land or sea.

surface tension Tendency of a liquid/gas surface to minimize its area [because all the attractive liquid molecules are on one side of the surface], symbol γ.

surface-to-air missile Missile launched from surface (6) against target above surface (DoD). Hence ** envelope, that airspace within kill capabilities of particular SAM system; ** installation, a ** site with system installed; ** site, prepared plot of ground designated for but not occupied by SAM system.

surface-to-surface missile Surface (6)-launched missile designed to operate against target on surface (6), including those underground.

surface visibility At eye level.

surface wave 1 Radio wave travelling round surface (6); most effective propagation mode of LW/LF.

2 Acoustic wave in surface-wave device.

surface-wave device New family of electronic devices based on surface acoustic waves sent across piezoelectric slab or other substrate; originally (1970s) used for delay lines and now for complex signal processing.

surface wind Generalized term for wind measured at surface (6); in US gradually switching from 20 ft (6.5 m) anemometer level to ICAO 10 m (32.8 ft) level.

surface zero See ground zero.

surfacing Improving low-drag quality of vehicle surface (in general task called stopping and *), eg by perfecting flatness and smoothness.

surfactant Surface active agent, material (usually liquid or particulate) which alters surface tension and/or performs other tasks at boundaries between dissimilar materials, eg detergent.

surfing Riding with enhanced L/D ratio on the field of increased pressure created by a hypersonic vehicle's own shockwaves.

surge 1 Gross breakdown of airflow through compressor, normally of axial type, resulting from local stall and usually characterized by muffled bang and sudden increase in turbine temperature; hence * line, * point. Often used synonymously with stall.

2 Various abnormally large currents, signal amplitudes or voltages in electrics or radio, eg on first switching on or caused by lightning or static discharge.

3 Planned large increase in flying rate of military unit, eg to explore ultimate potential of personnel and hardware over short or longer term under crisis conditions.

4 Unplanned transient increase in flow of fuel in aerial refuelling, sometimes causing a disconnect.

5 General change in atmospheric pressure at surface apparently superimposed on predicted diurnal or cyclonic change.

6 Foilraft linear motion (simulator).

surge box Term used for various kinds of device in aircraft fuel system to reduce pressure/flow excursions caused by fuel momentum either in tanks (sloshing) or in pipelines, esp. during high-rate refuelling.

surge diverter Protective semiconductor device having negative resistance/temperature coefficient to earth voltage surges.

surge line Boundary between gas-turbine operating region and region where surge of compressor is certain. In
surge point

A plot of pressure ratio against mass flow, the locus of all surge points. Generally same as stall line, stability line.
surge point Any combination of airflow and pressure ratio for gas turbine at which surge occurs.
surging 1 Occurrence of surge (1).
2 Fault in wind tunnel characterized by erratic or low-frequency pulsations in velocity, flow and pressure.
3 See sloshing.
surpic Surface picture.
surrogate factory One engaged in assembly of kit-built aircraft.
surrogate tanker An aircraft acting the part of an air-refuelling tanker; hence surrogate receiver.
Surface Surveillance towed-array sonar system.
surveillance Systematic observation of aerospace, surface or subsurface objects by any kind(s) of sensor.
surveillance approach Instrument approach conducted in accordance with directions issued by ground controller referring to a surveillance radar display (DoD).
surveillance radar 1 Primary radar scanning in azimuth, often through 360°, supplying P-type display (PPI). Not normally giving elevation or height of aerial targets.
2 Specif., primary radar whose purpose is to determine az/el position, track and (with SSR) identity of all aerial targets, and to provide radar separation, navigational assistance, storm warning and vectoring for final approach (but not normally to handle complete radar approach).
surveillance radar element, SRE Portion of GCA system which vectors incoming traffic until established on ILS and handover to PAR.
surveillance system Any means of surveillance not contained wholly in one vehicle or site, eg RPV, electronic communications and guidance, digital sensor data-link, and control/receive ground station.
survey 1 To examine damaged vehicle, eg crashed aircraft, often on behalf of insurers or underwriters, to establish damage, possibility of salvage (eg to fly out from crash site) and best course of action.
2 Normal meaning in photogrammetry and mapping.
3 Examination by surveyor (see below).
surveyor Technically qualified and designated official empowered to collaborate with aerospace design staff on behalf of national certification authority and examine subsequent hardware and design software to establish compliance with airworthiness requirements; usually concerned with particular design aspect, eg fluid systems, or with particular class of aircraft.
Survivac Survivability/vulnerability information analysis center.
survivability Capability of a system to withstand a man-made hostile environment without suffering an abortive impairment of its ability to perform its designated mission (USAF). Refers specific to various effects of NW attack, eg degradation of volatile memory.
survivability planner and associated re-router Automatically responds to battlefield threats to friendly aircraft.
survival capsule Detachable crew compartment, normally of military aircraft, capable of separation in emergency and soft landing on land or water, thereafter serving as shelter.
survival kit Man-portable package containing items to help sustain life remote from other human beings.
survival radio Self-contained, portable, shockproof, floating radio emitting homing (and possibly voice) signals on 121.5 and 243 MHz.
Survsat Survivable sat-com system.
SUS 1 Saybolt universal second(s).
2 Signal, underwater sound.
susceptance Reciprocal of reactance, defined as ratio of current quadrature component to voltage for same frequency, B = 1/Ω, unit siemens.
susceptibility Degree to which any hardware is open to an attack as a result of inherent weakness (DoD).
suspended underwing unit Dispenser.
suspension 1 Linkage between aerostat and load, hence * band (fabric band linking envelope to * lines), * bar connecting suspension lines to basket ropes in balloon, * line, main connections between envelope and basket or suspended car, and * winch connecting kite balloon to surface (6).
2 System of particles dispersed through fluid, including atmosphere.
suspension strap Webbing or wire rope connecting helicopter and cargo sling.
sustained flight Time-invariant flight, ie steady lift and airspeed.
sustained readiness program Keeping fleet operational by replacing structural parts damaged by fatigue or corrosion.
sustainer Propulsion, either rocket or airbreathing, that provides power for sustained flight following short high-thrust acceleration period under power of boost motor(s). Not normally applied to any stage of large or small multi-stage vehicle; must be long-duration propulsion system handling entire mission after separation or burnout of booster (in ramrockets and many related systems may in fact use booster case for combustion).
SUT 1 Autothrottle servo.
2 Tailplane [stabilizer] trim servo.
3 Surface and underwater target.
4 System under test.
Sutherland law Gives temperature variation for viscosity of air.
Sutton harness Traditional (WW1) personal seat harness with two lapstraps, two shoulder straps and central pinned clip passing through all four.
SUU 1 Suspended underwing unit (US).
2 Secondary user unit.
SUVOS Semiconductor UV optical source(s).
SUW Surface warfare.
SV 1 Satellite, or space, vehicle.
2 State vector.
3 Static vent.
4 Simulation validation.
5 Shop visit.
6 Synthetic vision [S adds system].
7 Singular value.
8 Solenoid [-driven] valve.
9 Servo valve.
Sr. Abb. for sievert.
SVA Security violation alert.
SVAS Shuttleworth Veteran Aeroplane Society (UK).
SVC 1 Service, service message.
2 Switched virtual circuit.
SVCTRL Serviceable (ICAO).
svce, SVCCE Service.
SVCS Secure-voice communications system.
SVD 1 System verification diagram (software).
SVF

2 Space Vehicles Directorate (USAF).
1 Singular-value decomposition.

SVF Schweizerische Vereinigung für Flugwissenschaften (Switzerland).

SVFR Special VFR.

SVGA Superior video-graphics array, 800×600 pixels.

SVI Smoke volatility index.

SVIS Synthetic vision information system[s].

SVLR Schweizerische Vereinigung für Luft-und Raumfahrt (Switzerland).

SVM Support vector machine.

SVMS Space-vehicle motor simulator.

SVN Satellite vehicle number.

SVO Servo.

SVP 1 Static-vent plate.
2 Senior vice-president.

SVR 1 Slant visual range; attempt to give pilot on final approach idea of when he will acquire approach lighting, reported as either nominal contact height at which 150 m (500 ft) segment of one crossbar will become visible, or at top of shallow fog layer as minimum visible length of lighting.
2 Shop-visit rate.
3 Service of external intelligence (R).

SVRL Several.

SVRR Service readiness review.

SVS 1 Synthetic-vision system.
2 Secure voice switch; E adds equipment.

SVTG Silicon vibrating-structure gyro.

SVT Servo throttle.

SVU Satellite voice unit.

SVUOM State institute for protection of materials (Czech Rep.).

SVVT VTOL (R).

SVWT Schweizerische Vereinigung für Weltraumtechnik (Switzerland).

SW 2 Single wheel (MLG).
1 Short-wave.
3 Surface wave.
4 Strategic Wing (USAF).
5 Space Wing (USAF).
6 Secretary of War (US).
7 Skin waviness.
8 Single-wedge (aerofoil).
9 Snow shower.
10 Software.
11 Switch [also often SW].

SOW 1 Software.
2 Surface wind.

Sw Common for wing area.

Swarm Smart weapon, anti-armour.

Swafrap Swedish air force rapid-reaction force.

swaging Joining by cold-squeezing one member around another, eg electrical or control-cable terminal or end-fitting on to end of cable [US, swaging].

SWALAS Shallow-water ASW localization and attack system.

swallowed shock Position of shockwave across airbreathing engine or other inlet inside duct, when mass flow is p/V but internal pressure is low (normally equated with zero throat). Can be feature of plain pitot inlet or any other type. Resumption of correct engine operation restores shock to normal position at inlet.

swallowing capacity Ability of inlet to handle large airflow, esp. over wide range of air densities and Mach numbers.

swan-neck Section of gas-turbine engine joining tandem axial compressors in which diameter is reduced.

SWAP 1 Severe-weather avoidance plan, or program (US).
2 System-worthiness analysis program (FAA 1966).
3 Society of World Aircargo Professionals [office, Darien, CT] (US).

Swaps Standing-wave acoustic parametric source.

SwarF Pronounced swarf, Senior Warfighter Forum [all combat commands, Pentagon Joint Staff; June 2004–] (US).

Swarm 1 Stabilized weapon and reconnaissance mount.
2 Small warfighter array of reconfigurable modules. See next.

swarming Warfighting concept in which dozens to hundreds of small networked warfighting units stealthily coalesce to attack a target and then disperse, ready for the next ‘pulse’.

swashplate Disc rigidly or pivotally mounted on shaft as drive mechanism for plungers or rams arranged parallel to shaft; when disc is normal to shaft, plunger stroke is zero, increasing to maximum at maximum * obliquity. In hydraulic motor * is driven, not driving, member.

swashplate plane The rotor control plane in a helicopter.

SWAT Special weapons and tactics team (US police forces).

Swat, SWaT 1 Slotted-waveguide technology.
2 Stovl weight-attack team.

swathe The preferred spelling is the former, universal in the US. Among aerospace meanings are:
1 Area treated in each pass over field by AG-aircraft, usually without deliberate overlap.
2 Area covered in one pass over target by SAR, camera or similar sensor, invariably with overlap.

sway Lateral movement without rotation (simulator).

sway braces, swaybraces 1 See crutches.
2 Additional struts, not normally part of aircraft, required to brace particular large or winged store.

sway clear space left around any shock-mounted item.

SWC 1 Special Weapons Center (Kirtland AFB, NM; USAF).
2 Sky wave correction (Loran).
3 Solar wind composition.
4 Space Warfare Center; in March 2006 renamed SDC.
5 Strategic Warfare Center.
6 Spot-wind chart.

SWCL Short-wavelength chemical laser.

SWD Surface-wave device.

SWE 1 Stress wave emission.
2 Software engineering.

sweat cooling See transpiration cooling.

sweating, sweated joint Joining two tinned members without additional solder or brazing metal.

sweep 1 Sweepback or sweepforward.
2 Total angular movement of aerial, eg surveillance radar, oscillating in azimuth (sector scan).
3 Total movement, normally expressed in linear
sweepback

measure, of time-base spot scanning across CRT or other display.

° One complete cycle of VG wing.

° Angular deviation of locus of centroids of propeller blade sections from radial line tangential thereto at propeller axis projected on plane of rotation (BS).

° Offensive tactical mission against surface targets, normally targets of opportunity (WW2).

° To range over continuous (usually large) band of frequencies.

° To employ technical means to uncover covert surveillance devices (DoD).

sweepback Visibly obvious backwards inclination of aerofoil from root to tip so that leading edge meets relative wind obliquely. This is usually done to increase critical Mach number.

sweepback angle Angle between normal to longitudinal OX axis (axis of symmetry in most aircraft) and reference line on aerofoil, normally 0.25 (one-quarter) chord line or, less often, leading edge; both normal line and reference line lie in same plane, which is usually that containing centroids of aerofoil sections from root to tip (thus for canted verticals, ** measured in plane of each surface).

sweepforward Visibly obvious forwards inclination of aerofoil from root to tip so that leading edge meets relative wind obliquely; hence * angle, or forward-sweep angle.

sweeping Modifying wing or tail to incorporate sweep (1).

sweeping check Confirming that cockpit flight controls [inceptors] move freely over full range of travel.

sweep jamming To emit narrow band of jamming able to sweep (7) back and forth over wide operating band of frequencies.

sweep oscillator Signal generator whose frequency is varied periodically by fixed amount at constant amplitude above and below central fixed frequency; also called Wobbulator (UK), sweep generator (US) or scanning generator.

sweep-tip blade Helicopter rotor (main or tail) blade whose locus of centroids is radial from root to near tip and then sharply inclines back.

sweep spot Condition in which aircraft can maintain precise altitude, heading and speed without pilot input or autopilot.

sweep Incorporating sweepback (never used of forward sweep).

sweepve Sandia winged energetic re-entry vehicle experiment.

SW/F/R Slow write, fast read.

SWG 1 Standard wire gauge (UK); standard range of sheet thicknesses.

² Square waffle grid (space structures).

Swift 1 Standoff all-weather radar for inflight terrain surveillance.

² Specification of working position in future ATC.

Swift 64 Pioneer mobile connectivity service enabling mobile phones to be used by airline passengers [2006-].

SWIM, Swim 1 System-wide integrity management (USAF).

² System-wide information management (ATC1).

Swims Shallow-water influence minesweeping system.

swim 1 Involuntary and often uncontrollable divergent excursion from desired track of tailwheel-type aeroplane running on ground.

² To turn propeller by hand to start piston engine; if not engaged in starting engine, or with turboprop, term is to hand-turn or pull-through.

° To calibrate compass deviation by recording its value at regular intervals, usually 15°, during 360° rotation of aircraft on compass base.

° Distortion of radio range; also called night effect.

° Sudden yaw of aeroplane consequent upon loss of power of engine mounted away from centreline.

swing-by Close pass of planet or other celestial body by spacecraft on Grand Tour.

swing force Aircraft or complete combat unit can fly air/air and air/ground in same mission.

swinging base Compass base; also called deviation clock.

swinging compass Magnetic compass used as standard for calibrating that in aircraft.

swing-piston engine Various topological families of piston engine in which two, three or more pistons oscillate around toroidal cylinder alternately compressing mixture between them, being driven by firing strokes or, in some, acting as pumps. Most do not have mechanical drive but supply gas, eg to drive turbine.

swing-role Often interpreted differently from swing force in that aircraft and crews can fly offensive missions or (on different occasions) defensive missions.

swing-wing aircraft Aeroplane with variable sweep (1); also called VG aircraft (colloq.).

Swinter Study of women in non-traditional environments and roles, which included military pilot training (Canada).

SWIP 1 Super weight-improvement program (US).

² Systems weapon improvement program.

Swipe Simulated weapon-impact predicting equipment.

SWIR Short-wave IR.

swirl 1 Gross rotation of flow about axis approximately aligned with flow direction, eg in propeller slipstream, upstream or downstream of turbine, downstream of gas turbine fuel nozzle, or induced by large drive fan in low-speed tunnel (removed by straighteners).

² Rotation of air in whirling-arm room or other non-evacuated chamber containing high-speed rotating object.

swirl vanes Fixed aerofols for imparting swirl to a fluid flow. At inwards-radial entry to a centrifugal compressor they are usually miniature wings parallel to axis of rotation. In turbine-disc cooling air and upstream of fuel burners they are radial.

SWIS 1 Stall-warning and identification system.

² Satellite weather information system.

swistail See fishtail.

SWIT Software integration and test.

switch A specialized aerospace meaning is the rejection of the target by a missile seeker, which instead locks on to a decoy; this may be followed by response.

switchblade An oblique flying wing aircraft [colloq.].

switchery Complete array of switches and other inceptors for on-board systems other than flight controls (colloq.).

switches off Traditional verbal command in hand-starting piston engine to ensure that ignition is inoperative at start (actually switches normally closed, short-circuiting HT).

switches on Seldom used; normal call is “contact”.

switch-in deflector For jet lift, shuts off normal jet nozzle and diverts flow through rotatable side cascade (1957-70).

switching system Automatic switching in large network, eg military communications, airline reservations or nationwide computer link; normally electro-mechanical pre-1960
**switchology**

and electronic later, allowing for on-line, real-time messages, data transfer, storage or display.

**switchology** Flueny in human interaction with operating systems (colloq.).

**swivel** Pivoted attachment for windsock.

**swivelling engine** Entire engine, or liquid-rocket thrust chamber, that is gimbal-mounted or pivoted so that thrust axes can rotate relative to vehicle.

**Swiz** SWIS (colloq.).

**SwL** 1 Strategic-weapon launcher.

**2** Single-wheel loading.

**SWLAN** Secure wireless local area network.

**SWMC** Shallow-water mine countermeasures.

**SWO** Station Warrant Officer (RAF).

**Sword** 1 Stand-off all-weather observation and reconnaissance drone.

**2** System for all-weather observation by radar on drone.

**J** Short-range missile defence with optimised radar distribution (US).

**SWOS** Synoptic weather observing (or observation) station.

**SWP** Stub-wing pod.

**SWPA** South-West Pacific Area (painted on many captured Japanese aircraft 1944-45).

**SWPC** Small War Plants Corporation (US, 1942-50).

**SWPT** Confusingly wing leading-edge sweep angle.

**2** System for all-weather observation by radar on drone.

**2** Surface-wave radar.

**SWS** 1 Standard warning system (CAA).

**2** Strategic Weapons School.

**SWSL** Supplemental Weather Service location.

**SWTDL** Surface-wave tapped delay line.

**SWTL** Surface-wave transmission line.

**SWTRR** Software test readiness review.

**SWU** Switching unit.

**SWY** Stopway.

**SX** Sheet explosive.

**Sx** Simplex.

**SXGA** Super extra graphics array, 1,280×1,024 pixels.

**SXT, Sxt** Sextant.

**SXTF** Satellite X-ray test facility.

**SYC** Statistical yield control.

**SYCAF** Système de Couplage Automatique sur Faisceau (ILS coupler, F).

**Syecp** Syndicat des Industries de Composants Electroniques Passifs (F).

**Syco** Symbiotic communications (USAF/DARPA).

**Syers, SYERS** Senior Year electro-optical relay [or reconnaissance] system [P7 adds preplanned product-improvement program].

**Sygong** System go/no-go.

**sylphon** Stack of aneroid capsules; sometimes called *tube.

**symbology** Symbols conveying meanings to human beings, the technology of their design and production and their incorporation in systems and displays; most important are alphanumericics, in various national languages, followed by more than 9,000 standard conventional symbols so far available for various technologies. About 50 different forms and variations have been agreed for HUDs, Hudsights and other weapon-aiming systems, eg simple cross or cross/ting reticles, range rings that unwind as range closes, and various aiming lines, wing bars and arrow or triangular markers.

**sync pulse/signal**

**symmetric aerofoil** Wing profile whose mean line is straight.

**symmetric double-wedge** Wing profile in form of sharp-edged parallelogram, used mainly for supersonic missiles whose subsonic qualities are unimportant.

**symmetric flight** Both left/right wings equally loaded.

**symmetric flutter** Left/right symmetry in amplitude and direction.

**symmetric immersion** Both flying-boat tip floats in water equally (rare).

**symmetric instrumentation** Installation of experimental sensing equipment (such as pressure transducers) over the entire surface of aircraft such that for each sensing head on left half there is an exactly corresponding unit on right.

**symmetric principal axis** See principal axis of symmetry.

**symmetric pull-out** Pull-out from dive with wings level.

**symmetric stall** Stall with wings level, longitudinal axis rotating within plane of symmetry.

**symmetry check** Measurements to corresponding L/R points from centrelines.

**Syname** Syndicat National de la Mesure Electrique et Electronique (F).

**synchro** Generalized term for bipolar a.c. synchronous systems in which a master unit or sensor commands identical response (eg angular position) by one or more instruments or other receivers. An alternative to voltage signalling by potentiometer and digital signalling by encoder.

**synchronization** 1 Commanding all aircraft engines to rotate at same speed.

**2** Commanding automatic guns to fire at cyclic rate forming exact fraction of multiple of blade-passing frequency of propeller; not same as interrupter.

**J** Process of adjusting timing (epoch), frequency and phase of spread-spectrum receiver's PN correlation to match those of received signal.

**4** Process of preadjusting outputs of two or more control (eg FCS) channels to reduce dead-zone if operated together or switchover transient if operated separately.

**synchronized aerodynamics** Performed by two [possibly more] sections of same aerobatic team; see synchro pair.

**synchronous corridor** Equatorial belt within which synchronous satellite must remain (normally describing small vertical figure-eights).

**synchronous orbit** See geostationary orbit.

**synchronous satellite** One whose rotation is synchronized with that of Earth; also called geostationary.

**synchronous sighting** See tachymetric aiming.

**synchro pair** Two aircraft which perform synchronized manoeuvres to entertain crowd while rest of team reposi-

**synchrophasing** Commanding all propellers of multi-engine aircraft to rotate in step with propeller of master engine, with all blades instantaneously at same angular positions.

**synchropter** Helicopter lifted by two or more rotors whose blades intermesh (suggest colloq.).

**synchroscope** Instrument for giving visual indication of synchronization, or lack of it, between two or more frequencies or speeds.

**syncom** Synchronous communications (satellite).

**sync pulse/signal** Sync is generalized term for synchronization between TV camera and receiver, or between any raster-scan sensor and display or output, hence * is integral
**Syncrude**

part of transmitted waveform to maintain lock on synchro-

**Syncrude** Synthetic crude petroleum; starting point for various synthesized petroleum-type hydrocarbons.

**synergistic curve** Trajectory for departing spacecraft for minimum energy requirement, i.e., lowest propellant consumption for given position and velocity; on Earth initially vertical to leave denser atmosphere quickly and then curving to take advantage of Earth’s rotation.

**Synergism** Favourable interrelationship between variables such that overall benefit of a change is greater than sum of individual gains; e.g., scaling down aircraft size has synergistic effects on structure weight, drag, engine size, fuel consumption and fuel mass for given range.

**Synop** Non-petroleum-based fuel produced to current (or broadened) Jet A specification.

**synodic period** Interval of time between identical positions of celestial body in solar system measured with respect to Sun.

**synodic satellite** Hypothetical Earth satellite located on Earth/Moon axis at 0.84 lunar distance from Earth.

**SYNOP** Special meteorological report.

**synoptic chart** Standardized map of weather, showing isobars, fronts and weather symbols, and covering large area for one particular time.

**synoptic meteorology** Collection of meteorological information covering large area at one time (as near as possible to present), e.g., with view to forecasting.

**syntactic foam** Composite material consisting predominantly of premanufactured hollow microspheres embedded in resin; for radomes usually 30-140 μ spheres with 1.5 μ wall, in epoxy or polyimide matrix.

**synthetic aperture radar** Various methods of summing the returns from many locations, e.g., at TAS 600 kt, spacing 1 kHz gives returns from 1 ft apart, so a block of 50 gives definition equal to 504-ft antenna.

**synthetic lubricants** Post-1948 families of turbine oils originally based on esters of sebacic acid, especially dioctyl sebacate; later with complex thickeners added.

**synthetic resins** Too numerous to outline, but mainly polymers or copolymers and often thermosetting; used as bases for many materials (e.g., plastics and paints) and as adhesives, including nearly all those for aerospace bonding and for fibre-reinforced composites.

**synthetic rubber** Vast family of rubber-like materials originally (1917) based on isoprene and today nearly all based on copolymers of butadiene; includes many solid propellant.

**synthetic training** All training that simulates, e.g., with simple Link, mimic boards, system rigs, air-combat simulators and, esp., flight simulators. Also generally held to include actual flight training when something, e.g., absence of external vision, is simulated.

**SySOP** Security operating procedure[s].

**Syreca** Système de restitution de combat aérien (F).

**syrup** Generic term for accumulation of spilled beverages, water [and condensate], toilet and lavatory fluids and dust.

**sys** System, or system identifier.

**SySPO** Systems Command Program Office[r] (USAF).

**system** Generalized term for any dynamically functioning organization of man-made devices.

1. Portion of vehicle, e.g., aircraft, missile, etc., forming integral network of related and inter-controlled devices to accomplish set of specific, related functions.

2. Composite of equipment, skills and techniques capable of performing and/or supporting operational role (USAF).

3. Often used to mean (1) plus supporting equipment, documents, training devices and all other products and services, as in weapon system.

4. Incorrectly used to mean mere assemblage of mechanical parts, e.g., engine LP.

**system concept** Integrated approach to design, procurement or operation of system in sense [4].

**System Design Review** The PSD leads to Requirements Analysis which the SDR supports in parallel by providing a top-level review of all relevant hardware to ensure that Preliminary Software and Hardware design can proceed with confidence.

**system discharge indicator, SDI** Yellow disc or blow-out plug in aircraft skin to indicate fire-extinguishing system discharged for reason other than fire or overheat warning.

**Système International** In full, SI d’Unités, system of unified units of measurement adopted by all principal industrialized countries since 1960 and gradually being implemented; seven base units, metre (m), kilogram (kg), second (s), ampere (A), kelvin (K), candela (cd) and mole (mol).

**System Requirements Review** A top-level multidisciplinary review to check the requirements against the original concept objective. It makes possible the Preliminary System Design.

**system engineering** Not briefly definable, but extremely broad discipline akin to operations research whose main objective is to apply broad overview of entire system [4] in order to advise customer and/or management on objectives and possibilities and refine and integrate all subsystems before start of hardware design.

**System Safety Analysis** The final stage in perfecting a system prior to certification. The SSA studies the results from the Functional Hazard Analysis and the answers proposed by the Preliminary SSA, and in a rigorous manner confirms that the proposed system does meet certification requirements.

**system source selection** Selection by government of industrial source, known as system prime.

**system turnover** Formal acceptance by customer of responsibility for system [4].

**Systo** Systems Command program officer (USAF).

**Systrid** Powerful 3-D CAD technique (Battelle).

**syzygy** Point on orbit, esp., that of Moon, at which body is in conjunction or opposition.

**SZH** Schweizerische Zentrale für Handelsförderung (Switzerland).
\( T \) Temperature, esp. absolute.
1 Time, especially elapsed time in seconds.
2 Tonn[e]s.
3 Thickness, including maximum of aerofoil.
4 Triode.
5 Turns.
6 One revolution (F), as in t/min = rpm.
7 Often, non-absolute temperature.
8 Threads, eg in tpi (per inch).
9 Trend landing forecast.
10 As subscript, total pressure.
11 Main landing-gear track.
12 Absolute temperature.
13 Short ton[s], usage usually confined to NW yield.
14 Navaid terminal frequency.
15 Designation suffix, turbocharged [piston engine].
16 Designation prefix: turboprop.
17 Tropical air mass.
18 Class: light autogyro (BCARs).
19 Twin-wheel landing gear[s].
20 Terrain-clearance altitude.
21 Airport terminal, followed by number.
22 Tracer.
23 Radar-target strength.
24 Electrochemical transport number (also t).
25 Threshold lights, lighting.
26 See basic \( T \).
27 True [headings].
28 Designation suffix: fully heat-treated.
29 A small T-shaped hangar for one [usually small private] aircraft.
30 Training, also (T).
31 Time, especially elapsed time in seconds.
32 Tonn[e]s.
33 Thickness, including maximum of aerofoil.
34 Triode.
35 Turns.
36 One revolution (F), as in t/min = rpm.
37 Often, non-absolute temperature.
38 Threads, eg in tpi (per inch).
39 Trend landing forecast.
40 As subscript, total pressure.
41 Main landing-gear track.
42 Absolute temperature.
43 True heading.
44 Severe thunderstorm.
45 Non-dimensional time [in structural analysis].
46 Total time.
47 Total-terrain avionics.
48 Total-terrain avionics.
49 Taws-TCAS; the box still fits a single LRU.
50 Traffic and terrain collision-avoidance system.
51 Tailplane trimming tank.
52 HP turbine inlet temperature (can have other meanings).
53 Comprised of TCAS, Class A TAWS and Mode S transponder.
54 Common US usage for power-turbine inlet temperature.
55 Total turbine exit (outlet) temperature.
56 Aerial [antenna] comprising a wire from the top of the fuselage or mast to the tip of the fin, with a quasi-vertical connection from near mid-point to the radio installation.
57 Telescopic, usually means apron-drive.
58 TDMA channel for air/ground data messages too long for R-channel (GPS).
59 Specialized, often inter-Service, military units assigned a mission to obtain and investigate specific enemy equipment items or facilities (1944–, OSS, later CIA).
60 Wide front for wing, narrow rear for tail, usually arranged in two rows back-to-back to make full use of ground footprint [usually 30 × 24 ft or 40 × 30 ft].
61 Notional top of the ionosphere.
62 Standard longitudinal floor rail tailored to receive pax seats, cargo tie-down rings or stretcher racking.
63 Thermally sensitive indicator inserted into airline meal, changing colour at 71°C.
64 Shaped like T or inverted T in cross-section.
65 Aeroplane tail with horizontal surface mounted on top of fin (vertical stabilizer).
66 Reference time in countdown, often for that of start of engine ignition.
67 Trunnion angle (INS).
68 Telescoped ammunition.
69 Twin-aisle (transport).
70 Target alert, or acquisition.
71 Terrain avoidance.
72 Tuition assistance.
73 Transition altitude (CAA).
74 True altitude.
75 Trainer, aircooled (USA 1919–24).
76 Ambient temperature.
77 Terrain-clearance altitude.
78 Traffic advisory.
79 Technical assessment.
80 Terminal automation.
81 Towed array.
82 Technischen Ausschuss (Daec).
83 Tantalum.
84 Actual temperature.
85 Radar antenna noise.
86 Tropical Atlantic.
87 Action time.
88 Helicopter rotor disk [disc] loading.
TAA

1 Transportation Association of America [office, Washington, DC].
2 Technical Assistance Agreement.
3 Target aspect angle.
4 Transatmospheric aircraft.
TAAATS The Australian advanced air-traffic system.
TAAF Test, analyse and fix.
TAAM 1 Terminal-area altitude monitoring.
2 Tactical (or Tomahawk) airfield attack missile.
3 Total airspace and airport modeller.
TAAP Tethered-aerostat antenna program.
TAATD Target acquisition advanced technology demonstration.
TAB 1 Technical Assistance Bureau (ICAO).
2 Tape-automated bonding.
3 Tabulation and insertion program.
4 Hinged rear portion of flight-control surface used for trimming (trim *), to reduce hinge moment and increase control power (servo *, balance *, spring * etc) or to increase hinge moment and effectiveness of powered surface (anti-balance *, flap *).
5 Rarely, auxiliary aerofoil hinged to trailing edge of flight-control surface, usually of servo type.
6 Small hinged spoilers on inside of propelling nozzle or rocket expansion nozzle for thrust vectoring or noise reduction.
7 Hinged panels along lower edges of side flaps (walls) of ejector-lift duct, deflected to give maximum augmentation.
8 Abb. tabulator, alphanumeric display.
Tabled flap Flap, usually Fowler, whose trailing edge is hinged (without slot) and at maximum landing setting is pulled down by linkage to much greater angle than main surface.
Tablock Flat washer with rectangular tab bent up to lock nut (sometimes capital T).
TABMS Tactical air battle management system.
Tabs Telephone automated (also total avionics) briefing system, or service.
Tabulated altitude Altitude of celestial body read from a table.
Tabun Lethal nerve gas (G, 1937; in US called GA).
TABY Theatre airbase vulnerability.
Tab-vee Alternative form of TABV, common name for NATO hardened shelter for aircraft.
TAC 1 Tactical Air Command (USAF, now part of Air Combat Command).
2 Trim augmentation computer.
3 Turbo-alternator compressor (Brayton cycle).
4 Thermosetting asbestos composite.
5 Terminal-area chart.
6 Test-access control.
7 Thrust-asymmetry compensation.
8 Total accumulated cycles (especially USAF).
9 True-airspeed computer.
10 Transportation Association of Canada [office, Ottawa, PQ].
11 Tacan.
12 Tac.
13 Tacally.
14 Tacamo Take charge and move out (USN airborne v.l.f. strategic communications system, mainly NCA to SSBN).
15 Tacan Tactical air navigation; UHF R-theta-type navaid [principally military] giving bearing/distance of aircraft from an interrogated ground station.
16 Tache Lightweight tactical beacon equipment; 2-channel ground/air voice (Burndept).
TACC 1 Tactical Air Control Centre (RAF).
2 Theater Air Control Center (USAF TAC).
3 Tactical air combat cycle.
4 Tanker Airlift Command, or Control, Center (USAF).
5 Taccar Time-average clutter coherent airborne radar.
6 Taccins Theatre automated command and control information management system.
7 TACCO, Taco Tactical co-ordinator; flight-crew member of ASW aircraft responsible for overall mission management during search or attack operations.
8 TACCS Tactical air command and control specialist.
9 Tacdew Tactical combat direction and EW.
10 TACDS Threat-adaptive countermeasures dispensing, or dispenser, system.
11 TA/CE Technical analysis and cost estimate.
12 Taces Tactical communications exploitation system.
13 Taceval Tactical evaluation, hardware development, test and training effort on production air weapon systems (USAF, RAF).
14 Tacfax Tactical digital facsimile.
15 TACG Tactical air control group (USAF).
16 TcGA Tactical ground-to-air.
17 Tach Tachometer, pronounced tack, as are following entries.
18 Tachogenerator, tachometer generator Tachometer of electric synchronous-motor type with shaft-driven generator feeding AC to one or more synchronized displays.
19 Tachometer Instrument for indicating speed of rotating shaft, in rpm and/or as percentage of normal maximum.
20 Tachometer cable Rotary drive of mechanical tachometer, two spiral layers of steel wire.
21 Tachometric Tachymetric.
22 Tachymetric aiming Aiming of gunfire, bomb or other weapon by continuously maintaining sightline on target, thus determining speed relative to surface target and in some cases track through target.
23 TACIU Test access control interface unit.
24 Tacjam Tactical jamming of UHF/VHF communications.
25 Tack Degree of stickiness in prepreg resin.
26 Tack coat Very thin coat of finish, usually dope, which precedes the full-density wet coat.
27 Tack rag Soft lint-free rag slightly damp with thinner.
28 Tack weld Small dab of weld metal making local link to hold parts in correct location (but capable of easy rupture if in error) while main weld is made.
29 TACL Tactical all-weather collection at long range.
30 TCCLS, Tacis Tactical airborne combat laser system(s) (USAF).
31 Taclmet Tactical countermeasures evaluation trainer.
32 TACMS Tactical missile system (USA).
33 Tacnav Tactical navigator, or navigation; mod or/mod adds modification.
34 Tacom Tactical-area communications.
35 Tacos Tactical combat.
36 Tacoris oscillation Pulsating (c 1 Hz) resonance in cryogenic refrigerant.
37 Tacor Threat-assessment and control receiver (ECM).
38 Tacos Tactical airborne countermeasures or strike.

TACMS
TACP

TACP Theatre [or tactical] air control party: -M adds modernization; O officers (NATO, USAF).
TacR Tactical reconnaissance.
TACS Tactical, or theater, air control system (USAF).
2 Less often, tactical air control squadron.
3 Thruster, attitude-control system.
Tacsatom Tactical satellite communications (DoD).
TACSI, Taesi TACS (1) improvements.
Tacsim Tactical simulation.
TACT / Transonic aircraft technology (NASA).
2 Tactical aircrew co-ordination trainer.
tact Tactical air-traffic flow management.
Tactas Tactical towed-array sonar.
Tactass Tactical towed acoustic-sensor system.
Tacte Totally advanced communications technology (RCA).
tactical Generalized term meaning concerned with warfare against directly opposing forces, usually involving air, land and sea forces together, and in limited theatre of operations.
tactical aeromedical evacuation From combat zone to outside it, or between points in combat zone.
tactical air combat cycle Standard fighter mission assumed in determining engine life.
tactical air control centre Theatre HQ of USMC air operations.
tactical air control centre Principal centre, shore or ship-based, from which all tactical air is controlled.
tactical air co-ordinator Directs, from aircraft, air close support of surface forces.
tactical aircraft shelter Normally protects against conventional attack but may be extended to offer protection against NW blast, radiation and CBW.
tactical air officer (afloat) Responsible under amphibious task-force commander for all supporting air operations until control is passed ashore.
tactical bomb line See bomb line.
tactical code Two-digit number in various colours on combat aircraft (R, C/S).
tactical finish Camouflaged: can be all one colour.
tactical input segment Subsystem for receiving EO and IR images in real time.
tactical intervention vehicle Designed to rescue hostages from parked aircraft.
tactical laser weapon system An array of mirrors aim powerful laser simultaneously at multiple munitions.
tactical targeting network technologies Creates networks between airborne platforms passing data, video and voice, at ≤ 2 Mbit/s over distances ≤ 100 nm, 185.3 km (USAF).
tactifs Tactical integrated flight system.
tactile faceplate Electronic display screen sensitive to fingertip touch for reprogramming, selecting from menu, changing scale or operating mode, or adjusting any variable.
tactile situational awareness system A high-tech aircrew vest.

Tacts Tactical aircrew combat training system (ACMI).

TAD / Turbo-alternator drive.
2 Target assembly data.
3 Technology availability date (or data).
4 Towed aerial decoy.
5 Theater, or tactical, air defense.
6 Trim-aid device.

Taggart

7 Target acquisition and designation.
8 Terrain-awareness display.

TAG Tactical air direction center.
Tads Target alert data display sets; part of FAAR.
tade, TADEC Totally automatic digital engine control [piston engines].
Tadil / Tactical digital intelligence, or information, link (C adds command, J adds joint [service]).
2 Tactical aircraft digital information link.
TADIRCM Tactical aircraft directional, or directable, IRCM.
TADIXS-B Tactical data information exchange system - broadcast.
Tadjet Transport, airdrop, jettison.
TADMS TR-1 Asars-2 data manipulation system.
Tadoc Transportable, or tactical, air-defense operations center, possible confusion with Tradoc.
tadpole Track of moving target on radar display presented with comet-like tail to show direction of travel. Most air-defence radars can select tadpoles on or off.
tadpole profile Aerodynamic profile with conventional nose followed by single-surface construction downstream (eg fin of A-4 followed by single-skin rudder).
TADS, Tads / Tactical air defense sight (US).
2 Towed angular deception system.
3 Target acquisition and designation sight, [one report says “system”]/PNVS adds pilot’s night-vision system.
4 Target airborne data system.
5 Tactical laser and designation system.
6 Triple air-data system.
7 Type Acceptance Data Sheet (PFA).
TAE Thrust-augmented entomopter.
TAEI Turning-area edge light[s].
TAEOM Terminal-area energy management.
TAERS Tactical aircrew eye respiratory system.
TAF / Tactical air force.
2 Terminal area , or aerodrome, forecast [international meteorological figure-code].
3 Thermal acoustic fatigue.
4 Thermo-acoustic facility.

TAFF Turn-around fault isolation.

TAFIS TAF (1) integrated information system.
Tafim Technical architecture framework for information management.
TAFS Airfield meteorological forecast.
Tafseg Tactical air force systems engineering group.

TAG / Telegraphist/air gunner (Royal Navy, WW2).
2 Thrust-alienvated gyroscope.
3 Tactical Airlift Group (USAF).
Teledoed-ammunition gun.
5 Transport Air Group (USMC).
6 Tailored air group.
7 Target-adaptive guidance.
8 Towed acoustic generator.
9 Technical Advisory Group (USAF).
10 Test analysis guide.
tag Small battery-powered transceiver designed to provide a communications link on ground between an airborne radar and its associated receiving interrogator, switched by the incoming signal (USAF).

Taggart Sometimes rendered Taggent, a tagging agent incorporated in a strike weapon and released on detonation for detecting and tracking biological aerosols.
tagging

Tagging Ataching unmissable warning notice during maintenance to point out, e.g., that item has been switched off or disabled.

Tags Technology for automated generation of systems.

Tagways Target weapons effects simulation, or simulator, or system(s).

TAH Transfer and hold.

TAH Twin altitude/height.

TAI J Total active inventory.

2 Thermal anti-icing.

TAIA Taiwan Aerospace Industry Association [office, Taipei (Taiwan)].

TAIC Transport Accident Investigation Commission (NZ).

tail J Rear part of aircraft, where applicable.

2 Assembly of aerofoils whose main purpose is stability and control, normally located at rear of aerodyne or airship.

J Trailing luminous area behind blip of moving target.

J Normal verb meaning in air-intercept shadowing from astern.

tail arm The moment arm of a horizontal or vertical (or inclined) tail surface. There are several definitions:

J The distance parallel to the longitudinal axis between the aircraft centre of gravity and a nominated point on the specified tail surface.

2 The distance between the c.g. and the centroid of the nominated tail surface.

3 Becoming the usual meaning, the distance parallel to the longitudinal axis between the intersection of the wing ¼-chord line and the spanwise location of the mean aerodynamic chord and the corresponding ¼-chord point on the nominated tail surface.

tail bearing The rearmost bearing of a gas-turbine main-shaft [suggest not common use].

tail boom Tubular cantilever(s) carrying tail (2) attached either above short fuselage nacelle or as L/R pair to wings.

tail bumper Projecting or reinforced structure under tail designed to withstand impacts and scraping on runway.

tail chase, tail chasing One aircraft closely following another, elementary form of air-combat training [often one word].

tail chute See tail parachute.

tailcone Conical fairing of rear of body, esp. downstream of turbine disc in jetpipe.

tail damping power factor Numerically the product of TDR [see next] and URVC.

tail damping ratio A [suggested limited] measure of anti-spin quality based on side area under tailplane multiplied by distance to c.g.

tail-down angle In an aircraft fitted with nosewheel landing gear, the angle between the ground line and the plane defined by the underside of the rearmost main landing wheels and the underside at the tail; thus, the angle of the longitudinal axis in a tailscrape test.

tail drag Restraining mass free to slide on ground to which moored airship stern is attached.

taildragger Aircraft with tailwheel or tailskid (colloq.).

tailed delta Aircraft with delta wing and horizontal tail.

tail efficiency factor A multiplier of elevator control power equal to 0.4T0H 2 (angle of attack, flap angle, thrust coefficient and ground effect), symbol n.

tail-end Charlie 1 Formation of aircraft in single line, each behind the other.

tailplane tank 2 Last aircraft in such a line.

3 Rear gunner in tail of large aircraft (1935–50).

taileron Single-piece horizontal tail surface, one of two forming tailplane whose left/right halves can operate in unison (as tailplane commanding pitch) or differentially (as ailerons commanding roll). Term preferable to elevaotor or rolling tailplane. Elevon differs in that it is hinged to wing. US term stabilator is ambiguous and can mean * or slab tailplane.

tailfeathers Free-floating flaps forming periphery of supersonic airbreathing propulsive nozzle, usually as outer boundary of large secondary nozzle. These take up slipstreaming angular positions aligned with streamlines.

tail fin Fixed stabilizing fin at rear; ‘tail’ normally being redundant.

tail-first Aerodyne configuration in which the only auxiliary horizontal surface is ahead of the wing, commonly called a foreplane or canard.

tail float Float supporting tail of float seaplane (now arch.).

tail group Complete tail (2), considered as design task or as element of total aircraft mass.

tail guy Secures tail of moored airship, often to tail drag.

tail heaviness Condition in which aircraft rotates nose-up unless prevented.

tailhook J CTOL by carrier aircraft.

2 Naval pilot (colloq.).

tail kit Prepacked item[s] to convert iron bomb into precision air/ground missile.

tail length Tailplane moment arm.

tailless aircraft Normally applied to aeroplanes and gliders only and usually meaning that there is no separate horizontal stabilizing or control surface, though there may be a vertical tail (2). In extreme case there is no tail surface, and (esp. if fuselage vestigial or absent) this is more often called flying-wing aircraft).

tail load Vertical up or down thrust acting on tailplane.

tail logo Bold logo of operator displayed on tail; hence ** light, also valuable as anti-collision beacon.

tail number See serial (2).

Tailored Air Group An embarked airpower package assembled from suitably configured air assets from any or all of the armed forces to suit a specific operation or campaign (UK).

tailored fuel Synthesized to meet specific operational specification.

tail parachute Parachute attached to tail, normally for anti-spin or anti-supertall purpose. Not used as braking parachute.

tailpipe Exhaust pipe of turboprop or turboshaft; according to some, piston engine exhaust pipe downstream of collector or manifold.

tailplane 1 More or less horizontal aerofoil at tail of aerodyne (invariably fixed-wing) providing stability in pitch; fixed or adjustable only for trim, and carrying elevators (US = stabilizer).

2 Aerofoil pivoted at tail about horizontal axis and driven directly by pilot of fixed-wing aerodyne or rotorcraft as primary flight control in pitch in translational flight; forms complete surface without separate elevators (US = stabilizer).

tailplane tank Fuel tank, invariably integral, in hori-
tail rotor  zontal tail, to increase system capacity and, esp., to control longitudinal trim without drag. tail rotor Helicopter anti-torque rotor, rotating at tail about more or less horizontal axis. Not used for rear tandem rotor. tail scrape See tailstrike. tail setting angle The acute angle between chord lines of wing and tailplane (1). tailsitter VTOL aerodyne whose fuselage is approximately perpendicular at takeoff, in hovering mode and at landing, today preferably called Vatol. tailskid Projection, usually a sprung lever with end-shoe, supporting tail of aerodyne on ground, esp. one whose c.g. is well aft of main landing gear. tailskid shoe Replaceable pad on end of tailskid which slides on ground. tailslide Transient flight condition of fixed-wing aerodyne in which relative wind is from astern, eg in stall from near-vertical climbing attitude. tailspin Spin (arch.). tailsitter Tailsitter. tailstrike Scraping rear fuselage on runway on rotation. Hence, * indicator, frangible foil which causes a bright flash on EICAS. tailstrike protection Any of several systems which prevent a tailstrike, usually by limiting authority of horizontal tail. tail surface Any aerofoil forming part of tail (2). tail turret Defensive gun turret, usually power-driven, forming the tail end of the fuselage, today becoming rare. tail undercarriage Rearmost unit of tailwheel-type landing gear (rare, suggest arch.). tail unit Complete tail (2) of horizontal, vertical and/or canted surfaces, often including ventral fins or strakes. Also called empennage. tail-up procedure Final closure of production at end of need for spares or support. tail view Tail-on view showing object from directly astern; not normal aspect for layout drawing. tail volume See \( V_\text{tail} \).
tailwagging Lateral flexure of fuselage. 2 Flat turns, esp. to steepen glide. tail warning radar Aft-facing radar, usually of active type, intended to detect other aircraft (and possibly SAMs) intercepting from behind. tailwheel 1 Rear wheel of * type landing gear, supporting tail on ground. 2 Auxiliary wheel under tail of aircraft with nosewheel-type landing gear (eg Albatmarle); fitted in place of tail bumper. tailwheel landing gear Landing gear comprising left/right main units ahead of c.g. and tailwheel at rear. tailwind Wind blowing approximately from astern of aircraft and thus increasing groundspeed. TAIMS Three-axis inertial measurement system. TAMS, Tains Tercom and, or Tercom-sided, inertial navigation system. TAIR Terminal-area instrumentation radar. TAIRCW Tactical air control wing. TAIS 1 Tactical air intelligence systems. 2 Technology application information system (SDI). TAIS 2 Tactical airspace integration system. 3 Thermal active intervention system. Take 5 Traffic crossing airway must maintain prescribed separation of 5 nm horizontally and 5,000 ft vertically from any GAT track in airway. takeoff 1 Procedure in which aerodyne becomes airborne; not normally used for launch of glider (except on aerotow) or high-acceleration launch of missile or RPV, and never for any ballistic vertical-liftoff vehicle. In author’s opinion verb is best as two words, noun and adjective as single word without hyphen. 2 Moment or place at which aerodyne leaves ground or water. 3 Net flightpath from brakes-release to screen height. 4 Power * for extraction of shaft power. take off To perform a takeoff. takeoff boost Boost pressure permitted for takeoff, usually 2 minute limit. takeoff cone Airspace occupied by aircraft in first minutes of flight. takeoff distance, TOD Field length measured from brake-release to reference zero (at screen); can be longer than runway and extreme limit TOD\(_2\) = entire runway + stopway + clearway = TOR\(_2\) \times 1.5. For multi-engine aeroplanes usually factored according to number of operative engines, thus TOD\(_2\) \neq TOD\(_3\). TOD\(_1\) = TOD required for particular aircraft and WAT, not normally to exceed 0.87 TOD\(_2\). takeoff distance available Actual distance at particular time, not necessarily length of runway. takeoff distance ratio TOD into wind divided by TOD downwind [with tailwind], usually expressed as percentage. takeoff liftoff area Heliport area, a square with side equal to main-rotor diameter (FAA). takeoff limit No general meaning. takeoff mass Not normal term; for rocket or space launcher usually liftoff mass or launch mass. takeoff noise Measured on extended runway centreline 3.5 nm (strictly 6,485.5 m, but taken as 6.5 km) from brakes-release. A second reference point, not used for certification, is at side or runway opposite supposed start of run 1 nm from centreline. takeoff power Power authorized for piston engine or turboprop for takeoff, usually 2½-minute rating for turbine engines. In case of turboshift, a lower rating than 2½-minute contingency. takeoff rating 2 Boost/manifold pressure/rpm figures authorized for piston engine at takeoff. 2 Thrust published for turbojet or turbofan at takeoff, normally achieved by engine control system rather than set directly by pilot, and subject to ATR or FTO techniques. takeoff rocket See rocket-assisted takeoff. takeoff run 1 Loosely, distance travelled over land or water in aeroplane or aerotow-glider takeoff to point of becoming airborne. 2 TOR, field length measured from brake-release to end of ground run plus one-third of airborne distance to screen height. TOR\(_2\) = TOR available = length of runway; TOR\(_2\), TOR\(_3\) are factored for engine-out cases, and TOR\(_2\) = TOR required. takeoff safety speed \( V_\text{safety} \), lowest speed at which aeroplane complies with required handling criteria for climb-out following engine failure at takeoff. takeoff speed Not defined but loosely = unstick speed. takeoff thrust Takeoff rating (2).
Talisman

Tactical air-launched decoy [vehicle or mission].

Tactical airborne laser designator.

Tactical airborne Loran (system).

Terrain-aided localization using EO sensors.

One calling for LEW technique or experience.

One calling for LEW technique or experience.

See T-VASI.

Armour-piercing bomb, 12,000 lb [5443 kg] (RAF WW2).

1 Actual weight at takeoff (2) on particular occasion.

Turbulent (Airmet advisory).

Container of all fuel, liquid, propellant, lube oil, hydraulic fluid, anti-icing fluid or toilet chemical, and often gun ammunition; not used for containers of breathing Lox, air-conditioning refrigerants, potable water or suppressant/extinguishant.

2 Turbulent (Airmet advisory).

Tanks, TANS

Tanks, TANS Tactical air navigation system; airborne
tantalum

computer storing many waypoints and fed by other inputs (eg Doppler, magnetic heading).
tantalum Ta, shiny metal, MPt 2,996°C, density 16.7, important in refractory alloys. A carbide is harder than diamond.
Tao Test automated operations.
TAOC Tactical air operations centre (RAF/Army).
TAOM Tactical air operations module.
TAOR Tactical area of responsibility (UK).
TAP 1 Terminal approach procedure(s).
2 Air-transport regiment (R).
3 Tactical autopilot, or technology.
4 Technical, or technology, assessment program[m]e.
5 Terminal-area productivity, or planning.
tap 1 To bleed; hence tapping, pipe for bleed air.
2 To cut threads in drilled hole; also tool for doing this.
3 Electrical power wire connected to main conductor at point along latter.
4 Engine throttle or power lever (colloq.).
TAPA 3-D antenna pattern analyser (USAF ECM).
Tape Total airport performance and evaluation (Euret).
tape 1 Main meaning in aerospace is as medium for software, usually magnetic or punched paper.
2 One form of CF or other reinforced-plastics prepreg, used for layups or moulding but seldom for filament winding.
3 Pinned-edge fabric strip used for surface finishing (surface *).
tape control Automatic control, eg of machine tool, by tape (1).
tape instrument Cockpit instrument whose presentation is based on linear tape driven over end spools, usually in conjunction with fixed and/or movable index pointers or bars. Usually vertical, as in VSFI.
tapelayer Computer-controlled tool for laying-up prepreg tape in manufacture of composite parts; automatically positions, starts, stops and dumps material rejected during prior editing.
tape lay-up The parts produced by the tapelayer.
tape mission Reconnaissance of Elint type in which digital (eg signal) or digitized pictorial information is stored on 7-track magnetic tape from which whole mission profile can be assigned to exact ground track, with each hostile emitter or other target assigned to precise location and timing.
taper For given wing section profile * equal in plan and thickness, usually defined as straight or compound; in some aerofoils * not equal in plan/thickness so section profile changes.
tapered-roller bearing Use of tapered rollers enables such a bearing to resist axial [endways] loading.
tapered sheet Thickness varies (usually at uniform rate) along one axis.
taper ratio Normally defined as ratio of tip chord Ct to either root chord or equivalent centreline chord Cc.
Common rendering, Rf = Cc/Ct.
taper reamer Used to smooth and true previously tapped hole.
taper tap Hand-turned tap (2) to initiate thread cutting.
Tapley meter Damped pendulum in heavy stable case where some of swing feeds record of instantaneous or maximum vehicle deceleration; not suitable for runway friction measures.
target allocation

Taps, TAPS 1 Tercom aircraft (or tracking and) positioning system.
2 Terminal applications processor system.
3 Target analysis and planning system.
4 Twin annular pre-swirl, or premix swirler.
5 Total, or towed, airborne plume simulator.
taps Throttles (colloq.).
tap test Crude search for delamination or other flaw in composite structure, typically with a coin.
TAR 1 Terminal-area surveillance radar (ICAO).
2 Terminal approach radar.
3 Thrust auto reduce (STT).
4 Threat-avoidance receiver; passive ECM.
5 Trials ATN router.
6 Test action request.
Tara Terminal and regional airspace.
Tarad Tracking asynchronous radar data.
Taran 1 Tactical attack radar and navigation.
2 Test and repair as necessary.
Taras Tactical [digital] radio system (Sweden).
Tarasov-Bauer Computer-based method of smoothing out judge’s scores to eliminate highest and lowest (CIVA).
TARC 1 Transport Aircraft Requirements Committee (UK 1956–62).
2 Tactical air reconnaissance center (USAF).
Tarcap * Target combat aircraft practice (practice), or patrol.
Tardis Tornado advanced radar display and information system.
TARE, Tare 1 Tactical air reconnaissance equipment.
2 Telemetry, or telegraph, automatic relay equipment (NATO).
tare Unladen, without load, crew or fuel; normally used only in connection with surface vehicles, except for ULDs, where * includes linings and fittings according to specification or registered with IATA.
tare effect Forces and moments on tunnel model caused by support-structure interference.
tare weight allowance Free allowance given by IATA to shippers for ULDs not owned by members.
tare-weight objective Non-mandatory target weight for a ULD.
TAREWS, Tarews Tactical air reconnaissance and electronic-warfare support; RPV (USAF).
TARG, Tarfx Telecoped ammunition revolver gun.
Target Training and rehearsal generation toolkit.
target 1 Objective of air-combat mission, either in air or on surface.
2 Objective of intelligence or Elint activity.
3 Any true echo (blip) seen or radar, and object causing it.
4 Objective of any missile.
5 To insert position co-ordinates of fixed surface * into guidance software of ballistic or cruise missile; also called targeting.
6 Unpiloted (towed or RPV) aerodyne serving as target for friendly fire.
7 Aircraft within surveillance range of TCAS.
target acquisition Detection, identification and location in sufficient detail for effective employment of weapons.
target alert EFIS warning of future turbulence.
target allocation In air-defence weapon assignment,
target approach point

Process of assigning particular target or airspace to particular interceptor or SAM unit (NESN).

target approach point

Navigation checkpoint, usually prominent land feature similar to initial point, over which final turn in to DZ or LZ is made.

target CAP

Target combat air patrol; patrol of fighters over enemy target area to destroy hostile aircraft and cover friendly surface forces.

target capture

To detect, identify and locate a target in flight.

target crossing speed

Relative lateral velocity or sight-line spin (angular rate) or aerial target seen from interceptor.

target date

Date on which particular planned event should take place.

target designation

Marking or otherwise pointing out a target, or setting it into HUD or fire-control system.

target designation control

Throttle thumbswitch for slewng sight (or HUD) brackets to contain a surface target.

target director post

Positions friendly aircraft, in all weathers, over predetermined geographical positions, eg targets.

target discrimination

See discrimination.

target dossier

File of assembled intelligence information on target, normally including multisensor readouts and Elint.

target drone

Pilotless target aircraft, today often an RPV.

target ensemble

Region of sky occupied (or expected to be occupied) by multiple air/ground munitions.

target-following radar

One locked on to target.

target indicator, TI

Visible pyrotechnic, electronic homing beacon or other device air-dropped on surface target.

targeting

1. To target (5).

2. Distribution of targets assigned to weapons, esp. to ICBMs and SLBMs.

target marker

Visible pyrotechnic dropped on surface target, or aircraft dropping same.

target of opportunity

1. Target visible to a sensor or observer and within range of weapons and against which fire has not been scheduled or requested (DoD).

2. Target which appears during combat and which can be reached by weapons and against which fire has not been scheduled (NATO).

Note: both the above can be ground or air.

3. NW target detected after operation begins that should be attacked as soon as possible within time limits for co-ordination and warning friendly forces.

target pattern

Flightpath of aircraft (meaning is normally in plan view) during attack phase (DoD).

target price

That hoped to be achieved, eg in incentive-type contract.

target recognition

Positive identification of type of target (eg type of aircraft), by visual means or by high-resolution sensor giving jet modulation or prop/rotor reflection signature.

target reverser

Jet-engine (turbojet or turbofan) thrust reverser comprising two deflectors (also called clamshells or buckets) which swing down to meet downstream of nozzle.

target strength

T = E - (S+2H) where S is source, E echo and H radar transmission loss; unit is dB.
TASS

2 Terminal airport surveillance radar.

TASS Tactical Air Support Squadron (USAF).

Tass 1 Tactical automated security system.

2 Towed-array surveillance system.

3 Terminal-area surveillance system (1995 onwards).

4 Tethered-aerosat surveillance system.

5 Target-acquisition sensor suite.

TASST Tentative airworthiness standards for [a future] SST (FAA).

Tasuma Target and surveillance unmanned aircraft.

Tasval Tactical-aircraft survivability against armour; SST (FAA).

Tatcof Terminal ATC; A adds automation.

TAT-C post-Jaws (USA/USAF).

Tatcof Terminal ATC; A adds automation.

TATC Transportable ATC facility.

TATF Terminal Automation Test Facility (FAA).

TATL Tati Trim and tailplane incidence (indicator) (pronounced ‘tatty’).

TATP Triacetone, or tricyclo-acetone, triperoxide, liquid high explosive.

TATR Tactical, or theater, ballistic missile; D adds defense, TAWS defense feasibility study, EWS early-warning system (USA).

TAV Target acquisition and tracking unit.

TAVC Targeted air support via co-ordinate (co-ordinated).

TAW 1 Tactical aircraft training system.

2 Tactical Aerial Targets Squadron (USAF).

TAWC Tactical Air Warfare Center.

TAWDS Target-acquisition/weapon-delivery system, with Pave Mover.

TAWDS Target-acquisition/weapon-delivery system, with Pave Mover.

Taw C Target acquisition and tracking unit.

TAXI Taxiway centreline (lights).

TAXI Taxi and parking facilities airfield chart.

Taxi To move aircraft on surface (land or water) under its own power.

Taxi/holding position Designated point at which all vehicles may be required to hold to provide adequate clearance for arrivals/departures on runway.

Taxi/warning system [previously EGPWS, now e-TAWS].

Taxi A Terminal A adds automation.

Taxi W Wing.

Taxiway Taxiway lights (ICAO).

Taxiway lights (ICAO).

Taxiing Participle/gerund from taxi; note spelling.

Taxiing Path on large apron or other paved area to be followed by nose gear, marked by continuous white line.

Taxitrack Assigned taxiing route at land airfield, not necessarily paved. Most or all may be perimeter track.

Taxiway Assigned taxiing route at land airfield, paved.

Taylor diagram Plot of dry and saturated adiabatic curves on axes of pressure and volume (reciprocal of density) showing loss of pitot pressure in moist air.

Taylor/Macoll Original more exact solution for pressure over up and down circular cone in supersonic flow (1932).

Taylor Maclaurin Mathematical expansion of f(x) for values near x = 0.

Taylor recorder Automatically counted number of times a preset vertical acceleration was exceeded (RAE, 1950).

Taylor series Power series of f(x) in ascending powers of x near x = a, where f(x) and derivatives are continuous near x = a.
Tc

Te 1 Tropical continental air mass.
2 PN code bit length, also called chip width.
3 Adiabatic flame temperature of rocket.
4 Superconducting critical temperature.
5 Torque concentrated at a particular location or plane in large panel.
T/C Top of climb.
t/c Thickness/chord ratio of aerofoil; inferior suffixes include r root, k kink and t tip.
TCA 1 Terminal control area.
2 Télécommande automatique: IR/optical + wire guidance for missile. Operator merely keeps sight on target.
3 Time of closest approach.
4 Track crossing angle.
5 Temperature control amplifier.
6 Technical collaboration agreement.
7 Turbine cooling airflow.
8 Technical, or technology, concept aircraft (SST).
9 Tungsten carbide alloy.
10 Traffic/collision avoidance; D adds device (for GA; 1980s).
11 Throttle-control assembly.
12 Transformational communications architecture.
13 The Canberra Association.
TCAC 1 Taiwan CAA.
2 Transatlantic Common Aviation Area.
TCADA 1 Time-critical automatic identification and attack.
2 Tactical communication control facility.
3 Tricyclo-acetone peroxide [liquid explosive].
TCAR Transatlantic collaborative [or co-operative] advanced [or AGS1] radar.
TCAS J Pronounced T-cass, traffic alert and collision-avoidance system [see entry]; -RA adds resolution advisory.
2 Tandem clapping aerial swimmer.
TCB 1 Turret control box (helicopter).
2 Trusted computer, or computing, base.
TCBM Transcontinental ballistic missile.
TCC 1 Thermal-control coating.
2 Thrust control computer.
3 Telecommunications center(s).
4 Titanium-coated carbon.
5 Turbine-case cooling.
6 Tactical co-ordination console.
7 Tactical control center.
8 Technical co-ordinating committee.
9 Troop Carrier Command (USAAF, WW2).
10 Temporary Council committee.
11 Tip clearance control [turbine rotor].
12 Traffic coordination centre.
TCCA Transport Canada Civil Aviation [certification authority].
TC, TCCC Tower control computer complex; S adds system.
TCCF 1 Tactical combat control facility (USAF).
2 Technical communication control facility.
TCCP Take-command control panel.
TCD 1 Time-critical data.
2 Total-contents display.
TCCDD Tower-cab digital display (ATC).
TCDL Tactical common data-link.
TCDS Type Certificate data sheet.

TCS

TCDD Tower-cab digital display (ATC).
TCAP Tracking and communications subsystem (ACMI).
TCB Telecommunications center(s).
TCBPP TCAP (2) internet protocol.
TCQ Throttle control quadrant.
TCR 1 Terrain-closure rate.
2 Thickness/chord ratio; usually t/c.
3 Time-compliance requirements.
4 Thrust centre position (of gross thrust vector).
5 Takeoff-chart computation program.
6 Traffic, or transport, control protocol; IP adds Internet protocol.
TCPA Time to closest point of approach.
TCPED Testing, collection, processing, exploitation and dissemination.
TCP/IP TCP (2) internet protocol.
TCQ Throttle control quadrant.
TCR 1 Traffic control system.
2 Terminal countdown demonstration test.
TCEA Training Centre for Experimental Aerodynamics (NATO, Brussels).
TCF Terrain clearance floor.
TCC 1 Tactical common data-link.
TCG Troop Carrier Group (USAAF).
TCH 1 Threshold crossing height.
2 See T/KP.
TCI 1 Tape-controlled inspection.
2 Time-controlled item.
TCM Tactical communications interface modem, or module.
TCIR Toxic-chemical inventory release.
TCJ Tactical communications jamming.
TCL 1 Taxiway centreline light[s].
2 Transient control logic.
TCLT Tentative calculated landing time.
TCM 1 Trim-control module.
2 Trellis coded modulation.
3 Thrust clutch motor.
4 Trajectory-correction, or change, manoeuvre.
5 Technical co-ordination meeting.
6 Transformational communications milsatcom, or military [also called TCS, TSAT].
TCMA Time co-ordinate map locator.
TCM Target co-ordinate map locator.
TCA Transport Canada Civil Aviation [certification authority].
TCM Test-content management system.
TCA Terminal control area.
TCO 1 Total cost of ownership.
2 Tape-controlled oscillator.
3 Tactical Control Officer.
4 Tone cut-off (noise reduction).
TCR 1 Traffic control system.
2 Terminal countdown demonstration test.
3 Technical co-ordination meeting.
4 Time-compliance requirements.
5 Takeoff-chart computation program.
6 Traffic, or transport, control protocol; IP adds Internet protocol.
TCQ Throttle control quadrant.
TCR 1 Traffic control system.
2 Terminal countdown demonstration test.
3 Technical co-ordination meeting.
4 Time-compliance requirements.
5 Takeoff-chart computation program.
6 Traffic, or transport, control protocol; IP adds Internet protocol.
7 Time-controlled item.
TCX 1 Traffic control system.
2 Terminal countdown demonstration test.
3 Technical co-ordination meeting.
4 Time-compliance requirements.
5 Takeoff-chart computation program.
6 Traffic, or transport, control protocol; IP adds Internet protocol.
7 Time-controlled item.
TCZ 1 Traffic control system.
2 Terminal countdown demonstration test.
3 Technical co-ordination meeting.
4 Time-compliance requirements.
TC/ς

14 Transformational communications system (DoD).
15 Transformation cycles per second, = THz.
TCSC Titanium-coated silicon carbide.
TCSEC Trusted-computer system evaluation criteria.
TCSS Terminal communications switching system.
TCT 1 Time-critical target, or targeting; A adds aid.
2 Tactical computer terminal.
3 Transverse-current tube.
4 Target-centred tracker.
5 Takeoff configuration test.
6 Turbomachinery and combustion technology.
7 Targeting cycle timeline = S2S.
TCTO Time-compliant, or compliance, technical order.
TCTT Time-critical target technology.
TCU 1 Tracking control, or and communications, unit.
2 Thermal cueing, or control, unit.
3 Tracking and communication unit (UAV).
4 Take-control unit.
5 Tacom control unit.
6 Telephone conversion unit.
7 Transport Communications International Union [Rockville, MD 20850] (US).
TCU, TCU Towering cumulus.
TCV 1 Total-containment vessel.
2 Terminal-configured vehicle.
TCW 1 Terminal controller workstation.
2 Tactical Communications Wing (RAF).
3 Tactics and Countermeasures Wing (RAF AWS).
4 Troop Carrier Wing (USAAF).
TCWF Terminal convective weather forecast [predictive tool] (MIT).
TCX Transfer-of-control cancellation message.
TCXO Temperature-controlled crystal oscillator.
TD 1 Target drone (USN category 1942–46).
2 Touchdown.
3 Transposition docking.
4 Time difference, or delay.
5 Tunnel diode.
6 Test directive.
7 Time duplex.
8 Tactical Director (USAF).
9 Tactical display.
10 Thrust decay; S adds system.
Tₐ, Tₐ, T¼ Dewpoint temperature.
Tₐ Ignition delay time of rocket.
TD Top of descent.
TDA 1 Tunnel-diode amplifier.
2 Temporary danger area.
3 Trade and Development Agency (US).
4 Theater-defense architecture.
5 Today.
6 Tail-down angle.
7Transient dynamic analysis.
TDAAPS Training data-acquisition analysis and playback system.
TIME 1 Transposition, docking and LM ejection.
2 Tactics development and evaluation.
TDAP Touchdown aim point.
TDAI Defensive defense alerting radar.
TDAS Test, or tracking and, data acquisition system.
TDAI, T-Dats Target detection, acquisition and tracking system.
TDC 1 Top dead centre.
2 Through-deck cruiser, for Stovls.
3 Technical Development Center (FAA).
4 Target designator, or designation, control.
5 Theater-deployable communications (USAF).
TDACP Tactical-data communications processor (USMC).
TDAS Traffic-data collection system.
TDD 1 Tactical-related data-dissemination system.
2 Target-detection device.
TDE 1 Target-data extractor.
2 Tactical-data equipment.
TDEC 1 Technical Development and Evaluation Center (CAA Indianapolis from 1939).
TDEFS Technology demonstrator for enhancement and future systems.
TDEU Test and data-extractor unit.
TDF 1 Tactical digital facsimile.
2 Tactical-display framework (Awacs).
TDG 1 Triggered-discharge gauge.
2 Two-displacement gyro.
TDH Tiedown helicopter.
TDI 1 Triple-display indicator [fluid pressure, three dial scales].
2 Tapped delay input.
3 Trade-data interchange, part of Apex.
4 Time-delay and integration (TICM).
5 Time-of-day interface.
TDL 1 Tactical data-link; MC adds management cell; PS adds processing system.
2 Tactical data-loop; S adds system.
3 Trapped delay-line.
4 Truck dock lift.
TDLS Tower data-link services, such as pre-departure clearance and D-ATIS.
TDM 1 Time-division, or -domain, multiplex.
2 Tactical-data management, or modem.
TDMC 1 Time-division, or domain, multiple access.
TDMMS Telemetry Doppler metric measurement system.
TDMS Test-documentation, or tactical-data, management system.
TDO Tornado.
TDöA Time-difference, or delay, of arrival.
TDOP Time-dilution of precision.
TDP 1 Touchdown point; D adds dispersion.
2 Target-data panel.
3 Technology-demonstration, or development, programme, or project.
4 Three-day planning; F/C adds forecast chart.
TDPF Tail-damping power factor.
TDPPS Tracking, or test, data-processing system.
TDR 1 Tail-damping ratio.
2 Takeoff-distance ratio.
3 Tactical-despatch reliability.
4 Transponder [XPDR more common].
5 Traffic-data record.
6 Terminal Doppler radar.
TDRE Tracking and data relay experiment.
TDRS 1 Tracking and data-relay satellite; S adds system.
2 Technology demonstration and [or for] risk-reduction.
4 Tactical-data system.
2 Time/distance/speed scale.
3 Tactical Drone Squadron.

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Tedlar

Tedlar

**teddarop canopy** Of smoothly streamlined shape, usually moulded from one transparent sheet.

**tear off a strip** To deliver spoken reprimand (RAF, colloq.).

**tearoff cap** Lightly sewn fabric parachute cover torn off pack by static line.

**tearstrap** Doubler fastened [if possible, bonded] to skin to arrest progress of tensile crack.

**tease** Faulty operation of circuit-breaker in which snap-action is absent; hence *-free.

**TEB** Tri-ethyl borane.

**TEC** Trans-Earth coast.

1. **Thermal** (or thermo-electric) energy converter.
2. **Thermo-electric** cooler, or cooling.
3. **Tower en-route control**.
4. **Temperature error correction**.

**TECEVAL** Technical evaluation (USN).

**tech** Adjective, to go * = unserviceable (colloq.).

**techint** Technical intelligence.

**tech mod** Technology modernization.

**Technamation** Technical animation, methods for training and educational displays giving illusion of motion, eg flow through pipes, rotation of shafts, etc.

**Technical Assistance Agreements** Bilateral agreements permitting disclosure of sensitive items by the US to the UK, notably concerned with LO technology (10 negotiated by early 2003).

**technical delay** Delay ascribed to fault in hardware, lasting longer than 5 (sometimes 15) min.

**technical despatch reliability** Percentage of scheduled flights which are unaffected by any prior technical fault, but ignoring delays due to other causes.

**technical electronics** All services other than commercial electrics.

**technical intelligence** An amalgam of the ten or more current methods of obtaining knowledge about an enemy’s methods and equipment.

**technically closed** Problem has been solved.

**Technical Standard Order** Establishes quality control for avionics and other equipment; thus TSO’d items bear technical intelligence for reasons other than traffic; not shown in timetable.

**technical survey** Inspection for monitoring (bugging) systems (DoD).

**Techroll** Patent (CSD) configuration for vectoring nozzle of solid-propellant rocket motor in which nozzle drive forces are reduced by fluid-filled constant-volume surround sealed by flexible diaphragm.

**Tecmus** Tactical ECM upgrade system.

**Tecom** Test and Evaluation Command [HQ, Aberdeen Proving Ground, MD 21005–5055] (USA, APG).

**Tecos** Terminal co-ordination system.

**TECR** Technical reason (ICAO).

**Teestat** Nazionale Associazione Tecnici di Stato (I).

**TED** Transferred-electron device.

1. **Tactical** (or threat) evaluation display.
2. **Trailing edge down, or device[s]**.
3. **Threat-environment description**.
4. **Tool and equipment drawing**.
5. **Trace of explosives detector**.

**TEDA** Triethylenediamine.

**Tedlar** Flexible PVF film for surface protection (registered name).
TEEDS

TEEDS  Tactical expendable drone system, for ECM saturation jamming.

TEEE  Tubular extendible element, produced by unrolling steel tape.

tee  Air/ground wind-direction indicator in shape of large T in white, either placed on ground and occasionally rotated or pivoted to base (and in a few cases moved by weather-cocking). Cross-piece is at downwind end of upright.

TE-Ebaps  Transferred-electron electron-bombarded active pixel sensor.

tee connector  T-shaped plumbing connector.

Tee Emm  Training memoranda [and excellent periodical] (RAF).

tee gearbox  One rotary shaft geared to another at 90° at a point other than one end.

tee junction  T-shaped connection of two microwave waveguides.

teetering rotor  Helicopter main rotor with two blades freely pivoted as one unit about horizontal axis transverse to line joining blade tips.

TEF  Total environment facility, for processing reconnaissance data.

Teflon  Trade name (du Pont) for large family of fluorocarbon-resin rubbers and plastics.

Tefzel  Trade name (du Pont) for fluoropolymer resins suitable –100/150°C.

TEG  Tactical exploitation group [satellites].

2 Thermo-electric generator.

tehp  Total equivalent horsepower, normally same as ehp.

TEI  Trans-Earth injection [or injection].

2 Text-element identifier[s].

3 Thermocouple engine instrument.

TEIM  Trans-Earth injection module.

tekites  Small glassy bodies unrelated to surrounding Earth surface and believed of extraterrestrial origin.

TEL  Tetraethyl lead.

2 Teletelbrief.

3 Telephonic (ICAO).

4 Transporter/launcher [USAF].

Telif 4) and radar, on one vehicle.

TELATS  Tactical electronic locating and targeting system (USAF).

telebrief  Direct telephone link between ground personnel, eg air controller or ground crew, and military aircrew seated in aircraft on ground.

telecommunications  Transmission, emission or reception of signs, signals, writing, images or sounds by wire, radio, visual or other EM system; abb. telecom.

teleconference  Conference between participants linked by telecom system.

Telex  Mechanical-remote-control systems in which push/pull commands are transmitted by tube-mounted cable with complex coiled overlayers [able to drive toothed wheel].

telegraph  Telecom using succession of identical electrical pulses.

teleguided  Not a normal expression; could mean a missile guided by radio command or by wires.

telematics  This word does not appear in normal English dictionaries. It appears to mean automatic control over wide areas encompassing several systems.

telemetry  Transmission of real-time data by radio link, eg from missile to ground station; today invariably digital and important in RPVs and unmanned reconnaissance systems. Data can be pressure, velocity, surface angular position or any other instrument output, or any form of reconnaissance output. Telemeter is verb; use as noun arch. Noun is * system or telemetering system.

telemetry intelligence  A branch of sigint, involving analysis of hostile telemetry signals.

teleoperator  Robot for performing mechanical tasks under remote control.

telephone  Transmission of sounds, signals or images by wire or other discrete-path link, eg microwave beam or optical link using free coherent beam or fibres.

telephone box  Figurative enclosure of aircraft whose energy has decayed in air combat to point where he is low and slow and has ‘no place to go’.

telephotography  Photography of distant objects on Earth.

telephotometer  Visibility meter.

teleprinter  Telegraphy with keyed input and printed written output.

teleprocessing  EDP (1) by computer fed by telecom system.

telestan  Television radar air navigation; use of ground radar to feed airborne TV display.

Telesacs  Telematics for safety-critical systems, in particular co-ordination of ACAS, STCA and precision navigation (Euret).

telepresence  Increasing output of space science experiments by use of Internet and broadband satellite communications to involve ground-based researchers.

telescope  In astronomy, instrument for collecting EM radiation (esp. light, radio, IR and X-ray) from extra-terrestrial sources.

2 To reduce overall dimensions by folding or, esp., linear retraction, eg helicopter rotor.

3 To reduce propeller diameter by cropping tips.

telescoped ammunition  Rounds in which the projectile is carried largely within the case, reducing length and increasing propellant energy per unit overall volume.

telescopic gauge  Precision rod sliding in tube and locked to measured dimension, eg hole diameter, subsequently measured by micrometer.

telestarting  To telescope (2, 3).

telestir  Render telecom, usually telephone, conversation unintelligible by scrambling.

2 Dedicated telephone cable plugged into aircraft, especially one armed with NW, waiting on ORP.

telester  US term for teleprinter; hence *-writer; often capital T (registered name).

television  Transmission and reception of real-time imagery by electronic means. Link usually by radio but may be any other telecom form, and imagery usually keyed to sound channel, entire received signal also being recordable by receiver; abb. TV.

television command  See television guidance.

television guidance  Command guidance by radio link sending steering commands from operator watching TV picture taken by camera in nose of vehicle.

telecratology  Technology of smart fasteners.

telltint  Telemetry intelligence.

telling  See track telling.

telltale  An indicator of position external to cockpit,
temperature probe

Such as rods projecting through wing skin to show landing-gear position.

temperatures probe

Tellurium, tellurium

Tellurium Te, semi-metal, density 6.2, MPt 450°C, metal alloys, glass, ceramics, electronics.

Tellis Turbine-engine on-line processing system.

Tem 1 Transmission electron microscope (or microscopy).

Test and evaluation master plan (AFSC).

Technical error message (ICAO).

Technical-objective camera.

Technical military planning operation.

Temporary flight restriction

Order prohibiting unauthorized aircraft from airspace above major accident, natural disaster or other event.

Temporary revision

Document printed on yellow paper which temporarily amends an item in a maintenance manual [now also issued electronically].

TEMS Turbine-engine monitoring system.

TEN Tactical environment network (USMC).

Tenbase T A standard high-capacity databus (Ethernet).

tenacity

Exploitation of national capabilities (US).

TEND Trend forecast.

tendency

Variation with respect to time, esp. change in atmospheric pressure in 3 h period prior to an observation.

Tenley Secure voice system for Tri-Tac, for NSA (US).

Tensabarrier

Such as flight-control circuit; can be used for flexible braking wires.

Tensioned Skin

Patented method of assembling circular-section structure from 3-D segment panels with skin under tension [Aviation Traders].

Tensioner

Section structure from 3-D segment panels with skin under tension.

Tensile force per unit cross-section required to cause rupture.

Tensile stress

That produced by two external forces acting in direct opposition tending to increase distance between their points of application.

Tensioner

Measures actual tensile stress in flexible cable, such as flight-control circuit; can be used for flexible braking wires.

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Tensioner
tephigra,

tephigram Graphical plot of atmospheric temperature and entropy on grid of intersecting isothermals and isentropic lines against vertical axis of height (decreasing pressure levels); also written Teph gram, for temperature and entropy. Pronounced tee-fee-gram.

tepigen Television picture generation (or generator).

tepop Tracking-error propagation and orbit prediction.

TER 1 Triple ejector rack.

2 Total-energy requirements.

TERA Terminal effects research and analysis.

terabit One trillion bits/s.

teraflop One trillion flops = 10^{12} \text{ operations per second}.

TeraGrid Most powerful computing system, created in US under auspices of NSF by linking 3,300+ processors to give speed of 13.6+ teraflops and storage of 450+ trillion bytes.

terbium Tb, soft silvery metal, density 8.23, MPt 1.356°C, importance growing.

terc Tactical electronic reconnaissance (Litton).

Terec Tactical electronic reconnaissance (Litton).

TERLS Thumba Equatorial Rocket Launching Station (UN facility in India).

TERMM Terminal and en route nav.

TERPS Tactical electronic reconnaissance processing system (primarily USN/USMC).

terminating bar lights Lights and wing-bar lights.

terminating bar lights In final approach clearance.

terminal Termination module.

Terminal and en route nav.

terminal VOR VOR located at or near airport at which particular flight terminates and specified as navaid used in final approach clearance.

terminal velocity Highest speed of which an aircraft (rarely, other aircraft) is capable, reached at end of infinitely long vertical dive at full power through uniform atmosphere (suggest arch.).

terminal radar service area Primarily an electronic environment, not extending below a floor at medium FL, providing radar vectoring and sequencing of all VFR and IFR aircraft landing at primary airport, separation of all aircraft in TRSA service area, and advisories on all unidentified aircraft on a workload-permitting basis.

terme 1 US term for tinned, or lead-coated, mild steel sheet (not plate).

terne plate US term for tinned, or lead-coated, mild steel sheet (not plate).

terp 1 Turbine-engine reliability programme.

2 Terminal instrument-approach procedure [see Terps].

Terps Tactical electronic reconnaissance processing and evaluation system (primarily USN/USMC).

Terprom Terrain profile matching, usually similar in principle to Tercom.

Terps Terminal en-route procedures (FAA).
tertiary airflow

tertiary airflow

tertiary airflow System, usually radar-based, providing pilot or other crew member with situation display of ground or obstacles ahead which project above either horizontal plane parallel to aircraft or plane containing aircraft pitch/roll axes so that pilot can manoeuvre aircraft laterally to avoid obstruction. Radar becomes primary flight instrument.

terrain board

terrain board Physical model of landscape formerly used in simulation of air activity.

terrain-clearance system

terrain-clearance system System, usually radar-based, providing pilot or autopilot with climb/dive signals such that aircraft maintains preset flight level while clearing peaks within selected height in vertical plane through flight vector. Unlike terrain-following, after each protruding peak aircraft levels out at prescribed FL.

terrain comparison

terrain comparison See Tercom.

terrain database

terrain database Comprises computer-stored 2-D grid of ground spot heights plus land culture information.

terrain-following system

terrain-following system System, usually radar-based, which provides pilot or autopilot with climb/dive signals such that aircraft will maintain as closely as possible a selected lo height above ground contour in vertical plane through flight vector. In effect system projects radar ski-toe locus which slides over terrain ahead to give minimum safe clearance.

terrain masking

terrain masking Obscuration of aerial and other targets by hills or buildings, esp. as seen at acute grazing angles by overland downlook radar.

terrain orientation

terrain orientation Holding topographical map so that aircraft heading is at top of sheet or folded sheet.

terrain profile

terrain profile Outline of profile of ground surface, usually with vertical scale × 5 (sometimes × 10) published on approach chart or other documents to assist pilots.

terrain-profile recorder

terrain-profile recorder Airborne instrument, recording sensitive radar or laser altimeter, giving hard-copy readout for mapping and surveying.

terrain-referenced navigation

terrain-referenced navigation Terrestrial reference guidance.

terrestrial radiation

terrestrial radiation Earth IR radiation; also called eradiation.

terrestrial reference guidance

terrestrial reference guidance Any method providing steering intelligence from characteristics (usually stored as quantified digital measures) of surface being overflown, thereby achieving flight along a predetermined path without the need for emissions. One example is Tercom. Also called terrain-reference (or referenced) navigation.

terrestrial refraction

terrestrial refraction Refraction observed in light from source within Earth atmosphere; thus caused only by inhomogeneities of atmosphere itself.

terrestrial scintillation

terrestrial scintillation Generalized term for scintillation effects observed in light from sources within Earth atmosphere: also called atmospheric boil, optical haze and shimmer.

Tesri

Tesri Series of EW jamming and aerial-pattern simulators.

tertiary airflow

tertiary airflow That passing through tertiary holes.

tertiary holes

tertiary holes Apertures in gas-turbine flame tube or combustor downstream of secondary holes admitting air purely for dilution and cooling purposes to achieve desired uniform gas temperature across chamber exit plane.

tertiary initiation

tertiary initiation Impact with Earth’s surface, especially land (NW).

TERTM

TERTM Thermal-expansion resin transfer machine.
thermal de-icing

2 Theater high-energy laser (US, Israel).

Thelact Tactical high-energy laser advanced-concept technology.

The LTAS The Lighter-Than-Air Society [Akron, OH 44306] (US).

Themis Thermal-emission imaging system.

Then Year Actual funds voted or spent; must be factored for inflation to enable comparison to be made with ‘now’.

theodolite Optical sight or telescope whose azel can be accurately read off angular scales.


theoretical gravity That at Earth’s surface if Earth’s mass was reshaped as perfect sphere.

theoretical thrust coefficient A thrust/time value for solid-propellant rockets computed from large equation involving an effective value and assumed conditions for various areas and pressures. Symbol Cm-1.

therapeutic adaptor Coupled to continuous-flow oxygen mask, approximately triples flow rate; used for passengers with respiratory or heart problem.

therapeutic oxygen Administered primarily to treat ailments, eg pulmonary or cardiac faults.

therm Non-SI unit of energy = 1010 BTU = 105.506 MJ.

thermal 1 Local column of rising air in atmosphere, usually caused by surface heat source.

2 To use (1) as energy input for soaring flight.

thermal acoustic fatigue Fatigue of structure caused by impingement or close proximity of hot gas jet.

thermal anticling Anticing by heating affected surface.

thermal barrier Notional barrier to further increase in some variable, eg flight speed in atmosphere or turbine entry temperature in engines, caused by inability of materials to withstand increased temperatures. Continually being eroded by new refractory materials.

thermal barrier coating Vast range of refractory materials, usually deposited by electron beam or plasma spray, based on zirconia, yttrium and similar exotics.

thermal battery Electrical cell stored inactive and activated chemically for one-shot high-power output.

thermal blooming See blooming.

thermal coating See thermal barrier coating.

thermal coefficient of expansion Increase of (1) length per unit length, or (2) area per unit area, or (3) volume per unit volume, caused by rise in temperature of 1°C (often defined as from 0° to 1°C, or from 15° to 16°C).

thermal conductance Rate of flow of heat per unit time through unit cross-section area; 1 BTU.ft-2h.°F = 5.67826 Wm-2h.°C; 1 Wm-2h.°C = 0.17611 BTU.ft-2h.°F.

thermal conductivity Time rate of flow of heat through unit area normal to temperature gradient per unit T° difference. Symbol λ or k, rate given by Fourier’s law. SI unit is Wm-1K-1; Imperial (obs.) might be BTU ft-1°F.

thermal cueing unit Adjunct to FLIR-based attack system which puts marker boxes round all likely surface targets, picking them according to their high temperature, and which automatically feeds target co-ordinates to the attack system if any of these boxes is touched by the pilot on the HDD touch display.

thermal cycling Oscillating between low and high temperatures.

thermal de-icing De-icing by heating affected surface.
thermal diffusivity

thermal diffusivity  Measure of transfer of heat by diffusion analogous to viscous motion; symbol $\alpha = \lambda / \rho C_p$.

thermal diode  Solid-state generator of electricity comprising layer of semiconductor at room temperature joined by thermal insulative layer to layer heated to 250–450°C.

thermal efficiency  Basic efficiency parameter of heat engine, defined as percentage ratio of work done in given time to mechanical equivalent of heat energy burned in fuel supplied in same period. Usual symbol $\eta$.

thermal emission  EM radiation solely due to body’s temperature (which if hot enough contains strong visible radiation).

thermal excitation  Acquisition of excess energy by atoms or molecules as result of collisions.

thermal expansion  Increase in dimensions caused by increase in temperature.

thermal exposure  Calories/cm² received by normal surface in course of complete NW detonation (DoD).

thermal fatigue  Mechanical fatigue caused by stresses repeatedly imposed by thermal cycling.

thermal gradient  See temperature gradient.

thermal gradiometer  Airborne instrument for detecting thermals by thermocouples on wing-tips which, in presence of temperature difference, sends electrical signal to cockpit indicator.

thermal heating  Tautological; kinetic heating is meant.

thermal imagery  Produced by measuring and electronically recording thermal radiation from objects (NATO). Normally IR wavelengths only are implied. Hence thermal imaging, to produce pictorial displays or printouts showing variation of temperature over field of view.

thermal index  A forecast value of the temperature difference between sinking and rising air.

thermal instability  Any combination of temperature gradient, thermal conductivity and viscosity resulting in convective currents, eg wind in atmosphere.

thermal keel  Generated by positioning engine jet nozzles well forward under the fuselage [helps reduce generation of sonic boom].

thermal lift  Lift due to thermal (1). 2 Lift imparted to air mass because of greater density of cold surrounding air, not quite synonymous with (1).

thermal load  Imprecise term usually meaning temperature gradient or temperature stress.

thermally expanded metal  Fabrication of parts from aluminium alloy sheets rolled together with intervening patterns of ‘ink’; the latter prevents the sheets bonding and, on subsequent heating, expands to force the unbonded parts to fit a mould.

thermal neutron  Neutron slowed, eg in moderator, to thermal equilibrium with surroundings at about 2.200 m/s (so-called slow neutron); * analysis is principal method used in detecting presence of explosives.

thermal noise  RF noise caused by thermal agitation in dissipative body (any conductor or semiconductor), also called Johnson noise.

thermal paint  Paint which changes colour very precisely as the component is heated, afterwards remaining at the colour appropriate to the highest temperature reached.

thermal picture synthesizer  Matrix of heat-emitting thin-film resistors on Si substrate, each representing individually addressed pixel to give overall large picture of 50 Hz.

thermochemistry

thermal protection  Protection against kinetic heating during atmospheric entry (re-entry) of spacecraft structure, RV or other body, esp. one intended for repeated space missions.

thermal pulse  Total IR emission from NW detonation, or plot of IR flux against time during complete burst and fireball climb.

thermal radiation  1 See thermal emission. 2 Total heat and light radiation produced by NW detonation (DoD).

thermal relief valve  Safety valve in fluid system to guard against excessive pressure caused by overheating.

thermal runway  1 Fault condition with element of danger affecting Ni/Cd batteries characterized by particular cells losing resistance (possibly because of high temperature) and thus taking increased current, lowering resistance still further in chain-reactive process. 2 Similar divergent overheating in current-carrying transistor.

thermal sensitivity  Of IR camera, quantified difference in temperature required to output different tonal value between black/white, typically 0.02–0.1°C.

thermal shock  Severe mechanical stress resulting from sudden extreme temperature gradient.

thermal soaring  See soaring.

thermal stress  See temperature stress.

thermal switch  Switch activated by temperature difference or particular temperature.

thermal thicket  Flight conditions in which kinetic heating (or other thermal problems) is a factor to be considered but does not yet impose a thermal barrier (colloq.).

thermal wind  Notional vector difference between winds at different heights, caused by horizontal variation of atmospheric temperature and hence pressure at all upper heights (note: not pressure surfaces).

thermal X-rays  EM radiation, mainly in soft (low energy) X-ray region, emitted by extremely hot NW debris.

thermoelement  See Seebeck element, eg thermocouple, thermopile.

thermoelectric effect  Non-SI unit of work (mechanical energy); 1 th = 4.1855 MJ.

thermionic  Involving electrons emitted from hot bodies.

thermionic converter  Electric generator powered by hot emitter and cold collector.

thermionic rectifier  Depends on unidirectional electron flow from cathode to anode.

thermionic tube  See thermionic valve.

thermionic valve  Evacuated capsule, usually glass, containing heated cathode emitting electrons attracted to anode, usually via one or more intervening control electrodes usually called grids. In US called vacuum tube.

thermistor  Protective resistor based on semiconductor having high negative temperature coefficient of resistance.

thermite  Mixture of finely divided magnesium and iron oxide used as heat source in welding and as incendiary filling; originally spelt with capital T.

thermobaric warhead  Creating both high-temperature and blast-wave effects [often said of FAE].

thermobarograph  Provides continuous readout of temperature and pressure.

thermochemistry  Branch of chemistry concerned with
thermochromic
thermochromic  LO technology in which appearance is changed by variation in temperature.
thermochromic tube  CRT with phosphor replaced by heat-sensitive layer.
thermocline  Sharp submarine temperature gradient.
thermocouple  Instrument based on Seebeck effect which measures temperature difference between pair of dissimilar-metal junctions; much used for high-temperature measures using refractory metals, and in common copper/constantan junction at room temperature, eg for met. observation.
thermodynamics  Science based upon heat flow and temperature changes, esp. those in moving fluids.
thermodynamic cycle  Operating cycle of any heat engine. In some, eg virtually all piston engines, one parcel of fluid at a time goes through complete ** in same enclosed (usually variable-size) volume; in others, eg gas turbines, continuous flow of fluid goes through ** by passing from one part of device to another, each component handling only one part of **. The working fluid may be recycled, continually changing state liquid/vapour.
thermodynamic efficiency  See thermal efficiency.
thermodynamic energy equations  Exact expressions of variation of pressure, volume and temperature in reversible processes in perfect gas.
thermodynamic equilibrium  Time-invariant state in which all processes are balanced by reverse process and entropy production vanishes.
thermoelectric cooling  Local cooling using Peltier and cooling 'hot' junction; 'cold' junction then falls to desired level at -20 to -30°C.
thermoelectric generator  Electric generator based on thermocouples using Seebeck, Thompson, Kelvin or Peltier effects; common spacecraft systems use nuclear reactor or radio-isotope to heat junction often based on Ge/Si alloy.
thermogram  1 Single-line output of traditional thermograph.  2 Pictorial output of thermographic camera.
thermograph  Recording thermometer using pen/chart or light-spot trace on film. Output is a thermogram.
thermographic camera  IR camera, usually of IRLS type.
thermography  Translation of temperature changes in a scanned scene into visual picture, today important in military and civil aerial reconnaissance, industrial process control, medicine and many other fields. Either black/white (black = cold, white = hot) or colour.
thermohydrometer  Hydrometer with thermometer, giving two chart outputs.
thermometer  Instrument for measuring temperature.
thermometer screen  Louvred box screening thermometer from direct sunlight; usually contains other met. instruments and in US called instrument shelter.
theronuclear  Processes in which extremely high temperatures are used to initiate fusion of light nuclei.
thoronuclear weapon  Hydrogen bomb.
thermopile  Thermoelectric generator comprising stack of thermocouples.
thermoplastic recording  Patented (GE) process for recording sound or video signals via electron beam direct on thermoplastic layer heated by microscopic currents induced in underlying conductive layer.
thermoplastics  Large class of synthetic polymers which may be repeatedly softened and remoulded by heating.
thermosetting plastics  Synthetic polymers that are chemically changed irreversibly by chemical action, for example a hardening agent, or by EM radiation, notably heat or UV irradiation, generally setting hard.
thermosphere  Outermost region of atmosphere from top of mesosphere outwards into space, characterized by more or less steady increasing temperature with distance from Earth.
thmostat  Device for maintaining a desired temperature by taking action at preset limits of low and high temperature.
thermotrophic model  Atmosphere used in forecasting one temperature and one pressure surface.
Thesh  Threshold, also Thld, THR.
theta  Greek letter θ, used for many parameters, including pitch angle (thus, θ = pitch rate) and azimuth (hence Rθ). See Appendix 1.
THI  Tactical hit indicator.
thickened fuel  Aircraft fuel designed to resist fine dispersion and instead to break down in crash into globules with near-zero surrounding vapour; generally synonymous with gelled fuel.
thick-film  Very diverse technology of electronics involving processing, high-current devices, current-generation (inc. solar cells) and many other topics, mainly using insulating substrates but often with semiconductor layer.
thickness  1 Of wing, maximum straight-line distance from external skin of upper surface to external skin of lower surface measured in plane of aerofoil profile and perpendicular to chord line.  2 According to some authorities, measured perpendicular to camber line.
thickness/chord  Ratio of thickness to chord of wing, both measured in plane of aerofoil profile at same station.
thickness distance  Distance aft of leading edge of maximum thickness of supersonic rhomboidal or double-wedge wing, expressed as % chord.
thickness gauge  See feeler gauge.
thickness lines  Lines joining points on chart where vertical distance between pressure surfaces is everywhere same.
thickness ratio  Wing t/c ratio.
thimble  1 Pear-shaped eye around which end of control cable is spliced.  2 Ratchet turning knob of hand micrometer.  3 Pimple-like radome, especially on or under nose (usually adjective).
thin-aerofoil theory  For most modern transonic aerofoils t/c is low enough for it to be assumed that thickness along the camber line is zero.
thin-case bomb  Conventional bomb for blast effect against soft target. Also called light-case (UK, WW2).
thindown  Progressive energy loss by primary cosmic rays in ionising surrounding medium.
thin-film circuit  Electrical or electronic circuit formed by depositing thin film on (usually insulating) substrate; normal manufacturing methods are vacuum deposition and cathode sputtering. Films may be conductive, semiconductor or insulating.
thin-film lubrication

thin-film lubrication Imperfect, with occasional metal/metal contact.
thin-film transistor IGFET constructed by evaporating on to insulating substrate metal electrodes, semiconductor layer(s), insulating upper layer and metallic gate; abb. TFT.
think tank Centralized group of people normally working for government or large corporation engaged in futures, forecasting, ultra-new technologies and other disciplines calling for visionary judgement.

thin route Airline route, usually intercontinental, offering only modest traffic.
thin-tape system Applied to aircraft skin to increase stealthiness of joints.
THIR Temperature, humidity and IR radiometer.
third-angle projection Convention in engineering drawing in which front view, side elevation and plan each show face nearest to it in adjacent view; traditional US arrangement becoming standard in European aerospace.
third-level carrier Generalized term for ‘third tier’ of scheduled airline operations, also called feeder or commuter and often of radial nature serving single city hub. No clear demarcation separating from second-level (local-service or regional).
thixotropic Becoming liquid when vibrated or stirred, setting after standing for a period.
THK 1 Turk Hava Kurumu [national air-sport association; office, TR-06100 Ankara] (Turkey).
2 Thick.
THL 1 Tailplane hinge line.
2 Tourelle helicoptere leger (F).
Thld Threshold.

ThN Thin.
ThO₂ Thorium oxide.

Thor, THOR 1 Thermionic opening reactor (burst power up to GW range).
2 Thermaertz operational reachback (Darpa).
thoriated Of a TIG electrode, impregnated with thorium oxide.
thorium Th, silvery radioactive metal, density 11.7, MPt 1,750°C.
Thornel Tradename for carbon and graphite fibres.
thou Thousandth of an inch, 25.4 μ.

THP 1 Thrust horsepower, often thp. 2 Through-hole plated.
3 Turbo-hydraulic pump.
4 Total-head pressure.

THR 1 Threshold, threshold lights.
2 Turboærcuteur à hélice rapide = propfan (F).
3 Thrust.
thread chaser Tool for removing contamination, eg paint or dirt, from thread.

thread filter Long fine screwthread on outer surface of cartridge inserted tightly into surrounding unthreaded cylinder to filter fine fragments, typically as last-chance * before oil reaches vital feed jets.
thread gauge Hand gauge with many specimen threads, one of which is matched with part.

threading the needle Process of accurately flying through a small gate in airspace, eg in setting a speed record (colloq.).

three greens

thread insert Steel helix screwed into soft (eg aluminium) hole.
threat 1 Hostile anti-aircraft defences, especially air defence radars, SAM systems, AAA and fighters.
2 A target that has satisfied the *-detection logic and therefore requires a traffic or resolution advisory (TCAS).

Threat awareness unit Minimum time flight crew need to discern collision threat and take avoiding action; performance envelope of aircraft divided by closure rate of intruder.
threat circle Projected on cockpit display showing computed region in which LO aircraft might expect to be detected by particular hostile radars.
threat cloud Total collection of warheads, chaff and other penetration aids in ICBM attack.
threat evaluation Process of detecting, analysing and classifying hostile offensive systems, either in warning of attack or during penetration of hostile territory when systems are surface-to-air.
threat library Numerical characteristics of hostile threats, especially EM emitters, stored in friendly computer (eg of RWR receiver).
threat simulation Simulation of hostile offensive systems, eg by add-ons to RPV target to include emissions, dispensed payloads and jamming.

1AF Association Aéronautique Astrophysique de France; PAN adds Phénomènes Aérospatiaux Non-identifies [UFO].
three-axis autopilot Has authority in pitch, roll and yaw.

three-bar VASI Comprises VASI plus additional pair of upwind (210 m, 700 ft) wing bars symmetrically disposed about centreline each having at least two light units, for use by LEW aircraft.
three-hay biplane Natural extension from two-bay.
three-bearing swivel module 3BSM, turbofan jetpipe comprising three sections with scarfed (diagonal) joints, such that rotation of the middle section causes the final portion to vector from horizontal to vertical (or slightly beyond). In some designs the whole unit can rotate relative to the aircraft to provide yaw control.
three-body problem Mechanics of motion of small body in gravity of two others.

3BSM Three-bearing swivel module (STOVL).
3BV 3-bar VASI.
three-control aeroplane Conventional, with separate pilot input for each rotational axis.

3-D cam Cam whose profile varies across its width and which moves axially as well as rotationally.
3-D flow Fluid flow which cannot be represented fully in 2-D, eg flow over a real wing.
3-DOF Three degrees of freedom, usually about orthogon al axes.

3DQP Three-dimensional quartz-phenolic.
3-D radar Radar enabling position of target to be determined in 3-D space, either by Cartesian methods or, more often, by az/el plus slant range.
3-D tool Jig or fixture used to define exact shape of finished assembly, eg complex hydraulic piping or wiring loom.
3E Environment, efficiency, economy.
three-floating seaplane Main float on the centreline and stabilizing float on left and right.

3GCS Third-generation cellular system(s).
three greens Landing gear is down and locked (colloq.).
3He

3He Helium, valency 3.

3LM Third-level maintenance.

three-moment equation For solving bending moments and other loads at ends of two adjoining spans of continuous beam.

3-P Planning, production, progress.

three-phase current Alternating electrical current made up of three phases, each with vector separation of 120°, carried by triple wire.

three-phase equilibrium See triple point.

three-pointer altimeter Dial instrument with short needle for thousands (ft or m), mid-length for hundreds and longest for tens.

three-point landing Correctly judged landing by tailwheel-type aeroplane in which main and tail wheels touch ground simultaneously with wing stalled.

three-point mooring Mooring for aerostat in which three lines are run (often from single point, eg nose of airship) to three ground anchors, usually at apices of equilateral triangle.

three-point tanker Equipped with two outer-wing HDUs and one at the tail.

3-pole switch Opens and closes three conductors or circuits.

three-poster STOVL or V/STOL vectored-thrust propulsion system having three jets; normally two cold fan jets and one hot core jet, but alternatively two main (rear) jets plus an auxiliary nose jet fed via a bleed air duct.

three-shaft engine Gas turbine having LP, IP and HP shaft systems.

three-stream engine 1 Turbofan (HBPR) in which fan thrust (probably VIGV modulated) and core jet are used for propulsion and LP compressor (core supercharger) is used for blowing purposes.

3 To 1 rule Any engine in which fan thrust, core thrust and lift thrust or bleed are used separately.

3-to-1 rule Air distance 3 n.m. for each 1,000 ft lost in letdown.

3-view drawing GA drawing, normally showing elevation (left side), front and plan.

3-way switch Routes input along either of two outputs.

3-wire Target of most carrier arrested landings, No 3 wire; hence ** landing.

3-wire circuit Neutral wire between two outer wires, latter having potential difference from neutral equal to half that between them.

threshold 1 Beginning of usable portion of runway, ie downwind end.

3 In automatic control systems, point at which response is first noticed, usually defined in terms of input displacement (see * level).

3 Flight condition when fixed-wing aerodyne is on point of stall.

3 Point at which sound just becomes audible (* of audibility or of hearing), normally 2 × 10−6 N/m².

3 EAS giving lowest comfortable cruising, possibly higher than that for minimum fuel.

3 See thresholds.

threshold contrast Smallest contrast in luminance visible under given conditions.

threshold crossing height Height of glideslope above threshold.

threshold curve Plot of sound frequency against noise level in dB (or other noise measure) just audible against quiet background, eg anechoic chamber.

threshold displacement Linear distance between end of full-strength runway pavement and displaced threshold, with latter shown on airfield charts as white bar across runway crossed by narrow black line, and expressed as minus quantity in certain navaid figures, eg Vorloc II = −380 ft.

threshold dose Minimum quantity of radiation producing detectable biological effect.

threshold illumination Minimum value of illuminance eye can detect under given dark adaptation and target size; also called flux-density threshold.

threshold level Threshold (2), esp. in rate gyro developing electrical output as function of rate of turn; that angular rate after rotational acceleration from rest at which there is first indication of output, or change in output; normal unit is s⁻¹ × 10⁻⁶.

threshold lights If fitted, bidirectional units, showing green towards approach and red towards runway, in continuous row across threshold (rare at displaced threshold).

threshold limit value Average airborne concentration of toxic substance(s) normal person can withstand 8 h per day 5 days per week, usually expressed as ppm or mg/m³ at 25°C/760 mm Hg.

threshold marking For simple runway, runway number in white, visible to pilot on approach; if displaced threshold, preceded by white transverse bar touched by four arrowheads pointing upwind and preceded by series of centreline arrows. For instrument runway, four bold white axial stripes in rectangular group on each side preceding runway number.

thresholds Limits on programme monetary changes imposed by US Defense Secretary.

threshold sampling time Time since overhaul at which engines are removed and inspected in preparation for extension in TBO; * may be less or more than new TBO.

threshold speed V₁, V₅₀ and V₇₅.

THR HOLD Thrust, or throttle, hold.

THRFR Thereafter.

throat 1 Point of smallest cross-section in duct, especially that in con/di nozzle, supersonic tunnel upstream of working section, gas-turbine rotor blades and rocket engine or motor thrust chamber and nozzle.

2 Entry to windsock.

throatable Jet or fluid flow controllable by changing shape or area of throat (unusual except in tunnels).

throat control In gas turbines, system controlling flow through nozzle guide vanes upstream of turbine.

throatless chamber Rocket thrust chamber without throat yet still achieving supersonic expansion, eg multi-chamber toroidal type.

throatless shear(s) Power shear for cutting large sheet or plate which may be rotated during cut to leave curved edge.

throat microphone Microphone held against skin of throat; better for deep or guttural voices or languages.

throttle 1 Input control, usually hand lever rotating through arc, for main vehicle propulsion.

2 System responsible under pilot for varying engine power.

3 Valve in carburettor or fuel control which governs
throttle back

admission to engine of either air, fuel or (piston engine only) mixture.

4 To reduce power of engine, also called to * back.
5 To constrict fluid flow path and thus reduce mass flow.

throttle back To reduce power.

throttle friction Pilot-operated device which greatly increases resistance of throttle lever(s) to movement, effectively locking them in set position; also called friction lock.

throttle icing Ice accretion in carburettor near or on partially closed throttle (3).

throttle lock See throttle friction.

throttle push Pilot action to increase power.

throttle sensitivity Change in thrust or power per unit movement of throttle lever.

throttle tension Locking resistance value of friction lock.

throttling capability Range of thrust expressed as percentage to 100, over which liquid rocket (occasionally other type of engine or propulsion)is designed to operate.

through-deck ship Generally, one with flight deck unobstructed by any full-width superstructure, even though not necessarily extending to bow.

through hardening Heat treatment or other procedure which increases hardness through the entire piece of metal [see case hardening].

through-stick feedback Characteristic of some autopilots that, when engaged, pilots flight controls move.

through-thickness pinning Repair of major damage to composite structure in which numerous fine pins are collapsed by a foam carrier.

throw 1 Part of crankshaft to which conrod attached, comprising webs and crankpin.
2 Loose measurement of distance to which ECS fresh-air inlet projects, in absence of bulk cabin air movement.

thrower ring Flange on rotating shaft which flings off leakage oil or other fluid.

throw-off clutch Mechanical shaft drive which automatically disconnects as a particular condition is reached [in starting an engine, when torque falls to zero].

throw weight Total mass of payload carried by ballistic missile, in case of ICBM including warheads, RVs, decoys and other penetrants, post-boost propulsion and terminal guidance systems.

THRP Port throttle (caption).

THRS Starboard throttle (caption).

THRU, Thru 1 Through.
2 I am switching you to ...
thrust horsepower

only in highly supersonic aircraft, in which area of propelling nozzle exceeds that of engine.

thrust horsepower Seldom-used measure attempting to determine power imparted to aircraft. For propeller aircraft normally engine bhp or shp multiplied by propeller efficiency (in case of turboprop plus a variable component due to exhaust thrust). For jet engines, basically thrust actually imparted to aircraft multiplied by TAS, keeping units compatible. See equivalent horsepower.

thrust lever Jet-engine throttle, or power lever.

thrust line Thrust-engine axis.

thrust loading W/F, total mass (in this case, weight) of jet-propelled vehicle divided by aggregate thrust, usually calculated for SLS-TO condition; units lb/kN = 224.8 lb/lb st, reciprocal 0.00448; 1 lb/lb st = 0.4535 kg kN-1, reciprocal 0.0098.

thrust meter Instrument for measuring thrust, more commonly of jet engine.

thrust power Appears always to be synonymous with thrust horsepower.

thrust rating computer Central element in auto power management system (ATS).

thrust rating panel AFCS cockpit display of limiting and target values of engine parameters, and selectors for operating mode (climb, cruise, MCT or TO/GA) or FTO temperature(s).

thrust reverser See reverser.

thrust section Portion of vehicle, esp. slender rocket, containing propulsion.

thrust specific fuel consumption See specific fuel consumption.

thrust spoiler Pilot-controlled spoiler which when actuated diverts jet from jet engine (esp. from turbofan core) to reduce thrust close to zero. Lighter and simpler than a reverser and merely eliminates possibly embarrassing idling thrust.

thrust structure In large ballistic vehicle propelled by multiple rocket chambers, structure which transmits thrust from all chambers and diffuses it into airframe. Normally large tubular truss structure at rear but can include side structures for laterally attached motors, eg SRBs.

thrust terminator Any quick-acting device for terminating thrust of solid rocket motor, including blow-off ports, nozzle ejection and inert-liquid injection into case.

thrust time lag Time from abrupt throttle movement to reach stabilized thrust or power.

thrust-vectoring Control of vehicle trajectory by rotating thrust line, esp. that of rocket; may involve gimbaled chamber, rotation of chamber about skewed axis, inert-liquid injection at nozzle-skirt periphery, jet tabs, spoilers, refractory vanes and other methods; abb. TVC.

thrust-weight ratio Basic measure of combat aeroplane performance; thrust (normally SLS-TO) divided by total mass of aircraft.

thrust wire Diagonal bracing wire transmitting airship propulsion thrust to envelope.

THRUTh Throughout.

THS Tailplane, horizontal stabilizer [a tautological usage].

THSÀ Trimable horizontal-stabilizer actuator.

THSD Thousandaad[s].

THT Transient heat transfer.

THUM, Thum Meteorological readings of temperature and humidity, hence * flight.

thumb-down Pilot’s visual confirmation of “switches off.”

thumbnail Common meaning is aircraft T/W (thrust: weight ratio) plotted against W/S (wing loading).

thumbstick Pilot input controller, eg for RPV or anti-tank missile, in form of miniature stick operated by thumb, typically attached to pistol grip and with * pivots between vertical thumb and operator.

thumb up Pilot’s visual confirmation of “contact”.

Thump Meteorological readings of temperature, humidity and pressure.

thunderstorm effect Error, possibly approaching 180°, of ADF in vicinity of thunderstorm; needle may point to nearby Cb or flick over, giving false indication of station passage.

thyatron Gas-discharge triode used as relay, switch or sawtooth generator.

thyristor Multilayer semiconductor device also called Si-controlled rectifier; bistable, in one state high-impedance in both directions, in other high-impedance in one direction only.

THz Terahertz.

Ti 1 Target indicator.

2 Thermal imager, or infra-red.

3 Training [or tactics] instructor.

4 Trial installation.

5 Thermal index.

6 Tertiary initiation (NW).

Ti Titanium: hence such alloys as Ti3Al2.5V, Ti6Al4V, Ti6Al2Sn4Zr2Mo and Ti10V2Fe3Al.

Tib, Tibs, TIBA, TIBS, TIB 1 Technical information broadcast service (USAF).

2 Telephone information briefing service.

TiB: Titanium boride.

TIC 1 Technical information centre.

2 Tantalum integrated circuit.

3 Target-insertion controller.

4 Total inventory count.

5 Transport & Infrastructure Committee (US House of Reps.).
tic

6 Technologies of information and communication (also F).
7 Turbine impingement control.

tic Visual marking pulse on telemetry readout indicating time intervals, often every 0.5 s (see time *).

TICA Technical Information and Communications Committee (ATA).

TICCS TIC’S Target information command and control system.

tick Audible marking pulse serving as regular (often infrequent, eg each 10 s or 60 s) time signal.

ticket Pilot’s licence (colloquial, especially pre-1914).

TICM Thermal-imaging common module(s).

TICO Titanium-colomboium.

Ticonal Magnetic alloy of Ni/Co plus a little Al/Cu.

tic-tac-airplane Miniature free-flight aircraft for sonic-boom research.

TID / Tactical (or target) information display.

TIDP Terminal interface function.

TIDT TIDP Thermal-imaging system with data-processing.

TIEC Thermal-imaging common module(s).

TICM Technical Information and Communications Committee (ATA).

TIM Target information command and control system.

Time Interval Management System.

Time signal Audible marking pulse serving as regular (often infrequent, eg each 10 s or 60 s) time signal.

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TIME

TIME 2 Training integrated [or integration] management [S adds systems].

3 Target information module.

TIME Top Industrial Managers in Europe (Int.).

time Normally measured by subatomic frequency reference, eg crystal clock, but defined according to position of celestial reference point; depending on which point chosen * called solar (Sun), lunar (Moon) or sidereal (vernal equinox), solar being subdivided into mean or apparent according to which Sun. Practical time designated GMT or according to designated longitude zone. SI unit is s, 3,600 to h, 86,400 to week.

timebase Straight line traced by spot on CRT or other display of cartesian and several other types providing timescale for measurement, eg of target range.

2 Straight line, regularly incorporating time tic, on data readout.

time between overhauls, TBO Period recommended by manufacturer and beyond which all warranties become invalid and operation may be in violation of certification.

time box Small box, usually rectangular or square, which moves along cockpit display future track, according to flight plan, at selected groundspeed.

time-change item One whose operation is limited to number of operating hours, number of operating cycles or (rarely) passage of time, and which must be periodically replaced on this basis.

time circle Basic symbology of many HUDs and other attack systems in which bright circle starts at 60 s and unwinds anticlockwise to 180° at 30 s and to vanish at 0 s.

time-compliant technical order Mandatory instruction for modification or for retrofit of equipment.

time constant Usually, time taken from start of input signal for instrument to indicate specified % final reading: for exponential response, eg thermometer, time to reach 63.2% final reading; also called relaxation time, lag coefficient. Same meaning in charge/discharge of electrical CIR circuit or current in L/R circuit.

2 Time taken for aeroplane to reach maximum angular velocity [any axis] after hard-over control input.

TIMED, Timed Thermosphere, ionosphere, mesosphere, energetics and dynamics satellite launched 2001 (NASA).

time dilation Apparent slowing-down of time as observer’s speed reaches significant fraction of that of light; also called clock paradox or twin paradox.

time dilation of precision Measure of error [usually in navigation] resulting from errors or variation in measured or calculated time.

time/distance/speed scale Simple written scale, either purchased (in which case of alderule type) or prepared before flight, with which unknown distance or speed can be immediately read if other two factors are known.

time/division multiplex Dividing several continuous measures, eg in telemetry system, or several input signals, to form single continuous interlaced pulse train sent over single channel to multiple receivers.

time/division multiplex access When multiple transmitters are using a single carrier the carrier is time-shared to avoid messages being garbled at receiver.

time group Four digits denoting time in hours and minutes, such as 1730.

time back Time at which a future event is scheduled, eg at which a particular squadron is to start engines (colloq. chiefly military).

time in service For maintenance time records, aircraft log and similar purposes, elapsed time from aircraft leaving surface until touching it again on landing (FAA).

time lag Any delay between stimulus and response, or cause and effect, esp. that between start of signal and full indication by instrument.

time mean bleed Short period of time during which large RCS bleeds are expected to be used, and beyond which thrust must be reduced.

time of flight Elapsed time from weapon launch, release or departure from gun muzzle to instant it strikes target or detonates.

time-of-flight spectrometer Instrument sorting particles, esp. neutrons, according to time to travel known distance.

time of origin Local time message is released for transmission.

time of useful consciousness See time reserve.

time on target Time, either planned or actual, at which aircraft attacks or photographs target.

2 Time at which NW detonation is planned at specified GZ (DoD).

time over target Time at which aircraft arrive(s) over designated point for purpose of conducting an air mission on a target (USAF).

time pulse distributor EDP (1) circuit that generates timing pulses during machine cycle, gated by command generator to carry out commanded operations.

time reserve Time between sudden total loss of oxygen supply and time when human can no longer be relied upon to function normally or rationally.

time-response parameter Addition of input time delay to assessment of response to pilot input of pitch rate [rotation] and normal acceleration.

Time-Rite Patented indicator of piston position for timing (1).

time-sensitive target[ing] An ephemeral target, previously unknown, which must be resolved or attacked immediately.

time series Sequence of time-variant measures, either continuous (eg barograph trace) or discrete (eg hourly met. pressure readings).

time sharing Use of one EDP (1) processor or computer, usually large and beyond means or requirements of each customer, by a number of customers or users whose programs are run in short bursts in time-division multiplexed form switched according to cyclic formula agreed between users (in simplest form, a round robin). 2 Planned allocation of time to external scanning [typically 18 s] and to looking around cockpit [typically 3 s].

time signal 1 Broadcast signal used as very accurate time reference.

2 Time reference mark along border of reconnaissance imagery or other film.

time/size plot Diagram whose ordinate is a measure of aircraft size, eg MTOW or pax seats, and abscissa is time in years.

time slot Slot (3).

time/speed scale Scale for given groundspeed used in conjunction with plotting chart or topographical map.

timeswitch Electrical switch activated by time of day or elapsed time from a start point.
time/temperature indicator

**time/temperature indicator**  Also called Smart Label, colour-coded sticker attached to galley trolley; changes colour with refrigerated contents. Upon activation turns green [17-hour life], turning yellow upon time/temperature expiry.

**time/temperature cycle recorder**  Records time engine spends at critically high TGT, to give realistic indication of hot-end life.

**time tic**  Time reference mark along telemetry readout; usually small inverted V every second along straight time-base.

**time tick**  Regular time signal of one or more audible brief sounds.

**time to go**  In air intercept, time to fly to offset point from any other initial position; after offset point, time to fly to intercept point (DoD).

**time-triggered protocol**  A data-communication platform.

**time zone**  Regions of local standard time, esp. over sea areas, where they are exactly divided by 15° widths of longitude.

**timing**  
1. Angular positions of piston-engine crankshaft at which valves first rise from seats or touch them again, and at which spark occurs; also called valve *, ignition *.
2. In US, assessment of human pilot’s ability to coordinate flight controls on correct time basis for smooth manoeuvres; not often regarded as a topic elsewhere unless demonstrably faulty.

**timing consideration**  Measure of time missile (or, possibly, other weapon such as aeroplane) is exposed on ground between withdrawal from hardened shelter and launch (probably arch.).

**timing disc**  Disc, engraved marking or other feature on piston engine to assist establishing exact crankshaft angular positions for timing purposes.

**timing parallax**  Film distance between time signal (2) and corresponding frame of imagery.

**timing pulse**  Pulse used as time reference in telemtry, radar and SSR and other electronic systems.

**TIMMC**  Titanium metal-matrix composite.

**Tims, TIMS** 1. Technology integration of missile subsystems.
2. Tactical information management system.
3. Training Integration Management System, flight scheduling and student records (USAF).

**tin** 1. Soft white metal, density 7.31, MPt 231.85°C, symbol Sn (stannum).
2. To coat surface of mild steel sheet with tin to prevent corrosion.
3. To coat metal surface with solder before making joint.
4. Aircraft, not necessarily metal (US collog.).

**Tina**  Thermal-imaging navigation aid.

**tineway**  Channels in ULD mating with tines of a fork-lift.

**tinfish**  Torpedo (UK collog.).

**TINS, Tins**  Thermal-imaging navigation system, or set.

**Tinsel**  Transmitter carried by bomber to jam ground instructions to German fighters (RAF WW2).

**tin-strip**  Metal prefabricated-plank airstrip for STOVL. _Int_ Integration time, especially radar filter integration time.

**tin-tray game**  Stewardess trolley race.

**tin wing**  Lightplane whose wings are metal-skinned.

**tip loss**  

**TIO**  US piston engine designation: turbocharged, direct injection, opposed.

**TIOS**  Two-in-one service (Satcoms).

**TIP**  
1. Message code: until past specified waypoint or other point (ICAO).
2. Tracking and impact prediction.
3. Technical information panel (Agard).
4. Test integration plan.
5. Tailored instruction program (US).
6. Threat image projection, to test X-ray baggage screeners.
7. Technical improvement program, or technically improved product (IFF).
8. Transit improvement program.
9. Tiros information processor.

**tip** 1. Extremity of aerofoil.
2. Angle of rotation of reconnaissance camera about aircraft transverse axis; also called pitch.
3. Wing-tip fuel tank (DoD) (colloq., adjective).

**tip aileron**  Aileron forming most or all of tip of wing.

**tip-back angle**  In aircraft with nosewheel landing gear, the angle between the vertical through the plane of ground contact of the rearmost MLG wheels and the plane through the ground contact line and the centre of gravity; symbol β.

**tip cargo**  Special cargo, eg radioactive isotopes, carried in small compartment in wingtip of some transports.

**tip chord**  Chord at tip of aerofoil, esp. wing, normally measured parallel to plane or symmetry of wing (for variable-sweep, at minimum swept angle) between points where straight leading/trailing edges meet curvature at tip. Where both edges have pronounced sweep at tip, or where they are joined by line not parallel to plane of symmetry (eg Lightning, Tornado) other definitions apply, often unique to type.

**tip cropping**  Cutting off at Mach angle.

**tip droppa**  Spoiler above wingtip used asymmetrically to cause yaw.

**tip drive**  Rotation of main rotor(s) of rotorcraft by thrust applied at or near tips.

**tip droop**  Downward folding of wingtips through large angle, usually 60°–80°, to move forward aerodynamic centre of wing at supersonic speed and decrease trim drag; in some aircraft (XB-70) also generated compression lift.

**tip fins** 1. The obvious meaning, fixed fins at the tip of a wing or horizontal tail.
2. Ridges across the tip of a turbine rotor blade which almost touch between the surrounding seal segments to form a labyrinth.

**tip float**  See stabilizing float.

**tip generator**  Wingtip vortex generator.

**TIPH**  Taxi into position [on runway] and hold, possibly to be discontinued practice (FAA).

**TIPI**  Tactical information processing and interpretation system (USAF).

**tip in**  To bank steeply away from takeoff flight path.

**tip jet**  Any system providing propulsive thrust at the tip of a helicopter main-rotor blade: pressure jet, cold [compressed-air] jet, ramjet, pulsejet, rocket or turbojet.

**tip loss**  Inefficiency of tip of aerofoil in lifting mode caused by spanwise deflection of isobars and relative wind, in some transonic cases approaching 90° and making tip mere dead weight.
tip loss factor

tip loss factor  Correcting factor in calculating lift of rotorcraft lifting rotor to allow for tip loss, usually 0.96+.

tip-path plane  Plane containing path of tips of helicopter or other rotorcraft main lifting rotor blades, tilted in direction of travel or horizontal acceleration.

tipping  See propeller tipping.

tip pod  Streamlined container carried centred on or below tip of aerofoil.

tip radius  Usually synonymous with radius.

tip rake  See rake.

tips, TIPS 1. Total integrated pneumatic system (C-5).
2. Telemetry integrated processing system (AFSC).
3. Technical issue panels (FAA).
4. Transatlantic industrial proposal solution(s) (AGS6).

tipsee  See winglet.

tip shroud  Shroud 1.

tip speed  Tangential speed of rotating tip of propeller or rotor due solely to its rotation and ignoring superimposed vehicle airspeed; i.e., \( V = r\omega \), radius multiplied by angular velocity.

tip-speed ratio  Helicopter forward [or whatever direction] speed divided by main-rotor tip speed, symbol \( \mu \).

tip stall  Stall of tip of aerofoil, esp. wing, while remainder of surface remains un stalled; common condition caused mainly by higher lift coefficient at tip unless stall strip applied inboard.

tip tank  Fuel tank formed as streamlined body, jettisonable or otherwise, carried centred on or below wingtip.

tip trailing vortex  See vortex.

tip vortex  See vortex.

TIR 1. Total indicator reading.
2. Target-illuminating radar.
3. Tracking and illuminating radar
4. Thermal imaging radar.
5. Traffic information radar.
6. Thermal infra-red.
7. Twin intermeshing rotors (helicopter).

TIRC  Tactical IR countermeasure.

tire  UK spelling 'tyre' is used in this dictionary.

tireness  General deterioration of airframe caused by long and intensive use, primarily manifest in repeated cyclic loading and successive severe gusts but also including superficial damage caused by impact of steps, ground vehicles, stones etc; no significant crack need be present but many structural parts will not be original and many boltholes will be oversized and re-reamed for bolts of increased diameter.

Tiros  TV/IR observation satellite(s).

Tirp  Terminal instrument radar procedure.

TIRS  Transverse-impulse rocket subsystem (planetary lander).

TIRSS  Theatre intelligence, reconnaissance and surveillance study (USAF).

TIS, tis 1. Tracking information (or instrumentation) subsystem.
2. Thermal-imaging sensor, or system.
3. Tactical Intelligence Squadron.
4. Traffic information service(s) [aircraft-position datalink, ground or airborne receiver].
5. Tactical input segment (satellite).

Tisar  Terrestrial inverse SAR.

Tis-B  Traffic information service, broadcast (FAA).

TISD  Tactical Information Systems Division (Langley AFB),

Tivo  Target-identification system, or sensor, electro-optical.

Tish, Tish  Thermal-imaging sensor head.

TisoAHV  See Ti.

TISR  Total inflight-shutdown rate.

Tiss, Tiss  Thermal-imaging security system, or surveillance system.

TTT  Turbine inlet temperature; see turbine temperatures.

tit  Any control button, especially to fire guns (UK, colloq., WW2).

Titan  Thunderstorm identification, analysis and 'nowcasting', under development from 1990s (USWB, NASA, FAA).

titanium  Ti, hard silvery metal, density 4.5, MPt 1,660°C, reactive but bulk metal passivated by oxide/nitride coating in atmosphere, vast range of aerospace uses, main tonnage Ti-Al-V alloys, see Ti.

titanium aluminides  Rapidly growing range of refractory (820°C) metals with properties marred only by poor toughness and ductility.

Tive  Tew's intermediate test equipment.

title block  Standardized rectangular format on drawing, usually lower right corner, listing title, part numbers, mod states, names of draughtsmen/tracers etc, dates and other information.

titles  Name of owner or operator painted on commercial or GA aircraft, to be read from a distance.

TII  Time indication unit.

TIV  Tactical intervention vehicle.

TIVO  US piston-engine designation: turbocharged, direct injection, vertical crankshaft (for helicopter), opposed.

TIVW  Total[ly] integrated warfare.

Tiz  Traffic information zone.

TJ  Turbojet.

TJAG  The Judge Advocate-General.

TJF  Transportable JTIDS facility (RAF).

TJIRJ  Turbojet/ramjet or turboramjet.

TJS  Tactical jamming system; R adds receiver, T transmitter.

TK 1. Turbocharger (R, G).
2. Thermal keel.

Tk  Track, track angle.

TKE, Tke  Track-angle error.

TKF 1. Tactical combat aircraft (G).
2. Takeoff, also TKO, Tko.

TKM  Tonne-kilometres.

TKOF, Tkof  Takeoff.

TKP 1. Tonne-km performed; basic measure of airline traffic.
2. Transport clearing house (R).

TKS  Chemical de-icing pastes and pumped liquid (typically 60% aqueous solution of glycol), from Tecalemit/Kilfrost/Sheepbridge-Stokes.

TKT  Sandwich of Teflon/Kapton/Teflon, uniquely resistant even to electric arcing.

TL 1. Thermoluminescence.
2. Transition level.
3. Transmission loss.
4. Unit.

T/L  Top level.
TLA 1 Towed linear-array sonar.
   2 Throttle [-or thrust-] lever angle.
TLA 1 Transition layer.
TLAR "That looks about right", for manual release of
   NW by captain of V-bomber [RAF, 1960-90].
TLBM 1 Top-level aircraft requirements [for reliability].
TLBM Through-life business model.
TLC 1 Trans-lunar coast.
   2 Tool(s) lifting capacity.
   3 Through-life costs.
   4 Takeoff and landing chart program.
   5 Tender loving care.
T-LCD Transmissive liquid-crystal display.
TLCM Through-life capability management.
TCLS Through-life customer support.
TLCSM Total life-cycle system management.
TLD 1 Technical-log defect.
   2 Top-level domain.
TLDHS Target location designation and hand-off
   system.
TLDM Royal Malaysian navy.
TLE 1 Type, or total, life extension.
   2 Target-location error.
   3 Treaty-limited equipment.
TLG Tail landing gear.
TLI Trans-lunar insertion.
TLLF Tactical low-level flight, or flying.
TLM Telemetry-word.
TLMC Time limits and maintenance checks.
TLO 1 Terminal learning objective.
   2 Touchdown, or takeoff, liftoff area [also TLOF].
TLP Tactical leadership program(me).
TLM 1 Target-locating radar.
TLS 1 Tactical, or transponder, landing system.
   2 Translunar shuttle.
   3 Through-life support.
   4 Target level of safety.
   5 Training laser system (MoD, UK).
TLSI Technical-log special inspection.
TLSN Tactical life-support system (USAF flight suit).
TLTV Towbarless tractor vehicle.
TLDV 1 Transition level [also TL].
   2 Threshold limit value.
TLWD Tailwind.
TWS Tactical laser weapon system.
TM 1 Training memoranda.
   2 Tactical missile.
   3 Trade mark.
   4 Ton-mile (seldom abb.).
   5 Transcendental meditation, relevant to aerospace.
   6 Transverse magnetic EM propagation mode.
   7 Telemetry.
   8 Technical manual, or memorandum.
   9 Thrust magnitude (of gross thrust vector).
10 Time.
11 Transmit manifold (Awacs).
12 Timer/media (access control).
13 Thermal model.
14 Terrain masking.
15 Test and maintenance [bus].
Tm Tropical maritime.
TMA 1 Terminal manoeuvring (or control) area, ie
   terminal airspace.

TMSA

2 Trimethylamine.
3 Target-motion analysis.
4 Traffic management advisor (FAA).
5 Timer/media access.
TMAC Tactical medium-altitude camera.
TMACA Tactical mid-air collision-avoidance system
   (helicopter).
TMB 1 Time mean bleed.
   2 Turbulent mixing boundary.
TMBACA Times microwave broadband airborne cable
   assembly.
TMC 1 Thrust-management computer [F adds function,
   S system].
   2 Titanium [or titanium-aluminide metal-] matrix
   composite.
   3 Terminal control.
   4 See next.
TMCC Travel Management Companies Corporation
   (Int.).
TMCR Total maintenance-cost reduction.
TMC 1 Technical monitoring and control[ling] system.
TMD 1 Tactical munitions dispenser.
   2 Theatre missile defence.
   3 Test, measure and diagnose [or measurement and
   diagnostic].
4 Tactical modular display.
TME Total mission energy, normally in non-SI kWh.
TMEL Trimethyl-ethyl lead.
TMET Tethered medium Earth terminal.
TFM 1 True mass flowmeter.
   2 Thrust-management function.
TMG 1 Track made good.
   2 Thermal/meteoroid garment.
   3 Towing motor glider.
   4 Ton-miles per gallon.
TMGS Transportable/mobile ground station.
TMIS Technicians maintenance information system.
TML 1 Tetramethyl lead.
   2 Terminal.
   3 TV microwave link.
TMLLFT Terrain-masking low-level flight, C adds
   computer.
TMM Tantalum manganese-oxide metal device.
TMMC Titanium/metal-matrix composite.
TMMS TOW mast-mounted sight.
TMN True Mach number.
TMO 1 Traffic management office (AFSC).
   2 Ten [nautical] miles out [from threshold].
TMP 1 Transverse-magnetized plasma.
   2 Twin machine-gun pod.
   3 Theatre mission planning; S adds system.
   4 Test-measurement program[me].
TMDA Traffic-management program alert.
tmpr, tmprly Temporarily.
TMR Technical-manual reference card.
TMS 1 Thrust-management system.
   2 Test and monitoring station.
   3 Traffic, or technical, management system, or
   specialist.
   4 Tactical mission system (helicopters).
   5 Transformer mains supply.
   6 Target-management switch [on throttle].
TMSA 1 Trainer-mission simulator aircraft.
   2 Technical Marketing Society of America.
TMT

Tri-mode semi-active.

Technology management team (ASTOVL).

Terrestrial MTI imagery (MR-Tip).

Traffic management unit (FAA).

Transducer matching unit (sonar).

Tomorrow.

Tactical miniature crystal oscillator.

Transponder Mandatory Zone.

Nuclear, thermonuclear (weapon prefix, USSR).

Technology need.

True north.

Truth in Negotiations Act (US Congress).

Thermal-neutral analysis, or activation.

Twin altitude.

So-called four-dimensional navigation system commanding three spatial dimensions and time.

Terminal node controller.

Tendency.

Tungsten nuclear engine.

Total noise exposure level; see noise.

Theatre nuclear forces (S’ or S-cubed adds ‘survivability, security and safety’).

Tonight.

Turn height.

Total noise index; see noise.

Trusted network interpretation.

Transfer of control message, non-radar.

Technical news-sheet.

Trinitro-toluene; for * equivalent see yield.

Tragflügel neue technologie, advanced supercritical wing (G).

Theatre nuclear weapon.

Tactical nuclear warfare.

Takeoff.

Technical order.

Table of organization.

Total obligation[al] authority, sum that may be obligated in coming FY for contracts possibly running for many years hence.

Time of arrival, hence TOA/DME.

Usually plural, transportation operating agencies (MAC, MSC and MTMC, US).

Training options analysis [software tool].

Takeoff obstacle accountability areas (study).

Table of organization and equipment.

True outside air temperature.

Tangential on-board injection.

In-flight refuelling technique in which shallow dive is maintained to match speeds of fast tanker (if necessary with spoilers or airbrakes) and slow receiver.

Top of climb.

Total operating cost (often t.o.c.).

Tactical operations center (US).

Transfer of communication[s].

Theatre operational CIS(3) architecture.

Tactical operations control centre.

Takeoff c.g. position.

Terminal operations control system.

Takeoff distance.

Time of day, or of departure.

Takeoff distance available; H or (H) adds helicopter.

Takeoff decision point.

Takeoff distance required.

Tactical optical-disk system.

Tone (usually tonne or short ton) of oil equivalent; measure of energy.

Table of organization and equipment.

Figurative forward extremity of ski shape whose contact with ground is commanded by TFR.

Any lateral extremity at foot of graphical plot.

See wheelbrakes.

Left/right (eg engines) have axes which in horizontal plane are inclined to meet aircraft centreline ahead of nose. Hence, toed out; axes meet centreline to rear, as in case of engines whose axes are perpendicular to tapered leading edge (eg Ju 52/3m).

Angle between major chord of winglet and OX axis, generating inward side force.

Hinged tapered plates along outer edges of cargo-aircraft vehicle ramp.

Takeoff engine pressure-ratio.

Takeoff fuel; quantity aboard at takeoff.

Time of flight.

Trigger on failure.

Takeoff field length.

Derated (flexible) take-off.

TO and/or go-around (overshoot).

Automatically advances throttle levers to takeoff thrust.

Joggling.

Takeoff ground roll.

Takeoff gross weight, either published MTOW or that at one particular takeoff.

Time of intercept.

Track on jam[ming].

Takeoff and landing; A adds analysis.

Tolerance.

Takeoff and landing data, kept handy in cockpit.

Maximum departure permitted between dimension of an actual part and its nominal value; usually part may be either over or undersize (eg 653 ± 0.1 mm) but occasionally * is unilateral (eg 653 - 0.1 mm).

Maximum error permissible in calibration of instrument or other device.

Maximum quantity of harmful radiation which may be received by particular person with negligible results, also called * dose.

Ability of individual to withstand cumulative doses of drug.

Crucial inceptor for converting fighter weapon system from peace to war (RAF 1965–94).
Imp. gal = 0.3484 tonne-km/litre (reciprocal 2.8703). statute mile = 1.5838 tonne-km (reciprocal 0.6314); per Unit of aircraft work; assuming long ton and ton-mile. See Tonka.

tooling See Tool.
toolmaker Skilled person, usually previously machinist, responsible for making many special-purpose in-plant tools (both jigs/fixtures and cutting tools) and in particular for setting up machines for semi-skilled operatives and minders, today often versed in NC.
toolroom Originally room where cutting tool bits were kept, today clean (often in strict sense) environment for super-accurate measures, gauges and manufacturing operations calling for abnormal standards of accuracy.
tool steel High-carbon steels retaining extreme hardness at elevated temperatures (note: bits are now usually carbides, cermet or other materials).

TOP 1 Total obscuring power; basic measure of chaff or aerosol, in US expressed in non-SI units sq ft/lb (cross-section of sky per unit mass dispensed), for 80% opaqueness to hostile radar or other sensor. 2 Tube à ondes progressives = TWT (F). 3 Technical and office protocol, similar to CNMA and MAP 6 (US). 4 Takeoff power. 5 Top of cloud(s).
topcap Total objective plan for career airmen personnel (USAF).
top chord Main transverse (end-to-end) upper member of truss.
top cover Defending friendly fighters watching over bomber or attack aircraft from higher level, esp. while over hostile territory. top dead centre Instantaneous position of piston engine or reciprocating-pump crankpin in which centreline of crankshaft, crankpin and cylinder are all in line with piston at extreme top of stroke; hence also corresponding position of piston.
top-down requirements capture See requirements capture.
top dressing Application of ag-chemical to land or growing crops from above; normally method of applying fertilizers rather than insecticides, for which technique may be to coat undersides of leaves also.
top-hat Family of standard structural sections based on five straight surfaces, each at 90° to neighbour(s); resembles top hat in shape.
topkap Tele-operated precision kill and targeting.
top loading Increasing apparent (effective) height of radiating aerial by adding metal plate, mesh or radial wires at extremity.
top lock Fitted in top edge of outward-opening door [hinged on sensibly-vertical axis] which is curved round to form top of cabin.

TOPM Takeoff performance monitor; S adds system.
topocentric Referred to observer’s position; measures, usually linear distance or az/el, based on observer’s position as origin.
topographic Represent physical features of Earth’s surface, both natural and man-made; hence * display, * map. DoD definition of * map: one which presents vertical position of features in measurable form as well as horizontal. Normally, essential feature is use of contour lines, as well as normal positional information.
top overhaul Overhaul of piston-engine cylinders (valve grinding, ring replacement, decarbonization etc) without opening crankcase.
topping

**tapping** Operating cycle of liquid-propellant turbopump for rocket engine in which cryogenic fuel is heated, producing high-pressure gas used to drive turbine(s); this gas then passes at lower pressure to combustion chamber (different nozzles from main flow), where it burns. Hence * cycle, * engine.

**tapping off** Replacement of cryogenic propellant lost by boiloff.

**tapping up** Replenishment of gas-filled aerostat, eg after a flight.

**topple** Real or apparent wander in vertical plane of gyro-axis (see toppled).

**toppled** Gyro whose gimbals have for any reason ceased to maintain its correct axis in space, so that further rotation of mounting results in violent direct precession. Traditional gyro instruments can be * by aerobatics or any rotation of aircraft axes beyond defined limits, instrument then being useless as attitude reference until gyro has settled again into normal operation. New term is needed for either topple or toppled.

**top rudder** Applying rudder towards the upper wing in a turn: thus, in a steeply banked L turn, pushing on R pedal [eg, to keep nose from dropping below horizon].

**TOPS** 1 Thermolectric outer-plane spacecraft. 2 Transfer orbit and payload-testing support.

**Topsat** Topographical synthetic-aperture radar.

**Topspin** 1 Material whose unauthorized disclosure might result in High grade of defence classification for Top Secret. 2 Tactical operational scene (Tamps).

**Topsar** Tactical optical satellite (UK).

**toroidal** Shaped like doughnut.

**toroidal vanes** Rings of curved section guiding air to eye of centrifugal compressor.

**torpedo director** Traditional optical sight for aerial torpedo attack; user sets target size/speed and receives azimuth guidance.

**torque** For all practical purposes, synonymous with turning moment or couple [which see]. A rigorous definition is effectiveness of a force in setting a body into rotation, according to which trying to loosen a tight nut unsuccessfully or rotate free end of rod fixed at other is not application of * (though in second case it is torsion). Often invertedly defined as resistance to a twisting action.

**torque component** Often invertedly defined as resistance to a twisting action.

**torque gauge** Indicator of torque in propeller shaft. 

**torque motor** Device, either instrument or component part of engine, for measuring torque; in turboprop or some piston engines, usually oil-pressure system sensing axial load on reduction-gear planetary helical gears or, less often, tangential reactive load around annulus gear. Also called torsion gauge or nutcracker.

**torqueometer** Device, either instrument or component part of engine, for measuring torque; in turboprop or some piston engines, usually oil-pressure system sensing axial load on reduction-gear planetary helical gears or, less often, tangential reactive load around annulus gear.

**torque roll** Performable only by aircraft with fast-responding (eg piston) engine on centreline giving very large torque in relation to aircraft weight; approach is made at flight idle at minimum safe flying speed, whereby upon throttle is banged wide open to cause rapid roll in opposite direction as aircraft accelerates, pilot recovering to wings-level with aileron.

**torque-set screw** Can be repeatedly unscrewed without losing original torque needed to release; used to latch long-MTBM panels.

**toric** Having a surface described by a segment of a conic section.

**toric combiner** Optical lens assembly used to combine a generated-information display with an image of real world.

**Torlon** Heat-resistant resin used in graphite-fibre composites for high-temperature applications (Amoco).

**tornado** Localized violent whirlwind east of Rockies in US with such low pressure in core as to explode structures in its path, usually pendant under a Cb. Also used for Gulf of Guinea thunder squalls advancing westwards in line.

**torus** 1 Box-like structure, eg wing torsion box, designed to resist applied torque. 2 Variable brake on rotating shaft, eg slat drive, triggered at particular point of system travel.

**torque coefficient** Product of propeller torque divided by \(\rho N^2\); \(k_0 = \Phi \rho N^2\).

**torque component** \(Q_c\), tangential force acting in plane of propeller rotation on any elementary chordwise lamina; thus total propeller torque \(Q = N/\rho V^2 \times \text{integral of } Q_c\) from axis to tip with respect to radius.

**torque dynamometer** Measures shaft power by measuring \(N\) (rpm) and torque.

**torque effect** Reaction on vehicle of torque applied to propeller or rotor (** for rotodome usually ignored); in helicopter countered by tail rotor.

**torque gauge** Indicator of torque in propeller shaft.

**torque horsepower** Shaft horsepower, often same as brake horsepower. Use to be discouraged because of confusion with thp (thrust horsepower).

**torque link** Pivoted links preventing relative rotation between cylinder and piston of oleo shockstrut; limiting factor with bogie main gears on allowable steering angle of nose gear. Also called scissors or nutcracker.

**torquemeter** Device, either instrument or component part of engine, for measuring torque; in turboprop or some piston engines, usually oil-pressure system sensing axial load on reduction-gear planetary helical gears or, less often, tangential reactive load around annulus gear.

**torquer** Device imparting torque to an axis of freedom of a gyro, usually in response to signal input.

**torque roll** Performable only by aircraft with fast-responding (eg piston) engine on centreline giving very large torque in relation to aircraft weight; approach is made at flight idle at minimum safe flying speed, whereby upon throttle is banged wide open to cause rapid roll in opposite direction as aircraft accelerates, pilot recovering to wings-level with aileron.

**torque-set screw** Can be repeatedly unscrewed without losing original torque needed to release; used to latch long-MTBM panels.
torsional divergence

torsional load

twist before reaching ultimate compressive stress.

torsional instability

which wing’s aerodynamic centre is ahead of shear centre or elastic axis, lurking unsuspected until a critical IAS is exceeded.

Characteristic of structural member such that, when loaded in compression or bending, it will twist before reaching ultimate compressive stress.

Potentially lethal design fault in which wing’s aerodynamic centre is ahead of shear centre or elastic axis, lurking unsuspected until a critical IAS is exceeded.

Characteristic of structural member such that, when loaded in compression or bending, it will twist before reaching ultimate compressive stress.

Instrument containing light horizontal rod suspended by fine fibre for measuring weak forces, eg gravitation, radiation.

Torsion bar tab

Torsion box

Main structural basis of wing, comprising front and rear spars joined by strong upper and lower skins; also called wing box, inter-spar box.

Normal seat harness of military pilot restraining torso over full length.

Tactical operational-readiness trainer.

 damned beyond repair.

Component along lift axis of resultant force on aircraft.

System in which oil is supplied, usually under cartridge or other stored gas pressure, and finally dumped overboard; common in target or cruise-missile propulsion.

Money for 5-year defence programme or any portion for a given FY (DoD).

Basic measure of quantity of energy imparted to vehicle by rocket, = integral of thrust versus time over total operating time, abb. T, expressed in Ns, kNs or (US) lbf-s.

Indicator showing quantity of variable (fuel, ammunition etc) that has passed sensing point (see detotalizing).

Damaged beyond repair.

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Damaged beyond repair.
Total terrain avionics

Cally and isentropically. If $T_s$ is static temperature, $T_H = T_s(1 + \frac{1}{2}[\gamma - 1]M^2)^{-1}$. Total terrain avionics Combine digital contour and map information to enhance sensors and displays for carefree flight at high speeds at low altitudes in bad weather without any high-energy or readily detectable emissions, thus facilitating stealth design.

tote, Tote Tracker optical thermally enhanced.

tote board Display presenting written information in tabular form, esp. in ATC (1) flight-progress board or cockpit alphanumeric tab (4). In RAF Fighter Command in WW2, presentation of tactical situation.

TOTS, tots Tower operator training system (USN ATC).

touch-and-go Practice landing in which aeroplane is permitted to touch runway briefly; in many cases flaps are moved to take-off setting while weight is on wheels.

touch-control steering Small inputs by pilot to change flight path while in autopilot mode.

touchdown J Moment, or location, of contact of aircraft with surface on landing or of soft-landing spacecraft with designated destination surface.

2 Intersection of glidepath with Earth’s surface, not necessarily point of any actual landing.

touch down To perform touchdown.

touchdown aim-point Area of runway on which pilot intends to land. This is usually in touchdown zone, but on STOL runway a ** marker is provided in form of 90 m (200 ft) axial white strip on each runway edge projecting inwards from white edge strips.

touchdown point That programmed into UCARS or other UAV recovery system.

touchdown ROD Touchdown rate of descent; value shown by ** indicator, usually sensitive VSI based on radio altimeter or laser altimeter.

touchdown RVR Touchdown runway visual range; RVR at time and place of landing.

touchdown zone That portion of runway selected by most pilots as touchdown zone; on precision instrument runway marked by three close axial white bars 90 m (200 ft) long on each side between centreline and edge, beginning 150 m (500 ft) beyond threshold.

touch drill Simulation of condition [e.g., securing a failed engine] by touching controls and instruments without actual activation.

touch-screen technology Ability of advanced displays to interface with humans by direct fingertip touch of part of display of interest, notably by touching particular line or word in alphanumeric readout.

touchwire Human input to electronic display in form of matrix of fine wires, any of which, when touched, switches enlarged local region of display to fill entire area (or, in alphanumericics switches in simplified readout of that particular item).

toughness Ability of structural material to absorb mechanical energy in plastic deformation without fracture.

tour Individual crew member’s assigned total of combat missions. To qualify, mission must be effective. RAF * in WW2 was usually 30.

2 More generally, * of particular duty for military personnel.

touring aircraft Original meaning, aircraft designed for long pleasure flights.

townend ring

2 Aircraft making appearances at successive air displays.

touring motor glider Light aeroplane designed to cruise under power but to soar when conditions permit.

tourist Originally (1949) special high-density airline accommodation usually synonymous with coach; today standard type of seating, denoted by symbol Y.

TOVC Top of overcast.

TOVS Tiros operational vertical sounder.

tow J Takeoff weight, usually meaning MTOW.

tow 2 Tube-launched optically-tracked wire-guided missile.

3 Time of week (GPS).

4 Time on wing [engine life].

tow J Standard manufactured form of reinforcing fibre, eg carbon, graphite, as long unwoven staple.

2 Aero * for one flight of sailplane; hence on *, * release.

towbar Connects tug and nose gear for towing or pushing away from gate.

towbarless tractor One designed to lift NLG off ground on to tractor body.

tow dart Dart-type aerial target towed by RPV or target drone or, in some cases and on 900 m (2,000 ft) line, by manned aircraft.

towed body Remote sensing unit of helicopter MAD or airborne magnetometer.

towed glider Glider on aero tow.

towel rack Rail-like aerial (antenna) for HF com or Loran (colloq.).

tower Airport or airfield control tower, esp. service or facility based therein; hence * airport, * frequency. * controlled. Increasingly coming to mean seat of ATC even if no physical * exists.

tower fly-by Fly past tower at low level, eg for determination of position error or visual check on aircraft configuration.

towering Opposite of stooping, refraction phenomenon in atmosphere in which visual image of distant object appears extended vertically.

towering cumulus Building rapidly, so that height exceeds any lateral dimension.

towering takeoff Helicopter rises vertically under full power and goes ahead as rate of climb decays to zero.

tower shaft Radial shaft transmitting drive from engine spool to accessory gearbox or other unit.

tower-snap recovery Recovery of RPV or other winged vehicle by flying it to hook a line suspended between arms on tower built for this purpose; in most systems line imparts decelerative drag which stalls vehicle within distance significantly less than height of tower.

towhook Pilot-operated coupling release on glider for tow cable.

towing basin See towing tank.

towing eye Eye (structural ring) attached to nose gear or other part of aircraft for towing on ground.

towing sleeve Towed sleeve (drogue) target.

towing tank Long, narrow water tank for hydrodynamic tests, also called seaplane basin/tank, along which models of hull/float forms, skis, ACVs and other objects are towed. Seldom used for wavemaking.

town The Treasury and MoD (RAF colloquial).

Townsend ring Pioneer ring-type cabling for radial engines, with chord seldom greater than external diameter of cylinders and no pretension at true aerofoil shape,
Townsend avalanche

though usually with tube around inner side of leading edge [Dr H C H Townend, 1929].

Townsend avalanche Cascade multiplication of ions in gas-filled counting-tube technology.

Townsend coefficients In DC gas-discharge. First \( \eta = \text{number of electron/ion pairs per volt} \); Second \( \gamma = \text{number of secondary electrons emitted from cathode per impacting positive ion} \).

Townsend discharge DC discharge between two electrodes immersed in gas and requiring cathode electron emission.

Townsend ionization coefficients Average number of ionizing collisions electron makes in drifting unit distance along applied field.

tow-reeling machine Powered winch for winding in cable towing aerial target or other device.

tow rope Connection between tug and glider, in WW2 typically 9 in [229 mm] or 10 in [254 mm] (circumference). Manila [hemp], later replaced by Nylon. See cable.

tow tractor Usually means prime mover for towing aircraft or baggage train.

Toxic-B Most common lethal air-dropped or dispensed war agent (USSR).

TP 1 Turning point.

2 Thermoplastics.

3 Test pilot, or point.

4 Target, or training, practice.

5 Teleprinter.

6 Terminal processor.

7 Traffic pattern; A adds altitude.

8 Turbulence plot.

9 Technical Publication(s).

10 Tactics planner.

11 Two-seat pursuit (USA 1919–24).

12 Telecommunication [singular] processor.

13 Trajectory prediction (ATC).

Tp 1 Tailplane trim [actuator].

2 Tropical Pacific.

TPA 1 Target-practice ammunition.

2 Traffic-pattern altitude.

3 Taildragger Pilots’ Association (US).

4 Trigger-pulse amplifier [D adds driver].

5 Taxi position awareness (Jeppesen).

TPAR 1 Tactical penetration-aid rocket, carrying expendable ECM payloads.

2 Trans-polar air route.

TPAWS Turbulence prediction and warning system (NASA).

TPC 1 Total programme cost(s).

2 Tactical pilotage chart.

3 Temperature-[or thermally]-protective coating.

4 Technical Partnership Canada.

TPCI Technical publications combined index.

TPD Tracking processing device.

TPDA Transmitting personal digital assistant.

TPDR Transponder (more often TXP or XPDR).

TPDU Transport Protocol data unit.

TPE 1 Tracking and pointing experiment.

2 Thermoplastic elastomer.

TPED Tasking, processing, exploitation and dissemination (Imint).

TPF 1 Terminal phase, final.

2 Technology performance financing.

3 Terrestrial-planet finder.

TR, Tr

TPFDD Time-phased force and deployment data.

TPA Transport Protocol Class 4.

TPFP Target-practice frangible projectile [-T adds tracer].

TPFT Tunable pipelined frequency transform.

TPG 1 TV picture generator, Tepigen.

2 Technology planning guide.

3 Topping.

T-phi, T0 T-S.

TP 1 Terminal phase initiation.

2 Third-party[] insurance.

3 Tons (or threads) per inch.

TPIS Tyre-pressure indicating system.

TPL 1 Transmitted pulse length.

2 Terminal permission list (Acars/Aeps).

TPM 1 Terrain profile matching, or mode.

2 Technical performance management.

TPMU Tyre-pressure monitor[ing] unit.

TPL Technical procedure notice; (L) adds electronic.

TPR 1 Tip-path plane [see tpp].

2 Total-package procurement (C adds concept).

3 Technology program plan (AFSC).

4 Terminal procedures publication.

5 Tri-phenyl phosphate, extreme-pressure anti-scruff oil additive.

6 Tph-plane plane, hence \( \alpha_{\text{tpp}} \) for helicopter AOA.

TPPX Target-practice proximity-fuzed.

TPR Target-practice proximity-fuzed.

2 Thermoplastic rubber.

3 Transponder [XPDR preferred].

4 Transient-phase restoration.

5 Turboprop pressure ratio.

TPRM Trusted protocol reference model.

TPS 1 Thermal protection system.

2 Test program set.

3 Technical problem-solving.

4 Thermal picture synthesizer.

5 Test Pilot School (USAF).

6 Tactical processing system.

TPSA Technologies, processes and system attributes.

TPSRS Terminal primary and secondary radar system(s).

TPR, TP/T 1 Target practice, tracer.

2 Transonic pressure tunnel.

Tpt Transport.

TPTA Tailplane trim actuator.

TPTO Temporary permission to operate.

TPU 1 Terminal position update (RV).

2 Tactical, or transmitter, or transceiver, processing unit.

3 Turbine power unit (Gripen).

TPWG Test planning working group.

TPWS Turbine prediction and warning system.

TPX-42 Numeric decoder of aircraft beacons.

TQ Total quality; C adds cost, E engineering, M management, PP planning and producibility and S supportability.

TQA Throttle-quadrant assembly.

TR, Tr 1 Track.

2 Thrust reverser.

3 Tracking rate.

4 Tactical reconnaissance (US, role prefix).

5 Torpedo reconnaissance (UK, defunct).

6 Technical report, or readiness.
T/R

7 Temporary revision (ADRES, CAATS).
8 Braking parachute (R).
9 Total reaction.
10 Trace.
11 Tail rotor.
T/R
2 Transmitter/receiver, communications radio.
12 Transmission/reception, or transmit/receive.
3 Transformer/rectifier (or TR).
13 Thrust reverser.
T/R
4 Thrust required [usually for unaccelerated level flight].
t5 Time from initial landing-gear wheel contact to maximum vertical reaction.
t6 Round-trip transit time, especially of radar signal.

TRA
1 Track angle.
2 Radar transfer-of-control message.
3 Track-reverser aft (SST).
4 Temporarily reserved [or restricted] airspace [or area].
5 Terrain-referenced avionics.
6 Thrust-reduction altitude.

TRAAMS
1 Time-referenced angle-of-arrival measurement system.
2 Trials recording and analysis console, giving immediate video-tape of fire-control system performance.
3 Tactical radar correlator.
4 Terminal radar approach control.
5 Tradoc Analysis Center.
6 Transit research and attitude control (satellite).

Trac, Trac-A
1 Total radar aperture-control antenna.
2 Traffic-control approach and landing system (USAF).

Tracs
1 Test equipment for rapid automatic checkout and evaluation.
2 Taxing and routing of aircraft co-ordination equipment (US 1960s).

trace
1 Line on CRT and many other displays made by electron beam, successive sweeps being linked by retraces.

2 Line of data on any linear graphic printout visible to eye (thus, not applicable to magnetic tape).
3 EDP (1) diagnostic technique which analyses each instruction and writes it on an output device as each is executed.

trace
tace Rate of accretion just exceeds sublimation.

Tracer
1 Tactical reconnaissance and counter-concealment enabled radar [for UAVs].
2 Ammunition whose projectiles leave bright visible trails.
3 Substance added (usually in very small proportion) to main flow in order latter may be followed accurately through process, living organism etc * may be physical, chemical or, often, radioactive.
4 True historic display on Hudwac or similar sight system featuring tracer line and other symbology for snapshotting, normally with real target scene through combiner glass.

Tracer line
1 Bright line on sight system showing locus of points where a projectile would now be had it been fired during preceding few seconds, ie where projectiles from continuous burst would now be. A range marker, usually a ring, is superimposed at actual target range. Pilot must then place this ring over target in order to hit it, or arrange for target to pass through ring.

track
1 Path of aircraft over Earth’s surface from take-off to touchdown.
2 At any time in flight, angle between a reference datum, and actual flightpath of aircraft over Earth’s surface, measured clockwise from 000° round to 360°. Magnetic * is referred to magnetic N; true * is referred to true N and is * normally used in plotting; required * is that desired; * made good is that found by inspection to have been achieved; great-circle and rhumbline * are those which are thus represented on chart.
3 To observe or plot a * (1), eg by radar or on plotting board.
4 Series of related contacts on plotting board.
5 To display or record successive positions of moving object.
6 To lock on to source of radiation and obtain guidance therefrom.
7 Path traced by tips of propeller, rotor or similar rotating radial-arm assembly.
8 Distance measured as straight line between centre of contact area of left mainwheel, or geometric centre of left main-gear bogie, and corresponding centre on right; in case of aircraft with centreline gears and outriggers, measured between outriggers; if landing gears are skids, measured between lines of contact; if main gears are skis, measured between centrelines; if gears are inflatable pontoons, measured between centres of ground contact area; not normally applied to marine aircraft, but would presumably be distance between CLs of two floats. Symbol W.
9 As plural, rails along which travel area-increasing flaps or certain translating leading edge slats, carrying these surfaces out approx. in direction normal to leading or trailing edge.
10 To keep device aimed at moving target.
11 Conductive path on printed-circuit board.
12 DME mode after lock-on, when pulse-pair rate is reduced.
13 Position and velocity of aircraft estimated from correlated surveillance data (TCAS).

track angle
See track (1).

track ball
Basic human interface with electronic displays, either for inputting data or calling up portion of display for any reason; comprises ball recessed into console rolled by operator’s palm in any direction to generate either stream of digital pulses or analog voltage about two co-ordinate axes to achieve desired place, eg particular aircraft on display.

track beacon
See NDB.

track clearance
Clearance to fly stated track (1) as far as particular fix.

track correlation
Correlating track information using all available data, for identification purposes.

track crossing angle
1 Angular difference between tracks of interceptor and target at time of intercept (DoD).
2 Generally, angle between two flight paths measured from tail of reference aircraft.

tracker
Hand-held electronic reader of coded information on parcel or letter, which is then automatically sent by radio (satellite if necessary) to management displays.

track handover
Process of transferring responsibility
tracking

for production of air-defence track from one track-production area to next (NESN).

tracking 1 Air intercept code: “By my evaluation, target is steering true course indicated” (DoD).

2 Precise and continuous position-finding of targets by radar, optical or other means (NESN). Hence synonymous with track (5).

3 Measure of correct rotation of separate blades of helicopter main rotor in that each should follow exactly behind its predecessor, ie all tips should lie in common tip-path plane.

4 Procedure to ensure * (3) by holding paper or fabric against painted blade tips and adjusting hub settings until a single spot results.

5 Correct holding of frequency relationships between all receiver circuits tuned from same shaft to maintain constant intermediate frequency in superhet or constant difference frequencies.

6 Keeping device, eg fighter aircraft, aimed at target; hence synonymous with track (10).

7 Ffth path in horizontal plane, especially along ILS glidepath.

tracking station Fixed station for tracking (2) objects in air or space.

track initiator Person responsible for taking decision on appearance of unknown blip on air-defence or other surveillance radar that it represents a target whose track is to be determined and assigned an identity.

track intervals Convenient time/distance divisions between checkpoints when navigating visually.

track lock lever Hand lever locking flight-crew seat in desired position.

track made good See track (1).

track marker Symbology on display indicating track, eg straight black or bright line, with or without arrowhead, cross, ring or square, depending on type of display; absent when display is auto track-oriented.

track oriented Aligned with current track at 12 o’clock position, eg hand-held map, projected map display, etc.

track prioritization Order of threat priority can be manually or automatically assigned to several targets, usually on basis of TTG.

track production Function of air-surveillance organization in which active and passive radar inputs are correlated into coherent position reports together with historical positions, identities, heights, strengths and direction of flight (NESN).

track-production area Area in which tracks are produced by one radar station.

track repetition Time between exact overflights of spot on Earth by satellite.

track separation 1 Lateral distance between aircraft tracks imposed by ATC.

2 Distance (often at Equator) or angular longitude difference between successive passes of Earth satellite.

track symbology Symbols used to display and identify tracks on radar or data-readout console or other electronic display.

track telling Process of communicating air-defence, surveillance and tactical-data information between command and control systems and facilities: back tell, transfer from higher to lower echelon of command; cross tell, between facilities at same level; forward tell, to higher level; lateral tell, across front at same level; overlap tell, to adjacent facility concerning tracks detected in latter’s area; and relateral tell; via third party.

traffic alert and collision-avoidance system

adjacent facility concerning tracks detected in latter’s area; and relateral tell; via third party.

track via missile SAM or AAM guidance system based on multirole electronically scanned radar [eg, Patriot].

trackway Standard prefabricated military track for land vehicles, quickly laid for recovery of force-landed aircraft or across infilled bomb crater on airfield, esp. to speed reopening of bombed runway.

track-while-scan Radar/ECM scan produced by two unidirectional sector scans simultaneously scanning in two planes, usually one vertically and one horizontally, allowing target common to both to be accurately tracked in az/el as well as (medium PRF) range/V. Target is not alerted as subject to special interest.

Traccon Terminal radar approach control (FAA).

Tracs 1 Terminal radar and [or approach] control systems (Canada DND).

2 Test and repair control system, automated data retrieval (TRACS).

3 Tool[s] for rapid advances in cockpit simulation.

4 Transportable radar and communications simulator.

5 Tactical radio countermeasures system.

traction wave Generated on tread surface of under-inflated tyre at high speed.

tractor Adjective meaning pulling, hence * aeroplane is pusher.

tractors Tool[s] for rapid advances in cockpit simulation.

tradcom Transportation R&D Command (USAf, defenc)

trade 1 Targets, eg a plurality of hostile aerial targets.

2 Of fighter, to encounter hostile aircraft.

tradeoff Generalized term for fair exchange between inter-related variables; thus in aircraft design there are numerous and continuing examples of * between wing area, thrust, fuel consumption, gust response, structure weight and many other parameters; in aircraft flight management pilot can * (used as verb) speed for height, etc.

trade winds Persistent winds blowing from NE around 30°N and SE around 30°S. At higher altitude are antitrades.

Tradoc Training & Doctrine Command (USA); possible confusion with Tagoc.

traffic 1 Quantity of vehicles, eg aircraft, in operation; measured as number in flight in region at one time, number under positive control, or general number in vicinity, or as number in given period. For control purposes includes * on movement area.

2 Number of landings and take-offs at airport in given period, eg one calendar year.

3 One aircraft in flight as reported to or noticed by another in vicinity.

4 Output of commercial or military air transport operator, measured in such units as number of pax or mass of cargo carried multiplied by mean distance each is transported, eg passenger miles or tonne-km (standard units compatible with SI are needed).

5 Number or frequency of messages on telecom system.

*traffic* Repeated, aural warning of midair (TCAS).

traffic advisory Information [without comment] sent to pilot about other traffic within ± 1,200 ft FL and [at existing closure speed] 45 s in time.

traffic alert and collision-avoidance system As initially
traffic circuit

conceived, exists in two levels. TCAS I is the baseline system which merely senses potentially conflicting traffic and warns crew [by traffic advisory]. TCAS II additionally provides traffic information within c30 nm [55 km], and two conflicting equipped aircraft are manoeuvred apart.

traffic circuit See Circuit.

traffic density The number of xpdr-equipped aircraft [excluding one’s own] within R nm [1.85R km] ≈ πR².

traffic information, radar Information issued to alert aircraft to radar target observed on ground radar display which may be in such proximity to its position or intended route as to warrant its attention.

traffic lights Any red/amber/green presentation, especially that by a radar altimeter referenced to a preselected low (minimum safe) height setting.

traffic pattern See circuit; * usually used for tracks/profiles of arrivals and departures of non-GA traffic, ie military or commercial.

traffic situation display TMS (3) tool for monitoring position of traffic to determine demand on airports and sensors.

TrAG Training air group (RN, WW2).

trail 1 Relative motion of dropped store, eg free-fall bomb, behind aircraft flying at constant V, broken down into * distance, cross-* range component of *, * angle, cross-* angle, and range component of cross-*. 2 Distance between centre of tyre contact area with ground and intersection with ground of free castoring axis; not relevant to power-steered aircraft. 3 To shadow another aircraft or hostile ship(s). 4 Tendency of freely hinged (ie, not irreversible) control surface to align itself with relative wind. Normally negative, surface ‘floating’ in line with wind, but an overbalanced surface has positive * and unless restrained will be blown to limit of its deflection. 5 To fly a tanker behind potential receivers. 6 To extend tanker’s hose.

trail angle 1 Angle between vertical and line joining bomb impact to aircraft at time of impact. 2 Several angles in landing gear, including acute angle between bogie beam and aircraft horizontal plane (negative when front axle is lower than rear) and acute angle between local aircraft vertical and axis of main-gear oleo strut (often not relevant because of gear geometry). trail blade That immediately following in same stage of engine fan, compressor or turbine, especially following a blade that breaks off.

trail distance Horizontal distance between point of bomb impact and point vertically below aircraft at time of bomb impact.

trailor 1 Aircraft following and keeping under surveillance a designated airborne contact (DoD). 2 General US term for towed road vehicle, esp. for human occupancy.

trail formation In direct line-ahead, each aircraft or element being directly in front of those following.

trailing aerial Aerial [antenna] in form of long wire, usually with weight or drogue on end, capable of being wound in or out from underside of aircraft.

trailing area Area of flight control or other pivoted surface on aircraft downwind of hinge axis.

trailing blade Trail blade (US usage).

trailing edge 1 Rear edge of aerofoil or streamlined strut. 2 Outline of pulse as amplitude falls from peak to zero or minimum positive value.

trailing finger Extra electrode in piston-engine magneto distributor which transmits large current from booster magneto to cylinder next in firing order when engine is started.

trailing flap Not a normal term but could be applied to Junkers double wing.

trailing link Landing gear in which axle [or pivot of bogie beam] is carried by arm pivoted to rear of leg. Also called levered suspension.

trailing sweep Sweep (5) when deviation is towards trailing edge.

trailing vortex Vortex extending downstream from point on body.

trailing vortex drag See lift-induced drag.

trail length Length of cable connecting aircraft to braking parachute, anti-spin parachute or other drag device.

trail line That between aircraft in level flight and bomb released from it. Projected, it reaches trail point.

trail point Where trail line reaches Earth’s surface.

trail rope 1 Trailed by balloon over ground to reduce groundspeed and assist in regulating height. 2 Carried in airship for ground handling.

train 1 Bombs dropped in short intervals or sequence (DoD). 2 Single tug towing several gliders on single towrope or series of ropes.

train bombing Two or more bombs released at predetermined interval from one aircraft as result of single actuation of release mechanism (USAFC).

trainer Aircraft for training flight personnel, esp. pilots.

training aids Items whose primary purpose is to assist instruction and growth of operator skill/familiarity, such as publications, tapes, films, mimic boards, systems rigs, procedure trainers and simulators.

training package Self-contained arrangement to train personnel (eg of an air force or of purchaser of GA aircraft) for fixed fee or fixed outlay per month; may include design of trainer, construction of facilities as turnkey contract or part of larger programme.

trajectory Flightpath in 3-D of any object, eg aeroplane or electron or other particle, with exception of orbits and other closed paths. Can be ballistic, acted on only by atmospheric drag and gravity, or controlled by various external forces.

trajectory band Webbing strip round top of aerostat envelope to reduce distortion.

trajectory plotting A particular meaning is using a wreakage field and knowledge of winds at all relevant altitudes to establish point in sky at which an aircraft broke up.

trajectory scorer Instrument carried by aerial target which continuously defines position of intercepting missile in sphere whose centre coincides with origin of target’s co-ordinate axes; readout is time-history record of missile range and angular position commensurate with scoring requirements.

trajectory shift Distance or angular measure of deviation of missile from ballistic trajectory under influence of a thrust mechanism (ASCC).
Trakmat

Trakmat UV-stabilized polypropylene overlain by mesh of galvanised-steel rods and wires.

TRAM, Tram Target-recognition attack multi-sensor; DRS adds ‘detection and ranging set’.

tram Trammel bar, or as verb to use same (colloq.).

trammel and adjust Traditional procedure for rigging airframe c1910–35.

trammel bar Hand gauge in form of straight bar, set-square, triangle or other shape provided with precision locating feet; used in checking dimensions, angles and alignments of large structures; abb. tram or tram bar.

tramming Use of trammeled bar.

tramping Uncommanded oscillation of rudder [less often, other control surfaces].

tramming Oscillation or vibration of aircraft in vertical plane.

tramline Zigzag flight path as result of (1).

trans Production batch, not all aircraft necessarily being to same standard (UK).

trans, TRANS Transmit, transmitter, transmitting.

transition Transition; ALT adds altitude, LEV level.

transatmospheric Operating between upper atmosphere and sub-orbital regime. Thus, a * aircraft would combine attributes of aircraft and spacecraft.

transatmospheric vehicle Also called aerospace plane, spacecraft capable of atmospheric flight with full propulsion, lift and control, and recovery at base similar to that of aeroplane. Launch may be either by vertical rocket or horizontal takeoff.

transattack period From initiation of NW attack to its termination (DoD).

transborder Crossing frontier, eg airborne pollution, fallout, virus etc.

transceiver Radio transmitter and receiver sharing common case and subcircuits, precluding simultaneous transmission and reception.

transcowl Translating (fore/aft-moving) structure of fan reverser.

transducer Device for translating energy from one form to another, eg mechanical strain to electrical signal (strain gauge), temperature to electrical signal (thermocouple), or electrical signal into sound (earphone or loudspeaker).

transducer gain Ratio, usually expressed in dB, of power delivered to transducer load (output) to available power input.

transductor Any magnetic device, eg saturable reactor or magnetic amplifier, in which non-linear characteristic controls circuit.

transsec Transmission security.

transerter Device for sampling unknown surface material, eg on planet other than Earth; hence * auger, tube containing spiral auger which carries sample material to various instruments and experiments.

transfer Transport between airport and ultimate destination.

transfer duct Air duct between front and rear fans in tandem-fan engine, containing shut-off valve and auxiliary inlet system for rear fan and core in lift mode.

transient peak ratio Peak value of phugoid parameter divided by that of immediate predecessor.

transient performance Air-combat performance sustainable for a few seconds only (eg by trading height for speed or vice versa, or allowing speed/energy to decay).

transient response Response to sudden changes in demand, eg hydraulic system or liquid rocket engine, where this factor is significant.

transfer ellipse See transfer orbit.

transfer loader Wheeled or tracked vehicle with platform positioned at any convenient height and with horizontal adjustment, used in transfer of cargo or casualties between modes of transport.

transfer function Mathematical treatment of ratio of output response to input signal, usually a Laplace transform, expressible as plot of frequency and in closed-loop systems controlling sensitivity of output to system error.

transfer of control Action whereby responsibility for provision of separation of an aircraft is transferred from one controller to another (see handover, handoff).

transerter Device for converting a.c. to d.c. at a different voltage; can be rotary machine or solid state.

transmitting Awaiting orders, or staging through en route to another destination.

transmitting line PL redrawn to slightly later time, parallel to original but displaced by calculated ground distance.

transformation Methods (Laplace, Fourier) of simplifying solution of differential equations; hence Laplace or Fourier transform or inverse transform.

transformation(al) Revolution in application of armed force brought about by netcentric warfare.

transmission security The ability of a system to withstand penetration by unauthorized access, either physical or electronic.

transmission line PL redrawn to slightly later time, parallel to original but displaced by calculated ground distance.

transmission Transference of control consisting of semiconductor material to which are attached metal electrodes. Name comes from transfer resistor, and in simplest form one electrode is emitter.
transistor amplifier
connected to p-type material, separated from other p-type
electrode (called collector) by layer of n-type.

transistor amplifier Amplifier employing one or more
transistors arranged in any of several configurations, eg
common-emitter, common-collector or common-base.

transition 1 Passage of celestial body through controlled airspace.
2 Instrument used to determine (1).
3 Apparent passage of celestial body across face of
another.
4 Condition in which three points are aligned, eg
observer and two objects on Earth’s surface, prefaced by
‘in’ (ie said to be in *).
5 Period spent on ground by passenger between
arrival on one flight and departing on another, hence *
area, * trollies etc.
6 A passenger in transit (6).
7 Period spent on ground by aircraft, especially
commercial transport, between flights; the most frequent
interval written into schedules for maintenance. Also
defined as turnaround stop enroute.
8 Motion of landing gear during retraction or
extension.

transition bearing Measuring time at which two surface
features have same (measured) bearing from aircraft in
flight.

transition mode Configuration of mobile system, eg SAM
missile, radars and support facilities, for moving on
ground to new location with radars folded, missiles
packed, launchers at 0° elevation and doors closed, etc.

transition 1 One meaning in aerospace is change from
jet-supported VTOL flight to wing-borne translational
flight and vice versa.
2 Another is sudden switch from blind instrument
approach to visual on first sighting ground, eg. runway
lights.

3 Another is SID to airway and thence to Star.

transitional surface Specified surface sloping up and out
from edge of approach surface and from line originating
at end of inner edge of each approach area, drawn parallel
to runway centreline in direction of landing (ICAO).

transition altitude QNH, altitude in vicinity of airfield at
or below which aircraft control in the vertical plane is
referred to true altitude; e.g., in London TMA, 6,000 ft.
(see transition level).

transition distance Ground distance covered in
transition (1 or 2).

transition down Change in helicopter flight level to dunk
sonobuoys in sea in ASW operation.

transition envelope That portion of flight envelope in
which trimmed controllable flight is possible in powered
flight regime, bounded by airspeed, height, ROC, power,
conversion angle, AOA, control margins, etc (USAF).

transition flight Flight at TAS below power-off stall
speed, where lift is derived from both wing and power-
plant.

transition height QFE, at or below which altitude is
referred to that of airfield.

transition layer Airspace between transition level and
transition altitude (NESN).

transition level QNE, lowest flight level available for use
above transition altitude (DoD).

transition lift parameter For jet VTOL, L/T × Aj/S,
where L is wing lift, T is jet lift, Aj is jet area (total) and S
is wing area.

transition manoeuvre Aeroplane manoeuvre linking two
glidepaths or approach trajectories; unusual except at
airports where approach has to be on instrument runway
and actual landing on a parallel runway.

transition point Point on 2-D aerofoil or other surface at
which boundary layer changes from laminar to turbulent,

transition strip Area of airfield adjacent to runway or
taxiway suitably paved to allow aircraft to taxi across it in
all weathers.

transition temperature Many meanings in which partic-
ular temperature-dependent change takes place, but
esp. temperature range in which metal ductility or fracture
mode changes rapidly.

transition up Change in helicopter flight level to pull
sonobuoys out of water.

transition zone 1 Narrow atmospheric region along
front where characteristics change rapidly, values lying
between those of dissimilar air masses on either side.
2 Short section of glidepath within which average pilot
makes transition from IFR to visual.

transition manoeuvre Periodic oscillator with negative resistance
and near-constant sum of anode/screen current.

transition time I Elapsed time between instant of filing
message with AFTN station for transmission and instant
it is made available to addressee.
2 Elapsed time between electrodes in valve or other
device for any electron.

translating Moving in straight line relative to surrounds-
ings.

translating centrebody Supersonic-inlet centrebody able
to move linearly into or out of inlet under control of
automatic control system.

translating nozzle Jet engine nozzle which in reverse
mode moves to rear, further from engine, opening gap in
jetpipe for gas deflected by reverser clamshells.

translation Motion in more or less straight line, from A
to B, with no rotation about any axis.

translational flight Flight at sensible airspeed, such that
wing generates lift; loosely from A to B, moving under
power from one place to another.

translational lift Additional lift gained by helicopter in
translational flight resulting from induced airflow
through main rotor(s) gained from forward airspeed.

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through main rotor(s) gained from forward airspeed.

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transmission

transmission 1 Process by which EM radiation or any other radiated flux is propagated, esp. through tangible medium transparent to such radiation.
2 Process of sending signal via telecom network.
3 Signal or message thus sent.

transmission coefficient Radiant energy which remains after passage through a layer, medium interface or other intervening material, relative to that incident upon it; expressed as fraction or percentage; symbol \( \tau \).

transmission factor Ratio of dose inside shielding material or hard shelter to that received outside in NW attack.

transmission grating Diffraction grating ruled on transparent substrate.

transmission level Ratio, usually expressed in dB, of signal power at any point in network to power at reference point.

transmission limit Particular frequency or wavelength above or below which almost all power is absorbed or diffused by medium.

transmission line Conductor conveying electrical power or signal, esp. wire, coaxial cable or waveguide carrying information signals.

transmission loss Decrease in power, usually expressed in dB, between energy sent and that received; in radio propagation through space, ratio expressed in dB of power received by aerial to that sent out by identical transmitting aerial; in underwater sound, symbol \( H \), \( H = 20 \log R \) where \( R \) is distance.

transmission modes Possible configurations of electric and magnetic field patterns in waveguide; TM (transverse magnetic) has magnetic vector perpendicular to direction of travel; TE (transverse electric) has electrical vector perpendicular to direction of travel; TEM has both vectors perpendicular to direction of travel. There are an infinite number of modes, but each cannot function below a particular cut-off frequency, and two parallel wires send nothing but DC.

transmission rate Of xpdr, average number of pulse pairs per second.

transmissivity Ratio of radiation transmitted through medium, or through unit distance of it, to that incident upon it, usually expressed as %.

transmissimeter Invariably, synonymous with visibility meter, telephotometer; instrument for measuring atmospheric extinction coefficient and determination of visual range.

transmittance 1 Ratio of EM radiation transmitted through medium to that incident upon it, \( T = I/I_0 \), (essentially synonymous with transmissivity).
2 Ratio of luminance of surface at which light leaves medium to illuminance of incident surface (provided units are compatible).

transmitter Equipment for converting code, sound or video signals into modulated RF signal and amplifying and broadcasting latter.

transmitter chain Klystron with TWT driver.

transmitter/receiver See transceiver.

transmutation Conversion of atoms into different element(s) by nuclear radiation.

transom Traditional name for near-vertical transverse bulkhead at stern of boat; occasionally present in seaplane float or flying-boat hull.

transonic General term for fluid flow in which relative velocity around immersed body or surrounding duct is subsonic in some places (seldom below M 0.8) and supersonic in others (seldom above 1.2). Thus * range depends on shape of body, being very narrow and close to M 1.0 for slender body with pointed nose of small semi-angle and very thin wings. A purist would argue should be transsonic.

transonic blading Rotating blading whose surrounding fluid has subsonic relative velocity at root and supersonic at tip.

transonic transport Aircraft designed to cruise at about M 1.15 without producing sonic bang at ground level.

transonic tunnel Wind tunnel whose working section can operate at Mach numbers close to that of sound, say 0.8 to 1.2.

transosonde Balloon, normally for meteorological purposes, designed to maintain constant pressure level.

transparency 1 Portions of airframe optically transparent, eg windows, canopies, moulded noses, etc; also called glazing.
2 Imagery fixed on transparent base for viewing by transmitted light, often synonymous with diapositive.

transponder Aircraft designed to give position and other radiated flux is propagated, esp. through tangible medium transparent to such radiation.

transponder sierra Code for ICAO SSR (DoD).

transponder landing system Closed-loop approach aid which uses aircraft xpdr to give aircraft position and transmits guidance on normal G/S and localizer frequencies to ILS instrument.

transponder sierra Code for IFF Mk X/SIF (DoD).
transponder tango

transponder tango Code for IFF Mk X basic (DoD).

transport Aircraft designed for carrying ten or more passengers or equivalent cargo and having MTOW greater than 12,500 lb (5,670 kg). Note: this was originally US usage, where * British meaning is called transportation, which also means ticket.

Transportation Security Administration Formed after 9–11 [2001] as part of DoT but separate from FAA (US).

transport equation Complicated integral/differential equation by Boltzmann for distribution function in fluid, eg gas at low pressure, subject to flow and intermolecular collision.

transporter 1 Land vehicle, usually large and for off-road use, for carrying large missile or other mobile system or system element.

transporter 2 Airside vehicle for ULD.

transporter/erector Transporter for ballistic missile or large radar which also erects its load into firing or operating position. Hence **/launcher, which also fires missile.

transporter mast See next.

transporter tower Airship mooring mast on mobile base.

transport joint Joint between major portions of structure, eg between centre section and outer panel, dismantled for transport (US transportation) in another vehicle.

transport support Airborne delivery of stores and/or personnel by airdrop.

transport wander See apparent wander.

transputer Transmitter plus computer with integrated signal-processing architecture.

transonic See transonic.

transuranium elements Also called transuranic, those of atomic number higher than 92 (uranium); not occurring in nature but produced by nuclear reactions.

transverse Though this means athwartships or sideways it is often related not to basic vehicle axes but to major axis of local part; thus in wing it is common to consider spar as longitudinal and ribs as *

transverse axis OY, pitch axis, parallel to line through wingtips.

transverse bulkhead See bulkhead.

transverse electric See transmission modes.

transverse-flow effect In helicopter translational flight air passing through main rotor is initially at higher level and that passing through rear of rotor disc is accelerated as it passes across top of rotor; ** is differential lift caused by this difference in relative wind, causing blades in rear part of disc to flap upward. Note: in this usage transverse means longitudinal.

transverse load One acting more or less normal to major axis of member, thus tending to bend it; thus weight of fuselage forms ** on wing.

transversely isotropic Materials having uniform elastic properties in one plane, independent of axis of testing.

transverse member Structural member running across from side to side; in wing and other aerfoils often interpreted as in chordwise direction.

transverse Mercator Map projection in which meridian is used as false equator; map is that produced by light source at Earth centre projecting on to cylinder wrapped round Earth touching along selected meridian, if necessary passing across pole. Parallels near pole almost circular but become ellipses of increasing elongation until Equator is straight line; great circles are straight lines parallel to selected meridian, otherwise complex curves.

transverse pitch Perpendicular distance between two rows of rivets.

transverse wave Displacement direction of each particle is parallel to wave front and normal to direction of propagation; includes EM waves and water-surface waves.

Trap, TRAP 1 Terminal radiation airborne measurements program; note, not Tramp.

Tactical related applications.

T Tac recovery, aircraft and personnel (USAF).

trap 1 Radio receiver, subcircuit which absorbs unwanted signals.

2 In ultra-high-vacuum technology, device which prevents vapour pressure of mercury or oil in diffusion pump from reaching evacuated region.

trap weight Maximum weight permitted for arrested carrier landing.

TRASR Tactical remote assessment/surveillance radar (through-wall sensor).

travelling wave A transverse structural deflection which moves along a linear structure in various modes defined by string theory.
travelling-wave aerial

travelling-wave aerial  One in which sinusoidal waves travel from feeder to terminated end.

travelling-wave amplifier  Microwave amplifier depending on interaction between slow-wave field (eg travelling along wire helix) and electron beam directed along axis.

travelling-wave magnetron  Usual type of modern multicylinder magnetron in which TWT-type amplification is used at high power.

travelling-wave tube  Various species of microwave amplifiers in which interaction takes place between electron beam and RF field travelling in same or opposite direction or in other arrangement; abb. TWT.

tread 1  To rotate in azimuth.
2  To take set of readings along line, either discrete readings (eg pitot pressure) at selected points or forming continuous plot, eg from point well below trailing edge of wing to point well above (in this case called pitot *).
J  Surveying method based on accurate distance/angle measures between fixed points.
#  Aircraft track made up of large number of straight links led by turns usually of 90° or 180°; used in search, patrol or EW duties (US term).

traverse 1  To rotate in azimuth.
2  To take set of readings along line, either discrete readings (eg pitot pressure) at selected points or forming continuous plot, eg from point well below trailing edge of wing to point well above (in this case called pitot *).
J  Surveying method based on accurate distance/angle measures between fixed points.
#  Aircraft track made up of large number of straight links led by turns usually of 90° or 180°; used in search, patrol or EW duties (US term).

traverse flying  Flying along traverse (4).

trawling  Free-ranging search for targets of opportunity.

TR 1  True track.
2  Thrust rating computer.
#  Traffic counts.

TRCS  Techniques for determining near-field radar cross-section of space vehicles, eg RVs.

TRCV  Tri-colour VASI.

TRD 1  Western rendering of turbo-reaktivny dvigatel, Russian for turbojet.
2  Torsional resonance damper.
J  Test requirements document.
#  Towed radar decoy.

TRI 1  Transit routing domain.

TRDI 1  Technical Research and Development Institute (JDA).

TRE 1  Has been used in classified ads to mean transmitter/receiver equipment, transponder equipment, tactical receive equipment.
2  Telecommunications Research Establishment, Malvern, later RSRE.
J  Type-rating examiner.
#  Target-rich environment.

Tread 1  Track ($) (US usage).
2  Normal meaning for * of tyre.

Temp  Recovery air temperature[s].

Trecom  Transportation Research Command (USA).

T-Recs  T-Recs Tactical radar electronic combat system.

TRE, Tree 1  Transient radiation effects on electronics.
2  Test and repair of electronic equipment.

TREF 1  Transient Radiation Effects Laboratory (USAF).

triangulation balloon

2  Transportable [RAF] or tactical [RNethAF] reconnaissance exploitation facility.

trefoil  Cluster of three parachutes.

Trek  Telesience research kit, ground-based workstations.

trellis control  See lattice fin.

trenched 1  Of rotating shaft, provided with multiple grooves forming labyrinth seal.

2  Of passenger-transport aisle, lower than rest of floor on which seats are mounted.

TRENDS  Conditions [eg, for landing] in next two hours.

Trends  Tilt-rotor engineering database system.

trepanning 1  Traditionally, using a cutter carried on the end of a rotating arm in order to cut a hole.
2  Using a high-power laser to cut a small hole and then expand it using a rotary motion.

TRES  Tactical radar and ESM system.

TRF 1  Tuned radio frequency.
2  Threat radar frequency (US adds ‘spectrum utilization’).
3  Tactical replay facility.

TRG 1  Tuned rate-gyro.
2  Training.

TRGB  Tail-rotor gearbox.

TRI 1  Type-rating instructor.

TRIA 1  Tungsten-reinforced iron alloy.
2  Tracking range instrumented aircraft (USAF).

Triac 1  Test Resources Improvement Advisory Council (AFSC).
2  Without initial capital, semiconductor gate (switch) similar to silicon rectifier but triggered by either positive or negative pulse.

Triad 1  US deterrent concept based on simultaneous demonstration of hard land missiles, SLBMs and recallable bombers.
2  Triple air defense (USA).
3  Technique for reading an integrated air defense (US); 8 adds system, but see next.

Triads  Tri-wall air delivery system, containers which glide down under lift from their yellow plastic packaging (USAF).

triage  Urgent investigation of casualties of NW attack to determine which need, and will respond to, medical treatment.

triagraph  Three-digit (numeral/letter) callsign used by whole formation or squadron (often changed), each aircraft having two-number suffix. To launch NW strike each aircraft would have had unique *, previously subject to frequent change (RAF).

triangle of velocities  Basic triangle in DR navigation with sides representing heading (course) and TAS, track and G/S, and wind velocity.

triangular parachute  One whose canopy is approximately triangular when laid out flat.

triangular pattern  Regular repeated flight pattern flown by aircraft with radio failure; equilateral triangle with sides 1 min (jet) or 2 min (others); flown left or right-handed depending on whether transmitter and receiver failed or only transmitter.

triangulation  Mensuration technique, eg in sheet metalwork, in which whole area is divided into equal adjoining triangles.

triangulation balloon  Small balloon used as sighting mark in triangulation survey.
**triangulation station**  Point on land whose position is determined by triangulation; also called trig point.

**triboelectrification**  Electricity produced by frictional processes.

**tribology**  Study of solid surfaces sliding over one another, with or without interposed fluid.

**tribometer**  Instrument for measuring sliding friction, usually small-scale between smooth surfaces (i.e., not of runway).

**tri-camera photography**  Simultaneous exposures by fan of three overlapping reconnaissance cameras.

**trichloroethylene**  Common solvent and cleaner, CH₂Cl₂.

**trichromatic**  Three-colour, e.g., TV or electronic display.

**tricycle**  Though nearly all aeroplane landing gears support at three points (ignoring different number of wheels at each point) this adjective means use of nose-wheel instead of tailwheel. Becoming redundant, adj. today being needed only to distinguish tailwheel-type aircraft.

**Tridop**  CW Doppler trajectory measurement using three fixed receivers.

**tri-ethyl borane**  TEB, volatile pyrophoric [spontaneously igniting on contact with air] ignition liquid.


**Trifon**  Trilateral fibre-optic missile (France/Germany/Italy).

**triform**  Structural member, usually an extruded section, providing attachment faces along three planes passing through same line, e.g., a broad-arrow or a Y shape.

**Trigatron**  Pulse modulator having DC-charged hemispherical electrode discharged by pulse from hemispherical trigger in gas-filled envelope.

**trigger**  Fitted with nosewheel.

**trigger J**  Pulse used in electronic circuits to start or stop an operation.

**trigger motor**  Linear actuator in pressure circuit (usually pneumatic), or driven electromagnetically, to fire gun.

**trigedral**  Having three plane faces meeting at junction of three interior angles [e.g., in corner reflector].

**trijet**  Aeroplane propelled by three jet engines.

**trike**  Three-wheel landing gear or ULA.

**trillion**  $10^{12} = 1,000,000,000,000$.

**Trim**  Trail/roads interdiction multisensor.

**trim 1**  Basic measure of any residual moments about aircraft e.g., in hands-off flight.

**trim 2**  Condition in which sum of all such moments is zero.

**trim angle**  Trim (5), positive when bow is higher than stern.

**trim curve**  Plot of elevator or tailplane angle (θT) against airspeed or Mach for each e.g., position, altitude etc.

**trim aid device**  Patented add-on to eliminate need for rudder to counter torque and gyro effects.

**trim air**  Hot bleed air added downstream of ECS pack(s) to achieve desired cabin air temperature.

**trimming tab**  See trim tab.

**trimming tanks**  Hands-off aircraft attitude (according to BSI, in pitch only).

5 Angle between longitudinal axis (OX) and local horizontal, esp. of airship, marine aircraft or seaplane float on water.

6 To make fine adjustment to value of any variable, e.g., velocity at cutoff of ICBM, fuel flow to engine or capacitance deposited on circuit.

7 To make fine adjustments to flap, LG door, external access panel or other part of aircraft surface so that when closed there are no surface discontinuities.

**trim die**  Die which trims to final dimensions.

**trim drag**  1 Sustained increment of induced drag caused by need to increase wing lift to counter download on tailplane, plus the induced drag of the tailplane itself, plus component parallel to downwash on tailplane.

2 Sustained increment of drag caused by need to deflect pivoted surface continuously in order to achieve required trim, e.g., to deflect elevons or tailplane up to counteract rearward shift in CP as aeroplane accelerates to supersonic cruise speed. Normally eliminated in SST by pumping fuel aft to shift e.g.

**trimetric drawing**  3-D perspective.

**trimetrogon**  Reconnaissance camera installation of three cameras in which one is vertical and others take high obliques at 90° to line of flight at inclination of 60° from vertical.

**trim for takeoff**  Automatic or manual trimming of flight-control system to correct settings for takeoff, abb. TFT.

**trimmed**  1 In correct trim; also called trimmed-out.

2 The * position of a flight-control surface or otherceptor may not always be at the neutral or zero position.

**trimmer**  Trimming system about any axis (as plural, about all axes); normally trim tab(s).

**trimmeron**  Small auxiliary irreversible surface used for roll trim.

**trimming moment**  Moment about reference point, usually e.g., exerted by trimming system or by seaplane float or hull when held in water at particular fixed trim angle.

**trimming strip**  Strip of metal (occasionally length of cord or wire) attached to trailing edge of control surface and adjustable on ground to achieve desired trim.

**trimming system**  Flight-control subsystem through which pilot inputs bias controls about all axes to obtain desired trim; in most cases ** operates via hinged trim tabs but in supersonic fighters inputs are separate irreversible actuators driving into surface power units and in simple lightplanes often a spring-loading device in cockpit.

**trimming tab**  See trim tab.

**trimming tanks**  Fuel tanks (occasionally for other
trimode scanner
liquids) located as far as possible from e.g. between which fuel can be pumped to achieve desired trim in pitch, eg in SST at subsonic or supersonic speed.
trimode scanner Circular aerial (antenna) using three EM modes in microwave cavity to move amplitude distribution in azimuth to scan 360°.
trim size Finished size of map or chart sheet.
trim speed Precise value of N₂, adjusted to ISA sea level, for particular engine; recorded by many manufacturers on data plate. It can correspond to MIL, rated thrust or some other power.
trim tab Small hinged portion of trailing edge of primary flight-control surface whose setting relative to surface is set by pilot via screwthread, powered trimmer actuator or other system preventing subsequent rotation under airloads and whose effect is to hold main surface in desired neutral position for trimmed flight.
trim tank See trimming tanks.
trim template Template used for marking finished shape of part already formed (eg in press) but not trimmed.
triad Yellow crystalline high explosive of mass number 3, crucial component of NW fusion materials such as Pu, Li-6 and deuterium.
tricle Tri-service tactical communications (DoD).
trinity Unstable radioactive isotope of hydrogen of number 1, crucial component of NW fusion materials such as Pu, Li-6 and deuterium.
trinuclear Thermonuclear fusion.
trip One complete flown sector; hence * time, * fuel.
2 To activate an electrical circuit-protection system, or action thus triggered. eg overvoltage *.
triplet Native pupil of 1 mm² area centred on natural pupil. E (in *) = LA (in nits × mm²).
trochee Trochee (an iamb in verse with tones). Trochees are found throughout the world, from Africa to East Asia.
trochee accent The accent on the second syllable in a trochee.
trochoide Path traced by point on circle which rolls along straight line. Commonest RC engine pistons are of related profiles.
tropical air mass Warm air originating at low latitudes, esp. in subtropical high-pressure system.
tropical conditions

various standardized conditions normally including ambient temperature at least 30°C (usually higher) and 100% RH, is hot and moist.

tropical continental \( T_c \), air mass characterized by high temperature and low humidity; usually unstable and associated with clear sky.

tropical cyclone Rotating storm: tropical depression, winds <63 km/h; tropical storm, <118.5 km/h; typhoon, cyclone or hurricane, 120+ km/h. See tropical revolving storm.

tropical maritime \( T_m \), air mass characterized by high temperature and humidity.

Tropical Maximum Atmosphere One of many artificially averaged atmospheres.

tropical revolving storm Largest and most violent form of thermal depression, generally less than 800 km (500 miles) diameter but with pressure falling in centre to about 960 mb, originating in ITCZ in 5° to 15° N or S; called cyclone (Bay of Bengal, Arabian Sea), hurricane (S Indian Ocean and W Indies), typhoon (China Sea) and willy willy (W Australia).

tropical trials Trials under tropical conditions, for most equipments simulated exactly to specification but for aircraft by flying to actual hot/high airfield; for aircraft low atmospheric density more important than high humidity specified for, say, avionics.

tropical year Period of revolution of Earth round Sun with respect to vernal equinox (with respect to stars, 365.2422 days); 365 days 5 h 48 min 45.85 s in 1990, increasing 0.0053 s per year.

trough Boundary between troposphere and stratosphere characterized by abrupt change in lapse rate (except at high latitudes in winter when change almost undetectable); height fixed in ISA at 11 km (36,089.3 ft), at pressure about 230 mb and relative density about 30%. In practice much higher over Equator (about 15–20 km) than over poles (about 8–10 km).

troposphere Lowest portion of atmosphere, extending from surface to stratosphere; characterized by lapse rate, humidity, vertical air movements and weather. Subdivided into surface boundary layer, Ekman layer and free atmosphere.

tropospheric scatter OTH radio propagation by reflection or scattering from irregularly ionised regions of troposphere; using forward scatter at about 25–60 MHz, ranges of about 1,400 km (870 miles) are possible.

tropospheric wave Radio wave propagated by reflection from place of rapid change in dielectric constant (high ionisation gradient).

troubleshooting Process of investigating and detecting cause of hardware malfunction (US usage; UK = fault diagnosis).

Tro/Tri Tactical reconnaissance optical, tactical reconnaissance IR day/night.

trough 1 Long but narrow region of low atmospheric pressure, opposite of ridge, with curving isobars at apex and absence of recognizable front.

2 Point in space where gravitational fields (eg Earth/Moon) cancel out (colloq.); neutral point but has implication of vagueness in location.

2 Repeated low portions of sine-wave flight 115–132K ft.

trouser Fairing for fixed landing gear in form of continuous streamline section round leg and upper part of wheel, usually tapering in chord and thickness.

Trowal Trough of warm air aloft (suggest arch.).

TRP Threat-recognition processor (USN).

2 Tuition-refund program(me).

3 Thrust-rating panel.

4 Terminal rendezvous point (usually TRV).

5 Time-response parameter.

6 Timed reporting point [operational squadron = time on target).

7 Mode-S transponder.

TRR Total removal rate.

2 Tyre (tire) rolling radius.

3 Test, rejection and repair.

4 Throttleable ram-rocket.

5 Test readiness review.

TRRAP Technology readiness risk assessment programme.

TriReq Track required.

TRRN Terrain.

TRRR, TR Trilateration range and range-rate.

TRS Tropical revolving storm.

2 Tactical reconnaissance system [or sensor, or squadron].

3 Teledetector retrieval system.

4 Track reporting system.

5 Triple-redundant system.

6 Tail-rotor swashplate.

7 Training research simulator.

8 Terminal-radar simulator.

9 Technology-readiness support.

10 Training and rehearsal system(s).

TRS A Terminal radar service area.

TSBS Terminal remote scanning beam MLS.

TSSR Terminal radar service area.

TRS Delivery support system.

TRSR Support system for surface ship, using satellite navigation.

TSSR Support system for surface ship, using satellite navigation.

TTR Arrivals under tropical conditions, for most equipments simulated exactly to specification but for aircraft by flying to actual hot/high airfield; for aircraft low atmospheric density more important than high humidity specified for, say, avionics.

tropical conditions

true bearing

true bearing Angle between meridian plane (referred to
true course

true N) at observer and vertical plane through observer and observed point.

true course Angle between aircraft longitudinal axis OX and plane of local meridian (referred to true N).

true heading See true course.

true-historic display One showing what would have happened, eg line showing locus of impact points where bullets would have hit had they been fired.

true meridian Great circle through geographical poles.

ture north Direction towards N pole of meridian through observer.

true position Position of celestial body or spacecraft computed from orbital parameters of Earth and body without allowance for flight time.

true power Actual (FR) power of a.c. electrical circuit.

true prime vertical Vertical circle through true E and W points of horizon.

true stress That computed as force divided by true area normal to the load, as distinct from Engineering stress.

true Sun As it appears to Earth observer, as distinct from mean, dynamic mean.

true track Angle between true N and aircraft path over ground.

true vertical Local vertical, line passing through observer and centre of Earth.

Tru-loc Flight-control cable end-fitting swaged on by machine with tensile rating equal to breaking strength of cable.

truncation error EDP(1) error resulting from use of only finite number of terms of infinite series, or from other simplifying techniques, eg calculus of finite differences.

trunk 1 Large-section lightweight air-conditioning duct, or duct between gasbag valve and gas hood.

2 Major route, with or without surrounding box conduit, for large number of controls, services, cables, wire looms and other lines.

3 * route or operator.

4 Compartment for baggage or general storage in GA aircraft (US usage derived from cars).

trunk route 1 Most important type of commercial route, eg between largest cities in country or countries, offering highest traffic. Hence * operator, domestic *, traffic.

2 Established air route along which strategic moves of military forces can take place (NATO).

truss Rigid load-bearing planar structure of spaceframe type, usually comprising essentially horizontal upper and lower chords linked by various vertical and diagonal members.

trusted Generalized description of network elements meeting specific measures of security.

truth table EDP (1) technique where coded signals are allocated to particular addresses, comprising series of adjacent address codes and output codes.

TRV 1 Terminal rendezvous point (army helicopters).

2 Tower restoral vehicle (USAF).

1 Thermal relief valve.

TRVR Touchdown runway visual range.

TRW 1 Tactical Reconnaissance Wing (USAF).

2 Thundershower (ICAO).

TRX Threat ready X-ray [airport security].

try-again missile Conceptual AAM of 1950s which, finding initial interception was outside design manoeuvre limits, made programmed turn for second attempt.

tryptique See carnets.

TsENTROSPAS, TsentroSpas

TS 1 Thunderstorm (ICAO).

2 Transport, or Training, Squadron, or service.

3 Transattack survivability, i.e. a post-strike system.

4 Thunderstorm sensor.

5 Track system (UAV).

6 Torpedo-bomber/scout (USN 1943).

7 Two-stroke.

8 Transmitter segment.

9 Turbouscharged (Satcom).

10 Time source.

Ts 1 Static temperature.

2 Note: Russian 'Ts' in this dictionary is rendered as C.

Tsb Total noise of radar system.

2 System equivalent noise temperature.

3 Sampling interval time.

T-S Graphical plot of absolute temperature (ordinate)—against entropy per unit mass of fluid S. Fundamental diagram in thermodynamics.

TSA Training systems acquisition.

2 Tail-strike assembly (USAf).

3 Transportation Security Administration (US, from 2001).

4 Traffic separation assurance (NASA Ames).

TSAAC TSE (3) Access Certificate, required by Pt 91 operators in order to fly to airports normally accessible only to scheduled carriers.

TSAFE TSA4 flight environment.

Tsg Common Western rendition of Central Aero and Hydrodynamics (research) Institute (USSR, R).

TSAM Tri-Service Attack Missile (US).

T, and P Temperatures and pressures.

TSAP Transport service access point.

TSAR, Tar 1 Tactical and strategic advanced reconnaissance.

2 Theatre search and rescue.

TSAS Tactile situation-awareness system.

TSAT, T-sat Transformational [communications] satellite.

TSB Transportation Safety Board [Québec K1A 1KB] (Canada).

TSC 1 Transportation Systems Center (US DoT).

2 Triple store carrier.

3 Tactical Support Center (USN).

4 Term service commitment.

5 Training system contract.

6 Terrorist Screening Center [FBI and other agencies] (US).

7 See TSCP.

TSCCM Technical surveillance countermeasure(s).

2 Tactical-strike coordination module (Tamps).

TSCSSS, TSCS3 Transformational satellite communications system space segment (USAF).

TSCP Transport security collaboration program[me].

(TS + European defence and aerospace).

TSD Transport service data-interface unit.

2 Traffic situation display.

3 Time/speed/distance.

TS diagram Plot of temperature against entropy, a closed 4-sided figure.

TSDU Transport service data-interface unit.

TSDS Telemetry storage and display system (UAV).

TSE Total system error.

TsENTROSPAS, TsentroSpas English renditions of
ministry for civil defence, emergencies and natural disasters (R).

**TSF**
2. Originally telegraphie sans fil = radio, now Télécoms sans Frontières (F).
3. Terascale Simulation Facility (LLNL).

*tsf, TSFC* Thrust specific fuel consumption; SFC of air-breathing jet engine.

**TSFE** Thermally stimulated field emission.

**TSGR** Thunderstorm plus hail (ICAO).

**TSHWR** Thundershower.

**TTC** Thrust specific fuel consumption; SFC of tsfc, TSFC sans Frontières (F).

**TSF** disasters (R).

**TSF** TTC
1. Transportable satellite ground terminal.
2. Transportable satellite ground terminal.

**TS**
1. Turn and slip indicator.
2. Track-situational indicator.
3. Transportation Safety Institute (US, from 1971).
5. Trading Standards Institute (UK).
6. Total-sky imager.

**TslAM** Common Western rendition of Central (research) Institute for Aviation Motors (USSR, R).

**TSIC** Touch-screen interactive control.

**TSIO** US piston-engine code: turbosupercharged, direct injection, opposed; now called TIO.

**TSIP** Trimble Interface protocol.

**TSIR** Total system-integration responsibility (AFSC).

**TskB** Common Western rendition of Central Construction (design) Bureau (USSR, closed).

**TSM** 1. Autothrottle servo mount.
2. Trouble-shooting, or technical-support, manual.

**TSMO** Time since major overhaul.

**TSMP** Terminal-segment master plan.

**TSMT** Transmit.

**TSMT**
1. Transmitter (alternative to XMTR).
2. Time, or total, since new.

**TsnI** English rendition of CSRI, Central Science Research Institute (R).

**TSNM** Transportation Sector Network Management (TSA3).

**TSNT** Transient.

**Tso** 1. Time since overhaul.
2. Technical service order (FAA).
3. Technical standard(s) order (CAA, from 1947).
4. Also interpreted as technical standing order.
5. Transportation Screening Officer (TSA).

**TSOC** Touch-screen operator console.

**TSOM** 1. See Tom.
2. Tentative specific operational requirement.

**TSP** 1. Turret stabilized platform.
2. Transonic small perturbation.
3. Transitional scanning polygon [M adds motors].
4. Time/space position [I adds indication or information].
5. Total support package (industry/RAF).
6. Transmitted signal power.
7. Twisted shielded pair.
8. Transmitter/responder.

**TSPG** Training Systems Product Group (USAf).

**TSPR** Total system-performance, or program, responsibility (AFSC).

**TSqLs** Thundersqualls.

**TspI** Time/space position information.

**TSR** 1. Torpedo spotter reconnaissance.
2. Tactical strike/reconnaissance.

**TSRA** Thunderstorm plus rain.

**TSS** 1. SST (F).
2. Tunable solid-state (laser).
3. Tethered satellite system.
4. Tacco sub-system.
5. Tactical surveillance sonobuoy, or supervisor.
6. Tail-strike sensor.
7. Target sight system.
8. Tangential signal sensitivity.
9. Technology support and services.
10. Tactical satcom system.

**TSSA** 1. Thunderstorm plus duststorm or sandstorm (ICAO).
2. Transport Salaried Staff Association (UK trade union).

**TSSAM** Tri-Service stand-off attack missile.

**TSSC** 1. Technical supply subcommittee (AEA).
2. Training System Support Center (F-22).

**TSSR** Total-systems support responsibility.

**TSTs**
2. Total wheel spin-up time on landing.
3. Technical support team.
4. Time-sensitive target, or targeting.

**TSTA** Takeoff safety training aid.

**TTM** Time-source transition module.

**TSTM[S]** Thunderstorm[s].

**TStO** Two stage to orbit.

**TStP** Terminal-segment master plan.

**TStn** English rendition of CSRI, Central Science Research Institute (R).

**TSSN** Total system-integration responsibility (AFSC).

**TSSS** Tactical sigint system training simulator.

**TST** 1. Transonic transport (usually M 1.1–1.2).
2. Threshold sampling time.
3. Technical support team.
4. Time-sensitive target, or targeting.

**TST** 2. Threshold sampling time.

**TTA** Technical Training Center (USAF), or Command
1. Technical Training Center (USAF), or Command
2. Total time.
4. Teletypewriter (ICAO).
5. Turnaround time.
6. Target towing (role prefix, UK, defunct).
7. All-weather (F).
8. Threat transmitter.
10. Torpedo tube.
11. Test tools.

**TtA**
1. Total time.
2. Dry-bulb [total] temperature.
3. Teletypewriter (ICAO).
4. Turnaround time.
5. Target towing (role prefix, UK, defunct).
6. All-weather (F).
7. Threat transmitter.
8. Twin-tandem landing gear.
10. True track.

**TT**
1. Total time.
2. Dry-bulb [total] temperature.
3. Teletypewriter (ICAO).
4. Turnaround time.
5. Target towing (role prefix, UK, defunct).
6. All-weather (F).
7. Threat transmitter.
8. Twin-tandem landing gear.
10. True track.
11. Test tools.
TTCP

TTCP  The Technical Co-operation Program[me] (US/UK).
TTCR  1 Time/temperature cycle recorder, or recording.
      2 Triangular trihedral corner reflector.
TTCS  Tactical terminal, or target-tracking, control system.
TTD  T  Tactical-threat display.
TTDF  Tip-turbine-driven fan.
TTE  1 Tooling and testing equivalency working group (AMC).
      2 Total time on engine.
TTEMP  Temperature test and evaluation master plan.
TTF  T  Time to first fix.
      1 Tanker task force.
      2 Threat training facility (US).
      3 Target-tracking flight.
      4 Torpedo Training Flight.
TFFF  Time to first fix.
TTG  T  Time to go, range divided by closing speed.

TTTL  1 Transistor/transistor logic; IC adds integrated circuit.
      2 Torpedo-tube launch.
TTLS  Transportable-transponder landing system.
TTM  Tape-transfer magazine.
TTNT  1 Tactical-targeting network technology, or technologies.
TTU  Tanker/transport training system.
TTUO, T3O  Academy).
TTTD  1 Tactical-threat display.
      2 Target-tracking radar.
TTTE  1 Tooling and testing equivalency working group (AMC).
      2 Total time on engine.
TTEMP  Temperature test and evaluation master plan.
TTF  T  Time to first fix.
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tumble

burner at fuel pressure not high enough to atomize continuous film but too high for it to converge as bubble.

tumble valve Piston-engine exhaust valve shaped in side elevation like tulip.

tunnel Tactical unmanned multirole air vehicle.

tumble 1 To rotate about lateral axis, ie end over end; rare in aircraft but not uncommon in spacecraft.

2 To rotate metal parts in drum, often with powder abrasive, to remove flash or burrs and obtain polished surface.

3 Of gyro wheel, to precess to limit after toppling.

tumblehome Distance measured parallel to transverse axis from vertical line through widest extremity of seaplane or flying-boat hull to any point on skin above.

tumble home line Abrupt change of curvature of mould line, buttock line or water-level contour at end of contour [marine aircraft].

tumble limit Angular displacement in pitch or roll at which traditional gyro instrument is on gimbals stops.

tumbler Drum in which metal parts are tumbled (2).

tumbler switch Snap-action electrical switch with short operating lever.

tumbling To tumble (1, 2, 3); to be in that condition.

tunable beam approach Pre-ILS landing system (BABS, SBA) in which pilot tuned receiver to particular airfield (arch). See also tuned-grid circuit.

tunable beam tuning Fine adjustment over continuous analog range of values to obtain that desired, eg RF frequency/wave-length or optimum operating condition of engine or other device.

2 See airframe. See also tunnel.

tunnel 1 See wind tunnel.

2 Axial fairing along body, eg to cover pipes, cables and other lines routed outside skin.

3 Channel along which baggage passes through screener.

tunnel diode Semiconductor device having single p-n junction across which electrons flow by quantum tunnelling; when biased to centre of a negative-resistance mode can operate as amplifier, oscillator or switch.

tunnel shock That occurring immediately downstream of supersonic working section in wind tunnel when Mach number falls below unity; intense if no second throat.

tunnel vision Inability to perceive anything outside an extremely small angular range of FOV, as if one were in a tunnel; caused by disease or high g.

turbine 1 Gas-turbine shaft power, ie turboshift or turboprop; eg helicopter can be said to have * power.

2 Prime mover whose power is obtained by action of working fluid (water, steam, cold or hot gas, etc) to give tangential circumferential forces reacting on blades or shaped passages which rotate a shaft. At redline speed a modern turbofan blade can move at 460 m (1,500 ft) s⁻¹, under 60,000 g. One or more are source of power in all gas- * engines and in turbochargers, turbopumps and many other rotary machines.

turbine-air screw unit See turboprop.

turbine bearing Bearing supporting turbine shaft.

turbine blade Radial aerofoil mounted in edge of turbine disc whose tangential force rotates turbine rotor. Each turbine stage has many blades, occasionally fabricated in groups of two or more. Called bucket in US. Inwards-radial turbine does not have *.

turbine disc Central member upon which turbine rotor blades are mounted; in some modern engines the blades and disc are monolithic. In many multistage turbines there are no flat discs, first and last stages being conical and intervening stages being rings gripped between them.

turbine entry temperature See turbine temperatures.

turbine gas temperature See turbine temperatures.

turbine rotor Complete turbine rotating assembly with 1–6 stages; stators are excluded.

turbine shroud Shroud around periphery of turbine rotor stage, formed by * section on tip of each blade.

turbine stage Single turbine disc or ring with inserted blades; for completeness should be associated with preceding stator (IGV) stage.

turbine stator Ring of fixed blades, also called inlet guide vanes, upstream of each turbine rotor stage, on to whose blades * directs gas with optimum distribution of V and pressure for maximum turbine work and efficiency (eg changes radial pressure/V, previously uniform, so that with increasing radius pressure increases while V falls).

turbine temperatures This entry describes temperatures in gas-turbine engines. Alphabetically, these are: CET, CIT, COT, EGT, RIT, SOT, TDT, TET, TGT and TIT. Following a particle through an engine, CIT is compressor inlet temperature, which is that of the ambient atmosphere corrected for any ram effect. COT is compressor outlet temperature, measured immediately behind the final stage of compression. CET, combustor exit temperature (also called combustion chamber outlet temperature, giving a second meaning for COT) is the temperature of the gas at the entry to the first-stage turbine stator. SOT is stator (first-stage) outlet temperature. TET is turbine exit temperature. TDT is turbine disc temperature TDT is cooled by the airflow and other sources to give the RIT.
turbofan-prop

sure ratio across the fan, not including any part of the turbofan pressure ratio form outward extensions of those of the compressor noise, but performance falls off more rapidly with of thrust. For given fuel consumption generates much propulsive airflow round core engine and generating most turbojet, plus extra turbine stages (usually on separate LP except slow aeroplanes (say, below 600 km/h, 375 mph); turbofan with gas turbine, eg *-supercharger, *-ramjet.

experiments (RAF, WW2). complete turbine, possibly of several stages.

turbine vane US term for turbine stator blade.

turbine wheel US usage for either one complete stage or complete turbine, possibly of several stages.

Turbinite Airborne searchlight for night interception experiments (RAF, WW2).

turbo 1 Turbocharger.

2 Generalized prefix meaning driven by or associated with gas turbine, eg *-supercharger, *-ramjet.

turbolower Air blower driven by exhaust-gas turbine to sweep burnt mixture from cylinders of two-stroke diesel. (Today also often used, esp. with diesels, to mean turbocharger).

turbocharger Piston-engine supercharger driven by exhaust-gas turbine.

turbofan Most important form of propulsion for all except slow aeroplanes (say, below 600 km/h, 375 mph); comprises gas-turbine core engine, essentially a simple turbojet, plus extra turbine stages (usually on separate LP shaft) driving large-diameter fan ducting very large propulsive airflow round core engine and generating most of thrust. For given fuel consumption generates much more takeoff thrust than turbojet, with many times less noise, but performance falls off more rapidly with forward speed. A few * engines have aft fan whose blades form outward extensions of those of the compressor turbine.

turbofan pressure ratio This invariably means the pressure ratio across the fan, not including any part of the core.

turbofan-prop Turbofan driving propfan mounted ahead of inlet and acting as fan booster stage to give jet as well as shaft power.

turbojet Simplest form of gas turbine, comprising compressor, combustion chamber and turbine, latter extracting only just enough energy from gas flow to drive compressor. Most of energy remains in gas, which is expanded to atmosphere at high velocity through constraining propelling nozzle. In supersonic aircraft often becomes 0.3.

Turbocharger.
turbine Time-variant random motion of fluid in velocity. which velocity of any particle, or at any point, is characterized by wild and unpredictable fluctuations which are extremely effective in conveying heat, momentum and material from one part of fluid to others. Called isentropic if rms velocity is same in all directions. US NWS defines light * as wind varies 0–19 ft/s and moderate as 19–35 ft/s. (5.79–10.67 m/s).

turbulence cloud Cloud formed because of atmospheric turbulence, usually distinctive layer above condensation level about 30 mb (say, 300 m, 1,000 ft) thick in otherwise stable air.

turbulence control structure Gigantic ‘golf-ball’ with numerous planar porous walls attached to inlet of engine on outdoor test to eliminate effect of wind.

turbulence number R (4) at which C d of smooth sphere becomes 0.3.

turbulence plot Term has been used for plotting wake turbulence behind aircraft, building or other bodies, and also for recording geographical locations of severe atmospheric turbulence, including CAT, over a long period.

turbulence screen Screen across wind tunnel to reduce turbulence, usually rectilinear array of crossing sharp-edged strips.

turbulent boundary layer One that is no longer laminar, characterized by gross random lateral motions, and Reynolds stresses much larger than viscous; all boundary layers become turbulent at R = 250,000+ unless surface unusually smooth, though apart from rise in skin-friction drag there should be no other significant effect and no separation.

turbulent bursts Microscopic eruptions which occur constantly over aircraft (or other) surface, beginning at surface; responsible for most of skin-friction drag and nearly half total aerodynamic drag.

turbulent flow Flow having turbulence superimposed on main movement, measured as velocity increments about all three axes expressed as fraction or % of mean flow velocity.

turkey 1 Badly designed aircraft, especially aeroplane, with sluggish or dangerous handling.

2 Aircraft with performance so poor as to be useless.

turn 1 Angular change of track; thus 30° * does not mean 30° bank. See * rate.

2 Of marching column, to make abrupt individual 90° turn, thus changing from column of route to line abreast.
turn and bank

Traditional flight instrument, at bottom right in the Basic 6: one centre-pivoted needle moves L/R around the upper arc to indicate slip, while a second moves round lower arc to indicate rate of turn; straight and level or at rest both needles are vertical.

turn and slip

Traditional flight instrument indicating rate of turn by a needle moving L/R around upper arc, and slip/skid by a ball in a lateral tube in lower arc. Alternatively, the needle is in the lower arc and the upper is a curved tube with a bubble.

turnaround

Elapsed time between aircraft parking at stopping point and moving off to continue flight or carry out fresh mission.

turnaround cycle

Comprises loading time at home base, time to/from destination, unloading/loading time at destination, unloading time at home, planned maintenance and where applicable, time awaiting facilities (DoD).

turnaround time

See turnaround, turnaround.

turnback

Abandonment of scheduled sector and diversion to alternate or to starting point, 80% [2002] for Abandonment of scheduled sector and turnaround time, 70% (occasionally more or less) tools, indexed to work in sequence; large capstan with power operation and turret on main bed-slates.

turndown

Both roll and yaw axes (US).

turn errors

See turning errors.

turn indicator

Gyroscopic flight instrument indicating rate of turn about aircraft vertical axis, almost always combined with slip/skid.

turning

General term for operation on a lathe in which workpiece is rotated.

1. Manoeuvre by which parachutist rotates to face direction of drift.

2. Rotating engine by means other than own power; also called cranking.

turning centre

Notional, vertical axis about which aircraft turns when manoeuvring on the ground. Inner wingtip can move forwards or backwards.

turning errors

Those due to instrument deficiencies, eg due to acceleration; see acceleration error.

turning moment

See couple, torque.

turn-in point

Point in space at which aircraft starts to turn from approach path to line of attack (DoD, NATO, becoming arch.).

turnoff

Point at which aeroplane leaves runway to taxi to parking place, normally also junction of runway and paved taxiway; high-speed is configured with gentle turn radius to avoid overstressing landing gear laterally.

turnoff lights

Flash lights at 15 m (50 ft) intervals defining curved path from runway centreline to taxiway centreline.

turnover assembly

Added at tail of vertical-launch missile to rotate towards target, then jettisoned.

turnover structure

Strong structure intended to protect aircraft occupants in event of overturn on ground, eg crash arch, crash pylon.

turnover voltage

Reverse V of point-contact semiconductor device (corresponding to reverse breakdown V of junction device) beyond which control over reverse current is lost.

turn radius

Half lateral distance required to change heading 180°. Radius is determined by TAS and bank angle: \[ R = \frac{V^2}{g \tan \phi}. \]

turn rate

By convention, aircraft change of heading rate is measured as Rate 1 = 360° in 2 min., Rate 2 in 1 min., Rate 3 in 32s, Rate 4 in 20s. Symbol \( \Omega \).

turnstile aerial

Crossed dipoles, equal quadrature-phase signals.

turntime

Time a transport aircraft is out of revenue service for heavy maintenance [US usage].

turrett lathe

Equipped with rotating toolholder for six (occasionally more or less) tools, indexed to work in sequence; large capstan with power operation and turret on main bed-slates.

turtleback

Top of fuselage, esp. aft of cockpit.

TUSA

Tactical unmanned surveillance aircraft.

tuslog

The US Logistics Group (USAFE).

tut

Targets under trees (AC2ISRC).

TUV

Tactical unmanned vehicle.

TV

Television.

1. Terminal velocity.

2. Theatre of war (USSR, R).

3. Thrust vectoring.

4. Transfer vehicle (cargo).

5. Test vehicle.

TVA

Thrust vector angle (of gross thrust vector).

1. Tuned vibration absorber.

2. Tuned vibration absorber.

3. Target vector analysis.

T-vasi, T-Vasi

See V/ASI.

TVAT

Television air trainer; carried on external pylon.

tvbc

Turbine vane and blade cooling.

tvbs

Television broadcast satellite.

TVC

Thrust-vector control (S adds system).

1. Turbine vane cooling.

TV command

Guidance by human operator watching TV picture from camera in nose of controlled vehicle.

TVCR

Tower visual control room.

TVD

Turboprop (USSR, R).

1. Terminal velocity.

2. Theatre(s) of military operation (USSR, R).

TVDS

Tactical-video distribution system.

tvdu

Television display unit.

TVE

Total vertical [separation] error.

TVGS

Text-to-volume generation system.

TV homing

Automatic homing guidance by comparing TV picture with sequence stored in missile memory.

TVI

TV interference.

1. Trials verification and installation.

2. Trials verification and installation.

TVIT, T-VIT

Tactical video imaging terminal.

TVLA

Tuned vertical line array (sonobuoy).

TVM

Track-via-missile.

T-VOR, TVOR

Terminal VOR.

TVP

Technology validation program (AIGT).

TVPm

Time-varying pulse manipulation.

TVR

Track-via-missile radar guidance.

1. Trajectory/velocity radar.

2. Trajectory/velocity radar.
TVRS
1 Tactical video link.
TVRS 1 Tactical voice-recognition system.

TVS 1 Target value structure.
TVS 1 Television system.
TVSU 1 Television sight unit.
TVT 1 TV tracker.
2 Thermal vacuum testing.
TV/IR 1 Thrust vectoring, thrust reversing.
TW 1 Threat warning.
2 Training, water-cooled (USA 1919–24).
3 Tare weight.
TW 1 Thrust/weight ratio.
2 Tare-weight allowance.
TW/AA 1 Tactical warning and attack assessment (Norad).
2 Terminal-weather data-link.
2 The Welding Institute (UK).
2 Treaty Working Group (JAA).

TV/AC 1 Technical Working Group (US/NATO Stanags).
2 Technical Working Group (US/NATO Stanags).
2 Technical Working Group (US/NATO Stanags).
TV/CC 1 Threat warning and countermeasures control.
2 Teward(s).

TVOC 1 TVOCC.
2 Tactical voice-recognition system.
2 Technical Working Group (US/NATO Stanags).
TV/O 1 TV/IR.
TV/0 1 TV/IR.
2 TVOCC.

TV-0 1 TV/IR.
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2 Technical Working Group (US/NATO Stanags).
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2 TVOCC.
two-stage supercharger

pilot of jet STOVL aircraft in which left hand controls speed only (including forward acceleration from hover) and right hand controls flight trajectory (including hover height).

Two-level bridge (jetway) Passenger bridge whose landside end can be raised or lowered to mate with either arrival or departure floor level.

2LM Second-level maintenance.

two-man rule Philosophy under which no individual is allowed unaccompanied access to NW or certain designated components or associated system interfaces.

two-meal service Two meals served on one sector.

2-minute turn Rate 1 turn; also called standard turn or procedure turn.

two-moment equation Relates simple-beam loading to shear and BM.

2 on 1 injector Rocket liquid injector spraying two streams of liquid A on to one stream of liquid B, the three meeting at various angles depending on design.

2-place Two-seater.

2.5-D Describes advanced synthetic vision systems which give important information on 3-D shapes.

2.5-engine aircraft Twin-engine aircraft certificated to use APU [or other centreline auxiliary engine] to give propulsive thrust, especially at takeoff.

2-point suspension Bifilar, hung from two points at same level on two filaments or cables.

two-point tanker Fitted with two HDUs which can be used simultaneously.

2-pole switch Opens or closes both sides of same circuit or two separate circuits simultaneously.

Two-position propeller One having only two settings, fine and coarse.

two-pulse rocket Motor, usually solid propellant, comprising two stages (eg, boost and sustain fired in series).

two-rate oleo Normally, first part of travel is at low rate (ie, large deflection per unit load); after loading to given limit, often close to static position at gross weight, high-rate law applies. Common on naval helicopters.

two-rate oleo Two stages (eg, boost and sustain fired in series).

2-point lander. Two, or 2. Two aircraft in a tactical formation: major variations are finger 2, fluid 2, deuce, loose deuce, pair, Rotte.

2½-axis machining Continuous-path machining (invariably with NC) on x, y axes, usually intermittent on z.

two-axis autopilot Simple autopilot having authority in roll and yaw only.

two-axis homing head Scans in az and el.

two-bay biplane One with wing assembly comprising rectangular cellule of inner and outer interplane struts with points of attachment linked by diagonal wires. Loosely, biplane with interplane struts at two different spanwise locations on each side of fuselage (discounting any struts near fuselage).

two-colour pyrometer High temperature is measured at two wavelengths.

two-control aircraft Aeroplane or glider with flight-control system in two axes only, invariably ailerons and elevator; thus no rudder or pedals.

two-cylinder See two-stroke.

2-D Two-dimensional.

2-position defined by lateral guidance only in Satnav.

2-DCD Two-dimensional convergent/divergent (nozzle).

2-D flow Flow which can be described completely in one plane, eg around wing of infinite span.

two-dimensional matrix Code for marking parts for identification, small area containing 100 times more information than bar code.

2-D inlet Two-dimensional inlets are in theory ideal for operation over wide range of Mach numbers but because of end and corner effects and mechanical complexity are in practice inferior to axi-symmetric.

two-D nozzle Jet nozzle of rectangular cross-section and constant longitudinal profile which can vector thrust in vertical plane. Studied for future US fighters. Also called platypus.

2 DOF Two degrees of freedom.

2-D radar Radar giving target position in two dimensions, eg az/el, or range/bearing; only a few can pinpoint body’s location in 3-D space.

2-D wing Usually one of infinite span, whose tip effects can thus be ignored; for some purposes constant-section wing joined at each end to tunnel wall is approximation.

twofold flocking Turbopan test for birdstrikes over whole area of fan and spinner.

two-frequency Glidepath and/or localizer having two unrelated radiation patterns.

2 GINS Two-gimbal INS (colloq.).

2H-2E Hybrid architecture of secondary power systems comprising two hydraulic and two electrical circuits.

Two-axial control Fundamental control strategy for
2-star red

series, either both driven by crankshaft or with first (LP impeller) driven by exhaust turbo.

2-star red Standard distress pyrotechnic, fired without pistol.

two-step supercharge Throttle is gated below rated altitude, thereafter being free to move to maximum position; used with or without two drive ratios.

2-stick Dual-control aircraft (colloq.).

two-stroke Piston-engine cycle in which every upstroke expels exhaust and compresses mixture and every downstroke provides power. Often abb. 2T. Not normally certificatable for unrestricted aviation use.

2-view drawing Orthographic projection drawing comprising two views, usually left-side elevation and plan.

TWP Two-way programme.

TWR
1 Threat-warning receiver (formerly sometimes rendered as tail-warning radar).
2 Tower (or twr); suffixes: INC, in cloud; INH, in haze; INK, in smoke; INP, in precipitation; INUN, in unknown obscuration.
3 Turbulence weather radar.

twr Tower; one definition = aerodrome control.

TWRG Towering.

TWS
1 Tail-warning set or system.
2 Track-while-scan.
3 Threat-warning system.
4 Through-wall surveillance.
5 Thermal weapon sight.
6 Tactical work station.
7 Terminal weather system.

TWSC Thin-wall steel case.

TWSRO Track-while-scan in receive mode only.

TWSS TOW weapon subsystem.

2 Track-while-scan system.

TWT Travelling-wave tube.

2 Transonic wind tunnel.

TWTA TWT amplifier.

TWU Tactical Weapons Unit (RAF).

2 Transport Workers Union, now Transport Workers of America (US).

TX, tx Transmitter, transmit, transmission.

Ty-Rap Patented nylon strap for tying and identifying bundles (loomis) of electrical wiring.

tyre Specifically for landing-gear wheels; US = tire.

tyre sizes Usual sequence of three numerical values is overall diameter, section width (undeflected) and (if present) inner diameter or bead size. Other measures include Types III and VII, radial and metric. There is a need for a uniform scheme.

tyro Callsign prefix, when calling military or D&D: I am inexperienced.

Tyuratam Soviet test centre for ICBMs, various other missiles and FOBs, and launch centre for Cosmos military satellites; location 45.8°N, 63.4°E.

Typhoon Tropical cyclone, revolving storm.

typical In structures and structural components, arithmetical mean structure calculated by measuring sections of all members actually produced. Typhannon A Japanese high-modulus ceramic fibre.

Ty-Rap Patented nylon strap for tying and identifying bundles (loomis) of electrical wiring.

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U

1 Overall heat-transfer coefficient.
2 Linear acceleration (archaic usage).
3 Internal or intrinsic energy.
4 Aircraft has 4096-code transponder with altitude encoding.
5 With appropriate suffix, flow velocity component along orthogonal axes, radial or tangential, or vehicle speed, e.g. U<sub>r</sub>.
6 Designation prefix, aircraft, un piloted (USN 1946–55), RAF (from 1956), or utility (USAF from 1952), USN (from 1955).
7 Modified mission, prefix and suffix, utility (USN).
8 Designation first letter, missile, underwater-launched (DoD).
9 Designation second letter, missile, attack on underwater target (DoD).
10 Airfield is unlicensed.
11 Upvayedamaya, = guided (R).
12 Umra, = factory modification (G, WW2); -B or Bausatz added conversion kit.
13 Upper (wing or flight level).
14 Identity unknown.
15 Until.
16 Unicom.
17 Uranium.
18 Aircraft category UAV (FAI).
19 Unidirectional [runway].
20 Other meanings include unmanned, unwatched, unverified, upward and user-fee.

U 1 Force in structural member due to unit load; also [quite different] uniform load per unit length or area.
2 Tangential velocity, or linear velocity of point in rotating structure, e.g. compressor rotor blade or aeroplane in roll.
3 Also used for translational velocities.
4 Surface unpaved.
5 Unit of atomic mass.
6 Specific internal energy.
7 Velocity along X [body] axis, alternative to U(5).
8 Subscript, upper surface.
(U) 243.0 Hz available on request.
U-alpha Free-stream fluid velocity, usually written U<sub>a</sub>.
U-code See U(4).
U-index Monthly mean of differences between consecutive daily mean values of vertical component of Earth’s magnetic field.
U-index Value of U-index divided by sine of magnetic co-latitude multiplied by cos of angle between magnetic meridian and horizontal component.
U-Joint Universal joint.
U-tail Aeroplane tail with twin verticals attached to fuselage (can be inclined outwards but not applicable to butterfly tail).
U-235 Fissile uranium, isotope typically 0.71 per cent of natural metal, nearly all the rest being U-238.
UA 1 Uncontrolled airspace.
2 Unit of account; standard accounting unit (EEC).
3 Until advised.
4 Air rep, upper air pirep.
5 Unnumbered acknowledgement.
6 Unit of Action (USA).
7 Unmanned aircraft.
UAA 1 Up and away (JSF).
2 University Aviation Association [office, Cahokia IL] (US).
7 Upper advisory area.
7c Unusual aerial activity (CAA, UK).
UAAA Ultralight Aircraft Association of Australia.
UAB Until advised by (ICAO).
UAC 1 Upper-air computer, or center (FAA).
2 Upper-airspace control (CAA).
3 Upper-area control centre.
5 Universal avionics computer.
UACC See UAC 3.
UACCV Unit of action command and control vehicle.
UACO Unmanned autonomous collaborative operations (USA, USAF).
UAE Unmanned aircraft system. including supporting infrastructure.
UAD 1 Unidirectional aligned discontinuous.
2 Upper advisory (route).
UADA Upper advisory area.
UADE Ultralightweight aerial diesel engine [usually Ulade].
UAI Union Astrononique Internationale [office, Paris] (Int.).
UAJ Unattended jammer.
UAL 1 Unidirectional approach light[ing].
2 Unit authorization list.
U-alpha See U-alpha.
UALV Unmanned airlift vehicle.
UAM Underwater-to-air (missile).
UANC Upper-airspace navigation chart.
U&L Upper and lower (wings).
UAOS Unmanned aerial, or aeronautical, observation system.
UAP Unidentified aerial phenomena.
UAPP Unified adaptive planning (or preplanning) program.
UAR 1 Upper air route.
2 Unattended radar.
UARS 1 Unattended radar station.
2 Unmanned air reconnaissance system.
UART Universal asynchronous receiver/transmitter.
UAS 1 University Air Squadron(s). (UK).
2 Upper airspace service.
3 Unmanned, or uninhabited, air, or aerial, system.
4 User aircraft system.
5 User application software.
6 Ulster Aviation Society (1968–; Newtonabbey BT36 6PE) (UK).
7 Unassigned (Telabs).
8 Unavailable service (Sprint).
9 Urea ammonium sulphate.
UASA Upper-airspace service area.
USASO Unmanned Air Systems Office (FAA).
UASTAS

UASTAS Unmanned airborne surveillance and target-acquisition system(s) (DND).

UASV Uninhabited, or unmanned aerial surveillance vehicle.

UAT Universal-access transceiver.

UATP Universal air travel plan (Int., US-based).

UAV Unmanned, or uninhabited, air, or aerial, vehicle; B adds bottle lab, S systems. Note: US official abb. is now UMV.

UB Utility bus.

UBE Ultra-bypass engine.

Ubee, ubie Alternatives to UBE.

UDE,UDE Gust vertical speed [design case].

Udet buoy Open-sea tethered buoy to assist downed aircrew (G, WW2).

U-data Unsymmetrical diethyltriamine.

UDF 1 U.h.f. direction-finding.
2 Unducted fan engine (GE trademark).
3 Unit development folder (software).
4 User data file [G adds generator].

UDID Restricted digital interface.

UDL Universal or unclassified, data-link.

UDM Universal docking module.

UDMH Unsymmetrical dimethylhydrazine rocket fuel.

UDMU Universal decoder memory unit (Gpats).

UDT Unidirectional transducer.

UDTE Upgraded data-transfer equipment.

UFE Unit equipment, or establishment, list of aircraft or other items serving with combat units.

UFE, u/e Under-excitation.

UECA Union Européenne Contre les Nuisances des Avions (Int.).

UEDC Uncontained engine debris pattern.

UEET Ultra-efficient engine technology (NASA).

UEJ Unattached expendable jammer.

UEO Western European Union (F).

UEP Unattached expendable pattern.

UEU Unattached expendable unit.

UEWR Upgraded early-warning radar.

UFF Unlinked format.

UEWE Updated early-warning equipment.

UEW Upgraded early-warning station.

UEXR Updated equipment removal.

UFC Undercarriage, ie landing gear.

UDT Ultra-thrust engine.

UDTC Upgraded data-transfer equipment.

UDU Multichannel digital university.

UDVE Undercarriage ventilation engine.

UDV Up- and down-draughts.

UDV Up- and down-draughts.
UGSS

UGSS Unmanned global strike system.

UGV Unmanned ground vehicle, usually controlled from air.

UH UDMH

UHB Ultra-high bypass engine.

UHC Unburned hydrocarbons.

UHCA Ultra-high-capacity aircraft.

UHD Ultra-high density.

UHDT Unable higher, due traffic.

UHE Ultra-high energy; CR adds cosmic rays.

UHF Ultra-high frequency, see Appendix 2.

UHH Ultra-high hardness [steel].

UHPT Undergraduate helicopter pilot training.

UHR Ultra-high resolution.

UHS Ultra-high-speed (logic).

UHV Ultra-high vacuum.

UI Unnumbered information.

UIAA See IUAI.

UIC Upper-airspace/information centre (ICAO).

UIF Unfavourable information file.

UIL User interface language.

UIP Upgrading instructor pilots.

UIR Upper-airspace flight-information region.

UIS Upper-airspace/information service, or system.

UIT 1 Union Internationale des Télécommunications.

2 UV imaging telescope.

UIT Unijunction transistor.

UK Training centre (USSR, R).

UKAATS UK Advanced Air Traffic System.

UKAB UK Airprox Board (CAA).

UKACC UK Air Cargo Club.

UKACCS UK air command and control information system.

UKAdge UK air-defence ground environment.

UKADR UK air-defence region.

UKAG UK Airports Group [organisations and suppliers; office, Rugby CV21 1BU] (UK).

UKAPE The UK Association of Professional Engineers [office, Bromley, Kent].

UKAS UK Accreditation Service.

UKATS UK Air Traffic Services, part of Nats.

UKcEB UK Council for Electronic Business.

UKF Unbemanntes Kampfflugzeug = UAV (G).

UKFSC UK Flight Safety Committee [office, Fairoaks Airport, GU24 8HX] (UK).

UKIRC M UK IR countermeasures.

UKISC UK Industrial Space Committee [FEI + SBAC, office, Wisbech PE13 1JZ] (UK).

UKIF UK land forces.

UKMF UK Mobile Force.

UKMSCS UK military satellite communications system.

UKN Unknown.

UKOAOA UK Offshore Operators’ Association.

UKRAOC UK Regional Air Operations Centre.

UKSCC UK Satellite-navigation Co-ordinating Committee.

UKSEDS UK Students for the Exploration and Development of Space (RAeS).


UKWMO UK Warning and Monitoring Organization.

UL 1 Ultralight.

2 Unleaded.

ultimate strength

Uplink

ULA 1 Uncommitted logic array.

2 Ultra-light aircraft.

3 Fairbanks, AK, tracking station.

ULAA Ultra-Light Aircraft Association (Australia; in UK became PFA in 1952).

ULAES Universal locator airborne integrated data system.

Ulana Unified local-area network architecture.

ULB Underwater locator beacon.

ULC Unit load container.

ULCE Unified life-cycle engineering.

ULCS Unit-level circuit switch.

ULD 1 Unit load device.

2 Underwater locating device.

ULD Ultra-long-duration balloon.

ULD Carrier See Dolly.

ULEA Ultra-long-endurance aircraft.

ULEV Unmanned long-endurance vehicle.

ULH Ultra-long-haul., generally taken to mean 8,000+ n.m. (14,816 km).

ULL Ullage (NASA).

ULLA Ultra-low-level airdrop.

ullage Volume above liquid in a tank; occasionally misused to mean last dregs of liquid itself remaining in tank.

ullage engine Rocket motor fired in ullage manoeuvre.

ullage manoeuvre Applying axial thrust to space-launcher stage or other liquid propellant tank(s) that are nearly empty in order to collect remaining propellants around delivery pipe connection.

ullage motor See ullage engine.

ullage space See ullage.

ullage washing Injecting gaseous nitrogen from ground supply before takeoff.

ULM Ultra-leger motorisé = ultralight aircraft (F).

MTOW (1 seat) 300 kg (661.4 lb), (2 seat) 450 kg (992 lb), stall ≤ 35 kt (65 km/h).

ULMS 1 Undersea-launch (or long-range) missile system.

2 Unit-level message switch.

ULN Ultra-low Nox.

ULP Upper-level protocol.

ULR Ultra-long-range; loosely = ULH.

ULS Unimproved landing strip.

ULSA Ultra-low-sidelobe antenna.

Ultem Fire-blocking furnishing materials based on PEI, seen as replacement for Lexan (GE).

ultimate factor of safety Number by which limit (or proof) load is multiplied to obtain ultimate load; purely arbitrary factor of safety, usually varying from 1.5 to 2, representing best humanly attainable compromise between economic structure weight and aircraft that will not break.

ultimate load Greatest load that any structural member is required to carry without breaking; that at which it may legally be on verge of breaking, and permanently deformed. Usually, limit load × UFS. Gust requirements, in which structure oscillates, can be superimposed on maximum static load to demand even greater design strength in
ultimate stress

“flappable” parts of structure, esp. wing. Hence, ultimate bending/compressive/tensile/torsional strength.

**ultimate stress** That in a member or piece of material at moment of fracture; in theory that in structural member loaded to ultimate strength.

**Ult-join** Unit-level trainer, joint operations integrated network.

**ultra-bypass engine** One name of unducted propfan, with BPR from 20 to 50 (Boeing).

**ultra-high bypass** UHB, alternative to above (McDonnell Douglas).

**ultra-high-density seating** Seating configuration for maximum number of passengers (invariably greater than original certification limit) with minimal pitch and no galley.

**ultra-high frequency** 300–3,000 MHz, see Appendix 2.

**ultra-high magnetic field** Generally, greater than 10 T (100 kG).

**ultra-high-speed photography** Rate higher than 10⁷ images/s.

**ultra-high vacuum** Previously below 10⁻¹³ torr (not apparently yet defined in SI, but this is 13.33 × 10⁻¹¹N/m²; density 3.2 × 10⁻³ mol/cc, mean free path (air 25°C) 3.8 × 10⁻⁹m.

**ultralight aircraft** Categories of small aeroplane. In USA, 1-seat with empty weight ≤254 lb (115.2 kg); in Australia, 1 or 2 seats, MTOW 540 kg (1,190.5 lb). France, see ULM, UK, see microlight, SLA.

**ultra-long-haul** FDP exceeding 16 hours.

**ultra-low airdrop** Below 15 m (50 ft) AGL.

**ultramicroscope** Instrument for observing extremely small particles by intense illumination causing diffraction rings on dark background.

**ultra-short takeoff** Use of short forward run by aircraft capable of VTO, normally called merely STO. Can involve pilot-selectable operating modes.

**ultrasonic** Mechanical vibrations, eg sound waves, of frequency too high to be audible to humans (opposite = infrasonic). Generally frequencies above 15 kHz, usually generated by electro-acoustic transducer and propagated through solids, liquids and gases.

**ultrasonic bonding** Techniques of joining materials with ultrasonic energy, in some cases to cause local melting (ultrasonic welding) and in others to cause either enhanced local diffusion or merely heating to accelerate curing or setting of adhesive.

**ultrasonic cleaning** The item to be cleaned is immersed in liquid [water or various proprietary fluids] and surrounded by small bubbles created by magnetostrictive transducers. The collapse of the bubbles [implosion] bombards the surface with shockwaves.

**ultrasonic inspection** NDT method in which cracks are revealed by discontinuity in propagation of ultrasonic waves through metal.

**ultrasonic machining** Techniques for shaping solids, esp. those too hard or for any other reason not machinable by conventional means. Most common method uses shaped tool oscillated vertically above work at frequency about 20 kHz, with space between tool/work fed with hard powder abrasive.

**ultrasonic rolling** Transducer (typically 20 kHz) placed inside one (rarely both) of rolls in rolling mill with objective of reducing rolling energy needed, reducing required temperature of metal being rolled and rolling to thinner gauges.

**ultrasonic welding** Techniques in which ultrasonic vibrations are used to join two metal (rarely, either or both is non-metal) surfaces brought into contact. Surfaces usually well mating, atomically clean and pressed together under pressure. In some techniques ultrasonic rearrangement of atoms is sufficient to cause melting at interface, while in others there is diffusion between the two faces.

**ultrasonic wind sensor** Most have three sources exchanging pulses between each pair, times being precisely measured.

**ultrasound** Sound of ultrasonic frequency.

**ultra-violet** Band of EM radiation of frequency just too high (ie wavelength too short) to be visible, links visible violet at about 3.8 to 4 × 10⁻⁷ m to limiting wavelength put at from 1 to 1.36 × 10⁻⁸ m (next major part of spectrum is X-ray at appreciably shorter wavelength).

**ultra-violet detector** Material, eg single-crystal silicon carbide, not triggered by sunlight or other incident radiation but instantly responsive to UV.

**ultra-violet imagery** That produced by sensing UV reflected from target (DoD).

**ULV** 1 Upper limit of video (HUD).

**ULM** 2 Ultra-low volume (crop spraying).

**UM** Rhymes with ‘come’, an unaccompanied minor [passenger under 16].

**UMA** 1 Unmanned aircraft, = drone or RPV.

**UMC** 2 Upgraded main computer.

**UMD** 1 Unrefuelled mission distance.

**UMD** 2 Unit manning document.

**UMG** Universal message generator.

**umkehr** Anomaly of relative zenith intensities of scattered sunlight near UV as Sun nears horizon, often cap U.

**UML** Unified modelling language.

**UMLS** Universal MLS.

**UMR** Unrefuelled mission radius.

**untrust** Modified, modification (G).

**UMS** 1 Unified message switch.

**UMTS** 2 Utilities management system.

**UMT** 1 Universal military training.

**UMT** 2 Universal mount.

**UMTE** Unmanned threat emitter.

**UMTS** Universal mobile telecommunications system, providing all previous facilities plus TV and video-conferencing on mobile devices (2004 on).
UMV

UMV Unmanned vehicle, from 2004 standard term in US military.

UN United Nations, many suffixes.

UNA Unable.

unaccelerated flight Flight without imposed acceleration, but there are several conflicting definitions and term needs redefining to avoid ambiguity; (1) flight along straight-line trajectory at constant V, thus no imposed acceleration; (2) rectilinear flight (eg straight and level) with no imposed acceleration normal to flightpath other than Earth gravity; (3) weightless flight with not even gravitational acceleration, thus curvilinear around Earth. Definition (2) allows acceleration along line of flight, thus speed can vary.

unaccompanied baggage Not carried on same aircraft with pax or crew to which it belongs; DoD definition adds 'not carried free on ticket used for personal travel'.

unanimity rule Basic IATA principle that fare from A to B is same as from B to A and same for all carriers offering identical service; can be relaxed.

UNAP Unable to approve.

unapproved Not tested to established requirements, thus flown on special dispensation, eg VW engines with single ignition.

unapproved part Can physically be installed but does not fulfil requirements. See counterfeit.

unaugmented In case of turbojet or turbofan, not equipped with afterburner, or not using afterburner.

unavi Unavailable.

Unavia Italian national organization for study and development of aircraft technology.

unbalanced cell Cell of Ni/Cd battery which has discharged more than others; first step to thermal runaway.

unbalanced field Any takeoff in which accelerate/stop distance is not the same as for normal takeoff to 35 ft.

unbalanced turn One with slip or skid.

unblown 1 STOL aircraft with USB, IBF, EBF or other powered blowing system in flight mode with blowing inoperative.

2 Of piston engine, not equipped with supercharger.

unburnt hydrocarbons Essentially unburnt fuel, contaminant emitted by engines and subject to emissions legislation.

UNC United Nations command; followed by various force initials.

uncertain Category of aircraft whose safety is not known, normally applied when 30 minutes have elapsed since arrival message or ETA and not answering radio call; hence uncertainty phase.

Uncertificated Aircraft category; airworthiness not established.

UNCL 1 Unified numerical-control language.

2 Unclassified.

Unclassified 1 Security category for official matter which requires no safeguards but may be controlled for other reasons.

2 Performance category for aircraft, usually civil transports, in service prior to 1951 and thus not built to CAR.4(b), BCARs or SR.422A/B.

uncontrolled airspace Airspace where no ATC service is provided.

uncontrolled mosaic Made up of uncorrected images matched from print to print without ground control or other orientation, giving mosaic on which distances and bearings cannot be accurately measured.

uncooled Descriptive of turbine blade devoid of internal or transpiration cooling.

uncoupled Generalized adjective for vehicle of essentially passive nature, devoid of helpful emissions and not responding when electronically challenged; applied to aircraft, usually means not equipped with transponder.

under the radar Flight levels as close as possible (see lo) to ground in attempt to thwart hostile attempts to obtain positive track by defensive radars; becoming pious hope.

underwater missile Launched below water surface.

under water Marine aircraft, moving on water [some authorities: under weigh, from weighing the anchor].

underwater spray Secondary airflow extracted from location on underside of variable wedge above supersonic airbreathing inlet, usually from point of maximum wedge depth at throat.

under cover Instrument flight training in which pupil is prevented from seeing outside aircraft, originally by unfolding opaque hood, later by two-stage amber or other method.

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unfrac Local adjective for vehicle of essentially passive nature, devoid of helpful emissions and not responding when electronically challenged; applied to aircraft, usually means not equipped with transponder.

undock To separate two vehicles in space previously joined and with intercommunication but not necessarily sharing common atmosphere.

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unfactored

assessing airline or other route network each sector is counted once only, in one direction only, despite fact it is used in both directions and may form part of from 2 to 48 distinct routes; hence * route mileage, * network.

unfactored Not multiplied by a factor, eg factor of safety; hence * load = limit load. See next.

unfactored performance That expected from average aircraft, flown by average pilot, with no safety factors.

unfavourable unbalanced field One whose clearway allows takeoff at increased weight at which TOD to 35 ft exceeds accelerate/stop distance.

UNFCCC United Nations Framework Convention on Climate Change [1994–] (Int.).

unfeather To restore propeller from feathered state to normal operative state with engine transmitting power and blades in positive pitch.

unfeathering accumulator Source of stored fluid [liquid or gas] pressure to guarantee ability to unfeather after failure of primary propeller control system.

unfilmed HIT not coated with protective ion barrier in order to improve resolution and SNR.

Unfo Undergraduate Naval Flight Officer (USN).

UNGA 2 United Nations General Assembly.

  2 Unione Nazionale Giovanile Aeronautica (I).

UNICE, Unice Union of the industrial federations of the EEC countries (English translation).

Unicom Private radio communications service on five frequencies based at airports, heliports etc, with or without tower in addition; used for various advisories other than ATC purposes (US).

unidentified aerial phenomena Source of stored fluid [liquid or gas] pressure to guarantee ability to unfeather after failure of primary propeller control system.

unidentified flying object Anything seen in the sky which, by virtue of shape or behaviour, cannot be identified as something known to humanity.

unidentified aerial Single well-defined direction of maximum gain.

unidirectional composite All fibres are parallel, usually aligned with direction of applied load.

unidirectional current Flowing in one direction only, eg signal pulses or d.c. with superimposed a.c.

unidirectional solidification Techniques for obtaining strongly preferred direction of crystalline grains on solidification of alloy from melt such that each crystal forms long string or column aligned with maximum applied load, transverse intercrystalline joints being rare. In most applications, eg turbine rotor blades, a step on route to single-crystal material.

Unido UN Industrial Development Organizations.

unified control This usually means unified flight control, which in turn usually means governing the trajectory of a fixed-wing aerodyne via a single three-axis inceptor, typically a wheel or cycle-type handlebar. Blériot (1908) has been followed by 60+ schemes, several of which have been flown (Clark, de Valroger, Chrislea, Ercoupe, Davis).

unified fuel control Control system for supersonic airbreathing engine governing engine acceleration, pilot input response, Mach, nozzle and Flap.

unified system Generalized term for TTC (tracking, telemetry and command) system handling all digital, video and voice signals in integrated system for larger or complex air vehicle or space payload. Also applied to simpler satellites, missiles and RPVs, eg unified-pulse systems in which each command pulse train comprises vehicle address, message ident and message, synchronized with radar ranging pulses; thus one * handles all vehicles.

Unified thread Standard 60° screw thread (US, UK, Canada).

uniform acceleration Time-invariant, giving straight line on V/T plot.

uniformly distributed load One imposing constant force on each unit area of horizontal floor.

uniformly varying load Magnitude varies directly with distance along straight-line axis from reference point.

uniform photo-interpretation report Third-phase machine-formatted intelligence report of particular objective containing detailed information extracted from photo sensor imagery (USAF).

uniform velocity Time-invariant speed and direction.

Uniheld Universal head-down display; standardized cockpit display of information from many sources and sensors with high brightness.

unijunction transistor Bar of doped semiconductor with p-n junction near centre, normally forward-biased, giving sharp peak of emitter V for small emitter current; used in pulse generators and sweep circuits. Also called double-base diode.

unilateral instrumentation In unyawed flight each half-aircraft behaves as mirror image of other and, therefore, full information can be obtained by fitting pressure-sensing heads, transducers, and other experimental equipment on one half only; ** should not be used during yawed flight.

unipole Hypothetical aerial radiating equally in all directions.

Unishear Fixed or portable high-speed shear for thin sheet.

unison ring Ring linking and driving all IGVs or stator blades [vanes] in one stage of a variable-stator engine.


unit 1 Fundamental subdivision of any numerical measure. Nearly all industrial countries have in theory adopted SI system. Base * of seven fundamental quantities are: length, metre (m); mass, kilogram(me) (kg); time, second(s); electrical current, ampere (A); thermodynamic temperature, kelvin (K); luminous intensity, candela (cd); and amount of substance, mole (mol). SI * of electricity or charge is coulomb. For payment of electricity supply, kWh.

  2 Military element whose structure is prescribed by component authority; normally applied only to small organizations at field level, eg squadron, or to element of airborne force, eg two or three aircraft.

  3 One complete item from production, eg production *, * sales.

unit aircraft Those provided to an aircraft unit for performance of a flying mission (DoD).

unit area That equal to square of unit length on each side.

unitary Having a single warhead, as distinct from dispersed or clustered munitions.

unit cost 1 Airline’s total costs divided by generated RPKs or RPKs.

  2 See Average flyaway *, average procurement *, program acquisition *.

unit deformation Deformation divided by original
Uniter

length or other undistorted measure; ie deformation per unit of original length.

Uniter Secure survivable fixed telecom network, part of DFTS and particularly linking UKAdge (RAF).

unit hydraulic tail Power unit driving tailplane (horizontal stabilizer, taileron).

unit load Also called unitized load, any collection of cargo items packaged to fit a unit load device.

unit load device Platform or container for cargo, of standard ISO dimensions and interfacing with handling and restraint systems, e.g., LD3 container or 88×125 pallet.

unit of action C2 vehicle Provides situational awareness to land and air component commanders, sending high-resolution targeting via AOC9 by datalink.

unit of issue See unit (1). In most practical flying SI is still unattained, distances being in nautical miles, pressures in lb/sq in, atmos, bar and various other units (hardly ever Pa), acceleration in g, and volumes in litres, US gal or Imp. gal instead of m³ (but fuel mass generally in kg).

unit of measurement See unit (1). In most practical flying SI is still unattained, distances being in nautical miles, pressures in lb/sq in, atmos, bar and various other units (hardly ever Pa), acceleration in g, and volumes in litres, US gal or Imp. gal instead of m³ (but fuel mass generally in kg).

unit stress Usually load divided by cross-section area normal to applied force direction.

unit training device Simulator.

universal gas constant See gas constant.

Universal Metrics A set of six performance measures designed to be applicable across the UK [and thus probably any other] aerospace industry, launched in 2002 by the SBAC Lean Aerospace Initiative. The objective is to enable companies to measure their performance and that of their supply chain.

universal motor Electric motor operative on a.c. or d.c.

universal polar stereographic Grid for regions from 80° latitude to poles.

universal receiver Operative on a.c. or d.c., with various protective devices.

Universal Safety Oversight Audit Inspection by ICAO-led team of safety and security measures taken by 187 member states to counter terrorism.

universal shunt Resistor in parallel with ammeter to increase range of currents measured as FSD is approached.

universal tester Usually, hand meter for measuring a.c./d.c. current, a.c./d.c. volts and resistances.

universal time Defined by rotation of Earth, and thus not absolutely uniform; ** 1, corrected for polar motion; ** 2, corrected for seasonal variation in rotation.

universal timing disc Disc graduated 000°/360° with associated pendulous pointer, attached to piston-engine crankshaft.

universal transmission function Attempts to describe mathematically IR propagation in atmosphere.

universal transverse Mercator Grid for co-ordinate system from 84°N to 80°S.

UNK, unk, unkn Unknown.

unknown traffic Flight details not known to the ATSU with which you are in contact.

UNL Unlimited (altitude, ceiling).

unlgd Unlighted (FAA).

Unlimited 1 Air race class for piston-engined aircraft: no restriction on engine capacity.

unstable air

...2 Aerobatic class: no restriction is imposed on flight manoeuvres apart from airframe strength limits.

unlimited ceiling Traditionally, less than 50% cloud, base 9,750+ft (2,972 m) AGL (FAA).

unload To reduce g (normal acceleration), usually to restore lost speed.

unloading See pump unloading.

unlocked Automatic-gun action in which at moment of firing breech is not locked (eg to barrel or case) but is of sufficient mass (inertia) for pressure to have fallen to safe level before breech opens significantly; usually synonymous with blowback action.

unltl Unlimited.

unnamed Aircraft has no pilot on board [but may have one in another aircraft or on ground].

unmask Point at which vehicle becomes visible to defending surveillance systems.

unmkd Unmarked (eg obstruction) (FAA).

Unmovic UN Monitoring, Verification and Inspection Commission.

unpaired channel DME channel without a corresponding VOR or ILS frequency.

unprepared airfield Usual meaning is without permanent paved runway.

unpumpable fuel That fuel deliberately designed to be unpumpable, through levels of sumps and booster-pump inlet sills, to avoid ingestion of any water.

unrefuelled range Range on fuel carried at takeoff; usually applied to aircraft with provision for inflight refuelling.

unreinforced ablator Without honeycomb filling or backing.

unreliable Unreliable.

unreliability coding Series of (usually five) dots following transmissions made by unusable Tacan for calibration or test purposes, indicating not to be used.

unrotated projectile Original name for unguided air and ground-launched rockets (UK, WW2).

UNRSTD Unrestricted.

UNSA Unmanned naval strike aircraft [projects].

unscheduled maintenance Those unpredictable maintenance requirements not previously planned or programmed but which require prompt attention and must be added to, integrated with or substituted for previously scheduled workloads (USAF).

unsealed strip Runway with no waterproof coating; normally means compacted earth, gravel or other substrate with or without top layer of rolled material or prefabricated mat of mesh or steel planking.

unshielded A major meaning is that portion of aerodynamic surface in full slipstream, not in wake of another part of aircraft, especially that part of rudder not in wake from horizontal tail in established spin. The URVC is based on this multiplied by its moment arm.

Unspec Unspecified.

unstable aerofoil Generally means one with extensive CP travel.

unstable air Air in which temperature decreases with height at rate greater than DALR or SALR; thus a parcel given a small vertical movement (up or down) will continue with increasing speed.
unstable aircraft

unstable aircraft General meaning is one which, when diverted [even slightly] from straight/level flight, will diverge in an uncontrolled manner.

unstart Explosively violent breakdown of correct (ie started) airflow through supersonic inlet to airbreathing engine, notably with expulsion of shockwave(s) and temporary reversal of flow. All highly supersonic (M3+) engines have such a large contraction ratio and constricted throat that any yaw, spillage from neighbouring engine, gunfire or other disturbance can cause *.

UNSTBL Unstable air mass.

UNSTD Unsteady.

unstick Point at which fixed-wing aerodyne leaves surface of land or water; hence * run = ground or water run; * speed = that at which aircraft becomes airborne, usually about 25% of way from \( V_g \) to \( V_s \) symbol \( V_{ws} \).

unstick-speed ratio \( V/V_{ws} \), ratio of aircraft speed to unstick speed either as % or as fraction. Usually plotted as abscissa on takeoff performance graph, esp. of marine aircraft.

unstressed Not bearing significant external load.

unsupported site Possible operating site for V/STOL aircraft but devoid of prestocked supplies, eg POL, ammunition etc.

Unsvc * Ground facility is unserviceable.

unsymmetrical Generalized chemical description of molecular structure where left is not mirror image of right; eg in 1, 2 dimethylhydrazine each N has an H and a CH3 attached (symmetrical), but 1, 1 dimethylhydrazine has left N joined to two H atoms and right N joined to two CH3 methyl molecules and is unsymmetrical (UDMH).

unsymmetrical flight Condition in which aircraft (aeroplane or glider) is not balanced about longitudinal axis, due to roll, roll/yaw or other rotary manoeuvre causing gross alteration to normally symmetric wing lift. Hence unsymmetrical load, that in unsymmetric flight.

unsymmetric thrust Thrust with one failed engine away from centreline; normally called asymmetric.

UNT Undergraduate navigator training (Soads system) (USAF).

UNTSO UN Truce Supervisory Organization.

unsuitable fuel Fuel that cannot be used in flight with wings level and at cruise AOA (or nose 3° up). \* Trapped fuel is that fuel remaining in worst case on ground using booster pumps for defuelling and switching off immediately associated LP warning lights illuminate. See Unpumpable fuel.

UNUSBL Unsuitable.

unwarmed exposed Friendly troops are in open when NW detonates on near enemy.

UOC Underwing ordnance capacity.

UEOS User operational evaluation system.

U-174 Standard headset jack plug (US, NATO).

UOR Urgent Operational Requirement (UK).

UGS UC-AV operational system.

UP Unrotated projectile (1938–1944 name for British rockets, virtually all air/ground).

2 Unguided projectile.

3 Unruly passenger.

4 Unknown precipitation.

5 Universal platform.

\( U_r \) Helicopter rotor-blade out-of-plane velocity normal to plane of disk.

upper baseplate

UPA Union of Professional Airmen [affiliated ALPA, office Washington, DC] (USA).

up and away I Descriptive of all powered-lift systems capable of giving VTO.

2 The operative mode giving VTO, as distinct from (e.g.) STOVL.

uparmour To improve armour protection.

UPB Unruly passenger behaviour, also called air rage.

UPC Unit production cost.

UPCF Union des Pilotes Civils de France.

up-chaff Normally, between chaff cloud or stream and target; hence * interception, with good radar view of target.

up-conversion Move to a higher EM frequency band.

update To refresh memory, radar picture or other electronic device with later information; hence * rate, rate (possibly as often as kHz) at which a system or input is scanned for new or changed values.

UPDFTS Updrafts.

updraft carburettor One fed by duct conveying air upwards from below; in US updraft carbureter.

UPDTS Updates.

Uped UV pre-initiation electrical discharge (laser).

up-45 line Straight sustained climb at inclination of 45°.

up-front control Single small panel in fighter cockpit giving complete control of all CNI functions.

up gear US voice command or check for raising landing gear.

upgrade To rebook passenger into higher class.

UPI Undercarriage position indicator (UK).

Upkeep Water-skipping dambusting bomb (UK, 16–17 May, 1943).

upkeep Generalized US term for all tasks aimed at preventing deterioration of hardware, eg GA aircraft; less used for commercial and military.

UPL AOPA (Luxembourg).

uplift \( I \) Total disposable load of cargo aircraft, or cargo taken on board.

2 Fuel taken on board, esp. away from home base.

3 Fuel taken aboard from air-refuelling tanker aircraft.

uplink I Telemetry, command, data or other electronic link between Earth and spacecraft.

2 Com. link from ground to aircraft, especially telephone call to passenger.

upload Load acting vertically upwards, or vertical component of loads, eg airloads due to lift.

unlock Mechanical lock securing device, eg landing gear, in up or housed position.

UPM I Universal processor module.

2 Ultra-portable multiplexer.

upper air Portion of atmosphere above lower troposphere, normally (eg for synoptic purposes) that above pressure height 850 mb. Hence, * chart. See next three entries.

upper-air observation Observation of upper air, above effective range of surface measures; also called sounding.

upper airspace Normally all FLs above 250 (7,620 m/25,000 ft).

upper atmosphere Not strict term, normally interpreted as above tropopause, but also as above 30 km or 20 miles.

upper baseplate Triangular or hexagonal frame on which cabin of flight simulator is mounted.
upper branch

**upper branch** That half of meridian or celestial meridian passing through observer or observer's zenith.

**Upper Flight Information Region** Same geographic areas as FIR but imposes special rules above 24,500 ft (7468 m) in US, 25,000 ft (7,620 m).

**upper limb** That half of limb of celestial body having greater altitude.

**upper sideband** USB = carrier frequency + modulation frequency; it carries the information.

**upper stage** Second or subsequent stage in multistage rocket, in most vehicles not fired in atmosphere.

**upper-surface aileron** Split surface forming part of upper surface of wing only, used for roll or, in some cases, as spoiler (rare).

**upper-surface blowing** Discharge of main propulsive jets (flattened laterally to cover more span) across top of wing; in high-lift mode deflected down by Coanda-effect attachment to upper surface of large trailing-edge flaps to give augmented lift. Can achieve Cl up to about 12 but reduces cruise efficiency.

**upper-tier technology** That required for exoatmospheric ballistic-missile defence.

**upper wing** Top wing of biplane; hence ** pylon, pylon attached above top plane of biplane.

**UPPL** Undergraduate pilot's licence.

**UPR** Upper airspace.

2 **User-preferred routing** [air route].

uprated Cleared to deliver more power, usually but not necessarily after incorporation of improvements; eg * gas turbine may operate at higher TGT or incorporate more efficient blades with reduced tip clearance; hence uprating, process of authorizing greater output from existing or improved machine.

uprig To adjust neutral position of spoiler or airbrakes (normally recessed in upper surface of wing) to provide up/down direct lift control.

**UPRM** Universal platform resource management.

**UPS** 1 Uninterruptable power supply, or supplies.

2 UV photoelectron spectroscopy.

**upset** Sudden externally imposed or undesired disturbance to flightpath, eg by violent gust. Classed as moderate if not worse than zero-g, severe if vertical acceleration is strongly negative. Usual definition of severe includes speed varying anywhere from V5 to VDF, bank ±60° and pitch ±30°.

2 Metalworking process akin to forging in which rod or other slender workpiece is heated and placed under axial compression to reduce length and increase diameter, usually at particular place and to attain particular longitudinal profile.

**upset rate** Frequency of problems suffered by computer[s] due to radiation.

**UPL** Upslope.

**UPSMS** UPS(1) management system.

**upstage** In a direction towards nose of multistage ballistic vehicle; * and downstage can refer to positions of items within same stage or to items in different stages.

**upstairs** 1 A loft, ie flying (colloq.).

2 High altitude, especially as distinct from low.

**upstream injection** Fuel is sprayed in opposite direction to engine airflow.

**uptime** Time when equipment is available for use.

**UPU** Universal Postal Union (Int.).

**USAAAVS** USA Agency for Aviation Safety.

**upward Charlie** Upward roll (UK colloq.).

**upward ident** Upward identification light; white light visible from hemisphere above aircraft and usually provided with manual keying from cockpit, eg to send aircraft callsign or other message.

**upward roll** Roll while in steep climb, usually zoom after fast low pass.

**upwash** 1 Upward movement of air around outside of trailing vortex behind wing giving positive lift, usually curving over to become downwash on inner side of vortex. 2 Upward movement of air ahead of leading edge of subsonic wing giving positive lift.

7 **See fountain.**

**upwind** Towards the direction from which the wind is coming: G/S = TAS - W/V.

**UQ** Ultra-quick (fuze).

**UR** 1 Unsatisfactory report.

2 Unscheduled removal.

**Ua** Helicopter rotor-blade radial velocity along blade at plane of disk.

2 **Gust reference velocity.**

**URA** 1 Unrestricted article.

2 Ultra-reliable aircraft.

**uranium** U, silvery radioactive metal, density 19.0, MPt 1,132°C. See *uranium.*

2 **Unravel, or unravelling, process of misinterpretation or misunderstanding.**

3 **Unrestricted article.**

4 **User-preferred routing** [air route].

**URCS** Unmanned radar and communications station.

**URD** User requirement[s] document.

**URE** Unintentional radiation exploitation.

**UREA** Universities Research Assessment Exercise (UK).

**urea** CO(NH2)2, traditional runway deicer, also used in some plastics.

**URET** Unmanned radar and communications station.

**URF** Undersea radioisotope power supply.

**URG** Underway Replenishment Group.

**urinal** Same word can mean an overboard tube or a sealable bladder.

**URIPS, Urips** Undersea radioisotope power supply.

**URITS** USAF rangeless instrumentation [originally interim] training system, not compatible with Actions and Raids, which are not compatible with each other.

**URR** 1 Ultra-reliable radar.

2 Ultimate recoverable reserve [petroleum].

**URS** User-requirements specification.

**URSI, URSI** Union Radio Scientifique International (Fr., pronounced as word).

**URTA** Upset recovery training aid.

**URV** Unmanned research vehicle.

**URVC** Unshielded radiator volume coefficient.

**US** 1 Under instruction.

2 **Ultra-sonic** (sometimes US).

**US, Us** Unserviceable.

**USAAAVS** USA Agency for Aviation Safety.
USAAC

USAAC USA Air Corps (1926–42).
USAADS USA Air Defense School.
USA AF USA Air Force (1941–47).
USAARL USA Aeromedical Research Laboratory.
USAAS USA Air Service (1918–26).
USAASVCOM USA Aviation Systems Command.
usability factor Percentage of time a runway has cross-wind within published limits.
usable fuel Not defined, but usually means fuel actually available, with no reserve, typically 95–98% of system capacity.
usable lift 1 Thermal worth using (sailplane).
2 See useful lift.
USABMD USA Ballistic Missile Defense Agency.
USAC Urban Systems Inter-Agency Advisory Committee (US).
USAEC USA Electronics Command.
USAETL USA Engineering Topographical Laboratory.
USAF US Air Force [see entries beginning AF].
USAF USAF Academy.
USAFE USAF Europe.
USAFSS USAF Security Service.
usage Usually means hours flown.
USAID US Agency for International Development.
USAFRS, USAFRS USAF Technical Support Activity.
USAFSS USAF Security Service.
USSTAF US Strategic Air Forces.
USSTAF USA Strategic Services Field.
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Utilization rate

The utilization rate is the proportion of total time an equipment is used, according to conditions, e.g., normal ** based on (say) 40-h week; emergency ** based on maximum attainable on 6-day week; wartime ** based on 7-day week with wartime crew, maintenance and safety criteria.

Utilities

Utilities include utilities control system, which serves routine domestic functions not crucial to safety of vehicle; occasionally means special system for specific purpose, and sometimes even a standby emergency system. Never involves flight control, navigation or weapon release, but see utilities control system.

Utility system

Utility system is a usually loose term meaning that system serves routine domestic functions not crucial to safety of vehicle; occasionally means special system for specific purpose, and sometimes even a standby emergency system. Never involves flight control, navigation or weapon release, but see utilities control system.

Utility finish

Utility finish provides fabric with tautness and fill, but lacks gloss.

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Utilization rate

Utilization rate is 1 For civil transports, utilization (2).

2 For combat aircraft, flying rate, usually qualified according to conditions, e.g., normal ** based on (say) 40-h week; emergency ** based on maximum attainable on 6-day week; wartime ** based on 7-day week with wartime crew, maintenance and safety criteria.

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Utilities control system is a system that serves routine domestic functions not crucial to safety of vehicle; occasionally means special system for specific purpose, and sometimes even a standby emergency system. Never involves flight control, navigation or weapon release, but see utilities control system.

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V 1 Volts, potential, e.m.f., also potential energy.
2 Velocity, including TAS, EAS or ASIR.
3 US piston-engine designation prefix, vee-type.
4 US piston-engine designation prefix, vertical orientation, ie crankshaft vertical (currently in use).
5 JETDS code, visible light(s).
6 Volume, or volume-fraction.
7 Total shear stress.
9 US military aircraft designation modifying prefix: staff/VIP.
10 Unit designation prefix: airplane (USN 1922–62).
11 Potential energy.
12 Vanadium.
13 Prefix, Victor airway.
14 Varying, variation, or varying between (Metar), or variable, or variable intensity.
15 Ground/air visual code: require assistance.
16 Secondary station (Loran).
17 Visibility, visual or visual descent point.
18 Experimental (G).
19 Veneer.
20 Vertical load.
V 1 Specific volume of gas.
2 Component of RMS velocity; phase velocity of EM wave.
3 Thermionic valve.
4 Linear [called lateral] velocity of point due to rotation of body in pitch.
5 Relative velocity between two moving bodies or points.
6 Propwash velocity relative to undisturbed air, ie ‘true’ $V_p$.
(V) 1 Suffix indicating item of electronic equipment can be configured to suit a number of platforms or system applications. Normally followed by numeral identifying which (JETDS).
2 121.5 kHz available on ATCC request.
$\vec{V}$ Vertical stabilizer (fin) volume coefficient.
$\vec{V}$ Horizontal tail volume coefficient ($L_Sr/S$).
$\vec{V}$ See capital delta [Appendix I].
$V^*$ Radial inflow velocity, eg to eye of centrifugal compressor.
$\vec{V}$ Velocity vector.
$V_g$ Free-stream velocity vector.
$\dot{\vec{V}}$ Volume rate of flow.
$V_1$ Decision speed; ASIR defining decision point on take-off at which, should critical engine fail, pilot can elect to abandon takeoff or continue. Calculated by WAT and runway friction index for each takeoff, never less than $V_{MCG}$. Also regarded as engine-failure recognition speed, made up of $V_{EF}$ plus increment due to pilot thinking time.
$V_2$ Two-box VASI, on either side of runway.
$V_2$ Takeoff safety speed; lowest ASIR at which aeroplane complies with those handling criteria associated with climb following one engine failure, normally obtained by factoring $V_{MCA}$, $V_{MSL}$ and pre-stall buffet speed. Aeroplane should reach $V_2$ at screen after engine failure at $V_1$ and climb out to 120 m height without speed falling below $V_2$.
$V_3$ Normal screen with all engines operating, at which aeroplane is assumed to pass through screen height in normal takeoff; usually about $V_2 + 10$ kt.
$V_4$ Four-box VASI.
$V_4$ Steady initial climb speed for first-segment noise-abatement climb with all engines operating.
$V_6$ Six-box VASI.
$V^*$ law The law governing noise caused by shear at the periphery of a jet [proportional to the eighth power of the shear velocity].
$V_{12}$ A V6 on each side of the runway.
$V_{16}$ Two V4 VASIs on each side of the runway.
$V_90$ Category of off-base military airfields dispersed through countryside and usable by fighters (Sweden).
$V_{A_90}$ Absolute velocity.
V-aerial Two rod conductors balance-fed at apex with geometry giving desired directional propagation.
V-band Original radar frequency band 46–56 GHz (obs.).
V-beam radar Uses an inclined and a vertical beam to determine target bearing, range and altitude.
V-belt Drive belt of tapering cross-section, often coming to narrow inner edge like V, mating with pulleys having inclined inner peripheral faces.
V-block Hardwood block with large V-notch used in hand sheet-metalwork.
V-bombers The UK’s only strategic jet bombers (1951–90), named Valiant, Vulcan, Victor.
V-blockboard A standard procedure for developing software, in which a V-shape is constructed by listing development activities on the left and verification activities on the right.
V-engine See vee engine.
V-force Squadrons equipped with V-bombers; crews graded as Combat, Select, Select Star [1957–90] (RAF).
$V_{ot}$ Relative velocity.
V-speeds See $V_i$, et seq.
V-tail See butterfly tail.
$V_A$ 1 Volts × amperes; basic measure of a.c. or reactive electrical power.
2 Visual aids (ICAO panel).
3 Unit prefix: fixed-wing attack squadron (USN).
4 Voice-activated.
5 Air army (USSR).
6 Veterans Administration (US).
7 Visual approach, and VASI.
8 Vortex advisory.
9 Volcanic ash.
10 Virtual airline [simmer].
11 Design manoeuvring speed; on basic manoeuvring envelope speed at intersection of positive stall curve (assumed in cruise configuration) with $n_1$ (limiting positive manoeuvring load factor). Highest EAS at which limit load factor can be pulled.
$V_8$ 1 Aquaplaning speed; speed (usually ASIR) at which wheels lose effective contact with runway covered with standing water.
V-A

2 Axial gas velocity.

V-A 2 Volt-amperes, electrical apparent power.

VAA 1 Vintage Aircraft Association (US).

2 Vertical alert annunciator.

VAAC 1 Vectored-thrust aircraft advanced [flight] control.

VAATE  Versatile affordable advanced turbine engine (USAF programme).

VAB 1 Vehicle (originally Vertical) Assembly Building, at KSC.

2 Vehicle Assembly Building [Tanegashima] (J).

3 Variable-area bypass.

VAB  Resultant velocity of circulation of two particles A and B.

VABI, Vahi

Variable-area bypass injector.

Vcc Absolute velocity; i.e., not relative.

VAC 1 Vintage Aeroplane Club, 1951–55; Vintage Aircraft Group 1964–74; Vintage Aircraft Club 1974–.

2 Valiant Air Command [Florida-based warbird centre].

3 Volts a.c.

4 Visual-approach chart.

VACA The Vintage Aircraft Club of Australia [office, Adelaide, SA].

vacancy Unoccupied lattice site in crystal.

Vachi Video and computer-based instruction.

VACIS, Vacis Vehicle and cargo inspection system.

VACL Virtual aircraft component location, 3-D software.

VACS 1 Variable-autonomy control system (UAVs).

2 Voice-activated control system.

VACT Visual air-combat training.

vacuum casting See vacuum melting.

vacuum evaporation Loss of molecules from body’s surface in space.

vacuum gauge Instrument for measuring low fluid pressure, eg Pirani, Knudson, ionization, McLeod.

vacuum melting Almost self-explanatory, preparation of advanced steels and other alloys in a near-vacuum in order to reduce [almost eliminate] the unwanted formation of oxides, hydrides and other impurities.

vacuum orbit Orbit of satellite round incomparably more massive body in complete absence of any atmosphere.

vacuum pump Device for establishing unidirectional flow of gas molecules and thus of evacuating fixed enclosure; following gross evacuation by mechanical pump alternatives include vapour/diffusion pump, cryopump etc. Also, in aircraft, simple device for applying depression to air-driven flight instruments, eg venturi.

vacuum specific impulse Specific impulse in vacuum operation.

vacuum system control Sucks air from aircraft toilet WC, vacuum thrust Thrust of rocket in vacuum, typically about 25% greater than at sea level (actual thrust rises by approx. product of atmospheric pressure and rocket nozzle exit area).

vacuum tube Electronic tube whose internal pressure is so low that residual gas or vapour atoms or molecules have no significant effect on operation; also called thermionic valve in most common form.

vacuum tunnel Wind tunnel operated at much less than sea-level pressure.

valve lead

VAD 1 Velocity/azimuth display.

2 VHPIC applications demonstration (programme).

3 Visual approach and departure [usually helicopter] chart.

VADR Voice and data recorder.

VADS Vulcan air-defense system (USA).

VAE Virtual air environment.

VAES Voice-activated electronic system.

VAFA Vintage Aircraft and Flying Association (UK).

VAFB Vandenberg AFB (USAF), see Vandenberg.

Vaitad Volcanic-ash forecast transport and distribution.

VAI Voice-interactive avionics (not VIA).

VAI-IPR Versatile affordable integrated-inlet fan for performance and reliability.

VAL 1 Visual approach and landing [chart].

2 Variable approach light [3 intensities, 2°–8° azimuth].

3 In valleys [mist/fog].

Valid Variability and life data.

validation Generalized word for activity intended to re-validate licence or authority, esp. training, examinations and emergency-procedure practice of graduate pilot, instructor or ATC (1) officer. ATC * involves simulated crises worse than any normally encountered.

validation phase Period when major-programme characteristics are refined by study and test to validate alternatives and decide whether to proceed to FSD.

valise Storage envelope for liferaft.

V- or, V-alpha Free-stream velocity, or far-field velocity relative to aircraft...

VALPT Variable-area LP turbine.

Valsaiva Called * manoeuvre, or * technique, involves pinching nose and blowing/swallowing to relieve dP on eardrums following sudden loss of cabin pressure.

Value Validated aircraft logistics utilization evaluation.

value engineering Complete engineering discipline devoted to seeking ways to achieve desired hardware performance, quality and reliability at minimal total cost, eg by elimination of unnecessary items, changes in material and manufacturing method, and simplification of design.

valve 1 Device for controlling fluid flow, eg into and out of piston-engine cylinder (inlet *, exhaust *) or into/out of aerostat, esp. airship.

2 Numerous other fluid-flow control devices in hydraulics, oxygen, propellants, hot-gas, bleed air, carburetion [US spelling] and other systems.

3 Vacuum tube (UK usage).

4 To release air or gas from aerostat into atmosphere.

valve clearance Gap between end of stem and rocker arm.

valve duration Time or angular crankshaft movement during which a valve remains open.

valve face Mating edge of valve (1) bedded by grinding into seat.

valve gear Mechanism driving valves of piston engine.

valve hood Umbrella-like cowl protecting main airship gas valve against rain or icing.

valve lag Angular motion of crankshaft between either maker’s specified valve-closing position or TDC and point at which valve actually closes.

valve lead ‘Leed’, not ‘led’, angular motion of crankshaft between closure of valve and either maker’s specified closing position or TDC.
valve lift

valve lift Total linear motion of poppet valve, ie cam stroke × mechanical advantage of valve gear.

valve line Cord operating aerosetat gas valve.

valve petticoat See petticoat.

valve ports Inlet and exhaust passages forming part of cylinder head.

valve rigging Linkage inside aerosetat (airship) envelope by means of which automatic valve is opened.

valve seat Angled ring, usually made of hard erosion-resistant material, forming poppet-valve mating face in cylinder head.

valve-seat recession Accelerating erosion of piston-engine poppet-valve seat caused by fragments of soft seat fuzzing to valve [avoided by leaded fuel or LRP].

valve timing Exact plot of crankshaft angular positions at which piston-engine valves open and close.

VAM 1 Variable aerofoil mechanism; usually infinitely reprofileable leading edge.

2 Visual anamorphic movie; external-scene (OTW) add-on to simulator.

Vamom Visite d’aptitude à la mise en œuvre et à la maintenance (Armée de l’Air, F).

Vamp 1 Variable aeronautical motion picture; see VAM (2).

2 VHISIC avionics modular processor.

VAMS Vector airspeed measuring system.

Van, VAN 1 Value-added, or visual-area, network.

2 Variable-area nozzle.

van See next (2).

VAN Generalized US term for air-conditioned towed vehicles for major support operations, eg strip, check and reassemble major avionic systems in field. Not called trailer.

Vandago 1 Common term for [usually checkerboard painted] runway control vehicle, called VAN in code.

vanadium Hard silver-white metal, symbol V, density 6.1, MPt 1,887°C, important alloying element, esp. in steels.

Van Allen belt(s) Inner and outer zones of high-intensity particulate radiation trapped in Earth’s magnetic field around Equator (inner mainly protons, outer mainly electrons) at radii from Earth’s centre from 8,700 to 26,000 km.

V&A Validation and accreditation.

Van de Graaff Registered name of high-voltage generator using rotating belt to convey electrical charges.

Vandenberg Originally Camp Cooke, CA, today main West Coast rocket test base, head of Pacific Missile Range, address Lompoc (USAF).

Van der Waals equation Best known equation describing behaviour of real (as distinct from perfect) gas: \( p + a/b^2 = RT, \) where \( p \) is pressure, \( v \) volume, \( R \) universal gas constant, \( T \) °K and \( a, b \) constants.

Van der Waals forces Intermolecular or intermolecular attractive forces between interacting varying dipole moments; varies as seventh power of radius.

V&F Vinyl and fabric.

V&V Verification and validation (software).

Van Dyke Generalized theory of aerodynamics at Mach + (hypersonics), where air can no longer be assumed perfect gas owing to molecular vibration, dissociation, electronic excitation and ionization.

vane 1 Generalized term for thin (flat or, usually, curved but not necessarily aerofoil section) aerodynamic surface either fixed in order to turn air or gas flow, or freely pivoted and thus aligning itself with fluid direction.

2 Stator blade of compressor or turbine (originally US usage).

3 Gas guide surface at nozzle to turbine (US and UK); abb. IGV.

+ Strips, usually of circular-arc section, in cascade at corners of wind tunnel, or used as valves to control flow.

5 Radial strips around fuel burner of gas turbine imparting rotary vortex motion. Often called swirl +.

6 Curved surfaces in cascade at angle bends of airflow in many gas turbines; again called swirl + though rotation is not desired.

7 Curved forward extensions to radial arms of centrifugal compressor or supercharger impeller, called rotating guide +, RGV.

8 Alternative (unusual) term for fence.

9 Swinging retractable leading-edge flaps normally housed in fixed glove of swing-wing aircraft and extended in high-lift mode, called glove +.

10 Common term for slot fixed to leading edge of flap and for various other auxiliary aerofoils carried on flaps, ailerons, droops and leading-edge slats.

11 Normal meaning for weathercocking surface, eg to indicate angle of attack, or wind direction or relative wind.

12 Particular application of (1) is sensor in SWIS.

vane passage The airflow channel between two vanes.

vane pump Large family of fluid pumps in which flat surfaces oscillate and rotate inside chamber eccentrically arranged around drive shaft.

vane rate Angular velocity of vane in SWIS indicating rate at which aircraft is approaching stall.

vane set Row of vanes (4) across wind tunnel, either fixed and profiled to change flow direction or pivoted and ganged to rotate in unison to control or divert flow.

vanilla aircraft Baseline aircraft on which individual customer fits are incorporated.

vanity unit Small cabinet housing wash basin, mirror and [probably] storage.

Vanvis Visual and near-visual intercept system; visual refers to EM frequency used, not to pilot acquiring target visually.

Van Zelm Catcher installation for catapult bridges thrown from aircraft carriers.

VAO Vitrified aluminium oxide.

VAP 1 Vortex avoidance procedure.

2 Visual-Aids Panel (ICAO).

Spray dispensing system for HCN or persistent Toxic-B (USSR), but not necessarily aerofoil section) aerodynamic surface either fixed in order to turn air or gas flow, or freely pivoted and thus aligning itself with fluid direction.

2 Alternative name for vapourising combustor.

vapourising combustor Gas-turbine combustion system in which fuel is vapourised prior to passage through burner and ignition (usually in walking stick); hence vapouriser, in which fuel is vapourised, and vapourising burner.

vaporising combustor
vapour

vapour Substance in gaseous state but below critical temperature; thus can be converted by pressure alone to liquid or solid (US = vapor).

vapour blasting Surface treatment of [usually metal] part by firing abrasive particles in high velocity jet.

vapour cycle Closed-circuit refrigeration, in which heat is extracted by refrigerant alternately evaporated and condensed.

vapour degreasing Immersion in hot solvent vapour, eg trichlorethylene.

vapour gutter Assembly of rings and radial struts, usually of > section, to retain flame in afterburner; also called flameholder or stabilizer.

vapour lock Complete breakdown of supply of liquid, eg fuel from tank, because of blockage by bubble of vapour at high point in pipe.

vapour-phase inhibitor Nitrite-based chemical, often locked in paper or other solid, which protects metal parts against corrosion by preventing formation of vapour, esp. of water; usually white powder which volatilises and recrystallises on metal surface.

vapour pressure Pressure exerted by molecules of vapour on walls of container; with mixture, sum of partial pressures. Compared with kerosene, wide-cut fuels have high volatility and thus high *, hastening boiling and vapour lock.

vapour tension Maximum attainable vapour pressure exerted by plane liquid surface with vapour above, varies with temperature.

vapour trail See condensation trail.

vapour-type thermometer Needle is driven by Bourdon tube sensing pressure from vapour capsule whose temperature is that indicated.

\( V_{\text{pp}} \) Approach speed.

\( \text{VAPS, Vaps} \) 1 Virtual avionics [or applications] prototyping system.

\( \text{2 Visual approaches.} \)

\( \text{Vaptar} \) Variable-parameter terrain-avoidance radar.

\( \text{VAQ} \) Unit prefix: airborne early-warning squadron (USN).

\( \text{VAR} \) 1 V.h.f. aural range, ie radio range.

\( \text{2 Visual/aural range; radio range in which two airways are located by A/N signals and two by visual means, eg panel instrument (obs.).} \)

\( \text{3 Volt/ampere(s) reactive; unit of wattless (reactive) electrical power.} \)

\( \text{4 Vacuum-arc remelting.} \)

\( \text{5 Variation.} \)

\( \text{6 Volcanic-activity reporting.} \)

\( \text{var} \) Variation (magnetic).

\( \text{varactor} \) Device employing p-n junction whose capacitance is varied by reverse voltage; important in parametric amplifiers.

\( \text{VARI} \) Vacuum-assisted resin injection.

\( \text{variable} \) When applied to IGV or stator ring, means variable-incidence; when applied to jet-engine inlet or nozzle, means variable profile and area.

\( \text{variable-area nozzle} \) Propelling nozzle whose cross-section area can be altered (usually, together with profile) to match changed Mach number and afterburner operation (airbreather) or atmospheric pressure from SL to vacuum (rocket).

\( \text{variable-geometry engine} \) Mounted directly under fixed-axis quasi-vertical lift jets [eg, LittFan], vectors thrust over large angle about transverse axis.

\( \text{variable-area wing} \) Rare arrangements have included variable span and even retractable lower wing of biplane into upper, but modern flap systems (eg Fowler) give significant change.

\( \text{variable camber} \) Apart from experimental aircraft, most important methods are hinged leading and trailing edges, eg F-16, which can each be pivoted slightly up, centred or pivoted fully down independently to suit desired flight condition. Tail surfaces, eg tailplane, rudder, are today often divided spanwise to change not just surface angle but also camber, for greater power.

\( \text{2 Camber is varied by elastic deformation of surface, eg 747 Kruegers.} \)

\( \text{variable-camber flap} \) See anti-balance tab.

\( \text{2 Flap, usually Krueger, whose profile changes on extension.} \)

\( \text{variable colour stripping} \) Removal of part(s) of spectrum to indicate presence of organic material or explosive devices.

\( \text{variable-cycle engine} \) Jet engine in which path of working fluid can be altered by shutters/valves/doors, eg to convert from turbojet or turbofan to ramjet, hybrid rocket or other form in cruising flight. Some authorities claim adding an afterburner and variable nozzle results in a *.

\( \text{variable-datum boost control} \) Auto boost control for supercharged piston engine in which governed boost pressure increases as pilot's throttle lever is opened.

\( \text{variable-delivery pump} \) Fluid pump whose output can be varied independently of drive speed, usually by variable-angle swashplate driving stroked plungers (at 90° stroke is zero).

\( \text{variable-density tunnel} \) Wind tunnel whose pressure can be varied over wide range (usually not below atmospheric) while in operation; normally pressurized to achieve desired Reynolds number.

\( \text{variable-diameter tilt-rotor} \) Full diameter for takeoff, transition to reduced diameter for fast translational flight.

\( \text{variable-discharge turbine} \) Gas turbine, eg driven by piston-engine exhaust, whose throughput (mass flow) can be controlled by valve (often called waste gate) to match turbine power to altitude and other variables.

\( \text{variable-displacement pump} \) Fluid pump whose output (mass flow) can be varied over wide range, often to zero, for any given input drive speed; often synonymous with variable-delivery, but ** explicitly implies reciprocating plungers or pistons whose stroke is variable.

\( \text{variable-floor-level bridge} \) Passenger bridge whose aisle end can be raised and lowered to match aircraft sill height.

\( \text{variable-flow ducted rocket} \) Propulsion for long-range AAM and ASMs offering sustained supersonic [even hypersonic] speed from combining rocket with ramjet.

\( \text{variable-geometry aircraft} \) Aircraft whose shape can be varied in gross manner, ie more fundamentally than by retractable landing gear or flaps; term has come to mean variable wing sweep, so should not now be used in any other context, unless circumstances change or clear explanation of meaning is furnished.

\( \text{variable-geometry engine} \) Invariably refers to air-breathing engine for supersonic propulsion in which for
variable-geometry inlet

reasonable efficiency it is essential to have not only fully variable inlet and nozzle but also variation in flow path in engine itself, eg to divert flow around HP compressor in supersonic mode or to convert engine into ramjet. Needs explanation when used.

variable-geometry inlet  See variable inlet.

variable-incidence  Pivotal mounted so that angle of incidence can be altered. * guide vane, stator blade or turbine inlet guide vane whose incidence is altered for best compromise between flow incident on leading edge and flow angle leaving trailing edge, invariably auto scheduled by engine control system. * tails, tailplane whose incidence is varied either for trimming, with elevators as primary flight control surfaces, or as primary flight control. * wing: wing pivoted on transverse axis so that over full (large) range of flight AOA fuselage can remain more or less level, eg to improve pilot view on approach or permit short landing gear.

variable inlet  Variable-geometry airbreathing engine inlet whose area, lip/wedge/centrebody axial position and duct profile can all be adjusted to match required flight shock position and mass flow. Mere downstream auxiliary inlets or spill doors do not qualify.

variable-inlet guide vane  Gas-turbine IGV whose incidence varies according to engine operating regime; very rare upstream of turbine but common upstream of first and often subsequent stages of axial compressor, to match airflow mass flow and whirl to rotor blade conditions and avoid stall; controlled by auto system always sensitive to rotor speed and inlet air temperature and occasionally to other variables.

variable load  All variables aboard aircraft other than fuel and payload.

variable metering orifice  In gas-turbine fuel system, key element in CASC comprising triangular orifice moved axially by stack of aneroid capsules and part-covered by sleeve moved by centrifugal SCG.

variable overhead  Varies with number of particular item manufactured.

variable-pitch  Synonymous with variable incidence. Normally confined to propellers, where incidence is called pitch. Usually means pitch can be varied on ground, or by pilot in flight, often only as choice of either coarse or fine pitch, without auto control such as constant-speed. Fine distinction between * and adjustable-pitch, latter explicitly meaning ground-adjustable only.

variable-ratio  Two main applications: in shaft-drive gearbox * drive is usually synonymous with constant-speed drive, ie ratio is varied to hold output speed constant despite varying input; * bypass engine or turbofan (rare) has bleed, two-position shutters or doors to change ratio of airflow between bypass duct and core.

variable-stability aircraft  Aircraft, invariably aeroplane, whose flight-control surfaces, and possibly structure, can be acted upon in flight to effect gross change of stability and control characteristics, either for research or to mimic the behaviour of a totally different type. The inputs should be seamless, not noticed by pilot.

variable-stator  Usually means gas turbine with not just one but several rows of variable-incidence stator blades (vanes) in axial compressor(s). These are required to avoid surge and/or blade stall.

variable-stroke  Though many reciprocating engines and machines patented with *, invariably means axial oscil-
VAT

VAT 1 Value-added tax; applicable to light and sport aircraft (UK).
2 Vernier axial thruster.
3 Visually-augmented target.
4 Vertical-acceleration threshold.

\[ V_{AT} \] Target threshold speed; scheduled speed for arrival at threshold at screen height of 10 m after steady stable approach at an angle of descent not less than 3°. Usually about 1.3 \( V_c \) (see \( V_{Tmax}, V_{Tmin} \)). Subdivided: \( V_{AT1} \), one engine failed; \( V_{AT2} \), two engines failed, etc.

VATA Voice and tone announcement system, synthesized voice warnings to helicopter pilot in NOE flight.

Vat-B Short-form weather report comprising word ‘weather’ and four numbers (DoD, from vis, amount [cloud], top [cloud] and base [cloud]).

Vatcas Very advanced ATC automation system (G).

VATE Versatile affordable turbine engine (NASA).

VATLS Visual airborne target-locator system; laser ranging device.

Vatol Vertical-attitude takeoff and landing, i.e. ‘tail-standing’.

VATS, Vats Video-augmented tracking system.

VATT Visually augmented tow target.

VAU Voltage averaging unit.

VAR Variable-area vane box.

VAW Volcanic-ash warning (ICAO study group).

VAWS Voice-alarm warning system.

VAWT Vertical-axis wind turbine.

\[ V_{wind} \] Axial velocity, especially of flow through an axial compressor or turbine.

VB 1 Vertical build [of engine]; \( A \) adds area.
2 Vacuum-bonded.

\[ V_b \] Maximum speed at which specified gust (eg \( \pm 66 \) ft/s) can be withstood without airframe damage; hence speed at left lower and upper corners of basic gust envelope. Usually more than half \( V_c \) and less than half \( V_D \). Plays role in establishing \( V_{RA} \).

\[ V_s \] Fluid velocity relative to propeller-blade at radius \( r \), \( = TAS + \omega r + V_2 \).

\[ V_{BC} \] Velocity blast contour.

\[ V_{BCW} \] Video bandwidth compression.

\[ V_{BE} \] Speed for best flight endurance.

\[ V_{BG} \] Airspeed for best glide ratio.

VBI Verband Beratender Ingenieure (G).

\[ V_{BL} \] MIL/DoD/Stan requirements define balked-landing speed as whichever is greater: maximum speed reached on go-around before high-lift devices can be retracted, or \( 1.8V_s \) with high-lift devices in intermediate [not defined] position.

\[ V_{BM} \] Volatile bulk memory.

\[ V_{BMC} \] Virtual battlefield management center.

\[ V_{BO} \] Velocity at burnout.

\[ V_{BR} \] Speed for best range.

\[ V_{BROC} \] ASIR for best rate of climb of helicopter, usually at or near SL.

\[ V_{BS} \] Visual bootstrapping subsystem.

\[ V_{BV} \] Variable-pitch valve.

\[ V_{BW} \] Verticalbordwaffe, dispenser of attack payloads (G).

\[ V_{V} \] 2 Vertical ballistic weapon.

\[ VC \] 1 US military aircraft prefix, staff/VIP transport.
2 Variable-camber.

\[ V_{CE} \] 1 Design cruising speed, usually one of speeds used in establishing structural strength.
2 Relative closing speed between two aerial targets.

\[ V_c \] 1 Rate of climb (note: not IAS or other horizontal speed in climb).
2 Circular velocity, satellite speed in linear measure.


VCAI Visible combat-avionics initiative, attempt to study system life prior to procurement (USAF).

VCAS 1 Vice-Chief of the Air Staff.
2 Visual calibration augmentation system.

VCASS Visually coupled airborne systems simulator (a helmet, Armstrong Lab.).

\( VCATS \) Visually coupled acquisition and targeting system (HMD).

\[ VCB \] Virtual-circuit bridge.

\[ V_{CC} \] 1 Vehicle-control centre.
2 Colour CRT display (F).
3 Voice communication control.

\[ V_{CCB} \] Video control centre, in pax cabin.

\[ VCCO \] Voltage-controlled clock oscillator.

\[ VCCS \] Voice communication[s] control system, or switch.

\[ VCD \] 1 Variable-capacitance diode.
2 Voltage-control, or -controlled, device.

\[ VCD\$ \] Vice-Chief of the Defence Staff (UK).

\[ VCE \] 1 Variable-cycle engine.
2 Virtual collaborative engineering.

\[ VCF \] Visually coupled flight system.

\[ VCH \] Visual committal height.

\[ VCD \] Voice-controlled, or command, interactive device.

\[ VCR \] Visually coupled acquisition and targeting system life prior to procurement (USAF).

\[ VCAI \] Visually coupled airborne systems simulator (a helmet, Armstrong Lab.).

\[ VCE \] Visually coupled acquisition and targeting system (HMD).

\[ VCB \] Virtual-circuit bridge.

\[ VCC \] Voice communication control.

\[ VCD \] Voice communication [many suffixes].

\[ VCO \] Voice communication switch, or system.

\[ VCG \] Voltage-controlled oscillator.

\[ VCH \] Vehicle control station, or system.

\[ VCD \] Voltage-controlled oscillator.

\[ VCT \] Conventional flying qualities (STOVL aircraft).

\[ VCO \] Virtual-cockpit optimization program (USA).

\[ VCS \] Voltage controller oscillator/synthesizer.

\[ VCM \] Visual countermeasures (OCM more usual).

\[ VCN \] Active minimum-control speed.

\[ VCN \] Visual computing network.

\[ VCNTY \] Vicinity.

\[ VCO \] Variable compression ratio.

\[ VCO \] Voice communication switch, or system.
VCSD

4 Voice-controlled, or voice command, system.
5 Visually coupled system.
6 Video-camera station, or system.
7 Variable colour stripping.

VDIV
eCommission, D-40002 Düsseldorf] (G).

VDHM
Variable-displacement hydraulic motor.

VDGS
eV (flight-safety technicians, G).

VDX1
Visual course cross-pointer indicator.

VCXO
Voltage-controlled crystal oscillator.

VCY
Vicinity.

VD
1 Video detector, or disk.
2 V.h.f. data.
3 Visual display.
4 Variable displacement.

9 Design diving speed: highest speed at which the aircraft is normally permitted to fly, forming vertical right-hand boundary to both basic manoeuvring envelope and basic gust envelope. One of speeds used in establishing structural strength.

2 Heading to a DME distance.

9 Doppler velocity [range rate].

9 Rate of descent (note: not airspeed during descent).

9 Vapour density.

9 1 Versatile drone autopilot.
2 Vehicle de défense anti-aérienne (F).
3 Vertical data analysis.

9 1 Variable-data format.
2 Visual-display controller.

9 1 Volume description document.
2 Variable-drag drogue.

9 1 Verband Deutscher Drachenfluglehrer eV (kite-flying instructors, G).
9 Verein Deutscher Elektrotechniker (G, technical society).

9 1 V.h.f. D/F; most common ground D/F.
2 Verein Deutscher Luftfahrzeugführer (G, PIC society).
3 Verband Deutscher Flugleiter (G).

9 Maximum demonstrated flight diving speed; highest IAS at which aircraft is ever flown (normally only during certification); associated with poor strength margins (inadequate for severe gust) and possibly poor handling, yet attainable at full power even in climb on many transports at low/medium levels.

9 1 Verband Deutscher Flugsicherungs-Techniker eV (flight-safety technicians, G).
9 Verband Deutscher Luftfahrt-Techniker (G, aerospace engineers' society).

2 V.h.f. data-link (Arinc), or digital link.

9 Verein Deutscher Maschinenbau-Anstalten (G).

9 Demonstrated maximum diving speed.

9 V.h.f. data, or digital, radio.

9 1 Visual exempt[ed].
2 Effective velocity ratio $\frac{V}{V_j}$.

Vol for a limiting speed at which something (eg flap, landing gear) may be selected and extended; suffixes, eg $V_{1a}$, $V_{1h}$, used for specific items and additional terms are used (more are needed) for limiting speeds for subsequent retraction. Main gears (usually not nose) are generally cleared to $V_{1a}$ when locked down, but $V_1$ always applies for selecting down or up.

9 1 Equiv EB Vehicle equipment bay.

2 Value engineering.

9 1 Value-exempt[ed].

1 Generalized symbental airspeed.

3 Effective velocity ratio $\frac{V}{V_j}$.

4 Visual coupling, or voice command, system.

5 Visually coupled system.

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vector computer

7 In translation from Italian, rocket launch vehicle.
8 Prefix to three-digit heading passed to interceptor engaged in interception (for recovery, corresponding word is steer).

vector computer Device for solving vector triangles, eg CSC.

toired Capable of being pointed in chosen directions.

toired attack Surface attack in which weapon carrier is vectored (4) to weapon-delivery point by unit which holds contact on target (DoD, NATO).

toired thrust Propulsive thrust whose axis can be rotated to control vehicle trajectory; term normally applied to swivelling-nozzle jet engine of aeroplane, corresponding term for space and military rockets being usually TVC.

toired flight control Control of trajectory by vectored thrust.

toiring Vectored.

toirc force Resultant of wing’s lift [or lift coefficient] and pitching moment [or its coefficient], acting through c.p.

toiring in forward flight See viff.

toirc quantity One that has magnitude and direction.

toirc sight Traditional type of bomb sight incorporating mechanical representation of vectors of relevant vector triangle.

vector steering Control of trajectory by vectored thrust.

vector triangle Closed figure formed from three vectors, eg (1) heading/TAS, track/GS and W/V, or (2) lift, drag and resultant force on lifting wing.

vector velocity See vorticity. Tantological on its own, velocity implying direction.

Vectra Extremely strong liquid-crystal polymer, in-jection moulded and often strengthened with chopped graphite or glass (Hoechst Celanese).

VEDM Vehicle and engine display management.

vee-belt V-belt.

vee depression Vee-shaped low extending between two highs, usually with squall.

veeder counter Stepping digital counter, eg odometer; today often LED or LCD.

vee engine Piston engine whose cylinders are arranged in two inclined in-line rows (banks) in V form seen from either end, driving on common crankshaft; hence vee-12 (often called V-12) * with six cylinders in each bank.

vee formation Aircraft formation in shape of horizontal V proceeding apex-first, for symmetry with odd number of aircraft.

Veep VIP.

veering Change of wind direction clockwise seen from above; now applies in either hemisphere.

vee tab Elevator spring tab with no-load up-deflection balanced by positive [typically + 10°] trim tab feature of some large aircraft in 1940s.

vee tail See butterfly.

Vef Speed at which critical engine failure occurs in accelerate/stop takeoff; defines V1 as * plus speed gained with critical engine inoperative during time pilot takes to recognize situation and respond. In US often Vef.

vegetable Mine laid by aircraft at sea (RAF, WW2), hence gardening.

vegetable oil Several, esp. castor, used for engine lubrication pre-1935.

VEGV Variable exit guide vane.

velocity of advance

VEH Variable edge enhancement, see EH.

vehicle Self-propelled, boosted or towed conveyance for transporting a burden on land, sea or through air or space. This is DoD/NATO wording. Only possible word in most generalized contexts, and also only word covering aircraft, spacecraft, missiles, RPVs etc. Air * identifies flying portion of weapon or reconnaissance system that has extensive non-flying portions.

vehicle axes Axes, usually cartesian, related to vehicle rather than to Earth or space.

vehicle correlator Radar subsystem intended to eliminate clutter caused by detection of large numbers of road vehicles [e.g., fleeing civilians] whose speeds exceed lower limit for detection in look-down mode.

vehicle mass ratio Ratio of final mass of vehicle, usually M2, after cutoff or burnout of propulsion to initial mass, usually M0. Normally applied to rocket vehicles.

veil cloud Loose term meaning either Cs or Cloud forming thin veil on mountain.

VEK Equivalent airspeed (EDP).

VEL True airspeed (EDP).

2 Velocity.

vela sensor Usually measures velocity and angle of attack.

velocimeter J Generalized term for velocity meter.

2 CW-reflection Doppler system for measurement of radial velocity, ie speed of approach or recession relative to observer.

velocity J Measure of motion; speed (linear or angular) in specified direction.

2 Loosely (though common in fluid flow), speed. SI unit is m/s. For some conversion factors, see speed.

velocity blast contour Plot of jet wake velocities immediately behind large jet as it proceeds from gate to takeoff point. Usual measure is 6 ft (1.83 m) above ground at distance 50 ft (15.24 m) behind tail.

velocity gate Sum of all velocities in planning space-flight.

velocity factor Ratio of speed of RF wave along conductor to its speed in free space, usually 0.6 to almost unity; symbol k. In typical co-axial cable value is about 0.66, often expressed as a percentage.

velocity gate Basic ability of CW, Doppler and certain other tracking radars to sense and lock on to particular radial velocity characteristic of target. Hence ** pull-off, basic ECM technique to pull radar off target signal and thus give infinite JSRR.

velocity gradient Rate of change of fluid speed per unit distance traversed perpendicular to streamlines, eg in boundary layer.

velocity head Not accepted term; usually means pitot pressure but has even been used to mean kinetic energy of unit mass of fluid.

velocity jump Angle between launch line and line of departure (ASCC).

velocity microphone Electrical output = f(V) where V is mean speed of particles on which sound waves impact.

velocity modulation Various techniques of modulating electron beams, eg by h.f. transverse field which impresses sinusoidal velocity contour causing corresponding variation in intensity of scanning spot.

velocity of advance Airspeed past propeller blades ignoring speed due to rotation of blades; essentially
velocity of light

Synonymous with slipstream speed. Always greater than aircraft airspeed, provided engine is operating.

velocity of light
In vacuum 2.9979250 × 10⁸ m/s, symbol c.

velocity of propagation
Speed at which EM wave travels along conductor, eg coaxial cable, waveguide; usually \( v = kc \), where \( k \) is velocity factor.

velocity of rotation
Rotational speed.

velocity of sound
See sound.

velocity potential
Integral of flow velocity parallel to surface.

\[ \phi = U_x + V_y (\text{rectilinear}) = \frac{\nabla}{2\pi} (\text{vortex}) = \frac{V}{V} \]

velocity profile
Plot of velocity of viscous fluid in traverse (2) perpendicular to flow direction; thus for laminar flow through small tube \( ** = \text{parabolic curve} \).

velocity ratio
1 Common meaning is \( \sqrt{q/q_j} \), where \( q_j \) = dynamic pressure of jet.
2 Free-stream relative velocity divided by propulsive jet velocity, \( V_0/(V_y - V_o) \).
3 Generally, velocity of jet or propeller slipstream to free-stream relative velocity.

4 Mechanical advantage.

velocity signature
Record of Doppler track of aerial or other moving target.

velocity vector
1 Flight path in three dimensions. In most aeroplanes, at high speed, this differs only slightly from the longitudinal axis, whereas in a modern fighter in a minimum-airspeed flypast the difference can be 20° or more.
2 Main reference on primary flight display showing desired flight path on which aircraft is held by FCS.

VEMD
Vehicle and engine multifunction, or management, display.

VEN
Variable exhaust nozzle.

vendor
Supplier to a programme, almost always managed by contractor, eg co-axial cable, waveguide; usually \( v = kc \), where \( k \) is velocity factor.

* list often includes suppliers of raw material and even services.

vendor audit
Survey of vendor profiles, eg before entering into discussion or negotiation.

vendor profile
Detailed standardized description of vendor companies for benefit of large-system prime contractors.

veneer
Thin sheet wood; when applied to plastics usually means sheet with simulated woodgrain.

vent
1 Opening to atmosphere, eg from fuel tank, to equalize internal and external pressures.
2 Opening in centre of parachute for stabilization.
3 Precision aperture in aircraft skin sensing true local static pressure; called static *.
4 Spanwise aperture on USB flap either to entrain air from below or to reduce Coanda attachment to upper surface.

vent cap
Vent (2) patch.

vent hem
Reinforced hem around vent (2).

ventilated shock
Shockwave at UST point which has been stabilized and weakened by a double slot system.

ventilated suit
Partial-pressure or pressure suit provided with ventilation system, eg by ventilation garment.

ventilated tunnel
Wind tunnel whose working section is perforated by holes or slots to prevent chocking at Mach 0.8–1.2.

ventilated wet suit
Designed to protect downed aircrew against exposure.

ventilation garment
1 Light inner suit, forming part of pressure suit, through which dry air is pumped to control body surface temperature and evaporation.
2 Capable of a closed volume to dissipate sudden increase in pressure.

ventilation cycle
Regular or automatic venting of Ni/Cd battery to avoid cell imbalance or thermal runaway.

vent plug
Piece of fabric covering vent (2) sewn to hem.

vent venting cycle
Cover over hole in outer skin [e.g., engine-bay ventilation] inserted manually after each flight.

ventral
1 On belly side of body; hence with horizontal fuselage, on underside, or, occasionally, firing or directed through underside.
2 Underfin, vertical or inclined, fixed or hinged.

ventral container/pallet/pod/pod/radar/tank
Criterion for adjective 'ventral', as distinct from fuselage, centreline etc; is that item either forms underside of fuselage or is flush against it, eg Beech 99 baggage container, RF-111 reconnaissance pallet, Harrier gun pod, RA-5C SLAR and Attacker drop tank.

ventral fin
Fixed or moveable fin on underside of body, usually but not necessarily at tail.

ventral inlet
Inlet on underside of body far enough from nose not to be called chin inlet.

ventral nozzle
Plain downward facing nozzle in underside of jetpipe from ejector-lift engine, with pilot or auto-controlled valve.

ventral turret
Defensive gun turret on the underside of the fuselage, usually aft of wing. One species was the ball turret.

venturi
Duct for fluid flow which contracts to minimum cross-section at throat and then expands (usually to same area as inlet); pressure at throat falls to minimum value which can be used to drive vacuum instruments or as measure of airspeed; flow throughout always subsonic.

venturi meter
Instrument for measuring fluid mass flow through calibrated horizontal venturi;

\[ Q = A_2 \sqrt{\frac{P_1 - P_2}{\rho(2[1 - (A_2/A_1)])}} \]

cross-sectional area at start of venturi, \( P_2 \), \( A_2 \) are values at throat and \( \rho \) is density. Assumes flow laminar and compressibility ignored.

venturi pitot
Combination of pitot tube and venturi, one giving pressure above atmospheric, other below.

venturi tube
See venturi.

vent valve
Located at a high point in an aircraft fuel system, this provides an escape route for air during refuelling, and can also spill excess fuel overboard.

Venus
Visual-engine numeric spaces, produces smooth 3-D landscapes.

VEO-wing
Vectored engine over, used in several RALS studies.

VER
1 Vertical ejector, or ejection, rack; VER-2 is twin-store *.
2 Vertical.
3 Version.

verb
APPC command.

Verdan
Versatile digital analyser; pioneer airborne computer used in Reins (Autonetics); colloq. translated as 'Very Effective Replacement for Dumb-Ass Navigators'.
vertical pressure gradient

**vertical camera** Optical axis is perpendicular to Earth’s surface; according to other authorities, axis is aligned with local vertical, no matter what local terrain may be. Need for clarification.

**vertical-cavity SEL(8)** Semiconductor laser whose optical modes are excited perpendicularly to laminate, i.e. vertically.

**vertical circle** Great circle of celestial sphere passing through zenith and nadir.

**vertical clearance** Height above ground.

**vertical data analysis** Identifies and separates out types of data in successive packets to reduce volume of header-style information (satcoms).

**vertical development** Depth of cloud from base to top.

**vertical ejector rack** Carries two superimposed external stores; much lower clean drag than TER.

**vertical engine** 1 Piston engine or gas turbine whose main rotating member rotates about vertical axis, usually for helicopter drive or jet lift.

2 Piston engine whose cylinders are vertical above or below crankshaft.

**vertical envelopment** Tactical manoeuvre in which troops, air-dropped or air-landed, attack flanks and rear of hostile surface force, effectively cutting off latter.

**Vertical Extension** Proposals to reduce FL at which IFR become mandatory, generally = below FL195.

**vertical fin** Fin; traditional fin is fixed, and word ‘vertical’ alone usually means powered fin serving as flight control.

**vertical force** Vertical component of Earth’s magnetic field.

**vertical gust** Gust; but in V-g recorder V signifies vehicle velocity.

**vertical gyro** Two-degrees-of-freedom gyro torqued on gimbal mounts to hold spin axis vertical, thus giving output signals proportional to rotation about two orthogonal axes, usually pitch/roll.

**vertical interval** Difference in height between two locations, eg between two targets or between observer and target.

**vertical launch** Launch of vehicle on initially vertical trajectory where such trajectory is not inevitable; eg non-ballistic vehicle or one launched from launcher of variable elevation.

**vertical layout** Traditional layout of project or design office in which an administrative or seniority hierarchy takes precedence over (1) project or programme, and (2) type of work.

**vertical lift** Lift force along local vertical generated by aerodyne wing, rotor or engine.

**vertical navigation, VNav** Guidance of flight trajectory in vertical plane, eg to minimize pilot workload in letdowns, holding patterns and during climb or descent to ATC cleared FLs along particular routes or on early stages of approach; provided by modern transport navigation systems, esp. those of energy-management type.

**vertical overspill** Vertical beam from weather radar reflected from surface below to give height ring on display; not present in mapping mode.

**vertical pincer** Any DA(3) engagement, one low and one high (relative to target).

**vertical pressure gradient** Change of atmospheric pressure per unit change in height (traditionally per 1,000 ft in UK/US).
vertical probable error

Product of range probable error and slope of fall.

vertical reference Earth-related vertical axis, ie local vertical normally approximated by vertical gyro.

vertical reference gyro Vertical gyro.

vertical replenishment Use of VTOL (helicopter) or V/STOL aircraft for transfer of stores and/or ammunition from ship to ship or to shore.

vertical reverse Aerobatic manoeuvre related to half flick (snap) roll; begun from tight turn by pulling hard back and applying full top rudder to flick inverted, there after completing second half of loop to recover level flight; often called vertical reversion (US term).

vertical riser Flat-rising VTOL, ie jet-lift aircraft taking off with fuselage horizontal.

vertical rolling scissors Defensive descending manoeuvre in vertical plane in attempt to make enemy overshoot and fly into attacker’s future flight path.

vertical separation Specified difference in FL between air traffic on conflicting courses; normally published for (1) tracks 000–179 and (2) tracks 180–359, and for FLs 0–180, 180–290 and 290+.

vertical situation display Abb. VSD, flight instrument designed to avoid CFIT. It adds a large rectangle in the lower half of the ND showing a side profile of the flight path and the terrain, based on current track. This gives a valuable extra view supplementing TAWS (Boeing).

vertical situation indicator See above.

vertical speed 1 Helicopter autopilot mode, rate of change of pressure altitude. 2 Loosely, rate of change of height.

vertical speed indicator Panel instrument indicating vertical speed, ie rate of climb/descent; invariably one pointer zeroed at 9 o’clock.

vertical spin tunnel See spinning tunnel.

vertical stabilizer Fin (US).

vertical stiffeners Angle or other sections riveted or bonded at intervals along spar web or fuselage keel to resist buckling in vertical plane.

vertical strip Single flightline of overlapping vertical reconnaissance images, eg of beach or road.

vertical tail Traditionally, fin(s) and rudder(s); hence ** area, aggregate area in side elevation of fin(s) and rudder(s), together with dorsal fin and any ventral fin(s) but exclusive of fillets, fairings or bullets.

vertical tail length Distance from c.g. to aerodynamic centre of vertical tail.

vertical tailplane Airbus term for fin.

vertical take-off and landing Aerodynamic has capability of rising from surface without airspeed, hovering and returning to soft landing again without airspeed, generating lift greater than its weight by rotors, ducted fans, jets, deflected propulsion or other internally energized means.

vertical tape instrument Display has roller blind translating vertically, against which are read fixed and/or moving index markers; usually engine instruments are grouped in multi-engine aircraft so that in correct operation all similar readouts are at same levels.

vertical translation Motion of aeroplane in vertical plane, esp. under direct lift force, without change of pitch attitude; can be achieved, eg, by Harrier viff or by F-16 symmetric wing-flaperon deflection with scheduled flap-eron/tailplane interconnect gain and with pitch hold engaged.

vertical tunnel See spinning tunnel.

vertical turn Turn with approx. 90° bank.

vertical virage Turn with approx. 90° bank (arch.).

vertical visibility Self-explanatory, can be looking down or up.

vertical wind tunnel See spinning tunnel.

vertigo Subjective sensations caused by faults in inner ear semicircular canals: subjective * = external world is moving past sufferer; objective ** = external world is rotating.

vertiplane VTOL aircraft having fixed wing with flaps powerful enough to lift aircraft at zero forward speed by deflecting propwash; FAI category E-4 but no records and (it would appear) no current flying examples.

vertrep See vertical replenishment.

Vervis Vertical visibility.

Very Patented signal pistol, standard Allied aviation from WWI; hence * light, * pistol etc.

very high Above FL 500 (DoD).

very high frequency 30–300MHz, see Appendix 2.

very high frequency omni-range see VOR.

very high speed photography Image rate 500 to 10/s.

Faster = ultra.

very large aircraft No definition known to exist.

very-large-scale integration Commonly accepted as over 10³ devices (some authorities, over 16 kbit) per chip.

very low frequency 3–30 kHz, see Appendix 2.

very light aircraft J MTOW ≤750 kg, 1,653lb (FAA).

Vfe Escape velocity = 2K/R where K is a constant (universal gravitational constant × primary-body mass) and R is distance from centre of primary body.

vespel polyimide Coating for bearing surfaces retaining low-friction qualities to high temperature.

vest Visualization of expeditionary support tools [software integration] (USAF).

vesta Vecteur à statoréacteur [long-burn ramjet] (F).

vestibule Region immediately inside main entrance door.

VEWS Volcano early-warning system (US Geological Survey).

VEX Vertical Extension.

VF 1 Voice, or variable, frequency.

VF2 Unit prefix, fighter squadron (USN).

Vf Design flap limiting speed; replaced by Vfe.

Vf 1 Surface wind.

Vf Volume fraction of fibre or whisker reinforced composites; expressed as % volume occupied by fibre.

vfe Fuel flow (CAA).

Vfe Aircraft forward velocity at moment of touchdown.

VFB Video-frame buffer.

VFC Maximum speed for flight stability (FC = full control); usually synonymous with Vmo, little used outside US and suggest passing from use.

VFCG Voice frequency carrier telegraph.

VFD Vacuum fluorescent display.

VFDRI Variable-flow ducted rocket.

Vf Maximum flaps-extended placard speed; usually an ASIR and in most flight manuals precise meaning is explained, eg whether limit is for landing setting or any lesser setting. Note: this is invariably a limit for an established flap setting; it does not allow for changed settings.
penetrating a 15.24 ms⁻¹ gust at maximum EAS.

\[ V_{GL} \]

MIL/DeStan defines design speed for landing as whichever is greater: 1.8V, at MLW with high-lift devices set for landing, or 1.4V, with such devices retracted.

\[ V_{FL} \]

Variable-floor-level bridge.

\[ V_{FL} \]

Critical flutter speed (usually for wing), normally \( \lesssim 1.2 \, V_L \).

\[ V_{FMED} \]

Variable-format message entry device.

\[ V_{FO} \]

Variable-frequency oscillator.

\[ V_{FOP} \]

Visual flight [rules] operations panel.

\[ V_{FR} \]

Visual flight rules, G adds Group.

\[ V_{Fr} \]

Vern für Raumschifffahrt, society for space travel (G).

\[ V_{FR-OT}, V_{FR/OT}, V_{FR} \]

On top.

\[ V_{FR-T} \]

Becoming used for “take-off failure recognition and reaction”

\[ V_{FSG} \]

Variable-frequency starter/generator.

\[ V_{FSS} \]

Variable-frequency selection system.

\[ V_{FTO} \]

Variable-frequency selection system.

\[ V_{FW} \]

Veterans of Foreign Wars (US).

\[ V_{FXR(R)} \]

Maximum flap-retraction speed.

\[ V_{FXR(X)} \]

Maximum flap-extension speed.

\[ V_G \]

2. Vertical gyro.

\[ V_{Ga} \]

3. Vortex generator.

\[ V_{G/C} \]

4. See V_{GND}.

\[ V_{GND} \]

5. Airline pilots’ association (G).

\[ V_G \]

1. Geostrophic wind.

\[ V_G \]

2. Gust design speed, usually \( V_{G\ast} \).

\[ V_G \]

UK De/Stan defines gust speed in two ways: on a V-n plot, intersection of \( C_{L\max} \) with 20 ms⁻¹ gust, or \( V_G (n_G+1)/(2) \) where \( n_G \) is the load factor resulting from penetrating a 15.24 ms⁻¹ gust at maximum EAS.

\[ V_{g} \]

Aircraft speed and normal acceleration; hence *= recorder.

\[ V_{gA} \]

Primitive instrument recording speed and applied loading diagram, graphic plot of these parameters, * recorder, continuous recording of these signals are filtered to pinpoint the source.

\[ V_{gA} \]

Visual graphics array, 640 × 480 pixels.

\[ V_{gA} \]

Visual graphics array.

\[ V_{gg} \]

Visual graphics array.

\[ V_{gg} \]

Aircraft speed, vertical acceleration and height; hence *= recorder, primitive instrument recording speed and applied loading in vertical (very rarely in other) plane.

\[ V_{ga} \]

1. Video graphics array.

\[ V_{ga} \]

2. Video graphics array, 640 × 480 pixels.

\[ V_{ga} \]

3. Video graphics adapter.

\[ V_{gD G} \]

Vertical gyro/directional gyro.

\[ V_{gg} \]

Visual graphics generator.

\[ V_{gh} \]

Aircraft speed, vertical acceleration and height; hence *= recorder, continuous recording of these parameters on wire or tape.

\[ V_{g1} \]

Vertical gyro instrument.

\[ V_{gk} \]

1. Supreme military command (USSR, R).

\[ V_{gk} \]

2. A CFD method (Fortran) for predicting characteristics of a 2-D single-element aerofoil.

\[ V_{GND} \]

Velocity relative to the ground, suggest usually = G/S.

\[ V_{GPO} \]

Velocity-gate pull-off.

\[ V_{grad} \]

Gradient wind.

\[ V_{GSS} \]

1. Velocity-gate steal; usually synonymous with V_{GPO}.

\[ V_{GSS} \]

2. Volunteer Gliding School[s] (UK ATC, now Air Cadets).

\[ V_{GS} \]


\[ V_{GS} \]


\[ V_{GTA} \]

Gas-turbine association (Netherlands).

\[ V_{GTD} \]

Gas-turbine association (Netherlands).

\[ VH \]

1. Designation, very heavy aircraft or unit (SAC, formerly).

\[ VH \]

2. Or \( V_H \), velocity hold.

\[ V_{H1} \]

1. Maximum speed in level flight with maximum continuous power; little used outside US. Definition should add that \( H = \) high altitude; this power at medium/low FLs would usually exceed \( V_{DF} \).

\[ V_{H1} \]

2. Now also taken to mean maximum speed in horizontal flight.

\[ V/H \]

Velocity/height ratio [in compatible units] in taking reconnaissance imagery and in sensor design (MO9/200 ft gives *= 5).

\[ V_{hi} \]

1. Hump speed.

\[ V_{hi} \]

2. Volume ration of horizontal tail.

\[ V_{hi} \]

3. Helicopter hover induced velocity.

\[ VHD \]

HVSIC hardware design [or description or descriptive] language.

\[ VHF \]

Very high frequency, see Appendix 2; /DF, adds direction finder; /DL, data-link; /PTN = radio link to public-telephone network.

\[ VHF \]

1. Omni-range See VOR.

\[ VHRT \]

V.h.f. R/T.

\[ VHL \]

Very high level (software language).

\[ VHMS \]

Vehicle health-management system[s].

\[ VHPC \]

Very high performance (or power) integrated circuit.

\[ VHR \]

Very-high-resolution radiometer.

\[ VHS \]

Very high speed [electronics].

\[ VHSC \]

VHSIC Very-high-speed integrated circuit; Si or SOS, then GaAs, two to three orders of magnitude faster than MSI/LSI; -2 adds Phase 2.

\[ V_{hi} \]

1. V.H. Headwind [head-on component].

\[ VI \]

1. Visual identification mode.

\[ VI \]

2. Viscosity index.

\[ VI \]

3. Video interface.

\[ VI \]


\[ VI \]

5. Heading [course] to intercept.

\[ VI \]

6. Association of Flemish Engineers [B-3500 Hasselt] (Belgium).

\[ V_{1} \]

1. IAS (not ASIR).

\[ V_{1} \]

2. EAS.

\[ V_{1} \]

3. Velocity induced by winglet, normally inwards normal to direction of flight. Note: winglet lift has a useful thrust component.

\[ V_{1} \]

4. Propeller induced velocity, made up of vector sum of \( V_{hi} \) and \( V_{xi} \).

\[ V_{1} \]

5. Mean velocity of air entering jet-engine inlet.

\[ VI \]

Versatile integrated avionics.

\[ VIAM \]

All-union (research) institute for aviation materials (USSR).

\[ Vias \]

Optical-grade polyurethane interlayer material.

\[ VIAS \]

Indicated airspeed.

\[ VIB \]

Vibration.

\[ VIB \]

Vibrating voltage regulator Controller of d.c. machines which uses vibrating points to sense voltage and adjust resistance controlling field current.

\[ VIB \]

Vibration indicator Instrument or sensor for either recording or indicating mechanical vibration either remote from crew or of too high a frequency to be obvious, esp. emanating from turbine engines. Modern turbofan engines are fitted with crystal transmitters whose signals are filtered to pinpoint the source.

\[ VIB \]

Vibration isolator See isolator.

\[ VIB \]

Vibration meter Instrument for recording vibration frequency; very rarely either amplitude or acceleration in addition.
vibration mode

Most physical objects, from wings to quartz crystals, can vibrate at a fundamental mode having lowest frequency, or (depending on dimensions, mounting, impressed forces, coupling and other factors) at any of numerous modes having different visual pattern and higher frequency. Fundamental mode usually longitudinal over length or thickness, flexural over width or thickness, and shear over thickness or face.

VIBRATOR 1 Mechanical source of high-power sinusoidal vibration for test purposes; also called vibration generator.

2 Rapid-action switch for alternately reversing polarity of transformer primary fed from d.c. to give raw a.c. output; also called vibrator converter.

VIBRATORY TORQUE CONTROL Mechanical coupling for rotary output, eg from piston engine, which at low rpm locks drive into hydraulically stiff configuration but at higher rpm unlocks and allows drive to be taken through slender quill shaft.

VIBROGRAPH Seismic instrument giving record of vibration displacement/time.

VIBRO POLISHING Immersion in a vat of small abrasive particles vibrated at a selected frequency.

VIC, V INC Formation of aircraft all in same horizontal plane having shape of V flying point-first; minimum number of aircraft 3.

VICIOUS CYCLING Standard maintenance procedure for Ni/Cd battery in which charge is violently drained and replaced; also called deep cycling.

VICKERS PYRAMID Hardness testing machine in which precise force drives pyramid-point diamond into specimen, hence * Number = measure of surface hardness.

VICON Visual confirmation (of voice instruction or clearance, especially to take off).

VICTOR AIRWAY Airway linking VORs, thus virtually all airways in US and many other countries; identified by prefix V (from 1952).

VICTORY ROLL Flamboyant barrel roll performed at low level over a fighter pilot’s home airfield to indicate at least one air-combat victory on that mission.

VID J Visual identification, or VID required.

2 Virtual (confusingly, also visual) image display.


VIDEO Generalized adjective or noun for electronic transmission of visual information.

VIDEO COMPRESSION Returning of video from primary radar so that each radial trace is briefly stored and then written more quickly; this allows time for cursive writing of synthetic data.

VIDEO DETECTOR Diode which demodulates video signal.

VIDEO DISPLAY Electronic display which, whether or not it presents alphanumerics, symbology and other information, presents pictures.

VIDEO EXTRACTOR System for analysing all signals, selecting all that form part of useful image (eg in TV or radar) and excluding all others; in SSR usually synonymous with plot extractor.

VIDEO LINK Telecom system conveying pictorial information.

VIDEO MAP(PING) Superimposition on radar display of fixed information or picture, usually derived from fine-grain photo plate scanned in synchronization with rotation of radar aerial or from computer memory, eg in GCA to show exact relationship of aircraft to surface obstructions.

VIDEO SIGNAL Telecom signal conveying video information.

VIDEOTEX System of computerized self-service information terminals giving complete information (usually without charge) to all users, eg passengers at airports.

VIDICON Most common form of video (TV) picture (camera) tube, in which light pattern is stored on photoconductive surface; this is then scanned by electron beam, which deposits electrons to neutralize charge and thus generate output signal.

VIDISSOR Modern form of pioneer Farnsworth camera tube; used in space TV surveillance (ITT).

VIDS Visual integrated [or information] display set [or system].

VIE Video image exploitation.

LES VIEILLES RACINES French association of aerospace pioneers and professionals.

LES VIEILLES TIGES French association of pioneer pilots.

VIERENDEL Girder (truss) comprising upper/lower chords and verticals, without diagonals or shear web, designed for flexure.

VIEW Opinion; thus ‘to take a dim *’ = to oppose or regret a decision or situation (RAF WW2).

VIEWS, VIEWS J Vibration indicator early-warning system.

2 Virtual integrated EW simulator.

VIF Vertical integration facility (space launch vehicle).

VIFF, VIFF Vectoring in forward flight; pilot control of trajectory by direct control of propulsive thrust axis of jet-lift VSTOL aeroplane, selecting downwards for lift (normal acceleration) and forward of vertical for deceleration, thus performing combat manoeuvres unmatched by any conventional aircraft. Hence verb to viff, viffing etc.

VIGIL Vinten integrated IR linescan.

VIGO PAD Small concrete pan preferably surrounded by concealing trees (STOVL).

VIGV Variable-incidence (or inlet or integral) guide vane(s).

VII Viscosity index improver.

VIIRS Visible/IR imaging radiometer suite.

VIM J Vacuum-induction melting.

2 Vendor information manual.

VIAAP Speed (IAS) for minimum drag.

VIAIP Speed (IAS) for minimum power, not necessarily same as above.

VIAIP Speed corresponding with lowest power at which both height and speed can be maintained, ie minimum speed for continuous cruise (not current use).

VIMAP Visible and infra-red mapping spectrometer.

V∞∞ V-infinity, ie free-stream velocity.

V (INT) Vehicle integrated intelligence.

VINYL ESTER Low-viscosity solventless liquid resin used as alternative to epoxy in wet lay-up of FRC materials.

VIO, VIO J Violent, meaning heavy static or other radio interference, normal code VLNT for other meanings.

VIOLET Route(s) into and out from target area on colour radar.

VIP J Value improvement programme.

2. Common meaning, very important person.

3 Integrated processor, or presentation (see next entry).
VIP levels

- Vehicle improvement programme.
- Variable installation position (engines).
- Voice over Internet protocol.
- Verified indentiy pass (TSA).

VIP levels Those of video processor yielding weather echo intensity for precipitation, from *1 (weak) to *6 (extreme).

VIPER, Viper Vitreous improved-performance extreme removal.

Viper Video-input encoder.

VIPPS Visual imaging pass-production system, controlling personnel access.

virage Tight turn (pre-WW1).

virog Streaks of water or ice particles falling from cloud but evaporating before reaching surface.

virgin fibre Continuous tow, long staple.

VIRS Visual and IR sensor systems.

virtual airline Air carrier created only as legal entity to facilitate franchising agreement.

virtual attrition Reduction in offensive tasking, either by reducing overall numbers or by transfer of attack aircraft to support roles, made necessary by effectiveness of defences.

virtual cockpit One offering no natural external view, only displays from sensors.

virtual collaborative engineering Links users at remote locations into conference [eg, all can have input to a drawing].

virtual gravity Terrestrial acceleration acting on parcel of atmosphere, reduced by centrifugal force due to parcel’s relative motion; symbol g* = approx. 99.99% g.

virtual height Apparent height of ionized atmospheric layer calculated from time for radio pulse to complete vertical round trip.

virtual image One visible in mirror but not projectable on surface.

virtual image display Small CRT binocular colour high-resolution image of surface target, which appears to be 935 mm (36.9 in) behind face of magnifying lens.

virtual inertia That part of inertia forces acting on oscillating body due to surrounding fluid (eg air) and proportional to fluid density.

virtual level Energy level of subatomic nuclear system for which excitation energy exceeds lowest nuclear-particle dissociated energy.

virtual manufacturing Integration of available technologies to get right information to right people at right time to increase speed and accuracy of decisions.

virtual mass Actual mass plus apparent mass.

virtual piston Pumping effect caused by collapse of launch tube by explosive lens.

virtual star Created by laser illuminating diffuse sodium c100 km above Earth to give continuous readout of atmospheric distortion of telescope optics.

virtual stress See Reynolds stress.

virtual temperature Temperature parcel of air would have had if it had been entirely free of water vapour, symbol T_v = (1 + 0.61 q) T where T is measured temperature and q is specific humidity.

virtual VFR Combined enhanced and synthetic vision giving pilot apparent VFR view of the external world at all times.

VIS Voice-interactive subsystem.

Vs Lowest selectable airspeed.

vis Invariably means visibility, but ambiguous.

Visa Vertically interconnected sensor array.

viscoelasticity Behaviour of material which has hereditary or prior stress-history memory and exhibits viscous and delayed elastic response to stress superimposed on normal instantaneous elastic strain.

viscosimeter Instrument for measuring viscosity; Saybolt and Engler * are simple calibrated containers with narrow orifice, result being obtained by timing run-off; accurate (absolute) * include Stokes (falling speed of small sphere), rotating-cylinder (outer cylinder drives inner via fluid interface whose drive torque is measured), capillary tube (Poiseuille), and oscillating disc (parallel and close to plane surface).

viscosity * Dynamic * can be considered internal friction in fluid; property which enables fluid to generate tangential forces and offer dissipative resistance to flow, defined as ratio of shear stress to strain; in air almost unaffected by pressure but increases with temperature, Symbol μ; unit Nm² = 1,000 cP; for air 1.7893 × 10 –5 Nm² (in traditional units 3.73 slug/ft-s).

2 Kinematic * is μρ where ρ is density; varies with pressure as well as temperature, units are m²/s = 100 cSt; 1 ft² s⁻¹ = 0.092903 m² s⁻¹ = 929.03 St. Also called dynamic *.

symbol μ

viscosity coefficient Synonymous with viscosity.

viscosity index Usually synonymous with viscosity, or its variation with temperature.

viscosity-index improver Long-chain waxy polymer[s] which stay thick at elevated temperatures.

viscosity manometer Instrument for measuring very low fluid pressure by torque exerted on disc suspended on quartz fibre very close to spinning disc; examples are Dushman and Langmuir gauges.

viscosity valve Liquid-system control valve controlled by viscosity of medium, eg in bypassing lube-oil cooler.

viscous aquaplaning Occurs when the runway is merely damp, with a water film not penetrated by tyres; important on smooth surfaces, especially coated with deposited tyre rubber; persists to low speeds.

viscous damping Energy dissipation in vibrating system in which motion is opposed by force proportional to relative velocity.

viscous flow Flow in which viscosity is important; can be laminar or turbulent but criterion is that smallest cross-section of flow must be very large in relation to mean free path. At very low R inertia becomes unimportant and flow is governed by Stokes equations.

viscous fluid One in which viscosity is significant.

viscous force Force per unit mass or volume due to tangential shear in fluid.

viscous stress Fluid shear stress, symbol τ = μdu/dy (Newton’s law) where u is velocity distant y from surface or other reference layer.

visgad Polyeurethane conductive coating for transparency, anti-fog, anti-scratch, anti-static.

visibility Distance at which large dark object can just be seen against horizon sky in daylight (DoD, NATO, see RVR, RVF).

visibility meter Instrument for measurement of visibility, visual range, eg telephotometer, transmissometer, nephelometer etc.
visibility prevailing

visibility prevailing Distance at which known fixed objects can be seen round at least half horizon.

visibility value Distance (see visibility) along runway, in miles and tenths.

visible horizon Circle around observer where Earth and sky appear to meet (USAF). Also called natural horizon.

visible light EM radiation to which human eye responds, typically with wavelength from 400 to 700 mm, 0.4 to 0.7 μm.

visible line Full line on drawing representing a line visible in assembled subject item.

visible radiation See visible light.

visible spectrum See visible light.

visionics Collectivc term for optical and electronic devices, operating at many EM wavelengths, which enhance human vision, especially at night and in bad weather or other adverse conditions.

vision-in-turn window Eyebrow window in roof of flight deck or cockpit.

visitor Person entering a foreign state for period less than three months.

visor Pivoting or translating fairing for forward-facing cockpit windows of supersonic or hypersonic aircraft, in latter case with thermal-protection coating.

visor Butyl ether + 15% aniline; rocket fuel with Salbei (G).

visor 1 Pivoting or translating fairing for forward-facing cockpit windows of supersonic or hypersonic aircraft, in latter case with thermal-protection coating.

visor 2 Hinged screen, transparent or tinted, protecting eyes against solar radiation and/or micro-meteorites in space exploration.

visor Virtual integrated software testbed for avionics.

visor Very intelligent surveillance and target acquisition.

visor 2 Variable-stability inflight-simulator test aircraft.

visor 3 Virtual integrated software tested for avionics.

visor 4 Virtual imagery simulation training aid.

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visual separation

generated (but in old simulators achieved by optics moved over a large model).

visual separation Basic method of avoiding collisions in TMAs or on ground by seeing and avoiding; normally involves conflicts between arrivals and departures and can be accomplished by pilot action or tower instruction.

VIT Vision in turn.

vital actions Rigorously learned sequences instilled into all pilots, either specific to type or, more often, as general good airmanship; necessary eg before entering aircraft, upon entering cockpit, on starting engine, before taxiing, before takeoff, etc. On simple aircraft generally remembered by mnemonics, eg Bumpf (check brakes, u/c, mixture, pitch, flaps) or HTMPFFG (hood/harness, trim/throttle friction, mixture, pitch, fuel cocks, flaps, gills/gyros).

vital area Designated area or installation to be defended by air-defense units (DoD).

vital items See essential items.

VITC Vertical-interval time code.

Vitreloy Dense ‘metallic glass’ (proprietary, Howmet).

vitrifying Transformation of ceramic from crystalline phase into amorphous or glassy state.

Vitro-Lube Ceramic-bonded dry-film lubricant with wide temperature range.

VITS 1 Video interface unit.

2 Virtual integrated training system.

VJ Velocity of propulsive jet, normally measured relative to vehicle.

VKIFD Von Kármán Institute for Fluid Dynamics (Int.).

VKS Military space force[s] (R).

VL Vertical landing, or lift, or launch.

2 Tunnel velocity \times characteristic model length.

V/L VOR/localizer.

V1 Relative velocity of flow on underside of aerofoil.

VLA Very light aircraft.

2 Very large aircraft.

3 Vertical line array.

4 Variable lever arm (flight-control ratio changer).

VLAS Vertical-launch autonomous attack system.

VLAC Vertical-Lift Aircraft Council (US Aerospace Industries Association).

VLAD Vertical line-array Difar.

Vladimir Very-large-array demonstration imager for IR.

VLAR Vertical [attitude] launch and recovery.

VLBI Very long baseline interferometry.

VLBTI Very long-burning target indicator.

VLC Very low clearance.

VLCHY Very low cost harrassment vehicle.

V/Lo, V/Le Best lift/drag speed.

VLE Virtual learning environment.

VLe Maximum speed with landing gear extended and locked; flight manual specifies whether main gear only or all units. Always significantly higher than \( V_e \) values.

VLEA Very-long-endurance aircraft, powered by solar cells charging fuel cell(s) for continuous flight of months or years.

VLED Visible LED.

\( V_{MCG} \) Minimum-control speed; more precisely specified as following three entries:

VLES Very large eddy simulation.

VLF Vectored-lift fighter; also see next.

v.L.F. Very low frequency. See Appendix 2.


VLo No longer used; was vague maximum landing- gear speed, now replaced by \( V_{Lo}, V_{Le} \).

VLJ Very light jet [being defined from 2004].

VLNT Violent.

VLO Very low observability.

VMD I US term, maximum speed for landing-gear operation; synonymous with UK \( V_v \).

2 Confusingly, also used to mean lift-off speed, in other words \( V_v \).

VLOF Lift-off speed, at which aeroplane becomes airborne; suggest \( V_{Lo} \).

VLR \( 2 \) Very long range [1942–45, ranges today considered modest].

2 Telecom code for long-range search/rescue aircraft.

\( V_e \) Velocity/length Reynolds number.

2 Very light rotorcraft.

VLS \( I \) Visible light sensor.

2 Vertical launch system.

3 Veiculo Lancador de Satelites (Brazil).

VLSI Very-large-scale integration.

VLSIC Very-large-scale integrated circuit.

VLSIPA Very-large-scale integration photonics architecture.

VLSA Very-large aircraft.

1 Vertical line array.

Vmax \( 2 \) Missile velocity.

V/M, v.m. \( 1 \) Velocity modulation.

2 Voltmeter (also V/M).

3 Voter/monitor (also V/M).


5 Heading to a manual termination.

VM \( 1 \) Speed at which precipitation (esp. slush) drag is maximum; always well below aquaplaning speed.

2 Design speed for bird-strike.

\( V_m \) Volume fraction of composite material occupied by matrix.

2 Missile velocity.

V/M See VM(2), (3).

VMA Code, fixed-wing attack squadron (USMC).

VMAD \( 2 \) Vertically mounted accessory drive.

2 Video-motion anomaly detection.

\( V_{max} \) Maximum CAS for clean aircraft.

VMc \( 1 \) Visual meteorological conditions.

2 Vehicle management computer.

VME Minimum-control speed; more precisely specified as following three entries:

VMECA Minimum speed at which aeroplane can be controlled in air; defined as limiting speed above which it is possible to climb away with not more than 5° bank and with yaw arrested after suffering failure of critical engine in takeoff configuration, with engine windmilling and c.g. at aft limit. There are usually suggested limits of required rudder-pedal force and on absolute value of \( * \).

VMEC Minimum speed at which aeroplane can be controlled on ground; defined as that above which pilot can maintain directional control after failure of critical engine without applying more than 70 kg pedal force,
V_{MCL}

without going off runway and if possible while holding centrel ine, with 7+ kt crosswind and wet surface.

V_{MCL} Minimum speed at which aeroplane can be controlled in the air in landing configuration, while applying maximum possible variations of power on remaining engine[s] after failure of critical engine.

V_{MCL2} As above but with any two engines inoperative.

V_{MCP} Speed, usually EAS, at maximum continuous power in level flight; V_{10} is more commonly used.

V_{MD} Maximum permitted diving speed.

V_{MDI} Vector mid-distance indicator.

VME 1 Virtual memory environment.

2 V.h.f. management entity [bus].

3 VersaModule Eurocard [bus].

VMEC Versa module Eurocard card cage.

VMEP Vibration management enhancement program[me].

VMF 1 Code, fixed-wing fighter squadron (USMC).

2 Navy (USSR, R).

3 Variable message format.

VMFA Code, fixed-wing fighter/attack squadron (USMC).

VMG Vertical main landing gear strut load at MRW and with full aft c.g.

V_{MIN} Minimum CAS for basic clean aircraft.

V_{MIN(OL)} Minimum maneuver speed (US).

VMM 1 Veille Météorologique Mondiale = World Weather Watch.

2 Vehicle management system.

VM3, VMP, VMMM Versatile mass media memory, 4 RTMMs.

VMO Variable metering orifice.

V_{MO} Maximum permitted operating speed under any condition, higher than V_{NE} and less than V_{DF} but latter is wholly exceptional limit not intended to be reached except during certification flying.

VMOS Virtual machine operating system.

Vmp Helicopter speed for minimum power.

Vnr Helicopter speed for maximum range.

VMS 1 Vehicle management system.

2 Vehicle monitoring system (robotics).

3 Vertical motion simulator.

4 Vehicle motion sensor.

5 Variable metering sleeve.

V_{MS} 1 Minimum EAS observed during normal symmetric stall, usually less than V_{c}.

2 Airspeed for minimum sink rate in gliding flight.

VMTI Video moving-target indicator.

VNU 1 Voice management [or message] unit.

2 Airspeed measurement unit.

3 Marine Air Group (USMC).

VNU Minimum demonstrated unstick speed, at which with all engines operating, and without regard to safety, noise-abatement or any other factor, aeroplane will leave ground and hold positive climb. According to Airbus, “vitesse minimum unstick”.

VN 1 Speed multiplied by (or plotted against) normal acceleration; more commonly V_{n}.

2 Vinyl/nitrile (PVC nitrile-based rubber).

V_{n} Component of wind acting perpendicular to heading; also called normal wind, normal component or (loosely) crosswind component.

V_{n} Fast speed (usually EAS) multiplied by or plotted against normal acceleration; hence * diagram, of which two forms; basic manoeuvring envelope and basic gust envelope.

V_{NA} Noise-abatement climb speed, usually synonymous with V_{1} (1st segment) but also commonly used for 4th segment Fuss.

V_{NAV}, V_{NAV}, V_{NAV} Vertical navigation; generalized topic of control of flight trajectory in vertical plane; now becoming automatic in transport-aircraft energy-managing flight systems. In a specific system, an add-on to LNAV giving glideslope guidance down to 350 ft AGL (WAAS).

V_{NE} Never-exceed speed; an exceptional permitted maximum beyond V_{MO} of which captain may avail himself in unusual circumstances. Implication is that * must be reported and explained.

V_{NII} All-union research institute [EM adds electro-mechanics, RA radio engineering] (R).

V_{90} Category of off-base airstrips usable by fighters (Sweden).

VNIR Visible to near-IR.

V_{NO} Maximum permitted normal-operating speed, generally replaced by V_{MO} in smooth air can be exceeded with caution.

VNR V.h.f. navigation receiver.

VNRT Very near real time.

VNTSC Volpe National Transportation Systems Center (US DoT).

VNV ALPA (Netherlands).

VO 1 Visual optics.

2 US piston engine code, vertical crankshaft, opposed.

V_{o} Operational speed (airspeed in FCS calculations).

VOA 1 Velocity of arrival.

2 Vitesse oxygénée Obschchestvo Aviastroitelei (aeronautical society, USSR, R).

3 VOLPE Vacuum optical bench.

3 VOLP Vacuum optical countermeasures.

3 Volatile organic compound[s].

V_{OC} Obstacle-clearance speed.

Vocational Tax relief Granted by Inland Revenue against cost of some commercial-pilot training (UK).

Vocoder Voice coder; device responding to spoken input (usually previously stored) to generate synthetic speech output.

VOCRAD Voice radio.

VOCS Voice-operated carrier suppressor.

VOD 1 Vertical-on-board delivery; usually synonymous with vertrep.

2 Vertical obstruction data.

3 Vertical on demand.

Voder Device with keyboard input controlling generation of electronic sounds, esp. synthetic speech output.

VODIR Has been used to mean VOR.

VOF Volume of fluid.

VOFVL Verband Österreichischer Flugverkehrsleiter (Austria).

Vogad Voice-operated gain-adjusting device; auto volume compressor or expander.

Voice Voice optimal interrogator (USN).

Voice frequency Normally taken as 25 Hz to 3 kHz for telecommunications, much greater range for hi-fi.
voice-grade channel

Covers about 300–3,000 Hz, for speech, analog, digital or facsimile.

voice keying

System enabling telecommunications to use common R/T transmit and receive sites and similar frequencies but with voice-operated carrier suppressor and delay network to switch outgoing signal to transmitter and incoming to receiver. Remote stations normally switch automatically to receive mode except when user is speaking.

voiceless homing

Any electronic homing system not using speech; traditionally meant radio range (arch.).

voice message unit

Software-controlled system providing voice or tone warnings of faults, sensor activity and other occurrences.

voice-operated relay

See voice keying.

voice rotating beacon

Short-range radio navaid transmitting stored-speech headings (usually QDMs) which differ from 00° round to 359°; a form of talking VOR, also called talking beacon, abb. VRB (arch.).

void

Undesired gap in welded joint.

void fraction

Percentage of total frontal area of jet engine through which airflow passes.

Also several meanings in composite materials and structures.

Voigt effect

Double refraction (associated with Zeeman) of light passing through vapour perpendicular to strong magnetic field.

VoIP

Voice over Internet Protocol.

VOR

Venus-orbiting imaging radar.

Voiska-PVO

Troops of air defence of homeland (USSR, R).

Voispond

Proposed Calcsel function that would automatically identify an aircraft by a voice recording.

VOL

1 Vertical on-board landing.

2 Volume

EDP (1) memory which dissipates stored information when electrical power is switched off; thus, next morning or after weekend all bits must be restored before computer operation. Also means electrical transients cause corruption (though this may be only temporary). Hence * data, * memory, volatility.

2 Having high vapour pressure, and thus low boiling or subliming temperature at SL pressure; hence volatility.

volcano early warning system

This would warn air traffic control centres within five minutes of the start of an ash-producing eruption (US Geological Survey).

Vol à voile(s)

Gliding, soaring (F).

Volbeat

Routine ground-to-air broadcast of meteorological information (ICAO). Today such broadcasts are Metars and apply to a designated list of airports.

Volcanic

Radial tracking/computing of flight paths to solve stacking problems (USA 1953).

vol générique

Dive (F).

vol plané

Planning (inclined) flight, ie glide by powered aeroplane (arch. except in F).

volt

SI unit of EMF, = W/A.

voltage

Ratio of output/input voltages.

voltage standing-wave ratio

Ratio maximum/minimum V along waveguide or coaxial.

volt-ampere

SI unit of alternating-current power, symbol S, made up of power component P watts and reactive component Φ: S = P + Q in; see power factor.

voltmeter

Instrument for measuring potential difference, ie V.

volume

SI unit is m³ (conversion factors for non-SI measures, from ft³ × 0.02831684, UK gal × 0.00454607 and US gal × 0.03889541; litre (dm³) = 0.035287 ft³ = 60.9756 in³; cm³ (cc) = 0.06102 in³; UK gal [Imp. gal] = 1.20095 US gal; US gal = 0.83267 UK gal.

volume fraction

Proportion, usually %, of reinforced composite (FRP) occupied by reinforcing fibres.

2 Generally, proportion of whole volume occupied by particular substance.

For aerostats see air *, gas *.

volumetric efficiency

Volume of combustible mixture (in diesel, air) actually drawn into cylinder of piston engine on each operating cycle divided by capacity (swept volume) of cylinder, usually expressed as %. Symbol ηv.

volume unit

Abb. VU.

voltage-fed aerial (antenna)

Fed from one end, where signal potential is maximum.

Vorloc, VOR/LOC

voltage gain

Ratio of output/input voltages.

voltage standing-wave ratio

Ratio maximum/minimum V along waveguide or coaxial.

volt-ampere

SI unit of alternating-current power, symbol S, made up of power component P watts and reactive component Φ: S = P + Q in; see power factor.

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Instrument for measuring potential difference, ie V.

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volume unit

Measure of audio volume to be output by electrical current, expressed in dB equal to ratio of magnitude of electrical waves to magnitude of reference volume, usually 1 mW; abb. VU.

volte

Spiral or planar helix; thus, spiral casing of centrifugal compressor or supercharger impeller.

Vom

Volts/ohms/milliamps tester.

Vomit Comet

Aircraft, e.g. KC-135, used for zero-gravity tests.

Von Brand

Standard method of measuring jet smoke by passing measured gas volume through filter and then recording intensity of calibrated light reflected by filter pad. Gives quantified measure of particulate matter trapped by chosen filter. Hence * scale for visible smoke.

von Kármán street

See street (also called Kármán street).

VOP

Variation of price.

VOR

V.h.f. omnidirectional radio range, announced by RCA in 1941 and forced through by US in 1959 to become universal global [except USSR] radio navaid. Comprises fixed beacon emitting fixed circular horizontal radiation pattern at 108–118MHz on which is superimposed rotating directional pattern at 30 Hz giving output whose phase modulation is unique for each bearing from beacon. Thus airborne station can read from panel instrument bearing of aircraft from station, called inbound or outbound radial. Each fixed station identified by three-letter keyed intermittent transmission (sometimes voice).

See Doppler *, VOR/DME, VOR steering guidance with DME distance information.

Vorgen

Vehicular Power and Ground Equipment.
VORMB, VOR/MB

indicator or (esp. in light aircraft) simple VOR receiver with localizer needle only.

VORMB, VOR/MB VOR marker beacon.

Vormet Sends scripted pilot’s weather reports to over-flying aircraft.

Vorpostenboot Flakship (G).

Vortic Combination of VOR and TACan (occasionally written VOR/TAC) offering from one fixed station VOR az, TACan az and TACan (DME) distance information; ident codes prove VOR and TACan signals are both from same fixed station. Normally * is end-product of trying to integrate civil (VOR/DME) with military (TACan) nav aids, latter being u.h.f. and therefore inherently incompatible.

vortex Fluid in rotational motion (possessing vorticity), eg streamed behind wingtip or across leading edge of slender delta. See line *, point *, trailing *.

vortex breakdown Sudden separation of large vortex from leading edge of slender delta (naturally followed by its decay) at particular AOA (higher than stalling AOA for most wings); essentially represents stall of slender-delta wing.

vortex burst See vortex breakdown.

vortex dissipator Bleed-air jet(s) blown down below and ahead of jet-engine inlet to prevent ingestion of material from unpaved airfields or contaminated runways.

vortex drag Drag caused by vortex formation; not normally a recognized part of aircraft drag.

vortex filament Line along which intense (theoretically infinite, at R = 0) vorticity is concentrated; either closed loop or extending to infinity.

vortex flap Hinged along its leading edge just behind leading edge of wing on upper surface. Opened to 45° vortex to increase lift.

vortex flow Fluid flow combining rotation with translational motion.

vortex generator Small flat blade perpendicular to skin of aircraft or other body set at angle to airflow to cause vortex which stirs boundary layer, usually to increase relative speed of boundary layer and keep it attached to surface; also called turbulator.

vortex hazard Danger to aircraft, esp. light aircraft, from powerful vortices trailed behind wingtips of large aircraft; also called wake hazard, wake turbulence.

vortex lift Lift generated by slender delta or similar wing having sharp, acutely swept leading edge (subsonic relative velocity normal to leading edge): large and powerful vortex is shed evenly on left/right wings, adding major non-linear increment to lift; also postpones stall to lower speed and extreme AOA, but with high drag.

vortex line Line whose direction at every point coincides with rotation vector, all of whose tangents are parallel with local direction of vorticity. Must be closed curve or extend to infinity, or to edge of fluid or to a point on an infinitely intense vortex sheet.

vortex panel A hypothetical treatment of aerofoil circulation by dividing the flow into a series of nodes on the surface.

vortex ring Vortex forming closed ring (eg smoke ring); collar vortex, and formed by helicopter as it slows to the hover.

vortex-ring state Operating state of rotorcraft (esp. helicopter) main rotor in which direction of flow through rotor is in opposite sense to relative vertical flow outside rotor disc and opposite to rotor thrust. Occurs in auto-rotative landing, and can occur with rotor under power if rate of descent equals rotor downwash velocity.

vortex separation Filtration of different types of particle from fluid by different centrifugal forces in vortex motion.

vortex sheet Theoretical infinitely thin layer of fluid characterized by infinite vorticity; in practice layer of finite thickness formed by large number of small vortices, eg as trailed behind lifting wing (where much of vorticity is quickly rolled up into two large tip vortices).

vortex street See street.

vortex strength Circulation round any body or other closed system, symbol Γ, constant at all points on a vortex filament.

vortex trail Visible (white) trail from wingtip, propeller tip etc, caused by intense vortex.

vortex tube Device devoid of moving parts in which pressure difference induces fluid flow through tangential slots into tube; violent vortex divides flow into surrounding warm flow and cold (about 40°C cooler) core.

vortex turbine Mounted in optimum location at wingtip to extract power from tip vortex.

vorticity Vector measure of local rotation in fluid; in uniformly rotating fluid proportional to angular velocity (in UK, exactly defined as twice angular velocity). Symbol ω [some authorities use Ω = V V where V is del (mathematical operator) and V is vector velocity (* curl V in US; often called rot. V, from rotation, in Europe).

vorticity component Circulation around elementary surface normal to direction of vorticity divided by area of surface; more strictly, limit of circulation as area of element approaches zero.

vortillon Name coined by McDonnell Douglas to describe fence around underside of DC-9 wing leading edge controlling boundary-layer direction.

VORV VOR without voice.

vos 1 Velocity of sound.

vos 2 Voice-operated switch.

VOT, VOT VOR test signal; ground facility for testing accuracy of VOR receivers.

tovot Binary logic element or device which compares signal condition in two or more channels and changes state whenever a predetermined signal mismatch occurs, usually to exclude a minority 'outvoted' signal. Also called a * monitor.

tovot threshold Difference between signals at which voter is switched or triggered; normally difference between one selected signal and mid-value signal from all others in parallel system.

voting system System in which outputs of several parallel channels are sensed and compared by voter so that any single malfunctioning channel may be excluded.

Votol, votol Vertical-only take-off and landing.

VOWS, vows Valuation of weight saved; measure of financial reward (usually in increased annual earning power) from cutting each unit of mass (kg or lb) from empty weight; eg VOWS for Concorde in 1974 currency was £50/lb.

Vox Vanadium oxide.

vox See Vox.

vox Voice (communication, keying or activation).
V/P

3 Vector processor.
2 Video processor.
1 Propellant volume; that volume occupied by solid propellant in a rocket motor.
2 Propwash velocity, V + v.
1 Vapour pressure.
VPAC Vapour-phase aluminate coating.

Vpath Vertical path.

VPD Virtual product design.

VPED Variable public display system.

V\(\text{A}_\text{E}\) Best angle-of-climb speed (UK usage, US = \(V_x\)).

V\(\text{A}_\text{E}\)SE Best angle-of-climb speed, single-engine (UK).

Vper Vertical-position indicator, maximum speed of satellite to centre of primary and a is semi-axis of elliptical orbit.

\[ V_{\text{per}} = \sqrt{\frac{K}{r_o^2}} - \frac{1}{a} \text{ where } K \text{ is constant, } r_o \text{ is distance to} \]

VR Variable reluctance [much less common, variable reluctance].

VRB Voice rotating beacon.
2 Variable.

VRBL, Vrbl Variable.

VRCC Volunteer Reserve.

VRCS Variable reluctance control system.

VRF Code: ferry squadron (USN).

VRD Virtual reality.

VRE Virtual reality system.

VRPS Voice recording and playback system.

VRP Vertical rate of climb.
2 Validated rate of climb.

VRP(D) Variable private network.

VRQ Virtual-reality maintenance trainer.

VRS Vertical reference gyro, = vertical gyro.
2 VDL(2) reference guide.

VRST Variable rate of climb (helicopter).

VRSI Vertical situation display.

VSKS Variable-speed constant-frequency.

VSS Variable-speed constant-frequency system.

VSSS Variable-stability control augmentation system.

VSSC Variable-stability control system.

VSSC Variable-stability control system (Notar).

VSSD Variable-stability control system display.

VSDE 1. Rough-air speed; maximum recommended EAS for flight in turbulence.

VRAM Video random-access memory.

VRB 1 Voice rotating beacon.
2 Variable.

VRBL, Vrbl Variable.

VRCC Volunteer Reserve.

VRCS Variable reluctance control system.

VRF Code: ferry squadron (USN).

VRG Vertical reference gyro, = vertical gyro.
2 VDL(2) reference guide.

vrille Spin (arch.).

VRK Very Restricted Knowledge, classification refined by suffix number, thus *-7 (NSA 1974+).

VRSF Virtual-reality maintenance trainer.

VROC Vertical rate of climb (helicopter).

VSD 1.35 \(V_{\text{A0}}\) (chiefly US).

V\(\text{v}_{\text{max}}\) Relative velocity.

V\(\text{v}_{\text{max}}\) VSAT, V-Sat Vestigial-sideband amplitude modulation.

V\(\text{v}_{\text{max}}\) VSAM Vestigial-sideband amplitude modulation.

V\(\text{v}_{\text{max}}\) VSSC Voice switching and communications, or control system (FAA).

V\(\text{v}_{\text{max}}\) VSSS Vertical stall speed (also \(V_{\text{S}}\), \(V_{\text{SS}}\), \(V_{\text{S}}\), \(V_{\text{SS}}\)).

V\(\text{v}_{\text{max}}\) Vendor service bulletin.

V\(\text{v}_{\text{max}}\) Visible.

V\(\text{v}_{\text{max}}\) VSX, V-Sat Vestigial-sideband amplitude modulation.

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V\(\text{v}_{\text{max}}\) Vendor service bulletin.
**VSDR**

3 VDL(2) specific DTE address.

**VSDR** Variable-speed digital recorder.

**VSER** Vertical-speed and energy rate.

**VSF** Void-sensing fuze.

**VSFI** Vertical-scale flight instrument.

**Vs1** Level-flight stalling speed with flaps set for landing.

**VSG** VDLS specific DTE address.

**VSHorad** Very short-range air defense (USA).

**VSI** 1 Vertical-speed indicator, output is rate of climb or descent.

2 Vertical-soft-iron component of Earth's field.

3 Vapour space inhibitor = VPI.

4 Vacuum superinsulation.

5 Velocity and steering indicator.

6 Variable-swath imagery.

7 Vertical situation indicator.

**Vs** Indicated stalling speed [avoid confusion with Vs1].

**Vs(in)** Stalling speed, clean, in inverted flight.

**VSIP** Virtual-system implementation.

**V6**, **V16** Vas with 6 or 16 boxes, the 16-box being on both sides of the runway.

**VSJ** Vazduhoplovni Savez Jugoslavije, aeronautical sport union of former Yugoslavia.

**VSL** Vertical-speed limit [A adds advisory, which may be preventative or corrective].

**VSLD** Velocity-, or vertical-, search lookdown.

**V-sled**, **VSLed** Vibration, structural life and engine diagnostic system.

**VSM** 1 Vertical-separation minimum, or minima.

2 Very small munition.

**VSMI** Verein Schweizerischer Maschinen-Industrieller [office, CH-8032 Zürich] (Switzerland).

**VSO** Stalling speed at MTWA with flaps at landing setting, engine[s] idling.

**Vs1** Stalling speed at MTWA in a specified configuration other than clean.

**Vt** Stalling speed at MTWA under 1 g vertical (normal) acceleration; obtained from Vs by correcting for any imposed normal acceleration that may have been present during an actual measured stall; a 'pure' Vs not normally entering into performance calculations.

**VSP** Vertical speed, not more common.

**VSR** 1 Very short range.

2 Volume search radar.

3 Valve-seat recession.

**VSRA** VISTOL research aircraft (NASA).

**VSRAD** Very short range air defense.

**VSRS** Variable-speed rotor system.

**VSS** 1 Video signal simulator.

2 Variable-stability system.

3 Vehicle systems simulator.

**VSSA** Variable-stability simulator aircraft.

**VSSC** Vikram Sarabhai Space Centre (India).

**VSSG** Minimum 'safe single-engine' speed, selected by manufacturer, for intentionally shutting down one engine in flight for pilot training; in UK and some other countries this is prohibited below 3,000 ft (907 m) AGL.

**VSSG** Vertical Separation Study Group (Navsep).

**VST** Variable-stability trainer; aeroplane with avionics and flight-control surfaces added to enable it precisely to duplicate flight characteristics of other types.

**Vst** One reference states 'stall or minimum flight speed, flaps up, no power'; not a normally recognised abbreviation.

**V-Star** Variable search and track air-defence radar.

**VISTOL** Vertical or short takeoff and landing.

**VSTT** Variable-speed training target.

**VSU** Voltage-sense unit.

**VSV** Variable-stator vane, or valve [A adds actuator, AS adds actuating system].

**VSVT** CAA of Lithuania (1992), in 1994 became DCA(2).

**VSW** 1 Vertical speed and windshear; hence VSWI = * indicator.

2 Variable-sweep wing.

3 Verification software.

**VSWE** Virtual strike warfare environment.

**VSWR** Voltage standing-wave ratio.

**VT** 1 Vernier thruster.

2 Voltage transient.

3 Vectored thrust.

4 Internal prison, eg for design teams (USSR, 1929–42).

5 Target speed.

6 Video tracker [SC adds system controller].

7 Variable time, or timing.

8 Validity time[s].

9 Vertical tail.

**Vt** Takeoff speed.

2 Confusingly, threshold speed, see VTDM, VTMAX.

**Vt(min)** Velocity of target.

**V** Threshold voltage, especially that established for automatic target detection.

5 Alternative to Vt.

**Vt** True airspeed, in aerodynamics.

**YTA** 1 Military transport aviation (USSR, R).

2 Vibration tuning amplifier.

3 Vertex time of arrival.

4 Voice terrain advisory.

**VTAS** 1 Visual target acquisition system.

2 True airspeed.

3 Voice, throttle and stick.

**VTC** 1 Vectored (or vectoring) thrust control.

2 Vernier thrust control.

3 Variable time-constant.

4 Vibratory torque control (Teledyne Continental).

5 Vertical turning center [machine tool].

**VTB** Touchdown [= landing] speed.

**VTDF** 1 Vectored-thrust ducted fan.

2 Vortex-tube dust filter.

**VTDM** Minimum threshold speed demonstrated.

**VTDP** Vectored-thrust ducted propeller.

**Vt** Circumferential component of propeller induced velocity.

**VTK**, **Vtk** Vertical track distance.

**VTL** Prefix to aviation de-icing fluid specification(G).

**VTM** Voltage-tunable magnetron.

**VTMAX** Maximum threshold speed, above which risk of overrunning is judged unacceptable; usually VAS + 15 kt.

**VTMIN** Minimum threshold speed, below which risk of stall (esp. in windshear) is judged unacceptable; usually VOC - 5 kt.

**VTO** 1 Vertical takeoff.

2 Varactor-tuned oscillator.

3 Volumetric top-off.

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Visiting technical officer (UK).  

MIL/DefStan requirements define T-O speed as whichever is lower: highest speed reached before high-lift devices can be retracted, or 1.6$V_s$ in T–O configuration.

**VTO** Vertical takeoff, conventional landing.

**VTO grid** Vertical takeoff grid designed to reduce erosion and reingestion problems in operating jet-lift aircraft from unprepared surfaces.

**VTOGW** Vertical takeoff gross weight.

**VTOL** Vertical takeoff and landing; VTOL adds redundant second 'vertical'.

**VTP** Vertical tailplane.

**VTOS** Takeoff safety (rotorcraft) (FAA).

**VTFR** Vertical temperature-profile radiometer.

**VTTR** Video tape recorder.

2 Vocational training, or tax, relief.

3 Variable takeoff rating.

**VTRAT** Visual threat recognition and avoidance trainer.

**VTRK** Vertical track.

**VTRM** Variable-thrust rocket motor.

**VTS** Video target simulator.

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W

**W** 1 Watt[s], and general symbol for power in SI countries.
2 Weight, including total W on a structural member; loosely synonymous with mass mg, and mass flow, esp. through jet engine.
3 Force of applied load.
4 Energy [work], E is preferred.
5 Tungsten [from wolfram].
6 Aircraft mission, prefix, electronic search or AEW (USN 1952–62).
7 Modified mission, suffix, AEW (USN 1944–62); prefix, weather reconnaissance (USAF from 1958, USN from 1962).
8 JETDS code: armament, automatic flight or remotely piloted.
9 Weather, and airport with NWS office (US).
10 West, western longitude.
11 Weapon.
12 Wave[s] or Mach-wave angle.
13 IFR flightplan; approved R-nav but no xpdr.
14 Wing [military unit].
15 Prefix, NW warp.
16 White light.
17 Width, wheel track, maximum tyre [tire] cross-section.
18 Warning, warning area.
19 Indefinite ceiling, sky obscured.
20 Secondary station (Loran).
21 See W-engine.
22 Without voice (radio).
23 Suffix, quenched in cold water.
24 Generalized symbol for special fluid velocities, eg vertical gust [or any velocity along the Z-axis], wing downwash, propeller slipstream etc.
25 Warm (air mass).
26 Load per unit distance, or per unit area, or per unit width of a panel.
27 Specific loading.
28 Linear velocity due to yaw, velocity normal to chord.
29 Suffix, wing; thus Ww = wing weight.
30 Rate term for weight or mass, eg per unit time.
31 Generalized symbol for work.
32 Range, of values.
33 Structural mass of wing.
34 Non-structural mass of wing.
35 Generalization code (W 13): approved R-Nav but no transponder.
36 Engine Piston engine with three linear banks of cylinders about 50°–60° apart; also called broad-arrow.
37 Wing Shaped like W in planform with sweepback inboard and forward sweep outboard.
38 Work authorization.
39 Prefix; word after...
40 Airmet weather advisory.
41 Wing anti-ice.
42 Weight per cross-section area (warhead).
43 Equipped airframe weight.
44 Air mass flow, eg passing through engine per second.
45 War Assets Administration (US, 1946 –).
46 Women’s Auxiliary Air Force (UK, 1939–49).
47 Wide-area anti-armour munition.
48 Wide-area active surveillance (radar).
49 World airline accident summary (UK CAA).
50 Wide-area augmentation system (GPS, US counterpart to Egnos).
51 Women’s Aviation Association of South Africa.
52 World Aerobic Championships.
53 Weapon-aiming computer.
54 Wide-angle collimated; S adds system.
55 World Aeronautical Chart (1,000,000 scale).
56 Women’s Army Corps (US, 1943 –).
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58 Warning and caution computer system.
59 Wide-area change detection (DDDB).
60 World Air Cargo Organisation [office, Zurich] (Int.).
61 World Air Games, held annually.
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63 World Air Development Division.
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65 Wide-area differential global navsat system.
66 Wide-area differential GPS.
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Wake turbulence

The lift-generating device of an aircraft produces a wake which trails behind the aircraft. Depending on the type of lift-generating device, the wake can have different characteristics:

- **Lift generated by wings**: The wake is called wake vortex and is characterized by a pair of counter-rotating vortices, one above and one below the aircraft. These vortices are generated due to the angular momentum of the fluid and are typically a few thousand feet in diameter.

- **Lift generated by fans**: The wake is called wake turbulence and is characterized by a series of oscillating vortices, one above and one below the aircraft. These vortices are generated due to the periodicity of the fan blades and are typically a few hundred feet in diameter.

**Wake vortex**

Wake vortexes are formed by the rotation of the engine blades and are typically a few thousand feet in diameter. They can be dangerous for other aircraft, especially in the case of large and heavy aircraft. The wake vortex is a small and powerful vortical flow that is generated by the engine blades and can cause significant disturbance to other aircraft. The wake vortex can be observed as a series of oscillating vortices, one above and one below the aircraft. The wake vortex can be dangerous for other aircraft, especially in the case of large and heavy aircraft.

**Wake turbulence**

Wake turbulence is generated by the fan blades and is typically a few hundred feet in diameter. It is characterized by a series of oscillating vortices, one above and one below the aircraft. The wake turbulence can be dangerous for other aircraft, especially in the case of large and heavy aircraft. The wake turbulence can be observed as a series of oscillating vortices, one above and one below the aircraft. The wake turbulence can be dangerous for other aircraft, especially in the case of large and heavy aircraft.

**Wake contraction ratio**

The wake contraction ratio is the ratio of the radius of the wake to the radius of the fan blades. It is typically a few hundred feet in diameter. The wake contraction ratio is used to determine the size of the wake vortex and the wake turbulence and is typically a few hundred feet in diameter. The wake contraction ratio is used to determine the size of the wake vortex and the wake turbulence and is typically a few hundred feet in diameter.
WARC

WARC World Administrative Radio Conference [suffix MOB added mobile service, ST space telecommunications, and two numbers indicated last two digits of year, eg 1992] (ITU).

war consumables All essential expendables directly related to hardware of a weapon/support system or combat/support activity (USAF).

War Executive Officer in squadron responsible for detailed planning of all combat missions (RAF).

war game Simulation, by whatever means, of warfare using rules intended to depict real life.

war gas Chemical agent designed for use against human body directly; eg not used to contaminate water supply. Liquid, solid or vapour.

warhead Portion of munition containing HE, nuclear, thermonuclear, CBR (2) or inert materials intended to inflict damage. DoD recognizes additional term, * section, as assembled * including appropriate skin sections and related components; thus * alone need not include fuzing, arming, safety and other subsystems.

Warhorse, War Horse Wide-angle reconnaissance hyperspectral overhead real-time surveillance experiment.

war HUD Wide-angle raster HUD.

warload Generally taken to include expendable weapons, external fuel and external EW.

Warloc W-band advanced radar for low-observables control.

Warlord War Executive (colloq.).

Warmaps Wartime Manpower Planning System (US).

war materiel All purchasable items required to support US and Allied forces after M-day (US).

warm front Locus of points along Earth’s surface at which advancing warm air leaves surface and rises over cold air.

warm gas thruster Propulsive jet composed of HP stored gas heated (eg by main rocket combustion) before expulsion through separate nozzle; various configurations but common for vehicle roll control.

warm sector Portion of depression, esp. recently formed, occupied by warm air.

warm-up Generalized term for process, or necessary elapsed time, in which device is operated solely for purpose of bringing it to steady-state operating condition, with steady running speed, temperature, pressure or other variables. Examples: piston engine, gyro.

warm-up time Published time for device, eg gyro, to reach specified performance from moment of energization.

Warn Weather-analysis radar network.

warned exposed Friendly forces are lying prone with all skin covered and wearing at least two-layer summer uniform.

warned protected Friendly forces are in armoured vehicles or crouched in holes with improvised overhead shielding.

warning area Airspace over international waters in which, because of military exercise, non-participating aircraft may be at risk.

warning indicator Device intended to give visual or aural warning of hazard, eg fault condition or hostile attack.

warning inflight Two books in which members record details of temporary duty elsewhere, leave and other absence (RAF Officers’ Mess).

warning net Designated telecom system for disseminating information on enemy activity to all commands.

warning order Preliminary notice of friendly action to follow.

warning panel Area of display, eg on aircraft flight deck, containing numerous designated warning indicators or captions, with or without attention-getting master *.

warning receiver Passive EM receiver with primary function of warning user his unit/vehicle/location is being illuminated by an EM signal of interest.

warning red Attack by hostile aircraft/missiles imminent or in progress.

warning streamer Brightly coloured fabric strip, flexible in light breeze, drawing attention to protective cover or other item which must be removed from vehicle before flight or launch.

WARP Wing aerial [or air-] refuelling pod.

Warp Weather and radar processor, a 1990s development (FAA).

warp Threads in fabric parallel to selvage, continuous full length of material.

warping Twisting wings asymmetrically to obtain lateral stability and control; usually imposed by diagonal downward pull on rear of wing near tip to twist (wash-in) and increase camber.

Warp Refueling pod system.

warp-sheet Standard raw-material form of reinforcing fibre, esp. carbon/graphite, in which broad sheet is made up entirely of parallel fibres; usually used cut to shape in multiple laminate structure.

warpwheel Pre-1914 lateral control wheel.

WARR Wissenschaftliche Arbeitsgemeinschaft für Raketechnik und Raumfahrt (G).

war-readiness spares kit Prepared kit of spares and repair parts to sustain planned wartime or contingency operations of weapon system for specified period (USAF).

Warren Structure in form of frame truss comprising upper/lower chords joined by symmetric diagonal members only; hence * bracing, * girder, * struts, * truss. * hipline in front view has only diagonal interplane struts, forming continuous zig-zag along wing.

Warren-Young Wing of rhomboid form with sweptback front wing joined at tips to swept-forward rear wing.

war reserve Inactive stocks, subdivided into nuclear and other, of all forms of supplies (US = materiel) drawn upon in light breeze, drawing attention to protective cover or other item which must be removed from vehicle before flight or launch.

Warrior Conceptual American all-arms fighting man able to project force anywhere on the globe.

WAR S West Atlantic route structure.

2 Whole-aircraft recovery system.

2 Wide-area reference station.

Warsaw Convention Principal international agreement on carriage by air, signed 12 October 1929 and subsequently amended, notably at The Hague in 1955.

wartime rate Maximum attainable flying rate based on seven-day week and with wartime maintenance/safety criteria.

warting Pitting of metal surface, esp. in gas turbine, caused by combined actions of carbon and atmospheric salts plus thermal cycling.

WAR S Weapon-aiming system.

2 Wide-area search, or surveillance.

2 Weapons avionics simulator.
**WASAA**

WASAA  Wide-area search [and] autonomous-attack: M adds munition, MM miniature munition.

**WASD**  Wide-area surveillance and detection.

**WASG**  Warranty and service guarantee.

**WASH**  Wake (colloq.).

2 To play upon or around, as 'the hot jet can * tyres of aircraft aster*.

**WASHED**  Subjected to impingement of fluid, especially of hot gas.

**WASHOUT**  Failed course of instruction, esp. as pilot.

**WASH-IN, WASHIN**  Inbuilt wing twist resulting in angle of incidence increasing towards tip.

**WASHING FLUID**  For cleaning aircraft exterior, typically mains water, possibly with a little detergent; for engine compressors, distilled water plus 1–11 per cent solvent, plus [option] inhibiting oil.

**WASHING MACHINE**  Trainer used by commanding officer or CFI and thus that in which failed pupil makes last flight (US colloq., probably arch.).

**WASH-OUT, WASHOUT**  Inbuilt wing twist resulting in angle of incidence reducing towards tips.

2 To fail course of flight (pilot) instruction.

3 Failed pupil pilot.

4 Removal of particulate matter from atmosphere by rain.

5 See next.

**WASHOUT PHASE**  Point at which flight simulator can no longer sustain sensation of acceleration.

**WASH PRIMER**  Self-etching primer to prepare surface of Al or Mg for subsequent priming or painting.

**WASP, WASP**  War Air Service Program (DoD).

2 Wide-area special [or surveillance] projectile (USAF).

3 Women Air Service Pilots (US, replaced WAFS 1942–44).

4 Seawall attack signal processor.

5 White alternate sector propeller [black/white to prevent deaths on the ground].

6 Windshear airborne sensors program (NASA/FAA).

**Waspalloy**  Registered (Pratt & Whitney) nickel alloys for gas-turbine rotor blading and similar purposes, typically with about 19% Cr, 14% Co and also Mo, Ti, Al etc.

**WASR**  Wideband antennas and sources research (AFRL).

**Wassar**  Wide-angle search synthetic-aperture radar.

**WASTE**  Those pupils who fail a course of instruction, wasted out or CFI and thus that in which failed pupil makes last flight.

**WASTE ENERGY**  Notional barrier to prolonged spaceflight caused by fact that plants used for fresh food/oxygen continuously convert more material to water than they return in consumable form.

**WATER**  Modern gas-turbine fuels typically contain 0.028 per cent by volume, still enough to cause freezing problems.

**WATER BAG**  Polythene bag carrying water ballast.

**WATER BALLAST**  Standard ballast carried by competitive sailplane.

**WATER BARRIER**  Runway overrun barrier using water as retarding material.

2 Notional barrier to prolonged spaceflight caused by fact that plants used for fresh food/oxygen continuously convert more material to water than they return in consumable form.

**WATER BIAS**  See sea bias.

**WATER BOMBER**  Aircraft designed for surface (eg forest) firefighting by dropping large masses of water; can be marine aircraft with means for quick on-water replenishment using rain inlet on planing bottom.

**WATER CART**  Dispenser of water to aircraft on apron, with supplies of either or both demineralized water for engines or potable water for passengers.

**WATER-COLLECTING SUMP**  Low point in any system where water could collect, esp. fuel tank and tray under vapour-cycle air-conditioning coils, from which water can be extracted.

**WATER-DISPLACING FLUID**  Commercial liquids (eg LPS-3) which preferentially attach themselves to metal surface in place of local droplets of moisture, thus arresting corrosion.

**WATER DOORS**  Watertight doors in the planing bottom of a seaplane or amphibian used as a fire bomber.

**WATER EQUIVALENT DEPTH**  Measure of depth of precipitation contamination on runway: WED = actual depth × density, thus 20 mm slush with SG 0.5 gives WED 10 mm. For water, *** = actual depth.

**WATERFALL**  Basic model of software life cycle.

**WATER FLAPS**  Surfaces hinged about near-vertical axis near afterbody keel of marine aircraft (esp. jet) which when under water are used differentially for steering and together for braking (usually also used as airbrakes).

**WATER GAUGE**  Pressure expressed as height of column of water; 1 in H2O = 249.089 Nm–2; 100 mm = 980.66 Nm–2.

**WATER INJECTION**  Injection of demineralized water, either pure or with 30–67% alcohol or (more commonly) 44–60% methanol, into cylinders of piston engine to cool charge and eliminate detonation at maximum BMEP, or into compressor inlet or combustor of gas turbine to cool air and thereby increase density and thus mass flow and power.

**WATER JACKET**  Container for cooling water around cylinder.
water level

water level Generalized term in lofting and aerospace construction generally (except vehicles whose major axis is vertical, eg most space launchers) to denote measures in the vertical plane; thus ** '93 = 193 mm above aircraft reference datum for measures in vertical plane, which may be longitudinal axis OX or some other essentially horizontal reference; abb. WL. Note: in US unit is often still inches.

waterline 1 Intersection of body exterior profile and a horizontal plane; often used as synonymous with water level, thus WL-0 is lowest point of body and all subsequent slicing planes are parallel to prime longitudinal axis or other horizontal reference. Thus * view, * plot (all waterlines drawn on common axis of symmetry).

2 Any horizontal reference other than local Earth surface used in aircraft attitude instrument or HUD.

waterloop Inverted turn by marine aircraft on water, eg after dipping wingtip float at high speed (full ** rare because usually aircraft rolls in opposite direction through centripetal force).

watermarking Sending spread-spectrum digital signal during first 900 ms of transmission to provide secure identification of sender.

water/methanol See water injection.

water recovery Recovery of usable water from propulsion exhaust, esp. aboard airship for use as ballast.

water resistance Drag caused by water to aircraft moving through it, made up of skin friction and wave-making.

water rudder Small surface usually hinged on centreline of marine aircraft to sternpost or rearstep heel; used for directional control on water.

waterspout Visible water-filled tornado over sea.

water suit Anti-g suit in which interfering is filled with water which automatically provides approx. required hydrostatic pressures under large normal accelerations.

water tunnel Similar to wind tunnel but using water as working fluid for large R at low V.

water twister Rotary liquid-turbine device which absorbs energy in MAG arrested landings.

wavemaker 1 Surface formed by points which are a function of time (f) and position (position). The wave motion falls for light and other EM radiation, which appears not to need a 'medium' for propagation (f = function of). 2 Formation of vehicle balls on land, sea or air timed to hit hostile territory at about same time.

wave angle Angle between upstream free-stream direc-

wave soaring

tion and an oblique shock created by a real [large source] supersonic body, symbol α.

waveband Particular portion of EM spectrum in telecommunications frequency region assigned by national authority for specific purpose.

wave cloud Formed at crest of a lee wave.

wave crest Peak of waveform.

wave disturbance Discontinuity or distortion along a met. front.

wave drag Additional increment of aerodynamic drag caused by shockwave formation, made up of distribution of volume along length (longitudinal axis) and drag due to lift; symbol for coefficient of ** C_DW.

waveform Shape of a repetitive (eg sinusoidal) wave when plotted as amplitude against time-base or when displayed on CRT.

wavefront generator Converts d.c. or raw a.c. into any desired waveform output, with any frequency, amplitude (both time-varying if required) or other characteristic, eg for testing airborne electronic systems.

wave front 1 Leading edge of shockwave group, or of blast wave from explosion.

2 In a repetitive wave, a surface formed by points which all have the same phase at a given time.

waveguide Conductor for EM radiation in reverse sense to normal conductor in that radiation travels through insulator (usually atmosphere) surrounded by metal walls, usually rectangular cross-section, along which waves propagate by multiple internal reflection. Rarer form is dielectric cylinder along whose outer surface EM radiation propagates.

waveguide modes See propagation modes.

waveguide mode suppressor Filter matching particular waveguide cross-section designed to suppress undesirable propagation modes.

wavelength Distance between successive wave crests; symbol λ = v/f where v is velocity of EM radiation (usually close to speed of light) and f is frequency.

wavelet Small shockwave, usually present in large numbers in boundary layers and around surface of supersonic body. Sometimes called Mach wave or Mach *.

wave lift Lift on lee side of ridge or mountains.

wavemaking resistance Drag of taxiing marine aircraft caused by gross displacement of water in waves; reaches maximum at about 20-30% of unstick speed.

wave motion Oscillatory motion of particle(s) caused by passage of wave(s), usually involving little or no net translation, i.e. particle resumes near-origin position after wave has passed. Direction of ** varies with transverse waves (eg EM radiation), longitudinal waves (sound) or other forms, eg surface (water/air interface) waves.

wave number Reciprocal of wavelength 1/λ or (alternatively) 2π/λ.

wave off, wave-off Any landing prevented, for whatever reason, by a command from the ground terminal or carrier DLCO.

wave period Elapsed time between successive crests, 1/f, where f = frequency.

wave rider Hypersonic aircraft designed to use shockwaves to increase L/D ratio.

Waves Women Accepted for Voluntary Emergency Service (USN, from 1942).

wave soaring Using wave lift.

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wave trough

wave trough  Point of minimum, or maximum-negative, amplitude, usually half-way between crests.

waviness  Surface irregularities with spacing greater than for roughness; height is mean difference between peaks and valleys and spacing is distance between peaks.

way  Speed of marine aircraft relative to water surface, also called way on.

waybill  Document listing description of each item of cargo, consignor, consignee, route, destination, flight number, date and other information.

Waymouth unit  Capacitance-type fuel contents gauge (tradename).

waypoint  1 Predetermined and accurately known geographical position forming start or end of route segment.

2 In US, as (1) but with addition 'whose position is defined relative to a Vortac station' (FAA).

3 In military operations, a point or series of points in space to which an aircraft may be vectored.

WB  1 Weather Bureau (US, NOAA).

2 Prefix: word before .

3 See W-BAR.

W/B  Weight and balance.

Wb  1 Weber.

W-BAR  Wing bar [runway lights at threshold, normally green].

WBC  1 Weight and balance computer.

2 Wideband convertor.

WBD  Wideband data, or detector.

WBDDS  Weapons-bay door drive system.

WBF  Wing-borne flight [jet V/STOL].

WBG  Wideband gapfiller.

WBGS  Wideband gap semiconductor.

WBL  Wing buttock [or base] line.

WBM  Weight and balance manual.

WBO  Wien-bridge oscillator.

WBF  Wet-bulb potential temperature.

WBR  Wideband receiver.

WBS  1 Work breakdown structure.

2 Weight and balance system.

WBSA  Wideband synthetic array.

WBSS  Wideband switching system.

WBVS  Wideband secure voice.

WBT  1 Web-based training.

2 Wideband transmitter.

WBTM  Weather Bureau technical memoranda.

WBVTR  Wideband video-tape recorder.

WC  1 Weather centre.

2 Wire-combed (runway surface).

3 Warnings and cautions (ECAM).

4 Wide-cut.

WC  Wavechange.

WCA  Wind correction angle.

2 Warning caution advisory.

WCAN  Wideband communications airborne network.

WCCS  Wireless control and communication system.

WCE  Workflow construction environment.

WCFB  Wide-chord fan blade.

WCG  Water-cooled garment.


WCM  Weapon control module.

WCMD  Wind-corrected munitions dispenser.

weakest maintained

WCMS  1 Wing-contamination [especially ice] monitoring system.

2 Weapon[s] control and management system.

WCNS  Weapon control and navigation system.

WCO  World Customs Organization (Brussels).

Wcomp  Wind component.

WCP  1 Working capital productivity.

2 Weapon[s] control panel.

3 WXR [weather radar] control panel(s).

WCOL  Worst-cycle quality level.

WCR  Weight/capacity ratio.

WCS  1 Weapon control system.

2 Waveguide communications system.

3 Writable control store (EDP).

4 Wing centre section.

WCSL  West Coast Spacelift Range (USAF).

WCSP  [CIL] Waist-cataapult safe parking line, aligned across deck midway between Cats 2 and 3 (USN).

WCTB  Wing carry-through box, joining pivots of variable-sweep aircraft.

WCTG  Wide-cut turbine gasoline.

WCTL  Worst-condition time-lag.

WD  1 Wind direction.

2 Warming display.

3 Word or word group.

4 War Department (US, replaced 1947 by DoD).

WDA  Weather display adapter.

WDAU  Weapon-dispenser arming unit.

WDC  Weapon[s]-delivery computer.

WDD  Western Development Division (USAF 1954–62, later Samso).

WDDS  Weather-data display system.

WDEL  Weapons Development and Engineering Laboratories (US).

WDF  Water-displacing fluid.

WDI  Wind-direction indicator.

WDIP  Weapon-data input panel.

WDL  Weapon, or weapons, data link; A adds archive, or architecture.

WDLY  Widely.

WDM  Wave - [or wavelength-] division multiplexing; AOR adds area of responsibility.

WDNS  Weapon-delivery and navigation system.

WDS  Wavelength dispersive spectrometer.

WDSPRD  Widespread.

WDLU  Wireless Development Unit (UK, WW2).

WDX  Weather-data extractor, or extraction.

WE  Weekend.

We  Mass of propulsion system (from weight of engine(s)).

We  Zero-fuel weight.

WEA  Weather.

WEAA  Western European Airports Association [office, Amsterdam, Schiphol] (Int.).

WEAAC  West European Airports Conferences (Int.).

WEAAP  West European Association for Aviation Psychology (Int.).


WEAG  Western European Armaments Group.

weakest maintained  Weakest fuel mixture at which under specified conditions maximum power can be maintained; also called WMMP.
weak extinction

**weak extinction** Cessation of combustion [the flame goes out] because of inadequate supply of fuel in a gas-turbine combustor.

**weak link** Point at which structure, esp. hold-back tie (eg on aircraft about to be catapult-launched), is designed to break when normal operating load is applied. Catapult launch **L** resists full thrust of aircraft engines but breaks when catapult thrust is added. Occasionally a safety feature fracturing only on overload.

**weak mixture** Fuel/air ratio for piston engine below stoichiometric; economical for cruising but engine runs hot. Hence **H** rating, maximum power permitted for specified conditions cruising with **L**; **S** knock rating, fuel performance-number grade under economical-cruise conditions.

**weak tie** Structural weak link designed to fail in normal operation (eg holdback on catapult takeoff).

**weapon-aiming system** That governing launch trajectory of unguided weapon.

**weapon bay** Internal compartment for carriage of weapons, esp. of varied types, eg AAMs, ASMs, NWs, free-fall bombs, guns, sensors, cruise missiles etc. If for one type of weapon preferable to be more explicit. Derived terms include **S** door, **H** fuel tank, **H** horeshoe pack.

**weapon control system** Avionics and possibly other subsystems (eg optics) built into launching aircraft to manage weapons before release and release them at correct points along desired trajectories. Should not be used to mean radio command or other form of guidance system of missile.

**weapon debris** Residue of NW after explosion; not usually well defined but generally means all solids (assumed recondensed from vapour) originally forming casing, fuzing and other parts, plus unexpended Pu, U-235 or other fissile material.

**weapon delivery** Total action required to locate target, establish release conditions and maintain guidance to target if required (ASCC).

**weaponer** Process of determining quantity of specific weapon necessary for required degree of damage to particular (surface) target. Takes into account defences, errors, reliabilities etc.

**weaponized** Modified to carry weapons (USAF UAVs).

**weapon line** See bomb line.

**weapon-replaceable assembly** Any item, not necessarily related to weapons, that can be quickly removed and replaced, such as a PCB.

**weapons assignment** Process by which weapons are assigned to individual air weapons controllers for an assigned mission (DoD).

**weapons of mass destruction** For arms-control purposes, strategic NW, C, B, R devices with potential of killing large numbers of people, but exclusive of delivery systems.

**weapons recommendation sheet** Defines intention of attack and recommends nature of weapons, tonnage, fuzing, spacing, desired mean points of impact, intervals of reattack and expected damage.

**weapons state of readiness** In DoD usage, lists of numbers of air-defence weapons and reaction times: 2 min, 5 min, 15 min, 30 min, 1 h, 3-h, and released from readiness.

**weapon system** A weapon and those components required for its operation (DoD, NATO). This could simply be a part of a manned aircraft, eg radar, HUD, WCS.

2 Composite of equipment, skills and techniques that form instrument of combat which usually, but not necessarily, has aerospace vehicle as its major operational element (USAF). As originally conceived in 1951, includes all type-specific GSE, training aids, publications and every other item necessary for sustained deployment.

**weapon-systems physical security** Concerned to protect aerospace operational resources against physical damage.

**weapon/target line** Sightline (straight line) from weapon to target.

**Weasel** See Wild*.

**weather** Short-term variations in atmosphere, esp. lower atmosphere.

**weather advisory** Expression of hazardous weather likely to affect air traffic, not predicted when area forecast was made.

**weather beam** Emitted by radar operating in weather mode, conical pencil of approx 5° total angle projecting horizontally ahead (thus filling whole troposphere about 100 km ahead).

**weather categories** 1 Traditional **L**, eg US cat C (contact), N (instrument) and X (closed), common today in many countries.

2 Precise measures of DH/RVR as they affect arrivals; Cat 1, DH 60 m/200 ft or better, RVR 800 m/2,600 ft or more; Cat 2, 60–30 m/200–100 ft, 800–400 m/2,600–1,300 ft; Cat 3a, 0 along runway, 200 m/700 ft in final descent phase; Cat 3b, 0, 50 m/150 ft; Cat 3c, 0, 0, (visual taxiing impossible).

**weather central** Organization collecting, processing and outputting all local weather information.

**weathercock** Tendency of aerodynamic vehicle to align longitudinal axis with relative wind; note that this affects pitch as well as yaw. Effect is felt in flight and when taxing.

**weathercock stability** Basic directional stability of air vehicle or re-entering spacecraft; in CCV (eg modern fighter) this is degraded to ultimate degree and replaced by synthetic **L** applied by avionics linking sensors to flight controls.

**weather forecast** Prediction of weather within area, at point or along route for specified period.

**weather map** Shows weather prevailing, or predicted to prevail.

**weather minima** Worst weather under which flight operations may be conducted, subdivided into VFR and IFR; usually defined in terms of ceiling, visibility and specific hazards to flight.

**weather radar** Airborne radar (less often, surface radar) whose purpose is indication of weather along planned track; traditional output is picture of heavy precipitation, but modern **H** can indicate severe turbulence (in meaningful colours) even if precipitation absent.

**weather reconnaissance** Flight undertaken to take measurements (traditionally = thun = temp + humidity) at specified flight levels up to near aircraft ceiling; today rare but also includes all forms of weather research.

**weather report** 1 Broadcast **L** by national weather service, eg each hour.

2 An actual, transmitted by airborne flight crew.

**weather satellite** See met. **L**.

**weathervane** US term for weathercock (eg on building).
and for weathercooking tendency of aircraft on ground to face into wind. Hence * effect of vertical tail, which progressively gives directionality to VTOL aircraft as forward speed increases. 

**weathervane stability** That provided in flight by fixed tail surfaces.

**weave** 1 To make continuous and smooth changes of direction and height while over a period following a desired track; weaving assigned to proportion of fighters escorting slower aircraft so that continuous watch could be kept astern and in other difficult areas. Hence, weaver. 2 Angular wander of spin axis, esp. of gyro, radar scanner, rotary mirror etc.

**WEB** Web effective burn (time).

**web** 1 Principal vertical member of a beam, spar or other primary structure running length of wing or fuselage, providing sufficient strength to resist shear and keep upper and lower booms (chords) correct distance apart. Occasionally expanded to * member, * plate.

2 In solid-propellant rocket, distance through which propellant burning surface will advance from initial surface until * burnout as defined by two-target method; usually measured as linear distance perpendicular to initial surface, symbol \( r_w \).

3 Any material form resembling sheet, either as discrete pieces or continuous * unrolled from drum or coil; esp. sheet form of prepreg, supplied in standard widths.

**web average burning-surface area** Total volume of solid rocket propellant, excluding slivers, divided by web; thus has dimensions of an area, symbol \( A_w \).

**webbing** Strong close-woven fabric strip produced to specified UTs, used eg for securing loose (bulk) cargo.

**weber, Wb** SI unit of magnetic flux; that flux which, linking circuit of one turn, produces EMF of 1 V as it is reduced to zero uniformly in 1 s. Symbol \( \Phi \). To convert from maxwell, multiply by \( 10^{-8} \).

**web fraction** Web (2) divided by internal radius of motor case or chamber; symbol f, expressed as \( \% \).

**web rib** Rib fabricated from sheet or plate.

**WEC** World Energy Conference.

**WECC** Wing electronic-combat management, or managers', course.

**WECPNL** Weighted equivalent continuous perceived noise level (see noise).

**WED** Water equivalent depth.

**wedge** 1 Air mass having wedge shape in plan, esp. such a mass of high pressure extending between two lows.

2 Sharp-edged essentially 2-D * forming one wall of 2-D inlet of supersonic airbreathing engine, extending ahead of inlet so that its shock may be focused on inlet lip and normally extending rearwards as a variable ramp. Hence * inlet.

3 Small * added above trailing edge of aileron [rarely, other control surface] giving blunt trailing edge; supersonic equivalent of aileron cord.

**wedge aerofoil** Sharp LE and blunt TE, useless except at supersonic speed where efficiency is high, so confined to use on missiles. See parallel double-*. 

**WEDS** Weapons effects display system.

**weeds, in the** 1 At lowest possible level, on TFR or manually (colloq).

2 Location of [usually inadvertent] landing outside airfield boundary.

**wee-heat** A simple form of on/off turbojet afterburning.

**weeping wing** Fitted with liquid-injection leading-edge de-icing.

**wef, WEF** With effect from.

**Wefax** Weather facsimile format; one selectable mode of data transmission between weather satellite and ground printout.

**Weft** Wings/engine(s)/fuselage/tail; most basic of mnemonics used in early aircraft-recognition instruction.

**WEG** Weapons Evaluation Group (USAF).

**Wehnelt** Type of cathode whose emissivity is enhanced by coating of radioactive-metal oxides.

**Welbull analysis** Standardised form of plotting component failure against age, categorised as infantile, wear-out and random.

**Weck** Coefficient for calculating propeller characteristic, also called speed/power coefficient, \( C_s = V \sqrt{\rho/PN^2} \), where \( V \) is velocity of advance, \( \rho \) is density, \( P \) is power and \( N \) is rpm See power/speed coefficients.

**weighing** Today almost all determination of aircraft weight is done by moving landing gears over platforms supported on load cells which measure forces by strain-gauges, whose output may be summed and displayed automatically. A few aircraft have landing-gear hydraulics giving a cockpit readout of weight and c.g. position.

**weighing points** Locations, published in engineering documents and stencilled on aircraft, where jacks may be applied in weighing process.

**weighing record** Hard copy updated each time aircraft is weighed; includes c.g. position.

**weigh-off** Free ballooning of airship before casting off to refine trim.

**weight** Force exerted on a mass by Earth’s gravity; thus a figure unique to a particular location which by international agreement is any at which \( g \) (free-fall acceleration) is 9.80665 m/s. For modern aeroplane some measures include: empty, complete aircraft plus systems measured in accord with specification (eg in US military usage, MIL-STD-3374); CDDR, empty minus items listed in STD-25140A such as engine(s), starter(s), electrics and avionics where removable direct from racking, wheels/brakes/tyres/tubes; standard empty, bare aircraft plus unusable fuel, full oil and full operating fluids (thus excluding potable water); basic empty, standard empty plus optional equipment: structure, bare airframe without systems and equipment other than wing/tail moveables and flight-control power units, flap actuation, landing gear and actuation, and equipped engine installation(s) minus engines; useful load, those items that when added to * empty (for transport, OEW) will add up to gross weight for design mission (transport, MTOW); operating weight (military), empty plus useful load minus expendable fuel (internal/external), ammunition and stores; operating empty (OEW), equipped empty + all consumables (fuel, lube, filled galleys and bonded stocks, toiletries etc) + removable furnishings, reading and entertainment materials, cutlery, flight and cabin crews and their baggage, ship’s papers; zero-fuel (ZFW), (military) operating plus ammunition/missiles/stores, (transport) MTOW minus usable fuel; gross (military), MTOW (civil), allowable at moment of takeoff; ramp (MRW), (civil) allowable at moment of starting engines; basic
weight and balance sheet

flight design (military), takeoff with full internal fuel and useful load for primary mission; minimum flying gross (military), empty + minimum crew, 5% usable/unusable fuel (zero for flutter) and lube consistent with fuel; maximum design, military equivalent of MRW allowing for full internal/external fuel (in some cases extended to higher figure still after air refuelling); maximum landing (MLW, civil), figure specified for each type between ZFW and MTOW; landplane landing design gross, basic flight design gross plus empty external tanks and pylons minus 60% internal fuel; maximum landing design gross, maximum design minus dropped tanks, fuel expended in one go-around (overshoot) or 3 minutes (whichever is less) and any items routinely dropped immediately after takeoff; bogey, also called target bogey, established 4% below specification * (in practice * tends to rise, and bogey is usually a pious hope); specification (military), that number written into original agreed specification; job-package target/bogey, series of targets for each * group parts-breakdown; current, also called current status, that representing best available information, obtained by adding to previously reported status all subsequent revisions.

weight and balance sheet  Document carried with transport (military/civil) recording distribution of weight and c.g. at takeoff and (military) landing.

weight breakdown  Subdivision of aircraft weight (usually a design gross) into broad headings: structure (itself divided into wing group, tail group, fuselage and landing gear), power-plant, equipment services, and disposable load (latter divided into fuel/consumable items and payload).

weight coefficients  Dimensionless ratios BF/TOW, BF/ZFW, RSV/LW, RSV/ZFW, TOW/LW and TOW/ZFW.

weight distributors  In a large gas-turbine engine the fuel pressure is equalised all round the combustor by a system of masses and springs, the latter being in unison at ‘6 o’clock’ and in opposition at the top.

weight flow  See mass flow.

weight gradient  Required change in weight, eg MTOW, for unit change in temperature, usually expressed in kg/°C, in such corrections as QNH variation, air-conditioning and anti-icing.

weight in running order  Traditional measure of piston-engine weight in which radiator/coolant/pipes/controls were added, plus oil within engine, but excluding tanks/fuel/oil/reserve coolant/exhaust tailpipes/instruments.

weightless  Condition in which no observer within system can detect any gravitational acceleration; can be produced either in free fall near a massive attracting body, eg Earth satellite, or remote from any attractive body.

weight-limited  Payload that can be carried is limited by restriction on aircraft MTOW or ZFW and not by available space.

weight-on-wheels  Signal sent to landing-wheel brake system confirming oleo struts are compressed, enabling brake [and, if fitted, lift dump] system to function.

weight per horsepower  Usually incorrectly called power/weight ratio, basic measure of piston or other shaft-output engine; dry weight divided by maximum power (latter can be 2½-minute contingency).

weight per unit thrust  Dry weight (mass) of jet engine divided by a specified measure of thrust (for turbojets/turbofans usually SLS/takeoff); in SI it is not possible to divide a mass by a force, but a meaningful ratio is still obtainable provided units of both are compatible and specified.

weightshift control  Controlling aircraft [micro, hang glider, or similar] by pilot moving his/her c.g. laterally or longitudinally.

Weir tables  Azimuth diagram and tables for interpreting radio direction finding (obs.).

weld bead  Metal deposited along welded joint.

weld bonding  Combination of resistance spot-welding and adhesive bonding with properties superior to either alone.

weld continuity  Specified as tack, intermittent, continuous.

welded patch  Thin sheet-steel patch welded over local damage in steel tubular airframe.

welded wing  Pair of aircraft in unvarying side-by-side formation about 500 ft apart.

welded steel blade  Propeller blade assembled by edge-welding two shaped sheets of steel to form aerofoil, also called hollow-steel.

weld fusion zone  Width of bead.

welding  Joining metal parts by local melting, with or without addition of filler metal to increase strength of joint, using gas torch, electric arc, electrical resistance, friction, explosive, ultrasonic vibration and other methods, often with local atmosphere of inert gas. Techniques generally called diffusion bonding are closely allied but often require no heat or added metal and rely upon natural bonding of two clean surfaces in intimate contact.

welding flux  Material, eg provided as coating on welding rod, which melts and flows over joint, excluding oxygen.

welding jig  Fixture for holding parts to be welded in exact relative positions while joints are made.

welding machine  Invariably an electric machine welding workpieces by spot, roll or seam methods.

welding rod  Consumable rod of correct metal to act as joint filler which also conveys current to form arc struck against workpiece; diameter selected according to current and usually with flux coating.

well 1 Generalized code word (including air intercept) = serviceable.

1 Internal space or compartment for retractable item such as landing gear, FLIR or radar.

Wellington boot  Radar viewing visor.

WEM  Warning electronic module.

WEMA  Western Electronic Manufacturers Association (US).

WEP 1 Weapon effect planning.

2 War emergency power.

WEPSS  Wideband enhanced passive surveillance system (USAF).

WES 1 Warning electronic system.

2 Weapons effects simulation, or system.

Westland-Irving  British name for an internally balanced flight-control surface, esp. aileron.

wet 1 To come in contact with surface of body; hence wetted area.

2 With water injection [see wet thrust].

1 Of station or pylon, plumbed for fuel, or carrying a tank.

4 Fuel included [hire cost per hour].
wet adiabatic

5 Structure is sealed to house fuel [see *wing, but
adjective also applicable to fuselage, fin or horizontal tail,
eg Airbuses].

wet adiabatic See saturated adiabatic, SALR.

wet and dry bulb See psychrometer.

wet assembly Important technique for modern aero-
space structures in which all primary components are not
only given successive surface treatments but are put
together and joined while their surfaces are still wet; eg
each component would be anodised, then coated with
primer and finally with Thiokol sealer, rivets or bolts also
being coated with Thiokol except in case of interference-
fit bolts (Taper-locks or radius-nose Hi-locks) which fill
holes completely.

wet boost Boost pressure permissible for piston engine
with water injection in operation.

wet builder Manufacturer employing wet-assembly
techniques.

wet-bulb potential Temperature air parcel would have if
adiabatically cooled to 100% RH and then adiabatically
brought to 1,000 mb level.

wet-bulb thermometer Has sensitive element surrounded
by muslin kept moist by supply of water, hence reading
gives indirect measure of relative humidity.

wet emplacement Rocket test emplacement or vehicle
launch pad whose flame deflector and nearby parts are
cooled by deluge of water.

wet film Film, usually large-format, used in traditional
optical camera.

wet filter Particles are retained by a liquid film on
element surface.

WET FUR Mnemonic for remembering aircraft
components for recognition purposes: wings, engines, tail,
fuselage, undercarriage, radiators (or radomes) (UK,
WW2).

wet H-bomb Thermonuclear device whose fusion
material is liquid, cryogenic or otherwise not a dry solid.

wet layup Fabrication of composite structure using
reinforcements saturated with liquid resin.

wet lease Hire of commercial transport from another
carrier complete with crew (at least flight crew, but often
not cabin crew) and in effect forming continuation of
previous operation, with major servicing performed by
owner, but with hirer’s logo and insignia temporarily
applied.

wet pad Wet emplacement for launches.

wet point, wet pylon Wet station.

wet rating Power or thrust with water or water/
methanol (rarely, water/ethanol) injection.

wet-run anti-icing Surface kept continuously above
temperature at which droplets freeze.

wet sensor ASW sensor dropped or dunked into ocean,
eg sonobuoy.

wet side Especially in a long banana-shaped accessory
gearbox, the portion on which are mounted the fuel, oil
and hydraulic pumps, and other items involving fluids.

wet start Faulty start of gas turbine in which unburned
or burning fuel is ejected from tailpipe.

wet station Plumbed for fuel [or other liquid] carried in
external tank.

wet suit Standard anti-exposure suit for working in sea;
eg in winch rescue.

wet sump Piston-engine sump which serves as container
for entire supply of lube oil.

WGU

wet takeoff Takeoff with water injection.

wetted area Total area of surface of body over which
fluid flow passes and on which boundary layer forms.
In case of aircraft usually simplified to visible external skin,
ignoring inner surfaces or air inlets, ducts, jetpipes and
air-conditioning system.

wetted fibre Fibre, eg carbon/graphite/boron/glass,
coated with same resin as will be used to form matrix of
finished part.

wetted surface See wetted area.

wet thrust 1 Thrust of jet engine with water injection.
2 Confusingly, thrust with afterburner.

wetting agent Surface-active agent which, usually by
destroying surface tension, causes liquid to spread quickly
over entire surface of solid or be absorbed thereby.

wet weight Weight of devices plus liquids normally
present when operating.

wet wing Wing whose structure forms integral fuel tank.
Note: not merely a wing in which fuel tanks are housed.

wet workshop Space workshop launched as operative
rocket stage whose propellants must be consumed or
removed prior to equipping as workshop in space.

WEU 1 Assembly of Western European Union [defence
organization of 10 original countries, created 1954 by
Modified Brussels Treaty, office B-1000 Brussels] (Int.).
2 Warning electronic unit.

WEWO, Wewo Wing Electronic Warfare Officer
(RAF).

WF US mission prefix, weather-reconnaissance fighter.

Wf Total weight of fuel.

Wf 1 Mass flow rate of fuel, various further suffixes.
2 Gross weight with full tanks.

WFA WX R[weather radar] flat-plate antenna.

WFC Wallops Flight Center (NASA).
1 Wet-film camera.
2 War Finance Corporation (US, WW1).

WFD Widespread fatigue damage.

WFG Waveform generator.

WFN Warm front.

WFO Weather forecast office.

WFOV Wide field of view.

WFP Warm front passage.

WFR Water/fuel ratio.

WFSC Wavefront sensing and control.

WFS Wide-field sensor.

WFU Withdrawn from use.

WFZ Weapons-free zone.

WG Working group.
1 Water gauge.
2 Weapons-grade Pu.

Wg Maximum growth, section width of tyre [tire].

Wg Helicopter rotor upwash velocity normal to chord.

W/G Water/glycol.

WGD Windshield (windscreen) guidance display,
transport-aircraft HUD for Cat IIIIB operations.

WG E Wideband gap-filler.

WGM D Wire-grid micrometeoroid detector.

WGN White gaussian noise.

WGS 1 Weapon guidance system (GPS).
2 Followed by 72 or 84, World Geodetic Survey [1972]
or System [1984].
3 Wideband gapfiller satellite, or system.

WGT Weight.

WGU Waveguide unit.
WH

WH Hurricane advisory.
Wh 1 Watt-hour.
2 White.

WHCA  White House Communications Agency.
Wheatstone bridge  Circuit with known and variable resistance with which unknown resistance can be accurately measured.

wheel 1 Early aircraft commonly had such an input to lateral control system (cf ships, road vehicles); terminology is needed for all forms of stick/control column/handwheel/yoke/spectacles. No modern captain would say “take the *”.
2 Complete turbine rotor, esp. single-stage or small size.
3 High-speed gyrostabilizing device (see reaction *, internal *, gyro *
4 Verb, change of heading by formation of aircraft.
5 Verb, to introduce 3-D curvature to sheet (see wheeling).
6 Noun, a defensive formation of several aircraft circling in horizontal plane.
7 Of column of marching men, to change direction whilst remaining in column of route.
wheelbarrow 1 Manoeuvre for airshows in which aircraft proceeds with nosewheel[s] in contact with runway and tail high in air (only possible with certain types of aircraft).
2 To reposition tailwheel-type light aeroplane by lifting tail and walking.
wheelbarrowing  Violent oscillation in pitch on ground, either because of undulating surface or harsh brake application and rebounds from nose gear (not applicable to tailwheel aircraft).
wheelbase Distance in side elevation between wheel centres of nose and main landing gears; where there are two sets of MLGs (eg 747, C-5A) measure is to point midway between mean points of contact of front and rear MLGs.
wheelbrakes Brakes acting on landing-gear wheels.
wheeledge Compartment containing train of drive gears to accessories which are usually mounted thereon, the whole tailored to fit against or around prime mover, eg turbofan. There is only a shade of difference between this and accessory gearbox.
wheel cover(s) Covers landing wheels when retracted.
wheeler Tail-high landing by tailwheel aeroplane, subsequently sinking into three-point position, also called wheely or wheeline.
wheeling Sheet-metal forming (on * machine) by locally squeezing it between upper and lower rollers; workpiece hand-positioned to achieve desired 3-D curvatures.
wheel landing  See wheels.
wheel load Vertical force exerted by each landing wheel on ground; hence ** capacity, but this is imprecise in comparison with various soil-mechanics and civil-engineering measures, eg CBR.
wheel mode Satellite or position thereof rotates, often fairly slowly (5–30 rpm), for attitude stabilization.
wheel satellite Made in shape of wheel, normally rotating either for attitude stabilization or to impart artificial gravity to occupants.
wheel track  See track (8).

whisker

wheel trimmer By separate [usually small] wheel inceptor[s], requiring pilot to remove hand from flight control.
wheel well Compartment in which one unit of landing gear is housed when retracted.
which transponder R/T code: please state type of transponder fitted, IFF, SSR or ATCRBS (DoD).
Whidds War HQ information display and dissemination system (USA).
whiffed Ne Nose up 30°–60°, bank 90°, change heading 180° ending in dive.
whiffletree 1 Also rendered whippettree, originally horse-traction linkage, which equalized and distributed pull of many horses at one point; now used to distribute pull of one large hydraulic jack or other load applicator over an area of airframe via array of beams pulled at intermediate point (usually mid-point) and transmitting pull from both ends to other such beams.
2 Also used loosely for any pivoted beam or bellcrank (US).
whip One meaning is upward jump of carrier pendant or runway arrester wire after being depressed by passage across it of landing wheel.
whip aerial Flexible aerial (antenna), either quarter-wave or of arbitrary length and usually vertically polarized, projecting at about 90° from skin.
whip stall US term which appears ill-defined; existing definitions agree only on fact that * is complete, violent and involves large positive change in pitch attitude; some suggest it is entered with flick manoeuvre, others make this impossible by suggesting possible tail-slide at outset. One authority gives tail-slide as alternative meaning. Recent authorities equate * with stall turn.
2 Distortion of a shaft from straight to curved caused by centrifugal force, tending to be rapidly catastrophic. See whirling mode.
whirler arm Large family of instruments or installations in which object (usually under test) is whirled on end of balanced beam rotated about vertical axis; originally used for aerodynamic tests, eg of aerofoils, but now more often used to apply sustained high-g acceleration to human beings and devices, sometimes in evacuated chamber.
whirling mode Vibratory mode of shaft in which elastic bending is suffered, giving severe out-of-straightness either at end or along length, pronounced only at certain critical rpm (critical whirling speeds).
whirl-mode flutter Aeroelastic flutter, esp. of wing, in which input energy is derived, at least initially, from whirling of engine or propeller shaft (catastrophic on one type of turboprop transport).
whirl tower Installation for static testing of helicopter main rotor, including overspeed conditions. Peripheral net retains separated blades.
whirl velocity Peripheral or tangential velocity, eg of flow in axial or centrifugal compressor.
whirlwind Small local tornado in dry air, without cloud or rain.
whirlybird Helicopter (rarely, other rotocraft) (colloq.).
whisker 7 Small single crystal, usually lenticular, whose **
whiskers

strength is very close to maximum theoretically attainable.

2 Sharpened contact pressed against semiconductor in point-contact transistor or solid-state diode; hence * resistance.

3 See next.

whiskers Multiple weak shocks on surface of real body, through each of which flow is retarded slightly. Hence whiskering effect.

whisper-shout A sequence of ATCRBS interrogations and suppressions of varying power levels transmitted by TCAS equipment to reduce severity of synchronous interference and multipath problems.

whistle Annoyingly high-pitched note, usually slightly varying in pitch, caused by interference carrier in superhet reception.

whistler RF signal, usually in form of falling note, generated by lightning; heard on Earth and Jupiter and in former case bounces to and fro along magnetic-field lines between N/S hemispheres.

Whitecomb body Streamlined body added to aircraft (eg wing trailing edge) to improve Area Rule volume distribution; many other names, eg speed bump, Küchenmann carrot.

White 1 Not black, hence can be disclosed to public.

2 Friendly, as alternative to Blue.

3 Overseeing authority in war game.

white, white hot TV/video mode giving positive (normal) picture, which in IR display renders hot as white and cold as dark.

white body Hypothetical surface which does not absorb EM radiation at any wavelength, ie absorptivity always zero.

white level Maximum permissible video signal, 100% + modulation or 0% -.

white noise 1 Strictly, noise having constant energy per unit bandwidth (Hz).

2 Commonly used to mean spectrum of generally uniform level on constant-% bandwidth basis (so-called broadband noise) without discrete-frequency components.

whiteout 1 Loss of orientation with respect to horizon caused by overcast sky and sunlight reflecting off snow.

2 Zero visibility caused by what one authority calls ping-pong-ball snow.

White Rating Holder of licence is authorized to land in cloud base > 400 ft, 122 m.

white room 1 Super-clean room in which air is continuously filtered to eliminate micron-size and larger particles and special rules almost eliminate introduction of contaminants by human beings or objects (eg india-rubber, pencils, handkerchiefs, etc) prohibited.

2 Anechoic chamber.

3 Overseeing authority in war game, esp. in netcentric warfare.

White Sands Chief USA missile range, large area of New Mexico; abbr. WSMR.

white-scarf syndrome Alleged antipathy towards UAVs by human pilots (US, esp. USAF).

white smoke Unburned fuel vapour in engine efflux.

white-tailed 1 Not bearing markings of a commercial air carrier.

2 Available for wet or dry lease with peelable logo and

3 Completed but unsold.

4 Company demonstrator (recently including UAV).

White World Ordinary [not black], especially in manufacturing industry.

Whitney punch Hand-operated tool for punching holes of selected sizes in metal sheet.

Whitworth Traditional UK screwthread with rounded crest and root and 55° angle.

whizzer TV zoom lens.

whizzkid Civilian analyst or adviser in DoD.

who World Health Organization (UN agency, HQ Switzerland).

whole-aircraft charter Operator charters complete aircraft for one flight or for a period, in contrast to split charter.

whole-body counter Nucleonic instrument for identifying and measuring body burden (whole-body received radiation) of human beings and other living organisms.

whole-range distance Horizontal distance between point vertically below release point and whole-range point.

whole-range point Point on surface vertically below aircraft at moment of impact of bomb released by it, assuming constant aircraft velocity (ASCC).

WH Welding Institute (BWRA).

2 Within.

3 Wallops Island, Virginia.

WIA Wounded in action.

2 Women in Aviation (US).

WI Weather information and display system.

WIC 1 Warning information correlation.

2 Women, infants and children.

3 Weapons instructor course.

wick 1 See static wick.

2 Throttle(s); eg to turn up * = increase propulsion power (colloq.). Invariably used for turbine engine(s), esp. jet(s).

WID Width.

WIDE Projection equipment used in simulator to generate FOV of 150° × 40° (Redifon); WIDE II, five projectors for 200°.

Wide Wide-angle infinity display equipment.

wide-area augmentation system Under development from 1995 to improve GPS accuracy (FAA).

wideband amplifier One offering uniform response over many decades of frequency.

wideband dipole Large ratio diameter/length.

wideband ratio Ratio of occupied frequency bandwidth to intelligence bandwidth.

wide body See wide-body aircraft.

wide-body aircraft Commercial transport with internal cabin width sufficient for normal passenger seating to be divided into three axial groups by two aisles; in practice this means not less than 4.72 m (15 ft 6 in) (B.767, narrowest **).

wide-cut Generalized term for aviation turbine fuels assembled from wider range of hydrocarbon fractions than kerosene-type fuels; more accurate term is wide boiling-point range, for whereas little or no kerosene-type boils below 174°C, * begins to boil at 52–53° and fractions continue to boil off at up to about 220°. SG well below 0.76, compared with 0.79–0.8 for kerosene-type fuels. Widely held to be dangerous because of high volatility
wide-deck

(arguable) but operational fuel of nearly all air forces and several airlines.

wide-deck Lycoming term for piston-engine cylinder having wide base held by hexagonal nuts on large-radius circle; no separate hold-down rings or plates.

widespread fatigue damage Potentially catastrophic reduction in strength of structure cause by networks of small [e.g., microscopic] cracks.

widget Any small cunning, fascinating device.

Widia German range of sintered tungsten carbides with 3–13% Co.

WIDS Weather information display system.

width Maximum lateral dimension of lifting-body aircraft, equivalent to span.

width of sheaf Lateral interval between centres of flak bursts or bomb impacts (DoD).

WIDS Wireless Intelligence and Development Unit (RAF, from October 1940).

WIE With immediate effect.

Wiedemann-Franz law States ratio of electrical to thermal conductivity for all metals is proportional to $K$ (for most metals observed value is slightly higher than ** figure).

Wien bridge Stabilized oscillator whose frequency is determined by circuits incorporating resistances, capacitances and two triodes.

Wien law States wavelength of peak radiation from hot-body source is inversely proportional to $K; = \frac{2.900\mu m}{T}$.

WIFU Weapons interface unit.

WIG, WIGE Wing in ground effect.

wigglystrip Rolled [occasionally machined] refractory strip with endless square-corner up/down form [combustors and afterburners].

wil light Wing ice inspection light.

Wilco R/T code: “I will comply with your instruction”.

wildfire Forest fire out of control.

Wildhaber-Novikov Best known form of conformal gears with mating profiles formed by convex/concave circular arcs whose centres of curvature are on or near pitch circles.

Wild Weasel Though originally name of specific programme, now generalized term for dedicated EW platform based on airframe of combat (eg attack or fighter) aircraft.

Williot Diagram which graphically portrays deflections of all joints (panel points) of loaded planar truss; result contains small inaccuracies which are removed by Mohr correction diagram, result being called Williot-Mohr.

will not fire Code sent to spotter or other requesting agency affirming that target will not be engaged by surface fire.

willy-willy Tropical cyclone (Australia).

Wimnet British range of tungsten carbides.

WIMS, Wims Worldwide intratheatre mobility study.

WIN 1 WWMCCS intercomputer network.

2 Web industrial network.

winch launch Launch of glider by winch, usually locally built on road vehicle and driven by latter’s engine.

winchman Member of aircrew of rescue helicopter in charge of winching payloads, eg rescues, and who may hand winch to colleague and descend to organize pick-up of incapacitated rescued from below.

window

winch suspension Rigging joining kite balloon and flying cable.

wind across Horizontal component of wind at 90° to catapult or centreline of (axial or angled) deck.

windage Loss of rpm of rotating device caused by air drag.

windage jump Vertical jump (up or down) of bullet trajectory caused by crosswind, eg firing laterally from bomber or gunship.

wind angle Angle between wind direction and true course (heading), measured 000°–180° L or R of course.

wind axes 1 In UK usage, three rectilinear axes (u, v, w) with origin within aircraft, usually at c.g., and directions each representing component of relative wind in longitudinal, lateral and vertical planes. Traditional names: lift axis, + upward; drag axis, + to rear; crosswind axis, + to left.

2 In US usage, X, Y, Z, each the exact opposite of drag, sideforce and lift and acting through c.g. to eliminate rotary and translational motions.

wind cone See winddeck.

wind correction angle Difference between course and track.

wind diagram US for triangle of velocities.

wind direction That from which wind is coming, expressed as number from 000° to 359°.

wind down Horizontal component of wind along axis of catapult or centreline of (axial or angled) deck.

Windsee Wind-tunnel data encoding and evaluation (EDP [1]).

wind factor Net effect of wind on aircraft progress, expressed as ± knots (USAF).

wind-gauge sight Drift meter; instrument which (BSI definition), by determining track on two or more courses, enables air, wind and ground speeds to be represented by vectors (arch.).

wind gradient Rate of change of wind with unit increase in height AGL; usually factor of interest is component of wind along runway, thus direct headwind at 150 m/500 ft veering to crosswind at threshold is regarded as change equal to full wind speed even though actual wind speed does not alter. See windshear.

winding See filament *.

WINDMG Wind magnitude.

Windmill An aerobatic manoeuvre comprising an upward Immelmann followed by a flat spin with AOA of c90°.

windmill 1 Of inoperative engine, to be driven by propeller (piston or turboprop) or by ram airflow through it (turboset or turbofan); hence windmilling, windmilling drag etc.

2 Small propeller-like * used on older aircraft to drive electrical generator and occasionally other machines; in principle like modern RAT but permanently operating.

3 Of free-turbine propeller, to spin idly in wind when aircraft parked (normally prevented by brake).

4 Propeller (colloq.).

windmill-brake state Operating condition of helicopter rotor in which thrust, flow through disc and flow outside disc are all in same direction, the rotor extracting power from the slipstream.

wind over deck Vector sum of wind plus speed of carrier.

window 1 Transparent area in skin for aircraft optics or IR (in latter case not apparently ‘transparent’).
Windpads

2 WW2 code for frequency-cut metal reflective slivers, wire, foil etc that later became better known by US name chaff (ECM).

3 Launch opportunity, defined as unique and possibly brief time period in which spacecraft can be launched from its particular site and accomplish its mission; usually recurring after a matter of days to months.

4 Small band of wavelengths in EM spectrum to which Earth atmosphere is transparent; there are many such, though together they account for only small part of total spectrum, rest being blocked. Like (3) this meaning rests on * being a small transparent gap in a dark continuum.

5 Verb, to enlarge local part of drawing or graphic display, usually to show greater detail.

Windpads Wind-profile precision air-delivery system (para-drop accuracy, USAF).

WINDR Wind direction.

wind rose Polar plot for fixed station showing frequency of winds and strengths over given (long) period from 000°–359°.

wind rotor Multi-blade rotor for forced aircooling of landing-wheel brake, of which it forms part.

Winds Wideband internetworking engineering, test and demonstration satellite (J).

winds aloft US term for upper winds.

windscreen Windows through which pilot(s) look ahead, called windscreen in US. Originally on open-cockpit aeroplanes complete assembly of frame and windows ahead of pilot’s head. On modern flight deck less obvious and generally replaced by such term as flight deck windows/transparencies/fenestration, which includes side and roof (eyebrow) windows.

windscreen wiper Term confined to mechanical devices with oscillating blades; rotary-disc and air-blast (eg for rain-shedding) excluded.

windshear Exceptionally large local wind gradient. Originally defined as ‘change of wind velocity with distance along an axis at right angles to wind direction, specified vertical or horizontal’ (BSI), which is same as wind gradient. Today recognized as extremely dangerous phenomenon because encountered chiefly at low altitude (in squall or local frontal systems) in approach configuration at speed where * makes sudden and potentially disastrous difference to airspeed and thus lift. In practice pilot must take into account air movement in vertical plane (see downburst) because sudden encounter with downward gust is more serious than mere fall-off in headwind. Often accompanied by severe turbulence and precipitation which can make traditional ASI under-read.

windshear indicator Modern electronic displays will show * situation well, but with traditional instruments an extra dial is avoided by adding an energy-rate pointer to VSI; this striped needle is driven by combined vertical-speed rate and rate of change of airspeed to show rate of change of aircraft energy. Pilot can readily work throttles to keep this needle coincident with VSI needle.

windshield See windscreen.

windshield guidance display Optical projector in glareshield giving HUD-type ground-roll guidance after blind (Cat IIIb) touchdown.

wind shift Sudden change in wind direction.

wind sleeve See next.

windsock Traditional fabric sleeve hung from mast to give rough indication of local wind strength/direction; also called wind sleeve, wind cone. Inlet called throat or mouth.

wind star Plot for determining wind by drawing drifts measured on two headings (US, arch.).

wind tee White T-shaped indicator displayed in signals area to show pilots wind direction; also called wind T. See tee.

wind tetrahedron US counterpart of wind T (which is also used in US): large pyramid shape indicating wind direction, rotated on pedestal.

wind tunnel Any of family of devices in which fluid is pumped though duct to flow past object under test. Duct can be closed circuit or open at both ends. Working section, containing body under test, can be closed or open (called open jet). Fluid can be air at any temperature/pressure or various other gases or vapours. Operation can be continuous, intermittent or as brief as a millisecond. Particular species is spinning tunnel.

wind-tunnel balance Apparatus for measuring forces and moments on object tested in tunnel; originally included actual mounting for object but today usually electrical force-transducers built into sting.

wind-tunnel stability axes Considered more helpful term than mere ‘stability axes’ for data from tunnels.

windup Integrator saturation in a digital flight-control system.

wind-up turn Turn by winged aerodynamic that becomes ever-tighter [rhymes with mind].

wind vane Small pivoted blade which aligns itself with local airflow; usually drives via rotary viscous damper to one or more precision potentiometers to form a flow-angle transmitter for AOA (pivoting on horizontal axis) or yaw.

windy drill Workshop tool driven by high-pressure air (colloquial).

wing 1 Main supporting surface of fixed- or rotary-wing aircraft. Despite term ‘rotating’ * aircraft’ not used in that context, usual word for rotating supporting aeroflots being blade. Normally taken to cover all parts within main aeroflot envelope, including all movable surfaces. Many terms, eg * jigger, * structure, are judged self-explanatory.

2 Numerous types of military unit, eg in RAF basic combat administration organization comprising perhaps three squadrons, often all sharing same base, but in US usually a larger unit comprising one or more groups with support organizations, in Navy a self-contained unit for deployment of organic air power at sea (one * per carrier) or land, and in Marines those aviation elements for support of one division.

3 Extreme left or right of battlefront or aerfermation.

4 To be positioned on *, to be alongside in formation (see wingman).

5 To fly (colloq.).

wing area 1 Area of surface encompassed by planview outline drawn along leading and trailing edges, including all movable surfaces in cruise configuration, and including areas of fuselage, nacelles or other bodies enclosed by lines joining intersections of leading or trailing edges with such bodies. One expression is \( S = \int_{b/2}^{\infty} \frac{c}{b} \, dy \) where b is span, c chord at distance y across lateral axis. Thus, pods hung below wing are excluded;
wing arrangement

wingtip tanks are normally excluded; winglets are included as they appear in plan view; in case where root meets fuselage or nacelle at sweep approaching 90° (eg with forebody strakes) most authorities include these portions and fuselage up to intersection of leading edge with fuselage. VG ‘wing wing’ is measured at minimum sweep. Forplanate for lifting canard is counted separately.

2 Net ** excludes projected areas of fuselage, nacelles etc. Note: US measures of gross * often omit all areas outside basic wing trapezium, such as exist if taper is greater at root.

wing arrangement

1 Basic configuration of aeroplane.

2 Height at which monoplane wing is mounted, eg low, mid etc; see wing position.

wing axis

Locus of all aerodynamic centres.

wing bar

Row of approach lights perpendicular to runway and starting beyond runway edge (Vasi).

wing bending moment

Bending moment. Hence *** relief, reduction afforded by masses (fuel, engine pods) distributed across span instead of being located in or on fuselage. 

wing bending torsion mode

Aeroelastic deflection, sustained or flutter, of swept wing in which bending introduces twist.

wing/body fillet

Fillet, possibly very large, filling in rear part of wing/body junction to prevent separation of flow and possibly reduce peak velocities and suction.

wing box

Primary structure of modern stressed-skin in which all loads are taken by cantilever beams comprising upper and lower (usually machined) skins joined to front and rear spars, plus small number of ribs (occasionally additional spar[es] within *). This strong structure, usually by far heaviest single piece of airframe, is usually sealed to additional spar[es] within *).

wing car

Airship car suspended to L or R of centreline.

wing cell

See cell, cellule.

wing centre section

See centre section.

wing chord

See chord.

wing drag

When lifting, induced plus profile drags.

wing drop

Sudden loss of lift on one wing, eg near stalling AOA, causing rapid roll not recoverable by aileron.

wing fence

See fence.

wing fillet

See fillet; avoided if possible, but often introduced because of need to accommodate main landing gears and in some cases combined with air-conditioning ducts on underside.

wing flaps

See flap.

wing flutter

See flutter.

wing guns

Guns mounted within or attached to wing.

wing heavy

Tending to roll in one direction.

wing in ground effect

Class of vehicles, arguably aircraft, supported by a wing riding close above Earth surface. Unlike ACV (hovercraft) they rely for lift on forward speed.

wingless wonder

1 Officer without brevet (RAF colloq., derogatory).

2 Aircraft whose wings have been permanently removed, to end its days in ground test programmes [eg, catapult/arrest].

winglet

1 Upturned wingtip or added auxiliary aerofoil(s) above and/or below tip to increase efficiency of wing in cruise, usually by reducing tip vortex and thus recovering energy lost therein and improving circulation and lift of outer portion of wing.

2 Miniature wing mounted horizontally on fuselage (not at nose or tail), on interplane struts or elsewhere (eg nacelles), often not so much for lift as to carry external load or connect bracing struts or main gears to fuselage. winglet lift

This invariably means the resultant force on the winglet, which is usually perpendicular to the surface in the vertical plane and inclined forwards [giving a positive thrust component] in the horizontal plane.

wing leveler

Simple single-axis autopilot with authority only in roll; often with heading lock and VOR/ADF coupler. Generally synonymous with aileron-centring device.

wing loading

Gross weight or MTOW divided by wing area (1); 1 lb/sq ft = 4.88243 kg m–2; reciprocal 0.204816.

wingman

Second in element of two combat aircraft, esp. interceptors; term loosely applied to pilot or aircraft. Flies off wingtip of element leader except when required to perform manoeuvres, eg day/visual intercept of un-identified aircraft.

wingover

US flight manoeuvre most briefly defined as climbing turn followed by diving turn; at apogee aircraft (usually trainer) is almost stalled, and rotation continues in pitch and roll so that recovery takes place at lower level by diving out on reciprocal. Almost = stall turn.

wing overhang

See overhang.

wing panel

See panel.

wing pivot

That on which VG wing (‘swing wing’) is attached.

wing plan

Shape of wing outline seen from above (see plan).

wing position

Height at which wing (1) is mounted relative to fuselage, esp. as seen from front, eg low, shoulder, parasol etc.

wing profile

See profile.

wing radiator

Cooling radiator mounted on wing, esp. inside wing, fed by leading-edge inlet.

wing reactions

Those forces applied to fuselage by wing.

wing rib

See rib.

wing rider

A wing walker [and more accurate term].

wing rock

Oscillatory roll/yaw motion of [usually swept-wing] aircraft at high AOA; similar to inertia coupling, but for different reasons.

wing root

Junction of wing with fuselage (not with nacelle or any other body). Some authorities include junction of wing with opposite wing, eg on centreline (upper wing of biplane). Hence ** chord, ** fillet, ** thickness.

Wings

1 Weather information and navigational graphics system (PC-based, overlays latest Wx on planned route by GA pilot).

2 Commander (Flying) on RN carrier.

wing section

Appears to be synonymous with aerofoil section, wing profile; only ambiguity caused by erroneously using term to mean portion of wing, eg centre section, outer panel.

wingset

Left and right (port + starboard) wings for same aircraft.

wing setting

See angle of incidence.

wingside

More specific than airsides: in immediate proximity of parked aircraft.

wing skid

Protective skid on underside near tip (rare since 1916).
wing skin

Usually refers to large stressed skin forming upper or lower surface of wing box; largest single piece of material in aircraft.

wing slot

Slot built into wing; extends through outer wing from lower to upper surface with profile generally similar to that left by open slat.

wing spar

Principal spanwise member of wing, in traditional or light aircraft usually isolated but in modern stressed-skin wing forming one face of wing box which itself behaves as a spar. Always extends full available depth, unlike stringers. In slender delta built perpendicular to longitudinal axis, thus in such wings there are many spars which terminate not at tip but at points along leading edge.

wing spread

See span.

wing strut

Primary structural links joining wings of biplane (interplane struts) or bracing high-wing monoplane diagonally to fuselage (such are actually ties in flight but struts on ground).

wing sweep

See sweep.

wing tanks

1 Tank; normally for fuel, either accommodated in wing or (integral) formed by sealing wing box.

2 Wing-mounted drop tanks where aircraft also has drop tanks elsewhere; thus ** may be dropped first to permit sweep to be increased.

wingtip

Outer extremity of wing; either extreme tip or general area.

wingtip aileron

Aileron forming entire tip of wing, either with chordwise inner end or extending inboard along trailing edge.

wingtip extension

Increase of span by adding at tip at same dihedral angle as wing.

wingtip fence

Winglet of very low aspect ratio.

wingtip flare

Pyrotechnic attached to wingtip and ignited by pilot to assist night landing (obs. technique).

wingtip float

Stabilizing float of flying boat, usually inboard from wingtip.

wingtip handler

Person walking beside sailplane being towed across airfield holding one tip so that wings are level.

wingtip rake

See rake.

wingtip sail

Winglet, especially prominent.

wingtip tank

External fuel tank, jettisonable or not, carried on wingtip.

wingtip vortex generator

Ducted windmill at wingtip providing shaft power. Does the opposite of generating vortex.

wingtip vortices

See vortex; always present off tips of conventional wings at lifting AOA, and when intense (eg tight turn) pressure at centre falls so low that moisture condenses to leave white visible trail.

wing truss

Wing plus all bracing struts and wires transmitting loads to or from fuselage.

wingunder

Bunt [suggest unpredmetiated].

wing waggle

Waggle.

wing walk

Area marked in upper surface where maintenance engineers may walk in soft shoes.

Wing Walk

Patented brushed-on paint for walkways offering high coefficient of friction.

wing walker

1 Passenger, invariably attractive girl, who seldom walks but rides standing securely attached to upper centre section of biplane at airshow.

2 Person[s] required to hold a wingtip of taxing aircraft to prevent unwanted weathercocking.

wing warping

Lateral control by warping; called primary on lower wing of biplane, secondary on upper. Relies on wing torsional flexure (see also warping).

wing yawmeter

Yawmeter in form of miniature wing, aligned vertically or (for AOA) horizontally, with sensing holes at 0.15 or less chord.

WINN, Winn

Weather information network (NASA, Honeywell and others).

WINS, Wins

1 Workshop in negotiating skills.

2 Wireless instrumentation station [sometimes WIS].

WIRENI

Wireless integrated network sensor.

WINTERM

Upper wind[s] and temperature[s].

winterization

Process of equipping aircraft for flight in Arctic-type environment; obviously includes full anti-icing and de-icing of airframe, engines, propellers and flight-deck windows and extends to landing gears, systems, fluid specifications and many items of GSE.

winter solstice

Point on ecliptic occupied by Sun at maximum southerly declination, around 22 December.

WIP

Work in progress [i.e., check if field is open].

wipe-off switch

Attached externally under belly or engine pod in most vulnerable place in belly landing; triggers safety system, eg tank inerting or fire extinguishers.

WIPO

World Intellectual Property Organization; handles copyright (eg EDP data); Berne Convention.

Wipps, WIPPS

Wideband integrated platform protection system.

Wire

Wide-field IR explorer.

wire

1 See fly by *.

2 Misleadingly in common use for the multi-wire cables used to arrest aircraft on carriers.

wire braid

Woven covering over ignition cables to prevent escape of emissions causing radio interference.

wire bundle

Large group of electrical wires individually tagged, clipped together and then attached as a unit to structure, usually in wiringway.

wired

1 Fitted with locking wire.

2 Acronym, wind-tunnel integrated RTIC/RTOC experiments and demonstrations.

wired program

One employing wired storage; also called fixed program.

wire-drawing

1 Manufacture of wire of required diameter by drawing through circular die.

2 Part-throttling fluid flow by passage through constriction (colloq.).

wired storage

EDP (1) storage which was originally litered on punched card and then converted to magnetic tape, and then to magnetic disk and finally to computer memory, where it is available for retrieval.

wirefinge

Measurement of diameter of wire or thickness of sheet; in UK by SWG measure based on Imperial (0.001–0.5 in).

wire edge

Sharp burr along edge of sheet frequently cut by shear.

wire gauge

1 Measure of diameter of wire or thickness of sheet; in UK by SWG measure based on Imperial (0.001–0.5 in).

2 Hand gauge for measurement of sheet thickness or wire diameter.

wire group

Several wires routed to common destination and tied by clips.

wire guidance

Command guidance of missile or other vehicle by electrical signals (bang/bang or analog) conveyed along fine wires unrolled behind vehicle and used to position surfaces governing trajectory.

wireless telegraphy

Transmission of Morse by radio.
wire link

Telemetry in which signals are conveyed by wire instead of by radio; also called hard-wire telemetry.

wire locking

Tying a group of nuts with safety wire to prevent rotation.

wiresonde

Meteorological balloon at low altitude transmitting data over fine wire(s).

wire-strike kit

Measures taken to reduce lethality of impact between low-flying aircraft, usually small helicopter, and electric (eg national grid) cable. Simplest form is forward-sloping sharp-edged deflector. Guillotines [as in WW2] appear to be extinct.

wireway

Large conduit forming secondary structure along which numerous electrical circuits (occasionally also fluid lines) are routed; in civil aircraft under floor or behind trim.

wire-wound

Constructed by wrapping ultra-high-strength (eg tungsten) wire on mandrel and bonding by plasma spray or other method. Usually final part, eg rocket case or nozzle, has several layers aligned in different directions; also called wire-wrapped.

wire-wrapped connection

Connection between single electrical signal wire and terminal made not with solder but by crimp wrapping by machine designed for purpose.

wiring

All internal wires in airship, divided into structural *, preserving cross-section and other dimensions, and gasbag *, distributing lift and preventing chafing.

WIS

WWMCCS information system.

Wisp

Waves in space plasma.

WIST

Windshear and turbulence (ICAO study group).

witness

1 Hole, groove, recess or slot cut in reference plate by each tool used in complete NC program for producing a large machined workpiece; if each * is dimensionally correct this proves software and cutters and reference plate is stored as master for that program.

2 Marks on surface of structure or component showing where two surfaces rubbed, scored, impacted, jammed or became deformed prior to crash of aircraft.

WWU

Weapon[s] interface unit.

Wizard!

Expression of approval (RAF WW2).

Wizzo

WSO (colloq).ial.

WJAC

Women’s Junior Air Corps (1939–, UK, became GVC [AC]).

WJIS

Wall-jet induced suckdown.

WK

Week.

WK, WKN

Weaken, weakening.

WKAC

Watch Keeping Certificate (RN navigators).

Wkd

Weekly.

wksp

Workshop.

WL

Water level, eg WL 365.8.

2 Weight-limited.

3 Will.

Wl

Actual aircraft landing weight.

WL reference

Horizontal axis used to define water levels, usually synonymous with static ground line (usually not synonymous with longitudinal axis).

WLC

Whole-life cost[s].

WL D

Welded [pipe or tube].

WLDP

Warning-light display panel.

WLFL

Wet landing field length.

WLG

Wing-mounted landing gear.

WLOP

Air-defence and aviation force (Poland).

Wooden bomb

Hypothetical concept of weapon or device which has 100% reliability, infinite shelf life and requires no special storage, surveillance or handling (DoD).
wooden round

wooden round  Missile that fails to work when needed (colloq.).
Wood's metal  Low-melting alloy (70°C), typically 50% Bi, 25% Pb, 12.5% Sn, 12.5% Cd.
woolnet  Yawstring.
woolpack  Cumulus.
Woolworth carrier  CVE, escort carrier (WW2 colloq.).
Woomera  Location in South Australia of Weapons Research Establishment, head of missile range extending northwest to Indian Ocean.
WOP  Wet (integral-tank) outer panel.
Wop  Radio (‘wireless’) operator (colloq., arch.); hence * AG adds air gunner.
Word  Wind-oriented rocket deployment (Stenel seat).  
word  Basic group of ordered characters, bits or digits handled in EDP (1) as one unit. In the latest standard buses [1533B and A629] bits 1/2/3 provide locked synchronization, bits 4 to a maximum of 19 send the word and 20 provides parity. In this protocol signal change negative to positive sends 0 and positive to negative sends 1.
word rate  Frequency derived from elapsed time between end of one word and start of next.
words twice  Please repeat each phrase or sentence.
Worf  Window Observational Research Facility.
work  I Transfer of energy, defined as force multiplied by distance through which output moves.
2 Transitive verb, to use a particular ground station by airborne radio officer, hence working that station.
2 work function  I Thermodynamic free energy A = U – TS where U is internal energy, T oK and S entropy.
2 Electronic: energy (usually measured in eV) supplied to electron at Fermi level in metal to remove it to infinite distance; governs thermionic emission.
work hardening  See strain hardening.
working  Productive flight by Ag-aircraft or RPH, hence * height, * speed, * endurance; last measure excludes time between base and * site.
working fluid  Fluid used as medium for transfer of energy within system or (in wind tunnel) for study of flow around body. Can be gas, vapour or liquid.
working line  On any graphical plot describing performance of a device [usually on 90° orthogonal axes], the line to which device is intended to perform. Prime example is gas-turbine compressor pressure ratio plotted against airflow, always a safe distance below surge line.
working load  That borne by structure or member in normal operation; in aircraft varies greatly with turbulence, manoeuvres and with aeroelastic forces, and maximum is usually taken. Hence working stress experienced.
working pressure/temperature  Value typical in normal operation.
working section  Where model or other body is placed in wind tunnel, may be of open-jet form, without bounding walls, in traditional low-speed tunnel.
working up  Process of turning newly formed squadron [or other unit] into state of complete combat-readiness.
work lights  Powerful airborne floodlights, directed forward or laterally, to enable agricultural aircraft to work in the dark.
work package  I Quantified series of operations required to make one part of airframe; eg one wing panel may be divided into 15 **, each of short time period and exactly costable.
2 Basic unit of manufacturing effort into which entire product (eg aeroplane) is divided for allocation of effort in agreed manner between programme partners.
work parameter  dH/T, change of enthalpy over total temperature, or CPdT/T, change in specific heat.
works  I A factory (UK, suggest colloq.).
2 A functioning mechanism (UK, colloq.).
workscope  A definition and schedule of work required for a particular item [especially an engine] on a shop visit, based on its condition and working environment.
Works finish  Unpainted except for a coat of primer [probably an archaic usage] (UK).
workstation  Local interface to any major CAE system or computer network.
world fare  Averaged value(s) of IATA tariffs.
World Geographic Reference System  Better known as Georef, uniform position-fixing and designation system for control of aircraft, targeting of ICBMs and many other functions (USAF).
World Weather Watch  Scheme to share and disseminate weather-satellite information internationally; also called VMM (WMO).
Worm  Write once, read many, or multiple.
wormhole  Theoretically achievable short cut between two points [lightyears apart] by warping spacetime.
Wortmann  Family of wing profiles designed by Prof F.X. Wortmann of Stuttgart; tailored to R appropriate to sailplanes (ie small chord), with outstandingly low drag which, esp. for flapped sections, extends over wide range of Cl.
WOS  Weather observing station.
WOT  Wide-open throttle.
Wow, WOW  I Weight on [rarely, off] wheels, hence Wow switch.
2 Women ordnance workers (US, WW2).
WP  I Warsaw Pact (now defunct).
2 Working paper.
2 White phosphorus; -T adds tracer.
Wp Payload.
W/P  I Waypoint; also WP or WPT.
2 Work in progress.
WPA  I Wheelchair Pilots Association (US).
2 Works Progress Administration (US 1935, for Federal relief).
3 Works Projects Administration (followed * 2 to develop US civil airfields for defense purposes, 1939–43).  
4 Weapon personality adapter.
wPa  Warm polar Atlantic.
wPAFB  Wright-Patterson AFB, Dayton, OH.
wPB  War Production Board (US 1942—).  
WPC  World plotting chart.
wPc  Warm polar continental.
WFPC  World Precision-Flying Championships.
WPM, wpm  Words per minute.
Wpn, wpn  Weapon.
wPp  Warm polar Pacific.
WPR  I Wideband programmable receiver.
2 Waypoint position report[s].
WPT  Waypoint.
W PU  Weapon programming or processing unit.
WR  I Work request.
2 Wave rider, waverider.
WRA

WRA 1 Weapon replaceable assembly.
2 War Resources Administration (US, WW2).

WRAC Women’s Royal Army Corps (UK 1946–93).


WRALC Warner-Robins Air Logistics Center (USAF).

wrap-around Wrap-round.

wrapped connection Not soldered but made by wire wrapping.

wrapping cord See serving cord.

wrap-round boosts Boost motors, usually four spaced at 90°, arranged around sides of body of missile or test vehicle and at burnout separated laterally.

wrap-round engine Turboramjet comprising turbojet core surrounded by separate ramjet duct; differs from afterburning turbofan in that there is no fan, all burners are in roughly same axial plane, and in RJ mode core is shut off.

wrap-round fins Rocket or missile fins which, before launch, are recessed around the curved body; they open after launch on hinges parallel to the longitudinal axis.

wrap-round windsreen Manufactured as single blown or vacuum-formed moulding forming entire front of cabin, or cockpit, extending from nose or engine cowl to behind front seat(s).

wrap-round wing skin Single sheet wrapped around leading edge and forming upper/lower wing surfaces back to rear spar.

WRB War Resources Board (US, WW2).

WRCP Weather-radar control panel.

WRCs Weapon-release computer set (USAF).

WRD War-reserve drop-tank (large quantities in store).

WRDA Weapons range danger area.

WRE Weapons Research Establishment [Woomera, office at Salisbury, South Australia].

Wrebus WRE break-up system; radio-commanded method of explosively disintegrating errant vehicle.

wreckage field Total area of land or seabed considered to contain every part of crashed aircraft, especially one that broke up in flight.

wreckage trail Wreckage field from aircraft which broke up at high altitude.

Wren[s] See W/RS.

Wright-Patterson AFB Vast complex outside Dayton, OH, formed by 1948 merger of Wright Field [1917] and Patterson Field [1931] (USAF).

wing (wringing it out) To demonstrate one’s piloting skill by flamboyant demonstration intended to push aircraft (usually training aeroplane) to limits; has overtones of poor airmanship.

wrinkle Visible buckle in skin.

wrist actimeter Gives alarm if pitch attitude changes, even slightly, with pilot dozing [interpreted as no wrist movement in 4 min]; can be set to alarm even with no aircraft rotation.

wrist pin 1 In UK: attaches radial-engine con-rod (articulated rod) to master rod; also called knuckle pin. Hence ** end of articulated rod.
2 US: attaches piston to con-rod [in UK called gudgeon pin].

wrist pin WRCP 1 Word-recognition system.

write In EDP (1), to enter in memory, to record input information.

write off To damage an aircraft so severely it is not judged worth repairing.

write-off 1 An aircraft so severely damaged that repair is uneconomic.
2 Unobligated balance of funds removed from account involved.

written off Struck off charge, for reasons of obsolescence, irreparable damage, total cannibalization or destruction in crash; does not include sale or MIA.

WRM 1 War-readiness (or reserve) materiel (USAF).
2 Warm.

WRMFNT Warm front.

WRNG Warning.

WRNS Women’s Royal Naval Service.

WRO Western Range Operations; CI adds communications and information (VAFB).

wrought Generally, shaped by plastic deformation, eg by forging or other hot or cold working as distinct from casting, sintering or machining.

WRP Wing reference plane.

WRR Wide-range ramjet (from 1995, France–Russia).

WRS 1 Wide-area reference station (WAAS3).
2 Wide-area reference station (WAAS3).

WRE break-up system; radio-commanded method of explosively disintegrating errant vehicle.

WS War-readiness spares (or supply) kit (USAF).

WRT Weather-radar receiver/transmitter.

WS 1 Weapon system.
2 Weather service (FAA).
3 Water service (cart).
4 Windshear (Sigmet warning).
5 Weather-advisory Sigmet.
6 Wireless School (RFC, RAF).

WS/L 1 Warning/status (display).
2 Windscreen.

Ws 1 Structure weight.
2 Maximum shoulder width of tyre [tire].

Wsg Maximum growth shoulder width of tyre.

WSHFT Windshear indicator.

WSI Water-separometer index (fuel).

WSM Water-separometer (or separation) index, modified.

WSOA Wide-swath ocean altimeter.

WSOp WSO(1) in RAF style.

WSIP Weapon[s] system improvement programme.

WSK Women’s Army Corps (UK 1946–93).

War-readiness (or reserve) materiel (USAF).

Weapon replaceable assembly.

Weather-radar control panel.

Warning.


Women’s Royal Army Corps (UK 1946–93).

Women’s Royal Naval Service.

Weapons system.

Weapons system.

Weapon system.

Weapon systems controller.

WS/RS System AIMS for Spares and Repair Support.

Weapon-system computational subsystem.

Weapon-system data-link.

Weapon-systems evaluation group (DoD).

Weapon system.

Weapon-system controller.

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WSL

WSL 1 Weapon-system level (programme lead responsibility).

  2 Wide-spectrum language.
  3 Workstation lift [cargo handling].

WSMC Western Space & Missile Center (Vandenberg, USAF).

WSMIS Weapon-system management information system.

WSMO Weather Service Meteorological Observatory.

WSMR White Sands Missile Range (USA, not same as WSTF).

WSMS Windshear monitor system.

WSO 1 Weapon-system operator (or weapon-systems officer).

  2 Weather Service Office.

WSOp WSO (1) in RAF style.

WSP 1 Weapon-system partnership.

  2 Wx systems processor.

WSPS Weapon-system project (or program[me]) office.

WSOA Wide-swath ocean altimeter.

WSPP Weapon-system physics section.

WSR 1 Weather Service Radar.

  2 Wet snow on runway.
  3 Warning and surveillance receiver.

WSRN Western Satellite Research Network.

WSSS 1 Weapon-specific simulator.

  2 Weapon-system status.

WSSA Weapon-system support activity.

WSSD Weapon-system support development.

WSGF Warning-system signal generator.

WSNN Worldwide seismic sensor network.

WSPS Weapon-system support programme.

WSRR Weapon-system support rig (RAF).

WSSS Weapon storage and security system.

WSST 1 Weapon-system trainer.

  2 Weather Service advisory, convective Sigmet.

WSTEP With step-change in altitude.

WSTF White Sands Test Facility (NASA, Las Cruces, NM).

WSW Windshear warning; / RG adds recovery guidance, / RGS adds recovery system.

WT 1 Waste-ticket (US manufacturing).

  2 Water twister.
  3 Wind tunnel.
  4 Water tank.
  5 Tornado watch.
  6 Wake turbulence.

WT, w.t. Wireless telegraphy.

WT, wt Weight.

WTA Water, turbine aircraft; demineralized water for injection with or without methanol.

wTa Warm tropical Atlantic.

WTC 1 Windshield temperature controller.

  2 Wake turbulence category.

WTD Wehrtechnischen dienstelle, military test (G).

WTE Wingtip extension.

wTg Warm tropical Gulf [of Mexico].

WTI Weapons and tactics instructor.

WTMD Walk-through metal detector.

WTO 1 World Trade Organization.

  2 Warsaw Treaty Organization.

WTOP Actual aircraft takeoff weight.

WTp Warm tropical Pacific.

WTR Western Test Range.

WTS 1 Two-seat trike (microlight class).

  2 War Training Service (US, succeeded CPT Program 1942–44).

WTSPT Waterspout.

WTSS Wideband tactical surveillance system.

WTT Weapons tactics, or tactical, trainer.

WTTC World Travel and Tourism Council (Int.).

WTU Wing-tip [electronic] unit.

Wu Useful load.

WUF Walk-up fare.

WUI Wildland/urban interface.

Würzburg Standard German aerial-target tracking radar, 1940–45.

WW 1 Warfighter visualization.

  2 Wave(s).

W/W War weary (US, WW2, refers to hardware).

W/WABNCP Worldwide airborne national command post(s) (US).

W/WACPS Worldwide airborne command-post system (US).

W/WMCCS Worldwide military command and control system (US).

W/WO Wing Weapon Officer (RAF).

W/WP World Weather Programme.

W/Ws Wild Weasel Squadron (USAF).

W/WSSN Worldwide Standardized Seismograph Network.


W/W3 World War 3, so far avoided.

W/Wu Weight of wing plus undercarriage (landing gear).

W/WV NBS exact-time service (US).

W/WX World Weather Watch (WMO).

  2 World Wide Web.

W(WW) Past weather (ICAO).

WX 1 Weather.

  2 Airborne weather radar.
  3 Indefinite obscuration.

W/XC Weather-radar controller.

W/XI Weather-radar indicator.

W/XIL No significant weather.

W/XP Weather-radar panel.

W/XR Weather radar.

W/XS Weather-radar system.

W/YPT Waypoint altitude.

WYSIWYG What you see is what you get, usually pronounced wizzywig.
X

X 1 Longitudinal axis (more strictly OX); all measurements parallel to this direction, esp. force; or a distance along a streamline.
2 Usual symbol for reactance.
3 US DoD aircraft designation mission prefix: research; and also modified-mission prefix: experimental.
4 IFR flight-plan code; transponder, no code.
5 On request.
6 Ground-to-air visual code: require medical aid.
7 Weather: intense.
8 Sky obscured.
9 On request.
10 Prefix, piston engine with one crankshaft driven by four cylinders, or banks of cylinders, in form of X when viewed from front.
11 Generalized prefix: expendable.
12 Helicopter rotor side force.
X 1 Generalized term for unknown quantity.
2 Horizontal axis (abscissa) of cartesian coordinates or graphical figure.
3 Any value measured parallel to (2) or any coordinate point measured along that axis; in particular distance along OX axis from helicopter c.g. to intersection with thrust vector of main rotor.
4 Reactance (X is more common).
5 Longitudinal displacement; distances measured along OX axis.
6 Mole fraction.
\( \bar{x} \) Forward extent of VTO ground vortex.
\( X \) Chordwise distance from apex to centroid of wing area.
\( x \) Position of c.g. as co-ordinate along OX axis.
\( \overline{x} \) Average of several values of x.
\( x \) Wind axis, aligned with direction of flight.
\( \overline{x} \) Fore/aft axis relative to Earth or space.
X-25 Iset communications network allowing dial-up access to 9.6 kb/s.
X-aerial Crossed rods, two longer (dipoles) and two shorter (director).
X-allocation First 126 paired (1–63, 64–126) DME interrogation frequencies [see X-channel].
X-axis X(1) or x (2).
X-band Former common-usage radar frequency band centred on wavelength of 3 cm, later amended to 2.73–5.77 cm (about 10.9–5.2 GHz), see Appendix 2.
X-bar Crossbar.
X-box generation Today's young, who from early childhood have been familiar with computers and [flight] simulators.
X-C Cross-country.
X-channel DME or Tacan channel associated or paired with another radio service on same frequency. There are 126, of which first 63 have ground/air 63 MHz below air/ground frequency and second 63 have ground/air 63 MHz above air/ground frequency.
X-Cty Cross-country; XC, X-C also common.
X-cut crystal Cut parallel to Z-axis, perpendicular to X-axis.
X-engine See X(13).
X-Geräte Pioneer beam-riding aid to navigation and bombing (G, WW2).
X-glider Expendable glider (ASW).
X-licences Range of licences for ground engineers, with endorsements for many disciplines and equipments (UK).
X-plates Vertically parallel deflection plates in CRT whose potential difference deflects beam horizontally and creates timebase.
X-ray Extremely short-wavelength EM radiation, with frequency higher than any other except gamma and nuclear radiations; typical wavelengths 10–1,000 pm.
X-ray analysis Based on diffraction of X-rays by crystalline solids.
X-ray astronomy Study of X-rays arriving at Earth from space (not possible at surface of Earth because of attenuation by atmosphere).
X-unit Non-SI unit of length = 10\(^{-13}\) m, = 10\(^{-11}\) cm = 0.1 pm = 100 fm.
X-wing Aircraft able to operate as helicopter or, with special [usually four-blade] rotor stopped with blades diagonal to airstream, as aeroplane. Studied by NASA 1969–.
XA 1 Extended architecture, giving (for example) relief from storage and I/O constraints.
2 ARINC code.
XB IATA code.
Xbar, XBAR Crossbar (ICAO style).
X-frame Cross-country.
Xc Capacitive reactance.
XCP Except.
X/C Percentage of aerofoil chord.
XCSRA Cross-Channel Special Rules Area (UK).
XCTR Exciter.
XCVR, Xcwr Transceiver.
X/d Distance along jet as multiple of diameter.
XDM Experimental development model.
XDR 1 Extended [ie, high] data-rate.
2 External data representation.
xducer Transducer.
xenon Xe, inert gas, density 5.9 gl\(^{-1}\), BPT = 107°C, used in lasers and gas-discharge tubes; best fuel for ion propulsion.
xfer Transfer.
xfmr Transformer.
XFR, Xfr Transfer.
XFS, XFSs Auxiliary flight-service station.
XFX Exo-skeleton flying vehicle.
XG Centre of gravity (c.g. is preferred).
XGA Extra graphics array, 1,024 × 768 pixels.
XI Central office for warfighting integration (USAF).
Xj Chordwise position of a vertical web where i is web number 1, 2, 3 . . .
XID Exchange identification.
XIPS Xenon-ion propulsion system.
XIR

XIR  X-ray image recording
X.  Inductive reactance.
xt  Moment of total lift of aerodyne about c.g.
XLTR  Translator.
XM  1 Extra marker.
2 External master.
XMT[S]  Transmit[s].
XML  Extensible markup language.
XMM  X-ray multi-mirror [mission].
xmn  Transmission.
xm  Extra marker.
XMTR, xmt  Transmitter.
XN  Runway intersection.
Xn  1 Net thrust [at a specified condition].
2 The nth in-phase signal sample applied to digital filter during any one integration period.
XNG  Crossing.
XO  1 Executive officer (USN).
2 Plans and operations [executive order] (USAF).
XOE  Operational electronic-warfare branch.
XPC  External power connector, or contactor.
XPCD  Expected.
XPDR, xponder  ATC transponder.
XPD, XPDTR  XPDR.
XPS  X-ray photoelectron spectroscopy.
2 Extended-range.
XRD  X-ray diffractometer or diffractometry.
XRED  X-ray energy dispersion analysis.
XRF/NAA  X-ray fluorescence neutron-activation analysis.

Xylolite

XRL  X-ray laser.
XRT  X-ray telescope.
XS  1 Atmospherics (ICAO).
2 Code: SITA.
xsm  Transmission (both radio and helicopter dynamic parts).
xSS  1 Expendable sonobuoy [or sonar or sonic] sensor(s).
2 Experimental small satellite.
XST  1 Experimental survivable technology.
2 Experimental supersonic transport.
xtal  Crystal.
XTI  X/open transport interface.
XTK  Cross-track distance error.
XTRA  X-band thin radar array (AFRL).
XTP  Express transfer protocol.
XTRM  Extreme.
XUAV  Expendable UAV.
XUV  Experimental unmanned vehicle (USA).
XVGA  X-video graphics adapter.
XWg  Distance along OX axis of c.g. of wing and under-carriage (landing gear) from c.g. of complete aircraft.
X-wind  Crosswind, crosswind component.
X  Heavy [stormy] weather.
XXX  CW transmission for uncertainty or alert (Int.).
Xydar  Liquid-crystal thermostoplastic, good microwave transparency and often glass-reinforced (Dartco).
xylene  Family of toxic aromatic and inflammable hydrocarbons in some ways resembling benzene, with general formula C8H10, widely used as solvent; trade name Xylol.
Xylonite  Proprietary thermosetting material similar to Celluloid.
Y  Yaw, yaw angle.
  2 Lateral axis (strictly OY) or any measure or component along that axis, esp. lateral force [e.g., helicopter-rotor side force], or cross-stream distance in wind tunnel.
  3 Admittance.
  4 IATA symbol, tourist class.
  5 US DoD aircraft designation prefix; prototype/service-test quantity.
  6 Yttrium.
  7 Year (eg in FY, fiscal *).
  8 Adiabatic factor.
  9 Bessel function of the second kind.
  10 Induced pressure, eg caused by presence of jet.
  11 Rules governing change from IFR to visual.
  12 Prefix yotta, multiplied by $10^{24}$.
  13 Other meanings include yes (affirmative) and yellow.
  y  1 Vertical axis (ordinate) of cartesian coordinates or graphical figure.
  2 Any value measured parallel to (1) or any co-ordinate point measured along that axis.
  3 Admittance (Y is more common).
  4 Perpendicular distance from extreme [surface] fibre to neutral axis.
  5 Prefix yocto, $= \times 10^{-24}$.
  6 Maximum transverse deflection of a beam.
  7 Today often used instead of Y(2).
  8 1 Co-ordinate position of c.g. along OY axis (normally at or near origin).
  9 Sample average value.
  10 Spanwise c.p. position expressed as f (b/2).
  11 Spanwise location [distance from aircraft centreline] of centroid of wing area.
  Y, Y'  Lateral axis fixed relative to direction of flight.
  Y, y  Lateral axis relative to Earth or space.
  Y-alloys  British aluminium alloys originally developed by Rolls-Royce and HDA for pistons, typically with 4% Cu, 2% Ni, 1.5% Mg and other elements, which because of their retention of strength to 250–300°C were chosen as ruling materials for Concorde with names RR.58 (UK) and AU2GN (F).
  Y-connection  One end of all three coils of 3-phase electrical machine connected to common point while other ends constitute 3-phase line; alternative to delta, also called star.
  Y-cut crystal  Cut parallel to Z-axis, perpendicular to Y-axis; thus parallel to one face of hexagon.
  Y-duct  Leads from two [usually lateral] inlets to single engine.
  Y-loader  Trolley with manually pumped hydraulic jack for loading bombs and other stores, packing them up from stowage.
  Y-plates  Horizontally parallel deflector plates whose potential difference positions electron beam vertically in CRT.
  Y-scale  Scale along line of principal vertical in oblique reconnaissance imagery, or along any other line which on ground area shown would be parallel to this.
  Y-section  Structural section resembling Y, often with flanged or beaded edges.
  Y-service  Electronic intelligence (UK, WW2).
  Y-valve  Lube-oil drain valve from dry sump.
  Y-winding  See Y-connection.
  YAF  Yesterday’s Air Force, California (US).
  YAG, Yag  Yttrium aluminium garnet Y₃Al₅O₁₂.
  Yagi arial  Directional aerial comprising driven dipole, reflector and one or more (usually linear array) parasitic dipole directors spaced at 0.15–0.25 wavelength; maximum radiation is projected parallel to long axis.
  yard  Traditional Imperial unit of length = 0.9144 m exactly.
  yaw  Rotation of aircraft about vertical (OZ) axis; positive = clockwise seen from above; symbol $\psi$.
  yaw damper  Automatic subsystem in aeroplane (usually jet) FCS which senses onset of yaw and immediately applies corrective rudder to eliminate it. Early types were called parallel because they operated whole circuit including pedals; modern series ** has no effect on FCS further forward than fin (though sensing gyro may be near c.g.) and its activity is unnoticed by pilot. Most aircraft are flyable throughout virtually whole flight envelope with ** inoperative.
  yawed wing  Wing proceeding obliquely to relative wind; slewed wing.
  yaw guy  Cable along ground under mooring airship for attachment of yaw-guy wires.
  yaw-guy wires  Ropes or cables dropped from bow of airship before mooring for securing to yaw guys; these stop nose from swinging.
  yawhead  Yaw sensor, eg angled pitots, on pivoted vane.
  yawing moment  Moment tending to rotate aircraft about vertical OZ axis, symbol usually N = qSc$_\parallel$ where q is constant, S is wing area, c$_\parallel$ is mean chord and c$_n$ ** coefficient; measured positive if clockwise seen from above.
  yaw lines  Yaw-guy wires (US).
  yawmeter  Instrument or sensor for detecting yaw; can be simple device, eg yaw string or two or more pitot tubes at different inclinations whose pressure difference is sensed, or electronic gyro-fed subsystem.
  yaw pointing  Additional flight-control mode for some modern fighters in which yaw can be controlled without changing flight trajectory by varying sideslip angle while holding zero lateral acceleration. Usually achieved by deflecting vertical canard while linked to rudder(s) and roll-control surfaces. Gives much quicker and better gun-aiming.
  yaw stability  Tendency to reduce yaw to zero, also called weathercock stability. The derivative can be written C$_{y\beta}$.
  yaw string  Crude yawmeter comprising string, wool or other filament allowed to align with relative wind, eg ahead of windscreen.
  yaw vane  Small vertical aerofoil on long pivoted arm giving weathercock indication of yaw.
  Yb  Ytterbium.
YBC

YBC Years between calibrations.
YBCO Yttrium barium copper oxide.
YbYAG Ytterbium:YAG.
YC 1 Tourist class.
2 Yaw computer.
YCV Ship class: aircraft transportation lighter (USN).
YCZ Yellow caution zone (runway lighting).
YD, Y/D Yaw damper.
y Yards [rarely, yds].
yd Yards [rarely, yds].
YDA 1 Yesterday.
2 Yaw-damper actuator.
YDC Yaw-damper computer.
YE Young Engineers [Liphook, GU30 7AZ] (UK).
yellow General colour for caution [in many airborne and ground systems]; also called amber.
yellow arc Range on dial instrument indicating caution, or higher than normal.
yellow card 1 Formal warning to airshow participant following serious breach of rules or potentially serious flying error.
2 Warning notice from captain to passenger[s].
yellow caution zone Region (of runway or glideslope angle) marked by yellow or amber lights.
yellow gear/stuff Aircraft GSE vehicles on airfield or carrier (service trucks, tugs, dollies, handling and store-loading equipment).
yellow sector 1 Area on left of ILS centreline (on right if using back course).
2 Arc on traditional ASI which should not be entered in severe turbulence.
YES Youth and Education Strut (PFA).
yield 1 Explosive power of NW, measured in TNT equivalent weights and usually given as: very low, under 1 kt; low, 1–10 kt; medium, 10–50 kt; high, 50–500 kt; very high, over 500 kt (0.5 Mt).
2 Revenue per traffic unit, eg per tonne-km, pax-mile, etc.
yield factor of safety Specified factor used in some airworthiness requirements to prevent permanent deformation of structures.
yield load Limit load × yield factor of safety.
yield point Unit tensile stress at which deformation continues (to breakage) without further increase in applied load. Measured by loading specimen to point where a permanent set occurs, typically 0.2%. This is slightly higher than elastic limit and not normally approached in practice.
yield strength Unit stress corresponding to a specified permanent elongation, for light alloys usually taken as 0.2%.
yield stress Ambiguously, stress at yield point, which may be higher than at yield strength; except in the case of ductile materials that experience strain hardening, the greatest that material can reach.
YIG Yttrium indium garnet.
YL Year lease (suffix to two digits of year).
YM Young Members; B adds Board; S adds Section (RAeS).
YMS 1 Yield management system.
2 See YM.
Yn The nth quadrature signal sample applied to a digital filter during any one integration period.
yocto Prefix, multiplied by 10⁻²⁴, symbol y; see yotta.
yoder rolling Manufacture of complex sections by sequential precision rolling operations tailored to each section.
yoke 1 Control column of large aircraft in which roll input is by two laterally pivoted handgrips in form of a Y. Occasionally refers to a wheel or spectacle.
2 Main magnetic structure of electrical machine supporting poles and conveying flux round linkage on each side of armature.
3 Frame on which are wound CRT deflection coils, or case of high-permeability metal surrounding such coils.
4 Interconnecting cross-member or tie.
5 In particular, tie linking helicopter main-rotor blade to hub.
6 Forked mounting, eg passing both sides of nosewheel.
yoke clip Alternative name for yokemount.
yokemount On centre of handwheel or spectacle [eg, for document or notepad].
YOS Years of service.
YOT “You over there,” man in right-hand seat of side-by-side military cockpit (colloq.).
yotta Multiplied by 10⁻²⁴ symbol Y; see yocto.
Young-Heinrich Original theory of colour vision, based on receptors for red/green/blue.
Youngman flap Patented (Fairey) trailing-edge flap carried on struts below trailing edge and in addition to normal deflection also having a negative (usually –30°) setting for use as dive brake.
Young’s modulus Basic measure of material strength under tension, ratio of normal stress (within limit of proportionality) to strain, ie ratio of tensile load per unit cross-section area to elongation per unit length, within elastic limit, symbol E. SI units kN/m² or MN/m².
yo-yo Family of air-combat manoeuvres in horizontal and vertical planes intended to reduce angle-of-attack and thus prevent overshoot of defender’s turn. Hi-speed * trades speed for height, lo-speed * opposite.
YP Yield point.
YPA Young Pilots’ Association (UK).
YR Your.
yr Year.
YS Yield strength (or stress).
YSAS Yaw-stability augmentation system.
YSZ Yttria-stabilized zirconia.
Yt Side force due to asymmetric thrust.
Y τ Lateral offset distance of mean thrust.
YTD year to date.
YTS Youth training scheme (UK).
YTSX Cross-stream distance across test section (tunnel).
ytterbium Yb, silvery metal, density 6.97, MPT 824°C, increasing use in electronics and steels.
yttrium Y, soft silvery metal, density 4.47, MPT 1,522°C, used in alloys, glasses, semiconductors and YAG, YIG.
Y2K 2000 AD.
Y_2O_3 Yttrium oxide.
yuqing Uncommanded rapid unsteadiness, usually up/down and rocking movements, between aircraft in formation aerobatic team, usually caused by turbulence.
Yukawa potential Describes meson field about a nucleon.
Yv Force derivations on the fuselage; (Yv)B is due to the fuselage, (Yv)P is due to the fin, and (Yv)F is the actual aerodynamic side force.
YvX Cross-stream distance along vane set (tunnel).
Yvζ Y-zeta, side force due to rudder deflection.
Z.

1. Vertical (normal) axis (OZ), or any parameter measured along that axis or parallel to it, eg normal force (also called N by some authorities) or structural depth. In particular, geopotential altitude.

2. Impedance; unit, ohm.


4. Section modulus (also called S).

5. Time suffix: GMT = Zulu.


7. US military aircraft modified mission designation prefix: planning (ie still a project).


10. Fluid pressure-difference (dP) due to difference in level (in Earth gravity).

11. Viscosity relative to absolute viscosity of water.

12. Atomic number.

13. Reflectivity factor.

14. Tower.

15. Flight rules governing change visual to IFR.

16. Freezing rain.

17. Prefix zetta, = \times 10^{21}.

18. See Zwillling.

19. Co-ordinate position of c.g. measured along OZ normal axis.

20. Co-ordinate position of c.g. measured along OZ normal axis relative to Earth or space.

Z-axis See Z (1).

Z-battery Fired unguided anti-aircraft rockets (UK, WW2).

Z-beacon See Z-marker.

Z-correction Correction for coriolis applied by moving celestial fix or PL at 90° to track (ASCC).

Z-fibre Process for curing laminates through which are passed small-diameter pins of pultruded CF or other material.

Z-harness See Z-type.

Z-Hud, Z-HUD HUD whose main optical power is a reflector subtending <10° from optical axis, reducing aberrations, and forming exit pupil in front of pilot’s eye.

Z-marker Also called station locator, former fan or cone marker filling radio-range cone of silence, typically with audible 3 MHz tone (suggest obsolete).

Z-meter Impedance meter.

Z-mill Sendzimir [steel rolling mill].

Z-optics Device in which optical path has shape of Z, as in Z-Hud.

Z-ring Sharp zigzag discontinuity in wall of combustion chamber [usually of gas turbine] containing numerous perforations admitting cooling air.

Z-scale Scale used in calculating height of object in oblique reconnaissance image.

Z-section Structural section in general form resembling Z, often with flanged or beaded edges and all angles 90°.

Z-Stoff Aqueous solution of calcium (rarely sodium) permanganate (G, WW2).

Z-technology IR sensor staring focal-plane array using chips along Z-axis.

Z-type harness Almost universal seat harness for military aircrew with four straps joined to common quick-release box.

ZA 1. Zone aerial (antenna).

2. Zenitnaya artilleriya, AA gun (USSR, R).

3. Zinc/air [battery].

ZAB Incendiary bomb or warhead (USSR, R).

ZAD Zone Aérienne de Défense (west, NE and SE, under Cofa, F).

Zahn cup Container with calibrated hole for measurement of liquid viscosity.

Zamak Family of Zn-based die-casting and stamping alloys, some of them important for rubber-press dies.

ZAO Zakrytoe Aktionernoye Obshchestvo, company constitution (R).

ZAP Box or dispenser of ZABs (USSR, R).

zap 1. To smash or render unserviceable (colloq.).

2. To adorn visiting friendly combat aircraft from competitor unit with unauthorized insignia or paint scheme.

3. To disable a (usually aerial) target in one pass.

Zapp flap Early form of trailing-edge flap resembling split type but with leading edge translated aft along guides and with pivoted arms holding surface at about mid-chord; thus small hinge moment or operating force.

ZAR 1. Zero-airspeed radius, at which retreating blade of helicopter is at rest with respect to local airflow.

2. Zeus acquisition radar.

ZAW Zentralausschuss der Werbewirtschaft (G).

Zbrozek corrections Refinements to alleviation factor.

ZBTA Zinc-base trial alloy; cheap material for NC alloys, some of them important for rubber-press dies.

Zcement, Z-Cement Zero CO\textsubscript{2} emissions.

ZD 1. Zero defects.

2. Zone de Défense (F, five departments in Pacific and Caribbean).


Zo Moment arm of total drag about c.g., ie vertical distance from drag resultant to c.g.

ZDA Zone défense aérienne (F, now RAs).

ZDS Zonal drying system.

ZEDS Zonal electrical distribution system of future CV.

Zeeman Effect in which line spectra, eg of incandescent gas, are each split up into two or more components by passage through magnetic field.

Zell, ZEL Zero-length launching, or to make such a launch; hence zelling.

Zemal Zero-length launch and flexible-mat landing.
zener current

That flowing in insulator in electrical field sufficiently intense to excite electrons direct from valence to conduction.

zener diode

Si junction diode having specific peak inverse voltage, at which point it breaks down and suddenly allows flow.

zero voltage

Field strength needed to initiate zener current, about 10^4 V/mm.

That associated with reverse-VA of semiconductor, more or less constant over wide range of current.

zenith

Point on celestial sphere directly overhead. Strictly this is observer’s; astronomical * is where plumb-line would intersect celestial sphere, and geographical * is where line perpendicular to smooth Earth would do so. These are not all synonymous.

zenith distance

Angular distance from celestial body to zenith.

zenographic

Of positions on surface of Jupiter, referred to planet’s equator and specified reference meridian.

zeolite

Natural hydrated silicate of Ca and Al; catalyst used in Obogs filter beds.

zeorin

Light warm westerly wind [Mediterraneon].

zeppelin

Though a proper name, often used to mean Self-forging fragment submunition (G).

zeplin

Monolithic, made in one piece.

zepto

Multiplied by 10^-23, symbol z; see zetta.

zero defects

Conceptual (sometimes attainable) goal of zero-draft forging stroke.

zero-delivery pressure

In delivery line of variable-displacement pump at normal operating speed with zero stroke.

zero-draft forging

One without draft, ie to finish any rigid airship.

zero dur

Glass ceramic with very low coefficient of expansion; used for LINs.

zero-force separation

Interstage separation in which all mechanical links have already been broken, including all electrical connectors, etc.

zero-fuel weight

MTOW minus total usable-fuel weight; usually limiting case for wing bending moment because wings are empty and fuselage is full. One symbol is W_e.

zero-g

Free-fall, weightlessness; or in deep space remote from massive bodies.

zero gross gradient

Altitude at which gross climb gradient (all engines operating, corrected for anti-icing) is zero.

zero

Zero-spiral angle bevel gear.

zero lash

Mechanism adjusted until there is no play or backlash, eg by using hydraulic valve lifters in piston engine.

zero-length launch

Launching of vehicle from aircraft or surface launcher in such a way that it is free as soon as it begins to move; in case of aircraft rockets, hung on clips instead of being accelerated along tubes or rails; for surface launch, thrust away by rocket boost motors whose vertical component is greater than weight. Sometimes abb. to zero-launch; usually abb. Zell, * launch(ing).

zero-lifted

Restored to new condition after having been service; applies esp. to airframe or engine and follows meticuluous inspection and rectification such that flight-time count may legally be restarted.

zero lift

Angle of attack at which aerofoil generates neither positive nor negative lift, ie no force normal to airstream; usually an obvious negative AOA for traditional cambered wing at below M_{I/c} but for supersonic wing can be positive angle.

zero lift line

Drawn through trailing edge of aerofoil parallel to relative wind when lift is zero.

zero meridian

Prime Meridian, 0° longitude.

zero point

Location of centre of NW at moment of detonation; usually above or below ground zero.

zero-power transfer switch

Automatically switches load when waveform is passing through zero.

zero-range ring

Circular arc forming range origin of most weather radars, and many other polar-type displays (most unusual to have origin as point).

zero rate of climb speed

TAS at which, for an established engine power [not necessarily maximum], drag reduces climb gradient to zero.

zero Reader

Pioneer (Sperry) flight instrument with cross-pointers driven by various selectable sensors to control trajectory (vertical and lateral displacement), pilot steering aircraft so that both needles cross at origin of display in method first used on ILS meter. In most respects similar to ILS meter that can accept inputs from en route navails and attitude sensors.

zero-splice

Monolithic, made in one piece.

zero stage

Extra axial stage added on front of existing multi-stage axial compressor in new uprated version of gas-turbine engine; can be overhung ahead of front bearing and may or may not be preceded by inlet guide vanes. Hence, more rarely, zero-** (for a second additional upstream stage).

zero-thrust pitch

Distance propeller advances in one revolution when operating at normal speed but moved through still air by external force so that it generates no thrust; also called exponential mean pitch.

zero-timed

Engine overhauled to Service limits, less rigorous than factory-remastered.

zero-torque pitch

Distance propeller advances in one revolution when moved through still air by external force at such a speed that its drive torque is zero; ie when windmilling in frictionless bearings. Symbol P_e.

zero landing

Totally blind helicopter landing enveloped in snow.

zero seat

Ejection seat qualified for operation at zero height, zero airspeed; ie pilot can safely eject from parked aircraft.

zero stage

See zero stage.

Zerstörer

Destroyer, large or long-range fighter (G, WW2).

ZFGW

Zero-fuel gross weight [= ZFW].

ZFT

Zero flight time (of hardware, or pilot recurrent training or type-conversion entirely on simulator).

ZGW

Zero-fuel weight.

ZG

Zero gravity (also Z-g).

ZG

Zero gravity (also Z-g).
ZHR

ZHR  Zenithal hourly rate (measure of meteor shower).

ZHAn  See Z-HUD.

Zhukovsky theory  Original (1907) description of airflow round wing in which viscous effects transmit disturbance far from solid surface and lift is direct function of airflow.

ZI  Zone of the Interior (US).

zinc  Zn, blue-white metal, density 6.92, MPt 907°C, cheap and important in alloys for casting (esp. die-casting) and dies, forms blocks and other press tooling, see Prestal, and in surface galvanizing, and electric batteries (see next).

zinc/air  Electrical battery in which KOH (potassium hydroxide) electrolyte is pumped through cell with Zn cathode (converted to oxide) and anode of porous Ni through which is pumped air (oxygen). Much higher energy density than lead/acid.

zinc chromate  ZnCrO₄, yellow pigment used as basis for yellow-green * primer; mixed with alkyl resins to give strongly adhering anticorrosive treatment almost universal in metal aircraft construction whose chromate ions are released by moisture.

zinc sulfide  ZnS, important phosphor in electronic screens and lighting.

zipper  Snag (US colloq., especially in air combat).

zip fuel  Exotic or high-energy fuel for airbreathing engines, esp. ethyl diborane and other liquids based on boron compounds.

ZIPPO  Zone indicate [or indicating] position officer [helicopter landing].

zipped, zipped up  Blast/radiation shields in place over all glazed areas of bomber after release of NW.

Zipper  * Target CAP (combat air patrol) at dawn or dusk (DoD).

2 ZIPPO.

ZIPS  See XIPS.

zip strap  Sharp-edge adhesive sealing strip covering gap or joint in LO aircraft, renewed after maintenance.

zipstring  Something simple and cheap.

zirconia  Zirconium oxide ZrO₂, important refractory (MPt 2,500°C) ceramic and abrasive.

zirconium  Zr, white, ductile metal, density 6.48, MPt 1,857°C; important as alloying element and in nuclear applications.

ZL  Freezing drizzle.

2 ZL  Zero-lift.

ZLA  Zero-lift angle.

ZLa  Zero-lift angle of attack.

ZLBH  Zero-lifed bare hull.

ZLDI  Zentralebstatnelle fur Luft- und Raumfahrt-dokumentation und Info (G).

ZM  Z-marker, v.h.f. station location.

2 Zettametre, see zetta.

zm  Zephtometre, see zepht.

Zun  Maximum operating height [usually expressed in feet].

ZN  Azimuth.

Zn  Zinc.

ZNKJRK  All-Japan Air Transport and Service Association.

ZnSe  Zinc selenide.

Zc  Drift (1).

ZOC  Zone of convergence (Eurocontrol).

zodiac  Band of celestial sphere centred on ecliptic extending 8° on either side and containing Sun, Moon and all planets used for navigation purposes (except, sometimes, Venus).

zodiacal counterglow  See gegenschein.

zodiacal light  Faint cone of light seen (esp. in tropics) pointing towards ecliptic after sunset or before sunrise.

ZOE  Zone of exclusion.

zogging  Directing accompanying aircraft by means of hand signals [from 1915] (UK).

ZOH  Zero-order hold in FCS sampling.

ZOK  Factory for experimental construction (USSR).

Zombie  Soviet strategic-reconnaissance aircraft intruding [legally] into Western airspace.

ZOMP  Weapon(s) of mass destruction (USSR).

zonal comfort system  Use of evaporative cooling to manage moisture in passenger compartment (trademark, CTT).

Zonal Drying  Removal of water condensate from thermal and acoustic insulation of transport aircraft (CTT).

zonal wind  In N hemisphere, wind’s westerly component.

Zone 1, 2 and 3  Surface skin areas whose smoothness and perfect profile are of high [1], medium [2] or low [3] sensitivity for causing aerodynamic drag.

zone 1  Administrative region of airspace, esp. controlled airspace.

2 Portion of drawing (see zoning).

3 Quadrant of radio range, portions of (early-type) Decca coverage and other navaid subdivisions.

4 Sector of Earth sharing common time, bounded by two standard meridians; there are 24.

5 Circular areas centred on NW explosion: I, within MSD (minimum safe distance), within which all friendly forces evacuated; II, all personnel maximum protection; III, minimum protection.

6 Regions of aircraft surface: * 3 combines thick boundary layer with modest local flow velocity; * 2 is intermediate; * 1 combines thin boundary layer with high local velocity, and is acutely sensitive to any disturbance [eg, caused by a rivet head].

7 Portion of aircraft/spacecraft with separately controllable ECS.

zone marker  See Z-marker.

zone numbers  Those locating an item on zoned drawing.

zone of intersection  Portion of civil airway overlapping or lying within any other airway (US chiefly, eg CAR 60,104).

zone of protection  Within cone of 45° total apex angle whose apex is top of lightning conductor (eg on airport building or tower).

zone signals  Radio-range quadrant signals (see zone [3]).

zone time  Civil time of meridian passing through centre of a time zone.

2 Time kept in sea areas in 15° zone of longitude or multiple of 15° from prime meridian (ASCC).

zoning 1 Dividing large engineering drawing into numbered/lettered grid so that items can more quickly be located by assigning each a grid reference.

2 Division of parts of aircraft into *, esp. for fire-protection purposes.

3 “Delimitation of areas surrounding an aerodrome to permit freedom of flight to aircraft approaching and leaving” [1936, suggest archae].
**Abnormally steep climb trading speed for height; applies chiefly to majority of aeroplanes whose T/W ratio is much less than 1 even at near SL; normally a manoeuvre in low-level display flying.**

2 Optimized steep climb by high-performance jet (which at SL might have T/W greater than 1, and thus could make sustained climb at 90°) at high altitude, normally starting at maximum level Mach, trading speed for height in order to reach exceptional height far above sustained level ceiling.

3 To enlarge or reduce image of object in TV, video, camera, etc, using lens of continuously variable focal length (* lens).

4 In air-combat, unloaded low-alpha climb to gain maximum height for minimum dissipation of energy.

**zoom boundary** Limits of flight envelope (in which ordinate is altitude) attained by zooming (see zoom [2]).

**zoom ceiling** That attained with a zoom (2).

**zoom climb** Zoom (1); second word redundant.

**zoom domain** The extension of the design envelope above the 1g ceiling which can be reached in a zoom.

**Zorflex** Activated-charcoal cloth (CCI).

**ZOS** Zone of separation.

**ZP** Zone of protection.

**ZPI** Zone position indicator radar.

**ZPU** Hostile AAA using close-range automatic weapons (US colloq., from a Soviet 14.5 mm AA gun designation).

**ZR** Freezing rain.

2 Zemětina měkká = SAM; K adds system, PVO has its own entry, SD adds medium-range, V troops (USSR, R).
Appendix 1:

Greek symbols

The following are some of the aerospace usages of letters of the Greek alphabet. In almost all cases the meaning is refined by a selection of suffixes or other additions.

\( \alpha \) (alpha)  1 Angle of attack, or tilt angle of primary nozzle \( (\alpha) \), AOA rate; \( \alpha_{eb} \), relative to fuselage reference line; \( \alpha_e \), effective; \( \alpha_{10b} \), induced \( \alpha_{geo} \), geometric; \( \alpha_w \), difference in AOA between wing and horizontal tail, \( \alpha_i \) also aerofoil at zero lift.

2 Generalized symbol for acceleration, angular as well as linear.
3 Absorption factor.
4 Propeller or compressor axial inflow factor.
5 Decay or attenuation coefficient (radio).
6 Coefficient of linear thermal expansion.
7 Degree of dissociation.
8 As subscript, free-stream conditions.
9 See Alpha eta rho in body of dictionary.

\( \beta \) (beta)  1 Angle of sideslip \( (\beta) \), sideslip rate.
2 Angle between fluid and tangentially moving blade; pitch angle; \( \beta_h \), helicopter coning angle.
3 Particular operating regime of propeller when pilot selects pitch directly (available on ground only).
4 Angle of incidence of tailplane relative to main wing.
5 Angle of yaw (airships).
6 Coefficient of cubic thermal expansion \( \gamma \) preferred.
7 Luminance factor.
8 Diffuser angle.
9 Angle between thrust line and body datum.
10 Tip-back angle.
11 Helical-gear skew angle.

\( \gamma \) (gamma)  1 Ratio of specific heats of gas (at constant pressure and constant volume).
2 Surface tension.
3 Dihedral angle.
4 Flight path (or gliding) angle, relative to horizontal: common suffixes are: c, climb; CMD, commanded by pilot; CON, commanded by an AFCS; D, d, dive or descent; DISP, displayed in cockpit; S, corrected to sea level.
5 Electrical conductivity.
6 Free-stream velocity (non-dimensional).
7 Magnetometer field strength, in MAD operations usually \( \approx 10^{-1} \) oersted.
8 Coefficient of cubic thermal expansion.
9 Shear strain (also \( \phi \)).
10 Suffix TiAl, low-density titanium aluminide \( (<350^\circ C) \).
11 Second Townsend coefficient.
12 Confusingly, some aerodynamicsists use this lower-case symbol for circulation, vortex strength.
13 Aspect ratio (width/length) of cut-out in uniformly loaded panel.

14 Often used for density.
15 Lock number.

\( \Gamma \) (capital gamma)  1 Circulation, vortex strength, rotation in fluid flow. Thus, \( \Gamma_i \) is wing-tip vortex.
2 Gamma function (mathematics).
3 Momentum conservation along streamlines.
4 Dihedral angle \( \gamma \) more common.

\( \delta \) (delta)  1 Small increment.
2 Control-surface or jet-deflection angle or deflection angle across shockwave \( \delta_s \) often used for aileron, \( \delta_e \) for elevator, but see other letters for angles of individual surfaces or bevel-gear cone angle. Suffix F for USB, flap deflection angle, TE flaperon.
3 Unit elongation or structural deflection.
4 Atmospheric pressure ratio, or relative pressure.
5 Slope of runway.
6 Boundary-layer thickness.
7 Blade elementary drag coefficient, suffixes A/E/F for aileron/elevator/flap.
8 \( \delta_{3b}, \delta_{5T} \), maximum vertical deflection of shock strut (MS) and tire [tyre] (MT) on landing.

\( \Delta \) (capital delta)  1 Generalized prefix, difference, differential.
2 Deflection of panel point of truss.
3 Increment, not necessarily small; thus \( \Delta_s \) for fuel.
4 Load on water, hydrostatic lift.
5 Ax change in local AOA due to roll.
6 Offset from datum or desired value.
7 Suffix 3 or H, Diamond tail rotor.
8 Suffix \( \tau \) = time difference.
9 Differential pressure, i.e. relative to local atmosphere.

\( \nabla \) Operator del (mathematics).

\( \epsilon \) (epsilon)  1 Angle of downwash. For a wing, often written \( \epsilon_{\alpha} \) for a propeller blade, most notation uses \( \epsilon_{\delta} \) for total angle at radius \( r \), \( \epsilon_{\alpha} \), advance angle and \( \epsilon_{\delta} \), induced angle.
2 Permittivity (dielectric constant).
3 Eccentricity (or suffix) eccentric load.
4 Emissivity.
5 Strain, direct \( (\epsilon_0) \).
6 \( \epsilon_e \), Elevator effectiveness.
7 \( \epsilon_u \), Angle of upwash.
8 \( \epsilon_s \), Wash-in or washout.
9 Complementary angle to sweepback, angle between leading edge and aircraft centreline.

\( \zeta \) (zeta)  1 Rudder angle; or helicopter rotor blade-lag angle.
2 Damping ratio.
3 Electrokinetic potential.
Appendix 1

\( \eta \) (eta) Generalized symbol for efficiency, with suffixes indicating which, eg \( \eta_a \), antenna aperture, \( \eta_m \), mechanical, \( \eta_p \), overall, \( \eta_r \), propulsive, \( \eta_t \), radiation, \( \eta_h \), thermal, or tailplane setting angle, \( \eta \), volumetric.

2 Elevator angle.
3 Ratio of wing lifts (biplane).
4 Electrolytic polarization.
5 Dynamic viscosity [\( \mu \) is more common].
6 Normalized incremental coefficient of backscatter.
7 First Townsend coefficient.
8 Fraction of semi-span \( 2y/b \).

\( \theta \) (theta) Generalized symbol for bearing, azimuth direction, angular distance, birdstrike impact angle, polar co-ordinate angle, etc, denoted by suffixes \( a \) [azimuth], \( e \) [elevation], etc.

2 Angle of pitch (all meanings, eg fuselage attitude, propeller or rotor blade, etc); subscripts many, eg \( b \), blade \( \theta \) elevation, etc.

3 Co-ordinate angle, etc, denoted by suffixes \( a \) [azimuth], \( e \) [elevation], etc.

4 Bearing and range.

5 Subscript 3dB; 3dB antenna beamwidth.

6 Subscript R, deflection of rear nozzle(s).

7 Subscript F, deflection of forward nozzle(s).

8 Subscript e, scan width in elevation.

9 Subscript a, scan width in azimuth.

10 Subscript XG, inclination of total gross thrust vector to flight path.

11 \( \lambda \) (lambda) Equivalent spring rate or stiffness.

12 Area ratio of wing \( S/b^2 \); also taper ratio, tip/root chord.

13 Damping coefficient.

14 Scale ratio (model: full size).

15 Thermal conductivity [also \( k \)].

16 Longitude (terrestrial or celestial).

17 Solid rocket volumetric loading.

18 Eigenvalues, with suffixes such as \( \phi \) = phugoid mode, \( s \) = short-period.

19 Aerodynamic pitch of propeller.

20 Landing-gear reaction factor.

21 \( k_c \), Compton wavelength.

22 Angle of sweepback, measured at 0.25 chord; if leading or trailing edge, with subscripts \( LE \), \( TE \).

23 Permeance.

24 Ionic/molar conductance.

25 Generalized prefix, micro \( \times 10^{-6} \), one millionth, \( \mu m = 10^{-6} \) metre.

26 Without any other symbol, micrometre or micron.

27 Coefficient of friction.

28 Permeability; \( \mu_b \), of vacuum.

29 Joule-Thomson coefficient.

30 Dynamic viscosity.

31 Aircraft velocity (non-dimensional).

32 Ratio of spans (biplane).

33 Amplification factor (radio).

34 Relative density of aircraft (aerodyne); \( \mu_i \), in response to a gust.

35 \( \Gamma \), specific fuel consumption of jet engine (normally air-breathing). Not to be confused with fact that sfc of shaft-drive engines is measured in \( \mu g/J \) (microgrammes per joule).


37 Engine bypass ratio.

38 Subscript FORS, microfibreoptic rate sensors.

39 \( \mu_s \), microsecond[s].

40 Refractive index.

41 Diffusion coefficient of a stressed panel.

42 Mass per unit length.

43 In the US, Poisson’s ratio [elsewhere, \( \nu \)].

44 Kinematic viscosity; suffix \( \nu \), effective turbulent.

45 Wave, or phase, velocity.

46 Reluctance, reluctivity.

47 Number of molecules (stoichiometric); \( v_c \), molecular diffusivity.

48 Frequency in \( s^{-1} \).

49 Poisson’s ratio.

50 \( \nu \), wave number (also \( v \)).

51 \( \xi \) (xi) Aileron angle.

52 Damping, for each mode; \( \xi \) is average.

53 Shielding factor of spacecraft.

54 (omicron) Too like \( \sigma \) to be used separately.

55 \( \pi \) (pi) Ratio of circumference of circle to diameter, \( 3.141592653 \).

56 Solar parallax.

57 Generalized multiplying factor in failure-rate analysis.

58 (capital pi) Generalized symbol for a product (math).

59 Often italic, osmotic pressure.

60 Generalized symbol for density; \( \rho_a \), air density at SL.

61 Radius of curvature.

62 Resistivity.

63 Reflection factor, reflectance.

64 Electric charge density (MHD, C/m³).

65 Relative density, eg to standard atmosphere, \( \rho/(\rho_o) \).
Appendix 1

Poisson’s ratio (ν preferred).
Prandtl interference factor (biplane).
Stefan-Boltzmann constant.
Electrical conductivity.
Velocity error, eg in INS readout.
Standard deviation.
Normal stress (also f); at least 15 variations, with suffixes; also surface tension (γ more common).
Radar cross-section.
Subscript zero, incremental backscatter coefficient.
Generalized symbol for solidity.
Ratio of chordwise position of leading edge at tip to length of root chord.
Subscript y, aircraft response to gust or turbulence.
Subscript H, Hertz pressure.
Σ (capital sigma) Generalized symbol for a summation.
τ (tau) 1 Temperature (also θ).
2 Transmission factor or coefficient.
3 Shear stress in fluid (also q).
4 Period (growth or decay), or time delay; also translational time response, distance constant divided by TAS.
5 Radar pulse width [subscript comp, compressed pulse width].

υ (upsilon) No aerospace meanings, loosely used interchangeably with v.

φ (phi) 1 Generalized function symbol.
2 Angle of bank or roll.
3 Angle between flight path and local horizontal; also induced angle of attack.
4 Slope of runway.
5 Rotor inflow angle.
6 Effective helix angle.
7 Latitude, terrestrial, celestial etc.
8 Shear strain (also γ, also called fluidity).
9 Polar co-ordinate angle.
10 Radiant [luminous] or magnetic flux (also capital).
11 Entropy.
12 Velocity potential.
13 Phase displacement (also θ); subscript m, phase margin.
14 Cos φ, electrical power factor.
15 Flight-control input frequency.
16 Wagner function.

Φ (capital phi) J Flux, magnetic or luminous.
2 Thrust or lift augmentation ratio in ejector.
3 Phase angle between input signal and polar coordinates of digital filter.
4 Φ Frequency difference between input signal and digital filter.
5 φ, Power spectral density.

Υ (psi) 1 Stream function.
2 Angle of yaw.
3 Azimuth angle.
4 Electrostatic, dielectric or luminous flux.
5 Helmholtz free energy.
6 Sweep angle of fin (vertical stabilizer), often with suffix number giving % chord of point of measurement.
7 Helicopter rotor-blade azimuth position, or Küssner function.
8 Rate of turn [°/s].

Ψ (capital psi) Electric flux.
Ψ w Age of a wake, especially from a rotating blade.
ω (omega) 1 Frequency (suffix c, carrier; n, natural or damped; r, resonant).
2 Angular velocity in rad/s.
3 Vorticity.
4 ω Specific weight, esp. piston engines.
5 ω, Gust frequency.

Ω (capital omega) 1 Ohms resistance.
2 Resultant velocity.
3 Solid angle (also θ).
4 Angular velocity, or rotational frequency, e.g. of helicopter rotor, or vorticity.
5 Turn rate, essentially same as 4.
6 Spatial frequency, ω divided by TAS.
Ω Ohm-second, = henry.
Ω Spin rate, rad/s.
Ω Conductance.
Appendix 2:

Powers of 10

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y yotta</td>
<td>$\times 10^{24}$</td>
</tr>
<tr>
<td>Z zetta</td>
<td>$\times 10^{21}$</td>
</tr>
<tr>
<td>E exa</td>
<td>$\times 10^{18}$</td>
</tr>
<tr>
<td>P peta</td>
<td>$\times 10^{15}$</td>
</tr>
<tr>
<td>T tera</td>
<td>$\times 10^{12}$</td>
</tr>
<tr>
<td>G giga</td>
<td>$\times 10^9$</td>
</tr>
<tr>
<td>M mega</td>
<td>$\times 10^6$</td>
</tr>
<tr>
<td>k kilo</td>
<td>$\times 10^3$</td>
</tr>
<tr>
<td>h hecto</td>
<td>$\times 10^2$</td>
</tr>
<tr>
<td>da deca</td>
<td>$\times 10$</td>
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<tr>
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<td>$\times 10^{-1}$</td>
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<tr>
<td>c centi</td>
<td>$\times 10^{-2}$</td>
</tr>
<tr>
<td>m milli</td>
<td>$\times 10^{-3}$</td>
</tr>
<tr>
<td>µ micro</td>
<td>$\times 10^{-6}$</td>
</tr>
<tr>
<td>n nano</td>
<td>$\times 10^{-9}$</td>
</tr>
<tr>
<td>p pico</td>
<td>$\times 10^{-12}$</td>
</tr>
<tr>
<td>f femto</td>
<td>$\times 10^{-15}$</td>
</tr>
<tr>
<td>a atto</td>
<td>$\times 10^{-18}$</td>
</tr>
<tr>
<td>z zepto</td>
<td>$\times 10^{-21}$</td>
</tr>
<tr>
<td>y yocto</td>
<td>$\times 10^{-24}$</td>
</tr>
</tbody>
</table>

[Other symbols]

$\times$ Available quickly on receipt of request.

§ Facility available if arrangements are made [suggest days] prior to takeoff.

% Emergency frequency [monitored].

%X Emergency frequency [available but not monitored].

‡ Times UTC but varied by DST [daylight-saving time].
Appendix 3:

Electromagnetic frequency bands

For convenience, the EM frequency spectrum has been divided up into arbitrary ‘bands’, each of which has been allotted an identifying number (radio) or letter (radar):

**Radio**

The following terminology is that agreed by the CCIR:

- **Band 4**, v.l.f. (very low frequency), 3–30 kHz; Band 5, l.f., 30–300 kHz; Band 6, m.f. (medium), 300–3,000 kHz (3 MHz); Band 7, h.f. (high), 3–30 MHz; Band 8, v.h.f. (very high), 30–300 MHz; Band 9, u.h.f. (ultra-high), 300–3,000 MHz (3 GHz); Band 10, s.h.f. (super-high), 3–30 GHz; Band 11, c.h.f. (extremely high), 30–300 GHz; Band 12 (awaiting a name), 300–3,000 GHz (3 THz).

**Radar**

During World War 2, to assist security, radar wavebands were given arbitrary letters: P-band, 0.225–0.39 GHz; L, 0.39–1.55; S, 1.55–5.2; X, 5.2–10.9; K, 10.9–36; Q, 36–46; V, 46–56.

From 1946 several schemes proliferated. For radar, one authority divided the spectrum into convenient wavelengths, resulting in (figures rounded off): L, 1–2 GHz; S, 2–4; C, 4–8; X, 8–13 [in US sometimes 12.5]; Q (changed to Ku), 13–20; K, 20–30; Ka, 30–40.

European usage centred on: P, 80–390 MHz; L, 390–2,500 MHz (2.5 GHz); S, 2.5–4.1 GHz; C, 4.1–7.0 GHz; X, 7.0–11.5 GHz; J, 11.5–18.0 GHz; K, 18–33 GHz; O, 33–40 GHz; Q, 40–60 GHz; V, 60–90 GHz.

The ITU refined this to the following, now [from 1984] actually nominated for worldwide use: v.h.f., 138–144 and 470–512 MHz; C, 420–450 and 890–942 MHz; L, 1.215–1.4 GHz; S, 2.3–2.5 GHz; C, 5.25–5.925 GHz; X, 8.5–10.68 GHz; Ku, 13.4–14.0 and 15.7–17.7 GHz; K, 24.05–24.25 GHz; Ka, 33.4–36.0 GHz; V, 59–64 GHz; W, 76–81 GHz; 92–100 GHz; mm, 126–142, 144–149, 231–235 and 238–248 GHz.

A different rationalized version has been adopted for space communications (not with GPS):

- L, 0.39–1.55 GHz; S, 1.55–5.2 GHz; C [overlapping S and X], 3.7–6.2 GHz; X, 5.2–10.9 GHz; Ku, 15.35–17.25 GHz; K, 10.9–36.0 GHz; Ka, 33–36 GHz.

In 1977 the US introduced a supposed definitive system covering an expanded range. This was adopted for electronic countermeasures, but the ‘old’ systems are still commonly used for military radar:

- h.f., 10–30 MHz; v.h.f., 30–100 MHz; A, 100–300 MHz; B, 300–500 MHz (0.5 GHz); D, 1–2 GHz; E, 2–3 GHz; F, 3–4 GHz; G, 4–6 GHz; H, 6–8 GHz; I, 8–10 GHz; J, 10–20 GHz; K, 20–40 GHz; L, 40–60 GHz; M, 60–100 GHz.

This system was adopted by NATO, but with the longer wavelengths changed to: A, 0–250 MHz; B, 250–500 MHz.

**Light**

For completeness, at frequencies higher than those listed above, the microwaves of radar give way to IR (infra-red). From this point it is more common to cite wavelength, the reciprocal of frequency. IR covers a range of wavelengths roughly extending from 100 μ (10⁻⁴ m) down to 0.75 μ. As wavelength is reduced further, the light becomes visible to the human eye, disappearing again into the UV (ultraviolet) at about 0.75 μ.
For the purpose of homologating records the FAI groups all aircraft into the following categories:

A (Free balloons)
AA Gas balloons,
AM Mixed (hot air plus gas),
AX Hot air. The following suffix numbers indicate envelope volume:
1 up to 250 m³, 2 250–400,
3 400–600, 4 600–900,
5 900–1,200, 6 1,200–1,600,
7 1,600–2,200, 8 2,200–3,000,
9 3,000–4,000, 10 4,000–6,000,
11 6,000–9,000, 12 9,000–12,000,
13 12,000–16,000, 14 16,000–22,000,
15 22,000+.

B (Dirigibles)
BA Gas filled
BM Mixed
BX Hot-air airships, suffixes:
3 900–1,600 m³, 4 1,600–3,000,
5 3,000–6,000, 6 6,000–12,000,
7 12,000–25,000, 8 25,000–50,000,
9 50,000–100,000, 10 100,000+.

C (Aeroplanes)
Group I Piston-engined.
C-1-a/o Landplanes up to 300 kg empty weight,
C-1-a 300–500, b 500–1,000,
C-1-c 1,000–1,750, e 1,750–3,000,
C-1-d 3,000–6,000, f 6,000–8,000.
C-2 Seaplanes. a up to 600 kg,
b 600–1,200, c 1,200–2,100,
d 2,100–3,400.
C-3 Amphibians. Weight classes as C-2.

Group II Turboprops. As Group I plus
C-1-g 8,000–12,000 kg, h 12,000–16,000,
C-1-i 16,000–20,000, j 20,000–25,000.

Group III Turbojets and turbofans. As above plus
C-1-k 25,000–35,000 kg, l 35,000–45,000,
C-1-m 45,000–55,000.

Group IV Rocket aircraft. As Group I.

D (Giders):
D-1 Single-seat, D-2 Multi-seat.

DM (Motor-giders):
DM-1 Single-seat, DM-2 multi-seat.

E (Rotorcraft)
E-1 Land rotocraft. Weight categories as for Group I landplanes.
E-2 Convertiplanes, E-3 Autogyros, E-4 Vertiplanes.

F (Model aircraft): Various subsections.

G (Parachuting): Various subsections.

H (Jet-lift VTOL aircraft): This section is growing.

I (Human-powered aircraft)

K (Spacecraft): Various types of mission.

M (Tilt-wing/engine aircraft)

N (STOL aircraft): The FAI is having difficulty in drawing demarcation lines for this category.

O (Hang-giders and paragliders): Various subsections.


R (Microlights): Category new in 1985, various subsections.

S (Space models): Category new in 1999.

Appendix 5:

Phonetic alphabets

Early radios suffered severely from interference, which often made messages almost impossible to understand. The meaning was greatly clarified by inventing a word to confirm each letter, as far as possible with no two words sounding similar. Even with modern clear electronic communications a phonetic alphabet is often helpful. The following alphabets are those used in English-language aviation:

**UK usage 1912 to October 1942**
- Johnny
- King
- London
- Monkey
- Nuts
- Orange
- Pip
- Queen, or Queenie
- Robert

**US/UK Combined Phonetic Alphabet October 1942**
- Johnny
- King
- London
- Monkey
- Nuts
- Orange
- Pip
- Queen, or Queenie
- Robert

**ICAO, from 1952**
- Juliet, in US often Juliett
- Kilo
- Lima
- Mike
- Oscar
- Papa
- Quebec
- Romeo

There are many such phonetic alphabets. The following is one used by German-speakers:
- Heinrich
- Ida
- Josef
- Kurfürst
- Ludwig
- Martha
- Nordpol
- Otto
- Paula
- Quelle
- Richard

- Sugar
- Toc
- Uncle
- Vic
- William
- X-ray
- Yorker, later York
- Zebra

- Sugar
- Tare
- Uncle
- Vic
- William
- X-ray
- Yoke
- Zed (USAAF); from Nov 42 Zebra

- Sierra
- Tango
- Union, from 1953 Uniform
- Victor
- Whiskey
- Extra or X-extra, from 1953 X-ray
- Yankee
- Zulu

- Siegfried
- Toni
- Ulrich
- Viktor
- Wilhelm
- Xantippe
- Ypern
- Zeppelin
Appendix 6:

US military aircraft designations

Since 1962 all US military aircraft have been designated according to a common system which assigns a letter for the basic mission, followed after a hyphen by a number for the aircraft basic type. A simple example is B-1, signifying bomber type 1. Modifying letters are then added to give information on permanent changes to the basic mission, and occasionally a status prefix is added to show that the vehicle is ‘not standard because of its test, modification, experimental, or prototype design’. Between the basic mission letter and the hyphen a further letter can be added to denote the following ‘vehicle types’: rotary-wing, V/STOL, glider, lighter-than-air. To the right of the number is added a series number, running consecutively from A (for the first production version) onwards, omitting I and O; the series letter is changed for each ‘major modification that alters significantly the relationship of the aerospace vehicle to its non-expendable system components or changes its logistics support’. Finally, in the fullest form of each designation, a block number is added to identify identical aircraft forming one production ‘block’; these numbers are usually multiples of 5, intermediate numbers then being assigned to identify later field modifications.

<table>
<thead>
<tr>
<th>Status prefix</th>
<th>Modified mission</th>
<th>Basic mission</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>Permanently grounded</td>
<td>A</td>
</tr>
<tr>
<td>J</td>
<td>Special test (temporary)</td>
<td>B</td>
</tr>
<tr>
<td>N</td>
<td>Special test (permanent)</td>
<td>C</td>
</tr>
<tr>
<td>X</td>
<td>Experimental</td>
<td>E</td>
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<tr>
<td>Y</td>
<td>Prototype</td>
<td>F</td>
</tr>
<tr>
<td>Z</td>
<td>Planning</td>
<td>O</td>
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<table>
<thead>
<tr>
<th>Modified mission</th>
<th>Basic mission</th>
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<tr>
<td>A</td>
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<td>C</td>
<td>Transport</td>
</tr>
<tr>
<td>D</td>
<td>Director</td>
</tr>
<tr>
<td>E</td>
<td>Special electronic installation</td>
</tr>
<tr>
<td>F</td>
<td>Fighter</td>
</tr>
<tr>
<td>H</td>
<td>Search and rescue</td>
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<td>K</td>
<td>Tanker</td>
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<tr>
<td>L</td>
<td>Cold weather</td>
</tr>
<tr>
<td>M</td>
<td>Multi-mission</td>
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<td>O</td>
<td>Observation</td>
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<td>Patrol</td>
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<td>Q</td>
<td>Drone UAV</td>
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<td>R</td>
<td>Reconnaissance</td>
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<td>Anti-submarine</td>
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<td>T</td>
<td>Trainer</td>
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<td>Utility</td>
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<td>W</td>
<td>Weather</td>
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<td>V</td>
<td>VTOL/STOL</td>
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<tr>
<td>Z</td>
<td>Lighter-than-air vehicle</td>
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</tbody>
</table>

As an example of how the system works, if there were a special-test version of the trainer variant of the US Marine Corps Harrier it would be the NTAV-8B (ignoring any block number) = N, special test; T, trainer; A, attack; V, V/STOL; 8, eighth V/STOL type; B, second production model.
## Appendix 7:
### US engine designations

Each US engine manufacturer has its own entirely individual designation system. Department of Defense designations for jet engines are governed by a common scheme, though the Navy still uses a strictly numerical sequence of Mk (Mark) numbers for its solid rocket motors. The following is the DoD scheme for jet and turbine engines:

<table>
<thead>
<tr>
<th>Status prefix</th>
<th>X</th>
<th>Experimental</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>Prototype</td>
<td></td>
</tr>
</tbody>
</table>

### Status prefix

- **J** Special test
- **X** Experimental
- **Y** Prototype

### Engine category

- **F** Turbofan (current)
- **J** Turbojet
- **LR** Liquid rocket
- **RJ** Ramjet
- **SR** Solid rocket
- **T** Turboprop/turboshaft
- **TF** Turbofan (formerly)

### Manufacturer code

- **A** Allison, now Rolls-Royce
- **AJ** Aerojet-General
- **GA** Garrett, now Honeywell
- **GE** General Electric
- **L** Textron Lycoming, Stratford, now Honeywell
- **LD** Textron Lycoming, Williamsport
- **MA** Marquardt
- **NA** Rocketdyne (North American)
- **P** Pratt & Whitney (formerly)
- **PW** Pratt & Whitney (current)
- **RR** Rolls-Royce
- **TC** Morton Thiokol
- **WR** Williams Research

Designations are completed by a suffix model number. In 1945 these began at 1 for AF numbers, using odd numbers only, and at 2 for the Navy, using even numbers. Thus the prototype C-130 had YT56-A-1 turboprops, while the first F-8 Crusader had a J57-P-12 turbojet. Today AF numbers start at 100 or 200 and Navy numbers at 400. Thus the F-15C has F100-PW-220 turbofans.

- Piston engines are designated by a letter giving the geometrical configuration of the cylinders, followed by a number giving the cubic capacity (displacement, or swept volume) in cubic inches rounded off to the nearest multiple of 5. Prefix letters can then be added (if necessary in multiple) giving further information. Suffix letters (previously numbers) indicate successive models of the same basic design.

### Configuration letter

- **L** Inline (upright or inverted)
- **O** Horizontally opposed
- **R** Radial
- **RC** Rotating combustion (Wankel type)
- **V** Vee

Thus Textron Lycoming’s TIGO-541-E is the fifth model in a family of opposed engines of 541.5 cu in capacity (in a new series distinguished by the number 541 from the original series rounded off to 540) with turbocharger, direct injection and geared drive.
Appendix 8:

US missile and RPV designations

US unmanned air vehicles have their own designation system. This works in the same way as that for military aircraft, though it should be noted that manned aircraft converted as remotely piloted drones or targets retain their original designation, with the drone prefix (Q) added. An exception is the Sperry (Convair) PQM–102, which is in accord with neither system.

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<tr>
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<td>Dummy</td>
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<td>J</td>
<td>Special test (temporary)</td>
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<tr>
<td>M</td>
<td>Maintenance</td>
</tr>
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<td>N</td>
<td>Special test (permanent)</td>
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<td>Experimental</td>
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<td>Y</td>
<td>Prototype</td>
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<td>Z</td>
<td>Planning</td>
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<td>B</td>
<td>Multiple</td>
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<td>C</td>
<td>Coffin</td>
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<tr>
<td>F</td>
<td>Individual</td>
</tr>
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<td>G</td>
<td>Runway</td>
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<td>H</td>
<td>Silo-stored</td>
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<td>L</td>
<td>Silo-launched</td>
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<td>M</td>
<td>Mobile</td>
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<td>P</td>
<td>Soft pad</td>
</tr>
<tr>
<td>R</td>
<td>Ship</td>
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<td>U</td>
<td>Underwater attack</td>
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<table>
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<td>E</td>
<td>Special electronic installation</td>
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<td>G</td>
<td>Surface attack</td>
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<td>I</td>
<td>Aerial intercept</td>
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<td>Q</td>
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<table>
<thead>
<tr>
<th>Type</th>
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<td>M</td>
<td>Guided missile/drone</td>
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<tr>
<td>N</td>
<td>Probe</td>
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<tr>
<td>R</td>
<td>Rocket</td>
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</tbody>
</table>

As an example, the original experimental Lockheed Aquila RPVs were designated XMQM-105: X, experimental; M, mobile launcher; Q, drone; M, guided (missile or drone); 105th guided type.
Appendix 9:

Joint electronics type designation system

US military electronic equipment is designated with the following series of letters and numbers, reading left to right:

1. Prefix AN, indicating that the equipment is a formally designated military system.
2. Three-letter equipment indicator code. The first letter indicates the platform from which the equipment operates, the second its type and the third its function. Platform letters are: A Piloted aircraft, B Underwater mobile (submarine), D Pilotless carrier, F Fixed ground, G General ground use, K Amphibious, M Mobile (ground), P Portable, S Water (surface), T Ground-transportable, U General utility, V Vehicular (ground), W Water (surface and underwater combination), Z Piloted/pilotless airborne vehicle combination.

Type indicators are: A Invisible light/heat radiation, C Carrier, D Radiac, G Telegraph or teletype, I Interphone/public address, J Electro-mechanical or inertial wire-covered, K Telemetry, L Countermeasures, M Meteorological, N Sound in air, P Radar, Q Sonar/underwater sound, R Radio, S Special or combination of types, T Telephone (wire), V Visual and visible light, W Armament, X Facsimile or television, Y Data-processing.

Function indicators are: A Attachment, B Bombing, C Communications, D Direction-finding, reconnaissance and/or surveillance, E Ejection and/or release, G Fire control or searchlight direction, H Recording and/or reproducing, K Computing, M Maintenance and/or test assembly, N Navigation aid, Q Special or combination of purposes, R Receiving/passive detection, S Detection and/or range and bearing search, T Transmitting, W Automatic flight/remote control, X Identification and recognition, Y Surveillance and control.

3. Number indicating place in the chronological sequence of all such systems to have entered service.
4. Designation modifying suffix giving additional information: A, B, C etc Successive major variants, (V) available in various configurations, (V)1, 2, 3 etc indicates the variant used in a particular installation, (X) under development, () not yet formally designated.

As an example, AN/ALR-62(V)4 indicates the 62nd type of piloted-aircraft countermeasures receiver/passive-detection system; this variant, the fourth, was specific to the EF-111A electronic-warfare aircraft.
Appendix 10:

Civil aircraft registrations

<table>
<thead>
<tr>
<th>Code</th>
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<td>A9C</td>
<td>Bahrain</td>
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# Appendix 10

## Civil aircraft registrations

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<th>Code</th>
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<td>Jamaica</td>
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<td>7P</td>
<td>Lesotho</td>
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</tr>
<tr>
<td>V7</td>
<td>Marshall Islands</td>
<td>9B</td>
<td>Ghana</td>
</tr>
<tr>
<td>V8</td>
<td>Brunei Darussalam</td>
<td>9C</td>
<td>Ghana</td>
</tr>
<tr>
<td>XA</td>
<td>Mexico</td>
<td>9D</td>
<td>Malta</td>
</tr>
<tr>
<td>XB</td>
<td>Burkina Faso (formerly Upper Volta).</td>
<td>9E</td>
<td>Malta</td>
</tr>
<tr>
<td>XC</td>
<td>Democratic Kampuchea (Cambodia)</td>
<td>9F</td>
<td>Zambia</td>
</tr>
<tr>
<td>XV</td>
<td>Vietnam</td>
<td>9G</td>
<td>Kuwait</td>
</tr>
<tr>
<td>XY</td>
<td>Myanmar</td>
<td>9H</td>
<td>Sierra Leone</td>
</tr>
<tr>
<td>YA</td>
<td>Afghanistan</td>
<td>9I</td>
<td>Malaysia</td>
</tr>
<tr>
<td>YI</td>
<td>Iraq</td>
<td>9J</td>
<td>Nepal</td>
</tr>
<tr>
<td>YJ</td>
<td>Vanuatu</td>
<td>9K</td>
<td>Zaire, Democratic Republic of Congo</td>
</tr>
<tr>
<td>YK</td>
<td>Syrian Arab Republic</td>
<td>9L</td>
<td>Burundi</td>
</tr>
<tr>
<td>YL</td>
<td>Latvia</td>
<td>9M</td>
<td>Singapore</td>
</tr>
<tr>
<td>YN</td>
<td>Nicaragua</td>
<td>9N</td>
<td>Rwanda</td>
</tr>
<tr>
<td>YR</td>
<td>Romania</td>
<td>9O</td>
<td>Trinidad and Tobago</td>
</tr>
</tbody>
</table>
## Appendix 11:
### British military aircraft damage categories

<table>
<thead>
<tr>
<th>Prior to 1941</th>
<th>Repair status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cat. U</td>
<td>Undamaged</td>
</tr>
<tr>
<td>Cat. M(U)</td>
<td>Capable of being repaired on site by the operating unit</td>
</tr>
<tr>
<td>Cat. M(C)</td>
<td>Beyond the unit’s capacity to repair</td>
</tr>
<tr>
<td>Cat. R(B)</td>
<td>Repair on site is not possible; the aircraft must be dismantled and sent to a repair facility</td>
</tr>
<tr>
<td>Cat. W</td>
<td>Write-off</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1941–1952</th>
<th>Repair status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cat. U</td>
<td>Undamaged</td>
</tr>
<tr>
<td>Cat. A</td>
<td>Aircraft can be repaired on site</td>
</tr>
<tr>
<td>Cat. Ac</td>
<td>Repair is beyond the unit capacity, but can be repaired on site by another unit or a contractor</td>
</tr>
<tr>
<td>Cat. B</td>
<td>Beyond repair on site, but repairable at a Maintenance Unit or at a contractor’s works</td>
</tr>
<tr>
<td>Cat. C</td>
<td>Allocated to Instructional Airframe duties, for ground training</td>
</tr>
<tr>
<td>Cat. E</td>
<td>Write-off</td>
</tr>
<tr>
<td>Cat. E2</td>
<td>Write-off and suitable only for scrap</td>
</tr>
<tr>
<td>Cat. E3</td>
<td>Missing from an operational sortie; missing aircraft were thus categorised after 28 days</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1952–1961</th>
<th>Repair status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cat. 1</td>
<td>Undamaged and can remain in service.</td>
</tr>
<tr>
<td>Cat. 2</td>
<td>Aircraft can be repaired within second-line servicing capability of the parent or nearest unit</td>
</tr>
<tr>
<td>Cat. 3 (Rep)C</td>
<td>Aircraft is repairable on site by a contractor’s working party</td>
</tr>
<tr>
<td>Cat. 3 (Rep)S</td>
<td>Aircraft is repairable on site by a suitably qualified Service unit</td>
</tr>
<tr>
<td>Cat. 3 (Rep)C Fly</td>
<td>The aircraft may be flown under limiting conditions specified by the holding unit until a suitable repair date is agreed with the controlling authority</td>
</tr>
<tr>
<td>Cat. 4 (Rep)</td>
<td>Not repairable on site because special facilities and/or equipment is required. Aircraft will be repaired at a contractor’s works after temporary repair, if necessary, and under restricted flight conditions</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>1961 – present</th>
<th>Repair status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cat. 1</td>
<td>Repairable on site by first-line maintenance personnel</td>
</tr>
<tr>
<td>Cat. 2</td>
<td>Repairable on site by second-line maintenance personnel</td>
</tr>
<tr>
<td>Cat. 3</td>
<td>Repairable on site but beyond the technical resources of the unit. Repairs will be done by a Service repair party (Cat.3(SER)), or civilian contractor’s working party (Cat.3(CWP)). Aircraft may be flown under limitations until repaired</td>
</tr>
<tr>
<td>Cat. 4</td>
<td>The damage sustained requires special equipment not available on site, and the aircraft must be moved for repair at an established Service repair depot (Cat.4(SER)) or to a contractor’s works (Cat.4(WKS))</td>
</tr>
<tr>
<td>Cat. 5</td>
<td>Damaged beyond economic repair</td>
</tr>
<tr>
<td>Cat. 5(GI)</td>
<td>Aircraft is damaged or surplus, but suitable for ground instructional use</td>
</tr>
<tr>
<td>Cat. 5(Comp)</td>
<td>Beyond economical repair or surplus, but salvage of components or spare parts is possible</td>
</tr>
<tr>
<td>Cat. 5(Scr)</td>
<td>Aircraft is damaged or surplus, but suitable for scrap only</td>
</tr>
<tr>
<td>Cat. 5(Missing)</td>
<td>Missing, presumed lost</td>
</tr>
</tbody>
</table>

Cat. 4 (Rogue) The parent unit and/or controlling authority have conducted technical investigations and air tests and are satisfied that the aircraft has unsatisfactory flying characteristics Beyond economical repair or surplus, but recoverable for breakdown to components, spares and scrap
Cat. 5(c) Beyond economical repair or surplus, but suitable for ground instructional use
Cat. 5(s) Beyond economical repair or surplus, and fit only for disposal as scrap
Cat. 5(gi) Beyond economical repair or surplus, but suitable for ground instructional use
Cat. 5(m) Missing
Cat. 5(GI) Damaged or surplus, but suitable for ground instructional use
Cat. 5(Comp) Beyond economical repair or surplus, but salvage of components or spare parts is possible
Cat. 5(Scr) Aircraft is damaged or surplus, but suitable for scrap only
Cat. 5(Missing) Missing, presumed lost
Appendix 12:
NATO Reporting Names

Since WW2 there have been three successive series of ‘type numbers’ or ‘reporting names’ assigned to Soviet aircraft by the NATO Air Standardization Co-ordinating Committee. When first assigned each new name was classified; this extended even to the suffix letters which identify important modifications of each basic design. For some reason the practice of assigning invented names has continued even though the correct designations are known. Bomber and reconnaissance names begin with B, transports with C, fighters with F, helicopters with H and other types with M. A single-syllable name (except for helicopters) denotes a propeller aircraft. Older aircraft are omitted from the following list.

<table>
<thead>
<tr>
<th>Aircraft</th>
<th>Reporting Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>Backfire</td>
<td>Tu-22M</td>
</tr>
<tr>
<td>Badger</td>
<td>Tu-16 (Tu-88 and Chinese H-6)</td>
</tr>
<tr>
<td>Beagle</td>
<td>Chinese H-5 (licence-built Il-28)</td>
</tr>
<tr>
<td>Bear</td>
<td>Tu-95, Tu-142</td>
</tr>
<tr>
<td>Blackjack</td>
<td>Tu-160</td>
</tr>
<tr>
<td>Blinder</td>
<td>Tu-22 (Tu-105)</td>
</tr>
<tr>
<td>Brewer</td>
<td>Most Yak-28 tactical versions</td>
</tr>
<tr>
<td>Camber</td>
<td>Il-86</td>
</tr>
<tr>
<td>Candid</td>
<td>Il-76</td>
</tr>
<tr>
<td>Careless</td>
<td>Tu-154, Tu-164</td>
</tr>
<tr>
<td>Cash</td>
<td>An-28</td>
</tr>
<tr>
<td>Clank</td>
<td>An-30</td>
</tr>
<tr>
<td>Classic</td>
<td>Il-62</td>
</tr>
<tr>
<td>Cline</td>
<td>An-32</td>
</tr>
<tr>
<td>Clobber</td>
<td>Yak-42</td>
</tr>
<tr>
<td>Coaler</td>
<td>An-72, An-74</td>
</tr>
<tr>
<td>Cock</td>
<td>An-22</td>
</tr>
<tr>
<td>Codling</td>
<td>Yak-40</td>
</tr>
<tr>
<td>Coke</td>
<td>An-24 (Chinese Y-7)</td>
</tr>
<tr>
<td>Colt</td>
<td>An-2 (Chinese Y-5)</td>
</tr>
<tr>
<td>Concorde</td>
<td>An-124</td>
</tr>
<tr>
<td>Coot</td>
<td>Il-18 and variants</td>
</tr>
<tr>
<td>Crate</td>
<td>Il-14</td>
</tr>
<tr>
<td>Crusty</td>
<td>Tu-134</td>
</tr>
<tr>
<td>Cub</td>
<td>An-12 and variants</td>
</tr>
<tr>
<td>Cuff</td>
<td>Be-32</td>
</tr>
<tr>
<td>Cuff</td>
<td>An-26</td>
</tr>
<tr>
<td>Farmer</td>
<td>MiG-19 (and Chinese J-6, including trainer)</td>
</tr>
<tr>
<td>Fencer</td>
<td>Su-24</td>
</tr>
<tr>
<td>Fiddler</td>
<td>Tu-28P/128 (Tu-102)</td>
</tr>
<tr>
<td>Firebar</td>
<td>Yak-28P</td>
</tr>
<tr>
<td>Fishbed</td>
<td>MiG-21 (single-seaters and Chinese J-7)</td>
</tr>
<tr>
<td>Fishpot</td>
<td>Su-11 (single-seater)</td>
</tr>
<tr>
<td>Fitter</td>
<td>Su-7, Su-17, Su-20 and Su-22 (including some two-seaters)</td>
</tr>
<tr>
<td>Flagon</td>
<td>Su-15 and Su-21 (including two-seaters)</td>
</tr>
<tr>
<td>Flogger</td>
<td>MiG-23 and MiG-27 (including trainers)</td>
</tr>
<tr>
<td>Forger</td>
<td>Yak-38</td>
</tr>
<tr>
<td>Foxbat</td>
<td>MiG-25 (including reconnaissance and trainer versions)</td>
</tr>
<tr>
<td>Foxhound</td>
<td>MiG-31</td>
</tr>
<tr>
<td>Frogfoot</td>
<td>Su-25, Su-28</td>
</tr>
<tr>
<td>Fulcrum</td>
<td>MiG-29</td>
</tr>
<tr>
<td>Fullduck</td>
<td>Su-34, Su-38</td>
</tr>
<tr>
<td>Halo</td>
<td>Mi-26</td>
</tr>
<tr>
<td>Harke</td>
<td>Mi-10</td>
</tr>
<tr>
<td>Havoc</td>
<td>Mi-28</td>
</tr>
<tr>
<td>Haze</td>
<td>Mi-14</td>
</tr>
<tr>
<td>Helix</td>
<td>Ka-27, Ka-28, Ka-29, Ka-31, Ka-32</td>
</tr>
<tr>
<td>Hermit</td>
<td>Mi-34</td>
</tr>
<tr>
<td>Hind</td>
<td>Mi-24, Mi-25, Mi-35</td>
</tr>
<tr>
<td>Hip</td>
<td>Mi-8, Mi-9, Mi-17</td>
</tr>
<tr>
<td>Hokum</td>
<td>Ka-50</td>
</tr>
<tr>
<td>Hoodlum</td>
<td>Ka-26</td>
</tr>
<tr>
<td>Hook</td>
<td>Mi-6, Mi-22</td>
</tr>
<tr>
<td>Hoplite</td>
<td>Mi-2 (excluding PZL variants)</td>
</tr>
<tr>
<td>Hormone</td>
<td>Ka-25</td>
</tr>
<tr>
<td>Hound</td>
<td>Mi-4 (and Chinese Z-5)</td>
</tr>
<tr>
<td>Madcap</td>
<td>An-71</td>
</tr>
</tbody>
</table>
### Appendix 12

<table>
<thead>
<tr>
<th>Aircraft</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maestro</td>
<td>Yak-28U</td>
</tr>
<tr>
<td>Mail</td>
<td>Be-12/M-12</td>
</tr>
<tr>
<td>Mainstay</td>
<td>Beriev A-50M</td>
</tr>
<tr>
<td>Mascot</td>
<td>Chinese HJ-5 (licence-built Il-28U)</td>
</tr>
<tr>
<td>Max</td>
<td>Yak-18 (and most variants except Yak-50/52/55 and Chinese CJ-6)</td>
</tr>
<tr>
<td>May</td>
<td>Il-38</td>
</tr>
<tr>
<td>Midas</td>
<td>Il-78M</td>
</tr>
<tr>
<td>Midget</td>
<td>MiG-15UTI</td>
</tr>
</tbody>
</table>

### NATO Reporting Names

<table>
<thead>
<tr>
<th>Aircraft</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mongol</td>
<td>MiG-21U variants</td>
</tr>
<tr>
<td>Moose</td>
<td>Yak-11</td>
</tr>
<tr>
<td>Moss</td>
<td>Tu-126</td>
</tr>
<tr>
<td>Moujik</td>
<td>Su-7U (but not later trainer versions)</td>
</tr>
<tr>
<td>Chinese aircraft</td>
<td>Most indigenous Chinese designs have not been assigned NATO reporting names. Two exceptions which have been published are:</td>
</tr>
<tr>
<td>Fantan</td>
<td>Nanchang Q-5</td>
</tr>
<tr>
<td>Finback</td>
<td>Shenyang J-8</td>
</tr>
</tbody>
</table>