



**Public Authority for Civil Aviation**

# **CAR 1**

## **Civil Aviation Regulation**

### **Definitions and Abbreviations**

**Effective: 12<sup>th</sup> July 2018**

**Approved by: HE Dr. Mohamed bin Nasser Al-Zaabi (CEO)**

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List of Effective Pages

Page No.	Rev No.	Date of Issue
1	02	July 2018
2	02	July 2018
3	02	July 2018
4	02	July 2018
5	02	July 2018
6	02	July 2018
7	02	July 2018
8	02	July 2018
9	02	July 2018
10	02	July 2018
11	02	July 2018
12	02	July 2018
13	02	July 2018
14	02	July 2018
15	02	July 2018
16	02	July 2018
17	02	July 2018
18	02	July 2018
19	02	July 2018
20	02	July 2018
21	02	July 2018
22	02	July 2018
23	02	July 2018
24	02	July 2018
25	02	July 2018
26	02	July 2018
27	02	July 2018
28	02	July 2018
29	02	July 2018
30	02	July 2018
31	02	July 2018
32	02	July 2018
33	02	July 2018
34	02	July 2018
35	02	July 2018
36	02	July 2018
37	02	July 2018
38	02	July 2018
39	02	July 2018
40	02	July 2018

Page No.	Rev No.	Date of Issue
41	02	July 2018
42	02	July 2018
43	02	July 2018
44	02	July 2018
45	02	July 2018
46	02	July 2018
47	02	July 2018
48	02	July 2018
49	02	July 2018
50	02	July 2018
51	02	July 2018
52	02	July 2018
53	02	July 2018
54	02	July 2018
55	02	July 2018
56	02	July 2018
57	02	July 2018
58	02	July 2018
59	02	July 2018
60	02	July 2018
61	02	July 2018
62	02	July 2018
63	02	July 2018
64	02	July 2018
65	02	July 2018
66	02	July 2018
67	02	July 2018
68	02	July 2018
69	02	July 2018
70	02	July 2018
71	02	July 2018
72	02	July 2018
73	02	July 2018
74	02	July 2018
75	02	July 2018
76	02	July 2018
77	02	July 2018
78	02	July 2018
79	02	July 2018
80	02	July 2018

Page No.	Rev No.	Date of Issue
81	02	July 2018
82	02	July 2018
83	02	July 2018
84	02	July 2018
85	02	July 2018
86	02	July 2018
87	02	July 2018
88	02	July 2018
89	02	July 2018
90	02	July 2018
91	02	July 2018
92	02	July 2018
93	02	July 2018
94	02	July 2018
95	02	July 2018
96	02	July 2018
97	02	July 2018
98	02	July 2018
99	02	July 2018
100	02	July 2018
101	02	July 2018
102	02	July 2018
103	02	July 2018
104	02	July 2018
105	02	July 2018
106	02	July 2018
107	02	July 2018
108	02	July 2018
109	02	July 2018
110	02	July 2018
111	02	July 2018
112	02	July 2018
113	02	July 2018
114	02	July 2018
115	02	July 2018
116	02	July 2018
117	02	July 2018
118	02	July 2018
119	02	July 2018
120	02	July 2018



CAR-1

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**Table of Contents- CAR 1- CIVIL AVIATION REGULATIONS**

List of Effective Pages .....1

Corrigendum of Amendments.....4

FOREWORD.....7

PART 1- DEFINITIONS.....8

    Section A.....9

    Section B..... 26

    Section C..... 28

    Section D..... 36

    Section E ..... 44

    Section F ..... 48

    Section G..... 54

    Section H..... 57

    Section I ..... 60

    Section J..... 65

    Section K ..... 66

    Section L ..... 67

    Section M..... 69

    Section N..... 76

    Section O ..... 78

    Section P..... 82

    Section Q ..... 88

    Section R..... 89

    Section S ..... 95

    Section T ..... 105

    Section U..... 112

    Section V..... 114

    Section W..... 117

    Section X ..... 118

    Section Y ..... 119

    Section Z ..... 120

Part 2- ABBREVIATIONS..... 121

ABBREVIATIONS..... 122

    DECODE ..... 122

    ENCODE ..... 156

ABBREVIATIONS FOR IDENTIFYING ..... 191

---

ENCODE ..... 192

ABBREVIATIONS AND TERMS TO BE TRANSMITTED AS SPOKEN ..... 194

    DECODE ..... 195

WORDS WHEN USED IN RADIOTELEPHONY ..... 199

    ENCODE ..... 199

ABBREVIATIONS AND TERMS TO BE TRANSMITTED USING THE INDIVIDUAL LETTERS IN NON-PHONETIC FORM  
WHEN USED IN RADIOTELEPHONY..... 203

    DECODE ..... 204

    ENCODE ..... 206

## FOREWORD

- (a) The Civil Aviation Requirements for definitions and abbreviations of terms have been issued by the Public Authority for Civil Aviation of Oman (hereinafter called the AUTHORITY) under the provisions of the Civil Aviation Law of the Sultanate of Oman.
- (b) This CAR-1 contains definitions and abbreviations of terms used in other CAR Codes.
- (c) CAR-1 is based on those definitions contained in ICAO Annexes and documents.
- (d) This CAR-1 shall be effective after the approval of the CEO.
- (e) The editing practices used in this document are as follows:
- (1) 'Shall' is used to indicate a mandatory requirement and may appear in CARs.
  - (2) 'Should' is used to indicate a recommendation
  - (3) 'May' is used to indicate discretion by the Authority, or the industry as appropriate.
  - (4) 'Will' indicates a mandatory requirement and is used to advise of action incumbent on the Authority.
- (f) This CAR-1 will be effective from the date of the signature of this regulation.

***Note — The use of the male gender implies the female gender and vice versa.***

## **PART 1 - DEFINITIONS**

## Section A

**ACAS broadcast.** A long Mode S air-air surveillance interrogation (UF = 16) with the broadcast address.

**ACAS I.** An ACAS which provides information as an aid to “see and avoid” action but does not include the capability for generating resolution advisories (RAs).

*Note — ACAS I is not intended for international implementation and standardization by ICAO. Therefore, only ACAS I characteristics required to ensure compatible operation with other ACAS configurations and interference limiting are defined in ICAO Annex 10 Volume 4 Chapter 4.2.*

**ACAS II.** An ACAS which provides vertical resolution advisories (RAs) in addition to traffic advisories (TAs).

**ACAS III.** An ACAS which provides vertical and horizontal resolution advisories (RAs) in addition to traffic advisories (TAs).

**Accelerate-stop distance available (ASDA).** The length of the take-off run available plus the length of stopway, if provided.

**Accepting unit.** Air traffic control unit next to take control of an aircraft.

**Accident.** An occurrence associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time as it comes to rest at the end of the flight and the primary propulsion system is shut down, in which:

- (a) a person is fatally or seriously injured as a result of:
  - being in the aircraft, or
  - direct contact with any part of the aircraft, including parts which have become detached from the aircraft, or
  - direct exposure to jet blast,
  - except when the injuries are from natural causes, self-inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew; or
- (b) the aircraft sustains damage or structural failure which:
  - adversely affects the structural strength, performance or flight characteristics of the aircraft, and
  - would normally require major repair or replacement of the affected component, except for engine failure or damage, when the damage is limited to a single engine, (including its cowlings or accessories), to propellers, wing tips, antennas, probes, vanes, tires, brakes, wheels, fairings, panels, landing gear doors, windscreens, the aircraft skin (such as small dents or puncture holes), or for minor damages to main rotor blades, tail rotor blades, landing gear, and those resulting from hail or bird strike (including holes in the radome); or
- (c) the aircraft is missing or is completely inaccessible.

*Note 1. — For statistical uniformity only, an injury resulting in death within thirty days of the date of the accident is classified, by ICAO, as a fatal injury.*

*Note 2. — An aircraft is considered to be missing when the official search has been terminated and the wreckage has not been located.*

*Note 3. — The type of unmanned aircraft system to be investigated is addressed in 5.1 of ICAO Annex 13.*

*Note 4. — Guidance for the determination of aircraft damage can be found in Attachment F of ICAO Annex 13.*

**Accredited medical conclusion.** The conclusion reached by one or more medical experts acceptable to the Licensing Authority for the purposes of the case concerned, in consultation with flight operations or other experts as necessary.

**Accuracy.** A degree of conformance between the estimated or measured value and the true value.

*Note — For measured positional data, the accuracy is normally expressed in terms of a distance from a stated position within which there is a defined confidence of the true position falling.*

**Acrobatic flight.** Manoeuvres intentionally performed by an aircraft involving an abrupt change in its attitude, an abnormal attitude, or an abnormal variation in speed.

**Active RAC.** An RAC is active if it currently constrains the selection of the RA. RACs that have been received within the last six seconds and have not been explicitly cancelled are active.

**Active surveillance.** The process of tracking an intruder by using the information gained from the replies to own ACAS interrogations.

**Acts of unlawful interference.** These are acts or attempted acts such as to jeopardize the safety of civil aviation and air transport, i.e.:

- unlawful seizure of aircraft in flight,
- unlawful seizure of aircraft on the ground,
- hostage-taking on board an aircraft or on aerodromes,
- forcible intrusion on board an aircraft, at an airport or on the premises of an aeronautical facility,
- introduction on board an aircraft or at an airport of a weapon or hazardous device or material intended for criminal purposes,
- communication of false information as to jeopardize the safety of an aircraft in flight or on the ground, of passengers, crew, ground personnel or the general public, at an airport or on the premises of a civil aviation facility.

**Admission.** The permission granted to a person to enter a State by the public authorities of that State in accordance with its national laws.

**ADS-C agreement.** A reporting plan which establishes the conditions of ADS-C data reporting (i.e. data required by the air traffic services unit and frequency of ADS-C reports which have to be agreed to prior to using ADS-C in the provision of air traffic services).

*Note — The terms of the agreement will be exchanged between the ground system and the aircraft by means of a contract, or a series of contracts.*

**Adaptive modulation.** A system's ability to communicate with another system using multiple burst profiles and a system's ability to subsequently communicate with multiple systems using different burst profiles.

**Advance Passenger Information (API) System.** An electronic communications system whereby required data elements are collected and transmitted to border control agencies prior to flight departure or arrival and made available on the primary line at the airport of entry.

**Advisory airspace.** An airspace of defined dimensions, or designated route, within which air traffic advisory service is available.

**Adequate aerodrome.** In relation to ETOPS, means an aerodrome that—

- (1) is associated with a CAR 139 certificate or meets safety requirements equivalent to such an aerodrome and
- (2) has suitable facilities and services available, for the aeroplane type concerned, that include—
  - (a) ATC or an aerodrome flight information service and

- (b) a meteorological reporting service and
- (c) at least one instrument approach procedure and
- (d) a visual approach slope indicator system for turbojet and turbofan powered aeroplanes and
- (e) sufficient lighting

**Advisory route.** A designated route along which air traffic advisory service is available.

**Aerial work.** An aircraft operation in which an aircraft is used for specialized services such as agriculture, construction, photography, surveying, observation and patrol, search and rescue, aerial advertisement, etc.

**Aerobatic flight.** Is described as follows:

- (1) an intentional manoeuvre in which the aircraft is in sustained inverted flight or is rolled from upright to inverted or from inverted to upright position; or
- (2) manoeuvres such as rolls, loops, spins, upward vertical flight culminating in a stall turn, hammerhead or whip stall, or a combination of such manoeuvres.

**Aerodrome.** Defined area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft.

**Aerodrome Facilities and Equipment.** Facilities and equipment inside or outside the boundaries of an aerodrome that are constructed or installed and maintained for the arrival, departure and surface movement of aircraft.

**Aerodrome beacon.** Aeronautical beacon used to indicate the location of an aerodrome from the air.

**Aerodrome certificate.** A certificate issued by the appropriate authority under applicable regulations for the operation of an aerodrome.

**Aerodrome climatological summary.** Concise summary of specified meteorological elements at an aerodrome, based on statistical data.

**Aerodrome climatological table.** Table providing statistical data on the observed occurrence of one or more meteorological elements at an aerodrome.

**Aerodrome control radio station.** A station providing radio-communication between an aerodrome control tower and aircraft or mobile aeronautical stations.

**Aerodrome control service.** Air traffic control service for aerodrome traffic.

**Aerodrome control tower.** A unit established to provide air traffic control service to aerodrome traffic. All traffic on the manoeuvring area of an aerodrome and all aircraft flying in the vicinity of an aerodrome.

*Note — An aircraft is in the vicinity of an aerodrome when it is in, entering or leaving an aerodrome traffic circuit.*

**Aerodrome elevation.** The elevation of the highest point of the landing area.

**Aerodrome identification sign.** A sign placed on an aerodrome to aid in identifying the aerodrome from the air.

**Aerodrome mapping data (AMD).** Data collected for the purpose of compiling aerodrome mapping information for aeronautical uses.

*Note — Aerodrome mapping data are collected for purposes that include the improvement of the user's situational awareness, surface navigation operations, training, charting and planning.*

**Aerodrome mapping database (AMDB).** A collection of aerodrome mapping data organized and arranged as a structured data set.

**Aerodrome meteorological office.** An office designated to provide meteorological service for aerodromes serving international air navigation.

**Aerodrome operating minima.** The limits of usability of an aerodrome for:

- (a) take-off, expressed in terms of runway visual range and/or visibility and, if necessary, cloud conditions;
- (b) landing in 2D instrument approach operations, expressed in terms of visibility and/or runway visual range, minimum descent altitude/height (MDA/H) and, if necessary, cloud conditions; and
- (c) landing in 3D instrument approach operations, expressed in terms of visibility and/or runway visual range and decision altitude/height (DA/H) as appropriate to the type and/or category of the operation.

**Aerodrome reference point.** The designated geographical location of an aerodrome.

**Aerodrome traffic density.** Is categorized under the following headings:

- (a) *Light.* Where the number of movements in the mean busy hour is not greater than 15 per runway or typically less than 20 total aerodrome movements.
- (b) *Medium.* Where the number of movements in the mean busy hour is of the order of 16 to 25 per runway or typically between 20 to 35 total aerodrome movements.
- (c) *Heavy.* Where the number of movements in the mean busy hour is of the order of 26 or more per runway or typically more than 35 total aerodrome movements.

*Note 1. — The number of movements in the mean busy hour is the arithmetic mean over the year of the number of movements in the daily busiest hour.*

*Note 2. — Either a take-off or a landing constitutes a movement.*

**Aerodrome traffic zone.** An airspace of defined dimensions established around an aerodrome for the protection of aerodrome traffic.

**Aerodrome traffic.** All traffic on the manoeuvring area of an aerodrome and all aircraft flying in the vicinity of an aerodrome.

*Note — An aircraft is in the vicinity of an aerodrome when it is in, entering or leaving an aerodrome traffic circuit.*

**Aeronautical administrative communications (AAC).** Communications necessary for the exchange of aeronautical administrative messages.

**Aeronautical beacon.** An aeronautical ground light visible at all azimuths, either continuously or intermittently, to designate a particular point on the surface of the earth.

**Aeronautical broadcasting service.** A broadcasting service intended for the transmission of information relating to air navigation.

**Aeronautical chart.** A representation of a portion of the Earth, its culture and relief, specifically designated to meet the requirements of air navigation.

**Aeronautical data.** A representation of aeronautical facts, concepts or instructions in a formalized manner suitable for communication, interpretation or processing.

**Aeronautical fixed circuit.** A circuit forming part of the aeronautical fixed service (AFS).

**Aeronautical fixed service (AFS).** A telecommunication service between specified fixed points provided primarily for the safety of air navigation and for the regular, efficient and economical operation of air services.

**Aeronautical fixed station.** A station in the aeronautical fixed service.

**Aeronautical fixed telecommunication network (AFTN).** A worldwide system of aeronautical fixed circuits provided, as part of the aeronautical fixed service, for the exchange of messages and/or digital data between aeronautical fixed stations having the same or compatible communications characteristics.

**Aeronautical fixed telecommunication network circuit.** A circuit forming part of the aeronautical fixed telecommunication network (AFTN).

**Aeronautical ground light.** Any light specially provided as an aid to air navigation, other than a light displayed on an aircraft.

**Aeronautical Information Circular (AIC).** A notice containing information that does not qualify for the origination of a NOTAM or for inclusion in the AIP, but which relates to flight safety, air navigation, technical, administrative or legislative matters.

**Aeronautical information management (AIM).** The dynamic, integrated management of aeronautical information through the provision and exchange of quality-assured digital aeronautical data in collaboration with all parties.

**Aeronautical Information Publication (AIP).** A publication issued by or with the authority of a State and containing aeronautical information of a lasting character essential to air navigation.

**Aeronautical station (RR S1.81).** A land station in the aeronautical mobile service. In certain instances, an aeronautical station may be located, for example, on board ship or on a platform at sea.

**Aeronautical information service (AIS).** A service established within the defined area of coverage responsible for the provision of aeronautical data and aeronautical information necessary for the safety, regularity and efficiency of air navigation.

**Aeronautical information.** Information resulting from the assembly, analysis and formatting of aeronautical data.

**Aeronautical information product.** Aeronautical data and aeronautical information provided either as digital data sets or as a standardized presentation in paper or electronic media. Aeronautical information products include:

- Aeronautical Information Publication (AIP), including Amendments and Supplements;
- Aeronautical Information Circulars (AIC);
- Aeronautical charts;
- NOTAM; and Digital data sets.

*Note — Aeronautical information products are intended primarily to satisfy international requirements for the exchange of aeronautical information.*

**Aeronautical meteorological station.** A station designated to make observations and meteorological reports for use in international air navigation.

**Aeronautical mobile (R)\* service (RR S1.33).** An aeronautical mobile service reserved for communications relating to safety and regularity of flight, primarily along national or international civil air routes.

**Aeronautical mobile service (RR S1.32).** A mobile service between aeronautical stations and aircraft stations, or between aircraft stations, in which survival craft stations may participate; emergency position-indicating radio beacon stations may also participate in this service on designated distress and emergency frequencies.

**Aeronautical mobile-satellite (R)\* service (RR S1.36).** An aeronautical mobile-satellite service reserved for communications relating to safety and regularity of flights, primarily along national or international civil air routes.

**Aeronautical mobile-satellite service (RR S1.35).** A mobile-satellite service in which mobile earth stations are located on board aircraft; survival craft stations and emergency position-indicating radio beacon stations may also participate in this service.

**Aeronautical operational control (AOC).** Communication required for the exercise of authority over the initiation, continuation, diversion or termination of flight for safety, regularity and efficiency reasons.

**Aeronautical radio navigation service (RR S1.46).** A radio navigation service intended for the benefit and for the safe operation of aircraft.

*Note — The following Radio Regulation are quoted for purpose of reference and/or clarity in understanding of the above definition of the aeronautical radio navigation service:*

*RR S1.10 : Radio navigation: radio determination used for the purpose of navigation including obstruction warning.*

*RR S1.9 : Radio determination: the determination of the position, velocity and/or other characteristic of an object, or the obtaining of information relating to these parameters by means of the propagation properties of the radio waves.*

**Aeronautical station (RR S1.81).** A land station in the aeronautical mobile service. In certain instances, an aeronautical station may be located, for example, on board ship or on a platform at sea.

**Aeronautical telecommunication agency.** An agency responsible for operating a station or stations in the aeronautical telecommunication service.

**Aeronautical telecommunication log.** A record of the activities of an aeronautical telecommunication station.

**Aeronautical telecommunication network (ATN).** A global internetwork architecture that allows ground, air-ground and avionic data subnetworks to exchange digital data for the safety of air navigation and for the regular, efficient and economic operation of air traffic services.

**Aeronautical telecommunication service.** A telecommunication service provided for any aeronautical purpose.

**Aeronautical telecommunication station.** A station in the aeronautical telecommunication service.

**AeroMACS downlink (DL).** The transmission direction from the base station (BS) to the mobile station (MS).

**AeroMACS handover.** The process in which a mobile station (MS) migrates from the air-interface provided by one base station (BS) to the air-interface provided by another BS. A break-before-make AeroMACS handover is where service with the target BS starts after a disconnection of service with the previous serving BS.

**AeroMACS uplink (UL).** The transmission direction from the mobile station (MS) to the base station (BS).

**Aeronautical Mobile Airport Communications System (AeroMACS).** A high-capacity data link supporting mobile and fixed communications on the aerodrome surface.

**Aeroplane.** A power-driven heavier-than-air aircraft, deriving its lift in flight chiefly from aerodynamic reactions on surfaces which remain fixed under given conditions of flight.

**Aeroplane reference field length.** The minimum field length required for take-off at maximum certificated take-off mass, sea level, standard atmospheric conditions, still air and zero runway slope, as shown in the appropriate aeroplane flight manual prescribed by the certifying authority or equivalent data from the aeroplane manufacturer. Field length means balanced field length for aeroplanes, if applicable, or take-off distance in other cases.

*Note — ICAO Annex 14, Chapter 2, Attachment A, Section 2, provides information on the concept of balanced field length and the Airworthiness Manual (Doc 9760) contains detailed guidance on matters related to take-off distance.*

**Afterburning.** A mode of engine operation wherein a combustion system fed (in whole or part) by vitiated air is used.

**AFTN communication centre.** An AFTN station whose primary function is the relay or retransmission of AFTN traffic from (or to) a number of other AFTN stations connected to it.

**AFTN destination station.** An AFTN station to which messages and/or digital data are addressed for processing for delivery to the addressee.

**AFTN origin station.** An AFTN station where messages and/or digital data are accepted for transmission over the AFTN.

**AFTN station.** A station forming part of the aeronautical fixed telecommunication network (AFTN) and operating as such under the authority or control of a State.

**AIP Amendment.** Permanent changes to the information contained in the AIP.

**AIP Supplement.** Temporary changes to the information contained in the AIP which are published by means of special pages.

**Air taxiway.** A defined path on the surface established for the air taxiing of helicopters.

**Air defense identification zone (ADIZ).** Special designated airspace of defined dimensions within which aircraft are required to comply with special identification and/or reporting procedures additional to those related to the provision of air traffic services (ATS).

**Air Navigation Service Provider (ANSP).** Any public or private entity providing ANS for general air traffic, including an organisation having applied for a certificate to provide such services.

**Air operator certificate (AOC).** A certificate authorizing an operator to carry out specified commercial air transport operations.

**Air traffic advisory service.** A service provided within advisory airspace to ensure separation, in so far as practical, between aircraft which are operating on IFR flight plans.

**Air traffic control clearance.** Authorization for an aircraft to proceed under conditions specified by an air traffic control unit.

*Note 1. — For convenience, the term “air traffic control clearance” is frequently abbreviated to “clearance” when used in appropriate contexts.*

*Note 2.— The abbreviated term “clearance” may be prefixed by the words “taxi,” “take-off,” “departure,” “en route,” “approach” or “landing” to indicate the particular portion of flight to which the air traffic control clearance relates.*

**Air traffic control service.** A service provided for the purpose of:

- (a) preventing collisions:
  - (1) between aircraft, and
  - (2) on the manoeuvring area between aircraft and obstructions; and
- (b) expediting and maintaining an orderly flow of air traffic.

**Air traffic control unit.** A generic term meaning variously, area control centre, approach control unit or aerodrome control tower.

**Air traffic flow management (ATFM).** A service established with the objective of contributing to a safe, orderly and expeditious flow of air traffic by ensuring that ATC capacity is utilized to the maximum extent possible and that the traffic volume is compatible with the capacities declared by the appropriate ATS authority.

**Air traffic management (ATM).** The dynamic, integrated management of air traffic and airspace (including air traffic services, airspace management and air traffic flow management) — safely, economically and efficiently — through the provision of facilities and seamless services in collaboration with all parties and involving airborne and ground-based functions.

**Air traffic service.** A generic term meaning variously, flight information service, alerting service, air traffic advisory service, air traffic control service (area control service, approach control service or aerodrome control service).

**Air traffic service (ATS).** A generic term meaning variously, flight information service, alerting service, air traffic advisory service, air traffic control service (area control service, approach control service or aerodrome control service).

**Air traffic services airspaces.** Airspaces of defined dimensions, alphabetically designated, within which specific types of flights may operate and for which air traffic services and rules of operation are specified.

*Note — ATS airspaces are classified as Class A to G as described in ICAO Annex 11 Chapter 2.*

**Air traffic services reporting office.** A unit established for the purpose of receiving reports concerning air traffic services and flight plans submitted before departure.

*Note — An air traffic services reporting office may be established as a separate unit or combined with an existing unit, such as another air traffic services unit, or a unit of the aeronautical information service.*

**Air traffic services unit.** A generic term meaning variously, air traffic control unit, flight information centre or air traffic services reporting office.

**Air traffic.** All aircraft in flight or operating on the manoeuvring area of an aerodrome.

**Air transit route.** A defined route for the air transiting of helicopters.

**AIRAC.** An acronym (aeronautical information regulation and control) signifying a system aimed at advance notification, based on common effective dates, of circumstances that necessitate significant changes in operating practices.

**Airborne collision avoidance system (ACAS).** An aircraft system based on secondary surveillance radar (SSR) transponder signals, which operates independently of ground-based equipment to provide advice to the pilot on potential conflicting aircraft that are equipped with SSR transponders.

*Note — SSR transponders referred to above are those operating in Mode C or Mode S.*

**Aircraft.** Any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface.

**Aircraft — category.** Classification of aircraft according to specified basic characteristics, e.g. aeroplane, helicopter, glider, free balloon.

**Aircraft — type of.** All aircraft of the same basic design including all modifications thereto except those modifications which result in a change in handling or flight characteristics.

**Aircraft address.** A unique combination of twenty-four bits available for assignment to an aircraft for the purpose of air-ground communications, navigation and surveillance.

*Note — SSR Mode S transponders transmit extended squitters to support the broadcast of aircraft-derived position for surveillance purposes. The broadcast of this type of information is a form of automatic dependent surveillance (ADS) known as ADS-broadcast (ADS-B).*

**Aircraft avionics.** A term designating any electronic device — including its electrical part — for use in an aircraft, including radio, automatic flight control and instrument systems.

**Aircraft-based augmentation system (ABAS).** An augmentation system that augments and/or integrates the information obtained from the other GNSS elements with information available on board the aircraft.

**Aircraft certificated for single-pilot operation.** A type of aircraft which the State of Registry has determined, during the certification process, can be operated safely with a minimum crew of one pilot.

**Aircraft classification number (ACN).** A number expressing the relative effect of an aircraft on a pavement for a specified standard subgrade category.

*Note — The aircraft classification number is calculated with respect to the centre of gravity (CG) position which yields the critical loading on the critical gear. Normally the aft-most CG position appropriate to the maximum gross apron (ramp) mass is used to calculate the ACN. In exceptional cases, the forward most CG position may result in the nose gear loading being more critical.*

**Aircraft earth station (AES).** A mobile earth station in the aeronautical mobile-satellite service located on board an aircraft (see also “GES”).

**Aircraft equipment.** Articles, including first-aid and survival equipment and commissary supplies, but not spare parts or stores, for use on board an aircraft during flight.

**Aircraft observation.** The evaluation of one or more meteorological elements made from an aircraft in flight.

**Aircraft operating manual.** A manual, acceptable to the State of the Operator, containing normal, abnormal and emergency procedures, checklists, limitations, performance information, details of the aircraft systems and other material relevant to the operation of the aircraft.

*Note— The aircraft operating manual is part of the operations manual.*

**Aircraft data circuit-terminating equipment (ADCE).** An aircraft specific data circuit-terminating equipment that is associated with an airborne data link processor (ADLP). It operates a protocol unique to Mode S data link for data transfer between air and ground.

**Aircraft data link processor (ADLP).** An aircraft-resident processor that is specific to a particular air-ground data link (e.g. Mode S) and which provides channel management, and segments and/or reassembles messages for transfer. It is connected to one side of aircraft elements common to all data link systems and on the other side to the air-ground link itself.

**Aircraft Operating Agency.** A person, organization or enterprise engaged in, or offering to engage in, an aircraft operation.

**Aircraft.** The term aircraft may be used to refer to Mode S emitters (e.g. aircraft/vehicles), where appropriate.

**Aircraft/vehicle.** May be used to describe either a machine or device capable of atmospheric flight, or a vehicle on the airport surface movement area (i.e. runways and taxiways).

**Air-initiated protocol.** A procedure initiated by a Mode S aircraft installation for delivering a standard length or extended length downlink message to the ground.

**Aircraft engine.** Means an engine that is used or intended to be used for propelling aircraft, and includes turbo-superchargers, appurtenances and accessories necessary for its functioning, but does not include propellers

**Aircraft Variant.** As used with respect to the licensing and operation of flight crew, means an aircraft of the same basic certificated type which contain modifications not resulting in significant changes of handling and/or flight characteristic, or flight crew complement, but causing significant changes to equipment and/or procedures.

**Aircraft operator.** A person, organization or enterprise engaged in or offering to engage in an aircraft operation.

**Aircraft operators' documents.** Air waybills/consignment notes, passenger tickets and boarding passes, bank and agent settlement plan documents, excess baggage tickets, miscellaneous charges orders (M.C.O.), damage and irregularity reports, baggage and cargo labels, timetables, and weight and balance documents, for use by aircraft operators.

**Aircraft required to be operated with a co-pilot.** A type of aircraft that is required to be operated with a co-pilot, as specified in the flight manual or by the air operator certificate.

**Aircraft security check.** An inspection of the interior of an aircraft to which passengers may have had access and an inspection of the hold for the purposes of discovering suspicious objects, weapons, explosives or other dangerous devices, articles and substances.

**Aircraft security search.** A thorough inspection of the interior and exterior of the aircraft for the purpose of discovering suspicious objects, weapons, explosives or other dangerous devices, articles or substances.

**Aircraft stand.** A designated area on an apron intended to be used for parking an aircraft.

**Aircraft station (RR S1.83).** A mobile station in the aeronautical mobile service, other than a survival craft station, located on board an aircraft.

**Aircraft tracking.** A process, established by the operator, that maintains and updates, at standardized intervals, a ground-based record of the four dimensional position of individual aircraft in flight.

**Air-ground communication.** Two-way communication between aircraft and stations or locations on the surface of the earth.

**Air-ground control radio station.** An aeronautical telecommunication station having primary responsibility for handling communications pertaining to the operation and control of aircraft in a given area.

**Airline.** As provided in Article 96 of the Convention, any air transport enterprise offering or operating a scheduled international air service.

**Airmanship.** The consistent use of good judgement and well-developed knowledge, skills and attitudes to accomplish flight objectives.

**AIRMET information.** Information issued by a meteorological watch office concerning the occurrence or expected occurrence of specified en-route weather phenomena which may affect the safety of low-level aircraft operations and which was not already included in the forecast issued for low-level flights in the flight information region concerned or sub-area thereof.

**Air-report.** A report from an aircraft in flight prepared in conformity with requirements for position, and

operational and/or meteorological reporting.

*Note— Details of the AIREP form are given in PANS-ATM (Doc 4444)*

**Airship.** A power-driven lighter-than-air aircraft.

**Airside.** The movement area of an airport, adjacent terrain and buildings or portions thereof, access to which is controlled.

**Aircraft radio station.** May be one of the following:

- (1) all installed radio equipment including antennae, indicators, controls, interconnecting cabling, and wiring into the aircraft electrical system, which are required in order to perform the intended function; and
- (2) all portable emergency radio equipment required to be carried by CAR-OPS 0

**Air-taxiing.** Movement of a helicopter/VTOL above the surface of an aerodrome, normally in ground effect and at a ground speed normally less than 37 km/h (20 kt).

*Note — The actual height may vary, and some helicopters may require air-taxiing above 8 m (25 ft) AGL to reduce ground effect turbulence or provide clearance for cargo sling-loads.*

**Air-to-ground communication.** One-way communication from aircraft to stations or locations on the surface of the earth.

**Airway.** A control area or portion thereof established in the form of a corridor.

**Airworthy.** The status of an aircraft, engine, propeller or part when it conforms to its approved design and is in a condition for safe operation.

**AIS product.** Aeronautical data and aeronautical information provided in the form of the elements of the Integrated Aeronautical Information Package (except NOTAM and PIB), including aeronautical charts, or in the form of suitable electronic media.

**ALERFA.** The code word used to designate an alert phase.

**AIP Amendment.** means permanent changes to the information contained in the AIP

**AIP service.** means a service for the publication of the AIP, AIP Amendments, AIP Supplements and aeronautical information circulars.

**Alert.** An indication provided to other aircraft systems or annunciation to the pilot to identify that an operating parameter of a navigation system is out of tolerance.

**Alert limit.** For a given parameter measurement, the error tolerance not to be exceeded without issuing an alert.

**Alert phase.** A situation wherein apprehension exists as to the safety of an aircraft and its occupants.

**Alerting post.** Any facility intended to serve as an intermediary between a person reporting an emergency and a rescue coordination center or rescue sub-center.

**Alerting service.** A service provided to notify appropriate organizations regarding aircraft in need of search and rescue aid, and assist such organizations as required.

**Alternate aerodrome.** An aerodrome to which an aircraft may proceed when it becomes either impossible or inadvisable to proceed to or to land at the aerodrome of intended landing where the necessary services and

facilities are available, where aircraft performance requirements can be met and which is operational at the expected time of use. Alternate aerodromes include the following:

- Take-off alternate. An alternate aerodrome at which an aircraft would be able to land should this become necessary shortly after take-off and it is not possible to use the aerodrome of departure.
- En-route alternate. An alternate aerodrome at which an aircraft would be able to land in the event that a diversion becomes necessary while en route.
- Destination alternate. An alternate aerodrome at which an aircraft would be able to land should it become either impossible or inadvisable to land at the aerodrome of intended landing.

*Note — The aerodrome from which a flight departs may also be an en-route or a destination alternate aerodrome for that flight.*

**Alternate heliport.** A heliport to which a helicopter may proceed when it becomes either impossible or inadvisable to proceed to or to land at the heliport of intended landing where the necessary services and facilities are available, where aircraft performance requirements can be met and which is operational at the expected time of use. Alternate heliports include the following:

- Take-off alternate. An alternate heliport at which a helicopter would be able to land should this become necessary shortly after take-off and it is not possible to use the heliport of departure.
- En-route alternate. An alternate heliport at which a helicopter would be able to land in the event that a diversion becomes necessary while en route.
- Destination alternate. An alternate heliport at which a helicopter would be able to land should it become either impossible or inadvisable to land at the heliport of intended landing.

*Note — The heliport from which a flight departs may be an en-route or a destination alternate heliport for that flight.*

**Alternative means of communication.** A means of communication provided with equal status, and in addition to the primary means.

**Altimetry system error (ASE).** The difference between the altitude indicated by the altimeter display, assuming a correct altimeter barometric setting, and the pressure altitude corresponding to the undisturbed ambient pressure.

**Altitude.** The vertical distance of a level, a point or an object considered as a point, measured from mean sea level (MSL).

**Altitude crossing RA.** A resolution advisory is altitude crossing if own ACAS aircraft is currently at least 30 m (100 ft) below or above the threat aircraft for upward or downward sense advisories, respectively.

**Altitude layer.** Each encounter is attributed to one of six altitude layers as follows:

Layer	1	2	3	4	5	6
from		2 300 ft	5 000 ft	10 000 ft	20 000 ft	41 000 ft
to	2 300 ft	5 000 ft	10 000 ft	20 000 ft	41 000 ft	

The altitude layer of an encounter is determined by the average altitude of the two aircraft at closest approach.

*Note — For the purposes of defining the performance of the collision avoidance logic, there is no need to specify the physical basis of the altitude measurement or the relationship between altitude and ground level.*

**Angular Displacement Sensitivity.** The ratio of measured DDM to the corresponding angular displacement from the appropriate reference line.

**Antenna port.** A point where the received signal power is specified. For an active antenna, the antenna port is a fictitious point between the antenna elements and the antenna pre-amplifier. For a passive antenna, the antenna port is the output of the antenna itself.

**Ampere (A).** The ampere is that constant electric current which, if maintained in two straight parallel conductors of infinite length, of negligible circular cross-section, and placed 1 metre apart in a vacuum, would produce between these conductors a force equal to  $2 \times 10^{-7}$  newton per metre of length.

**Anticipated operating conditions.** Those conditions which are known from experience or which can be reasonably envisaged to occur during the operational life of the aircraft taking into account the operations for which the aircraft is made eligible, the conditions so considered being relative to the meteorological state of the atmosphere, to the configuration of terrain, to the functioning of the aircraft, to the efficiency of personnel and to all the factors affecting safety in flight. Anticipated operating conditions do not include:

- (a) those extremes which can be effectively avoided by means of operating procedures; and
- (b) those extremes which occur so infrequently that to require the Standards to be met in such extremes would give a higher level of airworthiness than experience has shown to be necessary and practical.

**Application.** Manipulation and processing of data in support of user requirements (ISO 19104\*).

**Application entity (AE).** An AE represents a set of ISO/OSI communication capabilities of a particular application process (see ISO/IEC 9545 for further details).

**Approach angle.** The difference in the ground headings of the two aircraft at closest approach, with 180 degrees defined as head on and 0 degrees defined as parallel.

**Approach and landing phase — helicopters.** That part of the flight from 300 m (1 000 ft) above the elevation of the FATO, if the flight is planned to exceed this height, or from the commencement of the descent in the other cases, to landing or to the balked landing point.

**Approach control service.** Air traffic control service for arriving or departing controlled flights.

**Approach control unit.** A unit established to provide air traffic control service to controlled flights arriving at, or departing from, one or more aerodromes.

**Approach phase.** The operating phase defined by the time during which the engine is operated in the approach operating mode.

**Appropriate airworthiness requirements.** The comprehensive and detailed airworthiness codes established, adopted or accepted by a Contracting State for the class of aircraft, engine or propeller under consideration of ICAO Annex 8 (see 3.2.2 of Part II).

**Appropriate ATS authority.** The relevant authority designated by the State responsible for providing air traffic services in the airspace concerned.

**Appropriate authority.**

- (a) *Regarding flight over the high seas:* The relevant authority of the State of Registry.
- (b) *Regarding flight other than over the high seas:* The relevant authority of the State having sovereignty over the territory being overflown.

**Approval.** An authorization granted by an appropriate national authority for:

- (a) the transport of dangerous goods forbidden on passenger and/or cargo aircraft where the Technical Instructions state that such goods may be carried with an approval; or
- (b) other purposes as provided for in the Technical Instructions.

*Note — In the absence of a specific reference in the Technical Instructions allowing the granting of an approval, an exemption may be sought.*

**Approved.** Accepted by a Contracting State as suitable for a particular purpose.

**Approved maintenance organization.** An organization approved by a Contracting State, in accordance with the requirements of ICAO Annex 6, Part I, Chapter 8 — Aeroplane Maintenance, to perform maintenance of aircraft or parts thereof and operating under supervision approved by that State.

*Note — Nothing in this definition is intended to preclude that the organization and its supervision be approved by more than one State.*

**Approved training.** Training conducted under special curricula and supervision approved by a Contracting State.

**Approved training organization.** An organization approved by and operating under the supervision of a Contracting State in accordance with the requirements of ICAO Annex 1 to perform approved training.

**Approved Procedure Designer (APD).** An APD is an instrument flight procedures designer who has met the competency requirements laid down by the Authority and holds an approval for the design of instrument flight procedures for aerodromes, heliports and airspace, which are under the jurisdiction of the Authority.

**Apron.** A defined area, on a land aerodrome, intended to accommodate aircraft for purposes of loading or unloading passengers, mail or cargo, fuelling, parking or maintenance.

**Apron management service.** A service provided to regulate the activities and the movement of aircraft and vehicles on an apron.

**Auxiliary Power Unit (APU).** means any gas turbine-powered unit delivering rotating shaft power, compressor air, or both which is not intended for direct propulsion of an aircraft.

**Area control centre (ACC).** A unit established to provide air traffic control service to controlled flights in control areas under its jurisdiction.

**Area control centre.** A unit established to provide air traffic control service to controlled flights in control areas under its jurisdiction.

**Area control service.** Air traffic control service for controlled flights in control areas.

**Area minimum altitude (AMA).** The minimum altitude to be used under instrument meteorological conditions (IMC), that provides a minimum obstacle clearance within a specified area, normally formed by parallels and meridians.

**Area navigation (RNAV).** A method of navigation which permits aircraft operation on any desired flight path within the coverage of ground- or space-based navigation aids or within the limits of the capability of self-contained aids, or a combination of these.

*Note — Area navigation includes performance-based navigation as well as other operations that do not meet the definition of performance-based navigation.*

**Area navigation (RNAV) specification.** A navigation specification based on area navigation that does not include the requirement for performance monitoring and alerting, designated by the prefix RNAV, e.g. RNAV 5, RNAV 1.

*Note 1. — The Performance-based Navigation (PBN) Manual (Doc 9613), Volume II, contains detailed guidance on navigation specifications.*

*Note 2. — The term RNP, previously defined as “a statement of the navigation performance necessary for operation within a defined airspace”, has been removed from Annex 6 and 11 as the concept of RNP has been overtaken by the concept of PBN. The term RNP in those Annexes is now solely used in the context of navigation specifications that require performance monitoring and alerting, e.g. RNP 4 refers to the aircraft and operating requirements, including a 4 NM lateral performance with on-board performance monitoring and alerting that are detailed in Doc 9613.*

**Area navigation (RNAV).** A method of navigation which permits aircraft operation on any desired flight path within the coverage of ground- or space-based navigation aids or within the limits of the capability of self-contained aids, or a combination of these.

*Note — Area navigation includes performance-based navigation as well as other operations that do not meet the definition of performance-based navigation.*

**Area navigation route.** An ATS route established for the use of aircraft capable of employing area navigation.

**Arresting system.** A system designed to decelerate an aeroplane overrunning the runway.

**Arrival routes.** Routes identified in an instrument approach procedure by which aircraft may proceed from the en-route phase of flight to an initial approach fix.

**ASHTAM.** A special series NOTAM notifying by means of a specific format change in activity of a volcano, a volcanic eruption and/or volcanic ash cloud that is of significance to aircraft operations.

**Assemble.** A process of merging data from multiple sources into a database and establishing a baseline for subsequent processing.

*Note — The assemble phase includes checking the data and ensuring that detected errors and omissions are rectified.*

**Associated aircraft systems.** Those aircraft systems drawing electrical/pneumatic power from an auxiliary power unit during ground operations.

**ATN security services.** A set of information security provisions allowing the receiving end system or intermediate system to unambiguously identify (i.e. authenticate) the source of the received information and to verify the integrity of that information.

**ATS interfacility data communication (AIDC).** Automated data exchange between air traffic services units in support of flight notification, flight coordination, transfer of control and transfer of communication.

**ATS message handling service (ATSMHS).** An ATN application consisting of procedures used to exchange ATS messages in store-and-forward mode over the ATN such that the conveyance of an ATS message is in general not correlated with the conveyance of another ATS message by the service provider.

**ATS message handling system (AMHS).** The set of computing and communication resources implemented by ATS organizations to provide the ATS message handling service.

**ATS direct speech circuit.** An aeronautical fixed service (AFS) telephone circuit, for direct exchange of information between air traffic services (ATS) units.

**ATS route.** A specified route designed for channelling the flow of traffic as necessary for the provision of air traffic services.

*Note 1. — The term “ATS route” is used to mean variously, airway, advisory route, controlled or uncontrolled route, arrival or departure route, etc.*

*Note 2. — An ATS route is defined by route specifications which include an ATS route designator, the track to or from significant points (waypoints), distance between significant points, reporting requirements and, as determined by the appropriate ATS authority, the lowest safe altitude.*

**ATS surveillance service.** Term used to indicate a service provided directly by means of an ATS surveillance system.

**ATS surveillance system.** A generic term meaning variously, ADS-B, PSR, SSR or any comparable ground-based system that enables the identification of aircraft.

*Note — A comparable ground-based system is one that has been demonstrated, by comparative assessment or other methodology, to have a level of safety and performance equal to or better than monopulse SSR.*

**Atmosphere, International Standard.** means the atmosphere defined in ICAO Document 7488/2. For the purposes of Certification Specifications the following is acceptable—

- (1) The air is a perfect dry gas
- (2) The temperature at sea-level is 15°C
- (3) The pressure at sea-level is 1·013250 x 10<sup>5</sup> Pa (29·92 in Hg) (1013·2 mbar)
- (4) The temperature gradient from sea-level to the altitude at which the temperature becomes –56·5°C is 3·25°C per 500 m (1·98°C/1 000 ft)
- (5) The density at sea level  $\rho_0$ , under the above conditions is 1·2250 kg/m<sup>3</sup> (0·002378 slugs/ft<sup>3</sup>) for the density at altitudes up to 15 000 m (50 000 ft).

**Authority.** means the competent body responsible for the safety regulation of Civil Aviation. (See IEM 1.1, Authority).

**Autorotation.** means a rotorcraft flight condition in which the lifting rotor is driven entirely by action of the air when the rotorcraft is in motion.

**Authorized agent.** A person who represents an aircraft operator and who is authorized by or on behalf of such operator to act on formalities connected with the entry and clearance of the operator’s aircraft, crew, passengers, cargo, mail, baggage or stores and includes, where national law permits, a third party authorized to handle cargo on the aircraft.

**Authorized Economic Operator.** AEO is a party involved in the international movement of goods in whatever function that has been approved by or on behalf of a national Customs administration as complying with WCO or equivalent supply chain security standards. AEOs may include manufacturers, importers, exporters, brokers, carriers, consolidators, intermediaries, ports, airports, terminal operators, integrated operators, warehouses, distributors and freight forwarders.

*Note — The definition is aligned with that found in the World Customs Organization’s “SAFE Framework of Standards to Secure and Facilitate Global Trade.”*

**Authorized path.** A communication path suitable for a given message category.

**Automated Border Control (ABC).** An automated system which authenticates the electronic machine readable travel document or token, establishes that the passenger is the rightful holder of the document or token, queries border control records, then determines eligibility for border crossing according to pre-defined rules.

**Automatic dependent surveillance — broadcast (ADS-B).** A means by which aircraft, aerodrome vehicles and other objects can automatically transmit and/or receive data such as identification, position and additional data, as appropriate, in a broadcast mode via a data link.

**Automatic dependent surveillance — contract (ADS-C).** A means by which the terms of an ADS-C agreement will be exchanged between the ground system and the aircraft, via a data link, specifying under what conditions ADS-C reports would be initiated, and what data would be contained in the reports.

*Note — The abbreviated term “ADS contract” is commonly used to refer to ADS event contract, ADS demand contract, ADS periodic contract or an emergency mode.*

**Automatic dependent surveillance-broadcast (ADS-B) IN.** A function that receives surveillance data from ADS-B OUT data sources.

**Automatic dependent surveillance-broadcast (ADS-B) OUT.** A function on an aircraft or vehicle that periodically broadcasts its state vector (position and velocity) and other information derived from on-board systems in a format suitable for ADS-B IN capable receivers.

**Automatic relay installation.** A teletypewriter installation where automatic equipment is used to transfer messages from incoming to outgoing circuits.

*Note — “this term covers both fully automatic and semi-automatic installation*

**Automatic telecommunication log.** A record of the activities of an aeronautical telecommunication station recorded by electrical or mechanical means.

**Automatic terminal information service (ATIS).** The automatic provision of current, routine information to arriving and departing aircraft throughout 24 hours or a specified portion thereof.

**Automatic terminal information service (ATIS).** The automatic provision of current, routine information to arriving and departing aircraft throughout 24 hours or a specified portion thereof:

- *Data link-automatic terminal information service (D-ATIS).* The provision of ATIS via data link.
- *Voice-automatic terminal information service (Voice-ATIS).* The provision of ATIS by means of continuous and repetitive voice broadcasts.

**Autonomous runway incursion warning system (ARIWS).** System which provides autonomous detection of a potential incursion or of the occupancy of an active runway and a direct warning to a flight crew or a vehicle operator.

**Augmented crew.** means the crew on an aeroplane when it is comprised of more than the minimum crew required by the aeroplane certification.

**Auxiliary power-unit (APU).** A self-contained power-unit on an aircraft providing electrical/pneumatic power to aircraft systems during ground operations.

**Auxiliary data.** Data, transmitted in addition to basic data, that provide ground equipment siting information for use in refining airborne position calculations and other supplementary information.

**Average radius of rated coverage.** The radius of a circle having the same area as the rated coverage.

**Axial ratio.** The ratio, expressed in decibels, between the maximum output power and the minimum output power of an antenna to an incident linearly polarized wave as the polarization orientation is varied over all directions perpendicular to the direction of propagation.

## Section B

**Back Course Sector.** The course sector which is situated on the opposite side of the localizer from the runway.

**Background check.** A check of a person's identity and previous experience, including where legally permissible, any criminal history, as part of the assessment of an individual's suitability to implement a security control and/or for unescorted access to a security restricted area.

**Baggage.** Personal property of passengers or crew carried on an aircraft by agreement with the operator.

**Balked landing.** A landing manoeuvre that is unexpectedly discontinued at any point below the obstacle clearance altitude/height (OCA/H).

**Balloon.** A non-power-driven lighter-than-air aircraft.

*Note — For the purposes of this CAR 1, this definition applies to free balloons.*

**Bare Earth.** Surface of the Earth including bodies of water and permanent ice and snow, and excluding vegetation and man-made objects.

**Barrette.** Three or more aeronautical ground lights closely spaced in a transverse line so that from a distance they appear as a short bar of light.

**Base station (BS).** A generalized equipment set providing connectivity, management and control of the mobile station (MS).

**Basic data.** Data transmitted by the ground equipment that are associated directly with the operation of the landing guidance system.

**Base turn.** A turn executed by the aircraft during the initial approach between the end of the outbound track and the beginning of the intermediate or final approach track. The tracks are not reciprocal.

*Note — Base turns may be designated as being made either in level flight or while descending, according to the circumstances of each individual procedure.*

**BDS Comm-B Data Selector.** The 8-bit BDS code determines the register whose contents are to be transferred in the MB field of a Comm-B reply. It is expressed in two groups of 4 bits each, BDS1 (most significant 4 bits) and BDS2 (least significant 4 bits).

**Becquerel (Bq).** The activity of a radionuclide having one spontaneous nuclear transition per second.

**Beam centre.** The midpoint between the two minus 3-dB points on the leading and trailing edges of the scanning beam main lobe.

**Beamwidth.** The width of the scanning beam main lobe measured at the minus 3-dB points and defined in angular units on the boresight, in the horizontal plane for the azimuth function and in the vertical plane for the elevation function.

**Bi-binary.** Bi-binary is known as "Manchester Encoding". It is sometimes referred to as "Differential Manchester Encoding". Using this system, it is the transition of the edge that determines the bit.

**Bit error rate (BER).** The number of bit errors in a sample divided by the total number of bits in the sample, generally averaged over many such samples.

**Blind transmission.** A transmission from one station to another station in circumstances where two-way communication cannot be established but where it is believed that the called station is able to receive the transmission.

**Border integrity.** The enforcement, by a State, of its laws and/or regulations concerning the movement of goods and/or persons across its borders.

**Briefing.** Oral commentary on existing and/or expected meteorological conditions.

**Broadcast.** A transmission of information relating to air navigation that is not addressed to a specific station or stations.

**Broadcast.** The protocol within the Mode S system that permits uplink messages to be sent to all aircraft in coverage area, and downlink messages to be made available to all interrogators that have the aircraft wishing to send the message under surveillance.

**Burst profile.** Set of parameters that describe the uplink or downlink transmission properties associated with an interval usage code. Each profile contains parameters such as modulation type, forward error correction (FEC) type, preamble length, guard times, etc.

**Burst.** A time-defined, contiguous set of one or more related signal units which may convey user information and protocols, signaling, and any necessary preamble.

**Bypass ratio.** The ratio of the air mass flow through the bypass ducts of a gas turbine engine to the air mass flow through the combustion chambers calculated at maximum thrust when the engine is stationary in an international standard atmosphere at sea level.

## Section C

**Cabin crew-member.** A crew-member who performs, in the interest of safety of passengers, duties assigned by the operator or the pilot-in-command of the aircraft, but who shall not act as a flight crew-member.

**Calendar.** Discrete temporal reference system that provides the basis for defining temporal position to a resolution of one day.

**Candela (cd).** The luminous intensity, in the perpendicular direction, of a surface of 1/600 000 square metre of black body at the temperature of freezing platinum under a pressure of 101 325 newtons per square metre.

**Canopy.** Bare Earth supplemented by vegetation height.

**Cargo.** Any property carried on an aircraft other than mail, stores and accompanied or mishandled baggage.

**Cargo aircraft.** Any aircraft, other than a passenger aircraft, which is carrying goods or property.

**Carrier-to-multipath ratio (C/M).** The ratio of the carrier power received directly, i.e. without reflection, to the multipath power, i.e. carrier power received via reflection.

**Carrier-to-noise density ratio (C/No).** The ratio of the total carrier power to the average noise power in a 1 Hz bandwidth, usually expressed in dBHz.

**CAR M .**The applicable procedural or technical requirements and administrative procedures related to the continuing airworthiness of aircraft and aeronautical products, parts and appliances together with the approval of organizations and personnel involved in these tasks.

**Category A.** With respect to helicopters, means a multi-engine helicopter designed with engine and system isolation features specified in Part IVB and capable of operations using take-off and landing data scheduled under a critical engine failure concept which assures adequate designated surface area and adequate performance capability for continued safe flight or safe rejected take-off.

**Category B.** With respect to helicopters, means a single-engine or multi-engine helicopter which does not meet Category A standards. Category B helicopters have no guaranteed capability to continue safe flight in the event of an engine failure, and a forced landing is assumed.

**Category I operation.** A precision instrument approach and landing with a decision height not lower than 60 m (200 ft) and with either a visibility not less than 800 m or a runway visual range not less than 550 m.

**Category II operation.** A precision instrument approach and landing with a decision height lower than 60 m (200 ft) but not lower than 30 m (100 ft), and a runway visual range not less than 300 m.

**Category IIIA operation.** A precision instrument approach and landing with:

- (a) a decision height lower than 30 m (100 ft), or no decision height; and
- (b) a runway visual range not less than 175 m.

**Category IIIB operation.** A precision instrument approach and landing with:

- (a) a decision height lower than 15 m (50 ft), or no decision height; and
- (b) a runway visual range less than 175 m but not less than 50 m.

**Category IIIC operation.** A precision instrument approach and landing with no decision height and no runway visual range limitations.

**Capability report.** Information identifying whether the transponder has a data link capability as reported in the capability (CA) field of an all-call reply or squitter transmission (see “data link capability report”).

**Ceiling.** The height above the ground or water of the base of the lowest layer of cloud below 6 000 metres (20 000 feet) covering more than half the sky.

**Celsius temperature ( $t^{\circ}\text{C}$ ).** The Celsius temperature is equal to the difference  $t^{\circ}\text{C} = T - T_0$  between two thermodynamic temperatures  $T$  and  $T_0$  where  $T_0$  equals 273.15 kelvin.

**Certification.** A formal evaluation and confirmation by or on behalf of the appropriate authority for aviation security that a person possesses the necessary competencies to perform assigned functions to an acceptable level as defined by the appropriate authority.

**Certified aerodrome.** An aerodrome whose operator has been granted an aerodrome certificate by the Public Authority for Civil Aviation

**Certify as airworthy (to).** To certify that an aircraft or parts thereof comply with current airworthiness requirements after maintenance has been performed on the aircraft or parts thereof.

**Changeover point.** The point at which an aircraft navigating on an ATS route segment defined by reference to very high frequency omnidirectional radio ranges is expected to transfer its primary navigational reference from the facility behind the aircraft to the next facility ahead of the aircraft.

*Note — Changeover points are established to provide the optimum balance in respect of signal strength and quality between facilities at all levels to be used and to ensure a common source of azimuth guidance for all aircraft operating along the same portion of a route segment.*

**Channel rate.** The rate at which bits are transmitted over the RF channel. These bits include those bits used for framing and error correction, as well as the information bits. For burst transmission, the channel rate refers to the instantaneous burst rate over the period of the burst.

**Channel rate accuracy.** This is relative accuracy of the clock to which the transmitted channel bits are synchronized. For example, at a channel rate of 1.2 kbits/s, maximum error of one part in  $10^6$  implies the maximum allowed error in the clock is  $\pm 1.2 \times 10^{-3}$  Hz .

**Channel of standard accuracy (CSA).** The specified level of positioning, velocity and timing accuracy that is available to any GLONASS user on a continuous, worldwide basis.

**Chip.** A single digital bit of the output of a pseudo-random bit sequence.

**Circuit mode.** A configuration of the communications network which gives the appearance to the application of a dedicated transmission path.

**Civil aviation inspector.** A civil aviation inspector is an individual, designated by a Contracting State, who is charged with the inspection of the safety, security or related aspects of air transport operations as directed by the appropriate authority.

*Note — Examples of civil aviation inspectors include inspectors responsible for airworthiness, flight operations and other safety-related aspects, and security-related aspects, of air transport operations.*

**Clearance limit.** The point to which an aircraft is granted an air traffic control clearance.

**Clearance of goods.** The accomplishment of the customs formalities necessary to allow goods to enter home use, to be exported or to be placed under another customs procedure.

**Clearance guidance sector.** The volume of airspace, inside the coverage sector, within which the azimuth guidance information provided is not proportional to the angular displacement of the aircraft, but is a constant left or right indication of which side the aircraft is with respect to the proportional guidance sector.

**Clearway.** A defined rectangular area on the ground or water under the control of the appropriate authority, selected or prepared as a suitable area over which an aeroplane may make a portion of its initial climb to a specified height.

**Climb phase.** The operating phase defined by the time during which the engine is operated in the climb operating mode.

**Climb RA.** A positive RA recommending a climb but not an increased climb.

**Cloud of operational significance.** A cloud with the height of cloud base below 1 500 m (5 000 ft) or below the highest minimum sector altitude, whichever is greater, or a cumulonimbus cloud or a towering cumulus cloud at any height.

**Close-out.** A command from a Mode S interrogator that terminates a Mode S link layer communication transaction.

**Closest approach.** The occurrence of minimum range between own ACAS aircraft and the intruder. Thus range at closest approach is the smallest range between the two aircraft and time of closest approach is the time at which this occurs.

**Cluster of interrogators.** Two or more interrogators with the same interrogator identifier (II) code, operating cooperatively to ensure that there is no interference to the required surveillance and data link performance of each of the interrogators, in areas of common coverage.

**Cockpit crew zone.** The part of the cabin that is exclusively designated for flight crew use.

**Coded chip.** A “1” or “0” output of the rate 1/2 or 1/4 convolutional code encoder.

**Collision avoidance logic.** The sub-system or part of ACAS that analyses data relating to an intruder and own aircraft, decides whether or not advisories are appropriate and, if so, generates the advisories. It includes the following functions: range and altitude tracking, threat detection and RA generation. It excludes surveillance.

**COMAT.** Operator material carried on an operator’s aircraft for the operator’s own purposes.

**Combined vision system (CVS).** A system to display images from a combination of an enhanced vision system (EVS) and a synthetic vision system (SVS).

**Command and control (C2) link.** The data link between the remotely piloted aircraft and the remote pilot station for the purposes of managing the flight.

**Commencement of journey.** The point at which the person began his journey, without taking into account any airport at which he stopped in direct transit, either on a through-flight or a connecting flight, if he did not leave the direct transit area of the airport in question.

**Commercial air transport operation.** An aircraft operation involving the transport of passengers, cargo or mail for remuneration or hire.

**Commissary supplies.** Items, either disposable or intended for multiple use, that are used by the aircraft operator for provision of services during flights, in particular for catering, and for the comfort of passengers.

**Common mark registering authority.** The authority maintaining the non-national register or, where appropriate, the part thereof, in which aircraft of an international operating agency are registered.

**Common mark.** A mark assigned by the International Civil Aviation Organization to the common mark registering authority registering aircraft of an international operating agency on other than a national basis.

*Note — All aircraft of an international operating agency which are registered on other than a national basis will bear the same common mark.*

**Communication centre.** An aeronautical fixed station which relays or retransmits telecommunication traffic from (or to) a number of other aeronautical fixed stations directly connected to it.

**Competent Authority.** The Civil Aviation Authority or Airworthiness Authority designated by another Contracting State.

**Competency.** A combination of skills, knowledge and attitudes required to perform a task to the prescribed standard.

**Competency element.** An action that constitutes a task that has a triggering event and a terminating event that clearly defines its limits, and an observable outcome.

**Competency unit.** A discrete function consisting of a number of competency elements.

**Co-pilot.** A licensed pilot serving in any piloting capacity other than as pilot-in-command but excluding a pilot who is on board the aircraft for the sole purpose of receiving flight instruction.

**Comm-A.** A 112-bit interrogation containing the 56-bit MA message field. This field is used by the uplink standard length message (SLM) and broadcast protocols.

**Comm-B.** A 112-bit reply containing the 56-bit MB message field. This field is used by the downlink SLM, ground-initiated and broadcast protocols.

**Comm-C.** A 112-bit interrogation containing the 80-bit MC message field. This field is used by the uplink extended length message (ELM) protocol.

**Comm-D.** A 112-bit reply containing the 80-bit MD message field. This field is used by the downlink ELM protocol.

**Connection establishment delay.** Connection establishment delay, as defined in ISO 8348, includes a component, attributable to the called subnetwork (SN) service user, which is the time between the SN-CONNECT indication and the SN-CONNECT response. This user component is due to actions outside the boundaries of the satellite subnetwork and is therefore excluded from the AMS(R)S specifications.

**Connection.** A logical association between peer-level entities in a communication system.

**Convolutional turbo codes (CTC).** Type of forward error correction (FEC) code.

**Conference communications.** Communication facilities whereby direct speech conversation may be conducted between three or more locations simultaneously.

**Confidence level.** The probability that the true value of a parameter is within a certain interval around the estimate of its value.

*Note — The interval is usually referred to as the accuracy of the estimate.*

**Configuration (as applied to the aeroplane).** A particular combination of the positions of the moveable elements, such as wing flaps and landing gear, etc., that affect the aerodynamic characteristics of the aeroplane.

**Configuration deviation list (CDL).** A list established by the organization responsible for the type design with the approval of the State of Design which identifies any external parts of an aircraft type which may be missing at the commencement of a flight, and which contains, where necessary, any information on associated operating limitations and performance correction.

**Congested area.** In relation to a city, town or settlement, any area which is substantially used for residential, commercial or recreational purposes.

**Congested hostile environment.** A hostile environment within a congested area.

**Consignment.** One or more packages of dangerous goods accepted by an operator from one shipper at one time and at one address, receipted for in one lot and moving to one consignee at one destination address.

**Core satellite constellation(s).** The core satellite constellations are GPS and GLONASS.

**Consignment.** One or more packages of dangerous goods accepted by an operator from one shipper at one time and at one address, receipted for in one lot and moving to one consignee at one destination address.

**Consultation.** Discussion with a meteorologist or another qualified person of existing and/or expected meteorological conditions relating to flight operations; a discussion includes answers to questions.

**Contaminated runway.** A runway is contaminated when a significant portion of the runway surface area (whether in isolated areas or not) within the length and width being used is covered by one or more of the substances listed in the runway surface condition descriptors.

*Note — Further information on runway surface condition descriptors can be found in the ICAO Annex 14, Volume I — Definitions.*

**Continuing airworthiness.** The set of processes by which an aircraft, engine, propeller or part complies with the applicable airworthiness requirements and remains in a condition for safe operation throughout its operating life.

**Continuous descent final approach (CDFA).** A technique, consistent with stabilized approach procedures, for flying the final approach segment of a non-precision instrument approach procedure as a continuous descent, without level-off, from an altitude/height at or above the final approach fix altitude/height to a point approximately 15 m (50 ft) above the landing runway threshold or the point where the flare manoeuvre should begin for the type of aircraft flown.

**Contour line.** A line on a map or chart connecting points of equal elevation.

**Control area (CTA).** A controlled airspace extending upwards from a specified limit above the earth.

**Control area.** A controlled airspace extending upwards from a specified limit above the earth.

**Control zone.** A controlled airspace extending upwards from the surface of the earth to a specified upper limit.

**Control motion noise (CMN).** That portion of the guidance signal error which causes control surface, wheel and column motion and could affect aircraft attitude angle during coupled flight, but does not cause aircraft displacement from the desired course and/or glide path.

**Controlled aerodrome.** An aerodrome at which air traffic control service is provided to aerodrome traffic.

*Note— The term “controlled aerodrome” indicates that air traffic control service is provided to aerodrome traffic but does not necessarily imply that a control zone exists.*

**Controlled airspace.** An airspace of defined dimensions within which air traffic control service is provided in accordance with the airspace classification.

*Note — Controlled airspace is a generic term which covers ATS airspace Classes A, B, C, D and E as described in ICAO Annex 11, Chapter 2.*

**Controlled flight.** Any flight which is subject to an air traffic control clearance.

**Controller-pilot data link communications (CPDLC).** A means of communication between controller and pilot, using datalink for ATC communications.

**Coordinate system — conical.** A function is said to use conical coordinates when the decoded guidance angle varies as the minimum angle between the surface of a cone containing the receiver antenna, and a plane perpendicular to the axis of the cone and passing through its apex. The apex of the cone is at the antenna phase centre. For approach azimuth or back azimuth functions, the plane is the vertical plane containing the runway centre line. For elevation functions, the plane is horizontal.

**Coordinate system — planar.** A function is said to use planar coordinates when the decoded guidance angle varies as the angle between the plane containing the receiver antenna and a reference plane. For azimuth functions, the reference plane is the vertical plane containing the runway centre line and the plane containing the receiver antenna is a vertical plane passing through the antenna phase centre.

**Coordination interrogation.** A Mode S interrogation (uplink transmission) radiated by ACAS II or III and containing a resolution message.

**Coordination.** The process by which two ACAS-equipped aircraft select compatible resolution advisories (RAs) by the exchange of resolution advisory complements (RACs).

**Corporate aviation.** The non-commercial operation or use of aircraft by a company for the carriage of passengers or goods as an aid to the conduct of company business, flown by a professional pilot employed to fly the aircraft. (Note— that corporate aviation is a subset of general aviation).

**Corporate aviation operation.** The non-commercial operation or use of aircraft by a company for the carriage of passengers or goods as an aid to the conduct of company business, flown by a professional pilot(s) employed to fly the aircraft.

**Coulomb (C).** The quantity of electricity transported in 1 second by a current of 1 ampere.

**Course line.** The locus of points nearest to the runway center line in any horizontal plane at which the DDM is zero.

**Course sector.** A sector in a horizontal plane containing the course line and limited by the loci of points nearest to the course line at which the DDM is 0.155.

**Coverage sector.** A volume of airspace within which service is provided by a particular function and in which the signal power density is equal to or greater than the specified minimum.

**CPDLC message.** Information exchanged between an airborne system and its ground counterpart. A CPDLC message consists of a single message element or a combination of message elements conveyed in a single transmission by the initiator.

**CPDLC message set.** A list of standard message elements and free text message elements.

**Credit.** Recognition of alternative means or prior qualifications.

**Crew-member.** A person assigned by an operator to duty on an aircraft during a flight duty period.

**Critical engine(s).** Any engine whose failure gives the most adverse effect on the aircraft characteristics relative to the case under consideration.

*Note — On some aircraft there may be more than one equally critical engine. In this case, the expression “the critical engine” means one of those critical engines.*

**Cross-country.** A flight between a point of departure and a point of arrival following a pre-planned route using standard navigation procedures.

**Crossing encounter.** An encounter in which the altitude separation of the two aircraft exceeds 100 ft at the beginning and at the end of the encounter window, and the relative vertical position of two aircraft at the end of the encounter window is reversed from that at the beginning of the encounter window.

**Cruise climb.** An aeroplane cruising technique resulting in a net increase in altitude as the aeroplane mass decreases.

***Cruise relief pilot.*** A flight crew-member who is assigned to perform pilot tasks during cruise flight, to allow the pilot-in-command or a co-pilot to obtain planned rest.

***Cruising level.*** A level maintained during a significant portion of a flight.

***Culture.*** All man-made features constructed on the surface of the Earth, such as cities, railways and canals.

***Current data authority.*** The designated ground system through which a CPDLC dialogue between a pilot and a controller currently responsible for the flight is permitted to take place.

***Current flight plan.*** The flight plan, including changes, if any, brought about by subsequent clearances.

***Current slot.*** The slot in which a received transmission begins.

***Cyclic redundancy check (CRC).*** A mathematical algorithm applied to the digital expression of data that provides a level of assurance against loss or alteration of data.

## Section D

**D.** The largest overall dimension of the helicopter when rotor(s) are turning measured from the most forward position of the main rotor tip path plane to the most rearward position of the tail rotor tip path plane or helicopter structure.

*Note — “D” is sometimes referred to in the text using the terminology “D-value”.*

**DDM.** *Difference in depth of modulation. The percentage modulation depth of the larger signal minus the percentage modulation depth of the smaller signal, divided by 100.*

**Danger area.** An airspace of defined dimensions within which activities dangerous to the flight of aircraft may exist at specified times.

**Dangerous goods accident.** An occurrence associated with and related to the transport of dangerous goods by air which results in fatal or serious injury to a person or major property or environmental damage.

**Dangerous goods incident.** An occurrence, other than a dangerous goods accident, associated with and related to the transport of dangerous goods by air, not necessarily occurring on board an aircraft, which results in injury to a person, property or environmental damage, fire, breakage, spillage, leakage of fluid or radiation or other evidence that the integrity of the packaging has not been maintained. Any occurrence relating to the transport of dangerous goods which seriously jeopardizes the aircraft or its occupants is also deemed to constitute a dangerous goods incident.

**Dangerous goods.** Articles or substances which are capable of posing a risk to health, safety, property or the environment and which are shown in the list of dangerous goods in the Technical Instructions or which are classified according to those Instructions.

*Note— Dangerous goods are classified in ICAO Annex 18, Chapter 3.*

**Data link communications.** A form of communication intended for the exchange of messages via a data link.\* All ISO Standards are listed at the end of this chapter.

**Data link flight information services (D-FIS).** The provision of FIS via data link.

**Data product specification.** Detailed description of a data set or data set series together with additional information that will enable it to be created, supplied to and used by another party (ISO 19131\*).

*Note — A data product specification provides a description of the universe of discourse and a specification for mapping the universe of discourse to a data set. It may be used for production, sales, end-use or other purpose.*

**Data integrity (assurance level).** A degree of assurance that an aeronautical data and its value has not been lost or altered since the origination or authorized amendment.

**Data format.** A structure of data elements, records and files arranged to meet standards, specifications or data quality requirements.

**Data completeness.** The degree of confidence that all of the data needed to support the intended use is provided.

**Data accuracy.** A degree of conformance between the estimated or measured value and the true value.

**Data product.** Data set or data set series that conforms to a data product specification (ISO 19131\*).

**Data resolution.** A number of units or digits to which a measured or calculated value is expressed and used.

**Data traceability.** The degree that a system or a data product can provide a record of the changes made to that product and thereby enable an audit trail to be followed from the end-user to the originator.

**Data timeliness.** The degree of confidence that the data is applicable to the period of its intended use.

**Data product specification.** Detailed description of a data set or data set series together with additional information that will enable it to be created, supplied to and used by another party (ISO 19131\*).

*Note — A data product specification provides a description of the universe of discourse and a specification for mapping the universe of discourse to a data set. It may be used for production, sales, end-use or other purpose.*

**Data quality.** A degree or level of confidence that the data provided meet the requirements of the data user in terms of accuracy, resolution and integrity (or equivalent assurance level), traceability, timeliness, completeness and format.

**Data set.** Identifiable collection of data (ISO 19101\*).

**Data set series.** Collection of data sets sharing the same product specification (ISO 19115\*).

**Data signalling rate.** Data signalling rate refers to the passage of information per unit of time, and is expressed in bits/second. Data signalling rate is given by the formula:

$$\sum_{i=1}^{i=m} \frac{1}{T_i} \log_2 n_i$$

where  $m$  is the number of parallel channels,  $T_i$  is the minimum interval for the  $i$ th channel expressed in seconds,  $n_i$  is the number of significant conditions of the modulation in the  $i$ th channel.

*Note 1. —*

- (a) *For a single channel (serial transmission) it reduces to  $(1/T) \log_2 n$ ; with a two-condition modulation ( $n = 2$ ), it is  $1/T$ .*
- (b) *For a parallel transmission with equal minimum intervals and equal number of significant conditions on each channel, it is  $m(1/T) \log_2 n$  ( $m(1/T)$  in case of a two-condition modulation).*

*Note 2. — In the above definition, the term “parallel channels” is interpreted to mean: channels, each of which carries an integral part of an information unit, e.g. the parallel transmission of bits forming a character. In the case of a circuit comprising a number of channels, each of which carries information “independently”, with the sole purpose of increasing the traffic handling capacity, these channels are not to be regarded as parallel channels in the context of this definition.*

**Data circuit-terminating equipment (DCE).** A DCE is a network provider equipment used to facilitate communications between DTEs.

**Data link capability report.** Information in a Comm-B reply identifying the complete Mode S communications capabilities of the aircraft installation.

**Data link entity (DLE).** A protocol state machine capable of setting up and managing a single data link connection.

**Data link initiation capability (DLIC).** A data link application that provides the ability to exchange addresses, names and version numbers necessary to initiate data link applications (see ICAO Doc 4444).

**Data link service (DLS) sublayer.** The sublayer that resides above the MAC sublayer. For VDL Mode 4, the DLS sublayer resides above the VSS sublayer. The DLS manages the transmit queue, creates and destroys DLEs for connection-oriented communications, provides facilities for the LME to manage the DLS, and provides facilities for connectionless communications.

**Data integrity assurance level.** A degree of assurance that an aeronautical data and its value has not been lost nor altered since the data origination or authorized amendment.

**Data terminal equipment (DTE).** A DTE is an endpoint of a subnetwork connection.

**Data transfer delay (95th percentile).** The 95th percentile of the statistical distribution of delays for which transit delay is the average.

**Data transit delay.** In accordance with ISO 8348, the average value of the statistical distribution of data delays. This delay represents the subnetwork delay and does not include the connection establishment delay.

**Data transit delay.** In accordance with ISO 8348, the average value of the statistical distribution of data delays. This delay represents the subnetwork delay and does not include the connection establishment delay.

**Date of manufacture.** The date of issue of the document attesting that the individual aircraft or engine as appropriate conforms to the requirements of the type or the date of an analogous document.

**Datum.** Any quantity or set of quantities that may serve as a reference or basis for the calculation of other quantities (ISO 19104\*).

**Decision altitude (DA) or decision height (DH).** A specified altitude or height in a 3D instrument approach operation at which a missed approach must be initiated if the required visual reference to continue the approach has not been established.

*Note 1. — Decision altitude (DA) is referenced to mean sea level and decision height (DH) is referenced to the threshold elevation.*

*Note 2. — The required visual reference means that section of the visual aids or of the approach area which should have been in view for sufficient time for the pilot to have made an assessment of the aircraft position and rate of change of position, in relation to the desired flight path. In Category III operations with a decision height the required visual reference is that specified for the particular procedure and operation.*

*Note 3. — For convenience where both expressions are used they may be written in the form “decision altitude/height” and abbreviated “DA/H”.*

**Declarant.** Any person who makes a goods declaration or in whose name such a declaration is made.

**Declared capacity.** A measure of the ability of the ATC system or any of its subsystems or operating positions to provide service to aircraft during normal activities. It is expressed as the number of aircraft entering a specified portion of airspace in a given period of time, taking due account of weather, ATC unit configuration, staff and equipment available, and any other factors that may affect the workload of the controller responsible for the airspace.

**Declared distances - aerodromes**

- (a) *Take-off run available (TORA)*. The length of runway declared available and suitable for the ground run of an aeroplane taking off.
- (b) *Take-off distance available (TODA)*. The length of the take-off run available plus the length of the clearway, if provided.
- (c) *Accelerate-stop distance available (ASDA)*. The length of the take-off run available plus the length of the stopway, if provided.
- (d) *Landing distance available (LDA)*. The length of runway which is declared available and suitable for the ground run of an aeroplane landing.

**Declared distances — heliports.**

- (a) *Take-off distance available (TODAH)*. The length of the FATO plus the length of helicopter clearway (if provided) declared available and suitable for helicopters to complete the take-off.
- (b) *Rejected take-off distance available (RTODAH)*. The length of the FATO declared available and suitable for helicopters operated in performance class 1 to complete a rejected take-off.
- (c) *Landing distance available (LDAH)*. The length of the FATO plus any additional area declared available and suitable for helicopters to complete the landing manoeuvre from a defined height.

**Degree of standardized test distortion.** The degree of distortion of the restitution measured during a specific period of time when the modulation is perfect and corresponds to a specific text.

**Designated operational coverage (DOC) area.** The area in which a particular service is provided and in which the service is afforded frequency protection.

*Note — This area may, after proper coordination to ensure frequency protection, extend to areas outside the allotment areas contained in Appendix S27 to the Radio Regulations.*

**Defined point after take-off (DPATO).** The point, within the take-off and initial climb phase, before which the helicopter's ability to continue the flight safely, with one engine inoperative, is not assured and a forced landing may be required.

*Note — Defined points apply to helicopters operating in performance Class 2 only.*

**Defined point before landing (DPBL).** The point, within the approach and landing phase, after which the helicopter's ability to continue the flight safely, with one engine inoperative, is not assured and a forced landing may be required.

*Note — Defined points apply to helicopters operating in performance Class 2 only.*

**Degree Celsius (°C).** The special name for the unit kelvin for use in stating values of Celsius temperature.

**De-icing/anti-icing facility.** A facility where frost, ice or snow is removed (de-icing) from the aeroplane to provide clean surfaces, and/or where clean surfaces of the aeroplane receive protection (anti-icing) against the formation of frost or ice and accumulation of snow or slush for a limited period of time.

*Note — Further guidance is given in the Manual of Aircraft Ground De-icing/Anti-icing Operations.*

**De-icing/anti-icing pad.** An area comprising an inner area for the parking of an aeroplane to receive de-icing/anti-icing treatment and an outer area for the manoeuvring of two or more mobile de-icing/anti-icing equipment.

**Dependent parallel approaches.** Simultaneous approaches to parallel or near-parallel instrument runways where radar separation minima between aircraft on adjacent extended runway centre lines are prescribed.

**Deportation order.** A written order, issued by the competent authorities of a State and served upon a deportee, directing him to leave that State.

**Deportee.** Person who had legally been admitted to a State by its authorities or who had entered a State illegally, and who at some later time is formally ordered by the competent authorities to leave that State.

**Derivative version.** An aircraft gas turbine engine of the same generic family as an originally type-certificated engine and having features which retain the basic core engine and combustor design of the original model and for which other factors, as judged by the certificating authority, have not changed.

*Note — Attention is drawn to the difference between the definition of Aderived version of an aeroplane@ in Volume I of ICAO Annex 16 and the definition of Aderivative version@ in this Volume.*

**Derived version of a helicopter.** A helicopter which, from the point of view of airworthiness, is similar to the noise certificated prototype but incorporates changes in type design which may affect its noise characteristics adversely.

*Note 1. — In applying the Standards of ICAO Annex 16 Volume 1, a helicopter that is based on an existing prototype but which is considered by the certificating authority to be a new type design for airworthiness purposes shall nevertheless be considered as a derived version if the noise source characteristics are judged by the certificating authority to be the same as the prototype.*

*Note 2. — “Adversely” refers to an increase of more than 0.30 EPNdB in any one of the noise certification levels for helicopters certificated according to ICAO Annex 16, Chapter 8, and 0.30 dB(A) in the certification level for helicopters certificated according to Chapter 11.*

**Derived version of an aeroplane.** An aeroplane which, from the point of view of airworthiness, is similar to the noise certificated prototype but incorporates changes in type design which may affect its noise characteristics adversely.

*Note 1. — Where the certificating authority finds that the proposed change in design, configuration, power or mass is so extensive that a substantially new investigation of compliance with the applicable airworthiness regulations is required, the aeroplane should be considered to be a new type design rather than a derived version.*

*Note 2. — “Adversely” refers to an increase of more than 0.10 dB in any one of the noise certification levels unless the cumulative effects of changes in type design are tracked by an approved procedure in which case “adversely” refers to a cumulative increase in the noise level in any one of the noise certification levels of more than 0.30 dB or the margin of compliance, whichever is smaller.*

**Derived version of a CO<sub>2</sub>-certified aeroplane.** An aeroplane which incorporates changes in type design that either increase its maximum take-off mass, or that increase its CO<sub>2</sub> emissions evaluation metric value by more than:

- (a) 1.35 per cent at a maximum take-off mass of 5 700 kg, decreasing linearly to;
- (b) 0.75 per cent at a maximum take-off mass of 60 000 kg, decreasing linearly to;
- (c) 0.70 per cent at a maximum take-off mass of 600 000 kg; and
- (d) a constant 0.70 per cent at maximum take-off masses greater than 600 000 kg.

*Note — Where the certificating authority finds that the proposed change in design, configuration, power or mass is so extensive that a substantially new investigation of compliance with the applicable airworthiness regulations is required, the aeroplane will be considered to be a new type design rather than a derived version.*

**Derived version of a non-CO<sub>2</sub>-certified aeroplane.** An individual aeroplane that conforms to an existing Type Certificate, but which is not certified to ICAO Annex 16, Volume III, and to which changes in type design are made prior to the issuance of the aeroplane’s first certificate of airworthiness that increase its CO<sub>2</sub> emissions evaluation metric value by more than 1.5 per cent or are considered to be significant CO<sub>2</sub> changes.

**Design landing mass.** The maximum mass of the aircraft at which, for structural design purposes, it is assumed that it will be planned to land.

**Design take-off mass.** The maximum mass at which the aircraft, for structural design purposes, is assumed to be planned to be at the start of the take-off run.

**Design taxiing mass.** The maximum mass of the aircraft at which structural provision is made for load liable to occur during use of the aircraft on the ground prior to the start of take-off.

**Designated postal operator.** Any governmental or non-governmental entity officially designated by a Universal Postal Union (UPU) member country to operate postal services and to fulfil the related obligations arising from the acts of the UPU Convention on its territory.

**Detect and avoid.** The capability to see, sense or detect conflicting traffic or other hazards and take the appropriate action.

**DETRESFA.** The code word used to designate a distress phase.

**Digital Elevation Model (DEM).** The representation of terrain surface by continuous elevation values at all intersections of a defined grid, referenced to common datum.

*Note — Digital Terrain Model (DTM) is sometimes referred to as DEM*

**Direct transit area.** A special area established in an international airport, approved by the public authorities concerned and under their direct supervision or control, where passengers can stay during transit or transfer without applying for entry to the State.

**Direct transit arrangements.** Special arrangements approved by the public authorities concerned by which traffic which is pausing briefly in its passage through the Contracting State may remain under their direct control.

**Direct link service (DLS).** A data communications service which makes no attempt to automatically correct errors, detected or undetected, at the link layer of the air-ground communications path. (Error control may be effected by end-user systems.)

**Directory service (DIR).** A service, based on the ITU-T X.500 series of recommendations, providing access to and management of structured information relevant to the operation of the ATN and its users.

**Discrete source damage.** Structural damage of the aeroplane that is likely to result from: impact with a bird, uncontained fan blade failure, uncontained engine failure, uncontained high-energy rotating machinery failure or similar causes.

**Disembarkation.** The leaving of an aircraft after a landing, except by crew or passengers continuing on the next stage of the same through-flight.

**Disinfection.** The procedure whereby health measures are taken to control or kill infectious agents on a human or animal body, in or on affected parts of aircraft, baggage, cargo, goods or containers, as required, by direct exposure to chemical or physical agents.

**Disinsection.** The procedure whereby health measures are taken to control or kill insects present in aircraft, baggage, cargo, containers, goods and mail.

**Displaced threshold.** A threshold not located at the extremity of a runway.

**Displacement sensitivity (localizer).** The ratio of measured DDM to the corresponding lateral displacement from the appropriate reference line.

**Disruptive passenger.** A passenger who fails to respect the rules of conduct at an airport or on board an aircraft or to follow the instructions of the airport staff or crew-members and thereby disturbs the good order and discipline at an airport or on board the aircraft.

**Distress phase.** A situation wherein there is a reasonable certainty that an aircraft and its occupants are threatened by grave and imminent danger and require immediate assistance

**Ditching.** The forced landing of an aircraft on water.

**DME dead time.** A period immediately following the decoding of a valid interrogation during which a received interrogation will not cause a reply to be generated.

*Note — Dead time is intended to prevent the transponder from replying to echoes resulting from multipath effects.*

**DME/N.** Distance measuring equipment, primarily serving operational needs of en-route or TMA navigation, where the “N” stands for narrow spectrum characteristics.

**DME/P.** The distance measuring element of the MLS, where the “P” stands for precise distance measurement. The spectrum characteristics are those of DME/N.

**Domain.** A set of end systems and intermediate systems that operate according to the same routing procedures and that is wholly contained within a single administrative domain.

**Downlink.** A term referring to the transmission of data from an aircraft to the ground. Mode S air-to-ground signals are transmitted on the 1 090 MHz reply frequency channel.

**Downlink ELM (DELM).** A term referring to extended length downlink communication by means of 112-bit Mode S Comm-D replies, each containing the 80-bit Comm-D message field (MD).

**Doppler shift.** The frequency shift observed at a receiver due to any relative motion between transmitter and receiver.

**Double channel simplex.** Simplex using two frequency channels, one in each direction.

*Note — This method was sometimes referred to as cross-band.*

**Downstream clearance.** A clearance issued to an aircraft by an air traffic control unit that is not the current controlling authority of that aircraft.

**Dual instruction time.** Flight time during which a person is receiving flight instruction from a properly authorized pilot on board the aircraft.

**Duplex.** A method in which telecommunication between two stations can take place in both directions simultaneously.

**Duty period.** A period which starts when a flight or cabin crew-member is required by an operator to report for or to commence a duty and ends when that person is free from all duties.

**Duty.** Any task that flight or cabin crew-members are required by the operator to perform, including, for example, flight duty, administrative work, training, positioning and standby when it is likely to induce fatigue.

**Dynamic load-bearing surface.** A surface capable of supporting the loads generated by a helicopter conducting an emergency touchdown on it.

***Dynamic side-lobe level.*** The level that is exceeded 3 per cent of the time by the scanning antenna far field radiation pattern exclusive of the main beam as measured at the function scan rate using a 26 kHz beam envelope video filter. The 3 per cent level is determined by the ratio of the side-lobe duration which exceeds the specified level to the total scan duration.

## Section E

**EASA.** The European Aviation Safety Agency established by the European Council.

**EDTO critical fuel.** The fuel quantity necessary to fly to an en-route alternate aerodrome considering, at the most critical point on the route, the most limiting system failure.

*Note — Attachment C contains guidance on EDTO critical fuel scenarios.*

**EDTO significant system.** An aeroplane system whose failure or degradation could adversely affect the safety particular to an EDTO flight, or whose continued functioning is specifically important to the safe flight and landing of an aeroplane during an EDTO diversion.

**Effective acceptance bandwidth.** The range of frequencies with respect to the assigned frequency for which reception is assured when all receiver tolerances have been taken into account.

**Effective adjacent channel rejection.** The rejection that is obtained at the appropriate adjacent channel frequency when all relevant receiver tolerances have been taken into account.

**Effective coverage.** The area surrounding an NDB within which bearings can be obtained with an accuracy sufficient for the nature of the operation concerned.

**Effective intensity.** The effective intensity of a flashing light is equal to the intensity of a fixed light of the same colour which will produce the same visual range under identical conditions of observation.

**Effective margin.** That margin of an individual apparatus which could be measured under actual operating conditions.

**Effective side-lobe level.** That level of scanning beam side lobe which in a specified multipath environment results in a particular guidance angle error.

**Electronic aeronautical chart display.** An electronic device by which flight crews are enabled to execute, in a convenient and timely manner, route planning, route monitoring and navigation by displaying required information.

**Electronic flight bag (EFB).** An electronic information system, comprised of equipment and applications for flight crew, which allows for the storing, updating, displaying and processing of EFB functions to support flight operations or duties.

**Elevated heliport.** A heliport located on a raised structure on land.

**Elevation.** The vertical distance of a point or a level, on or affixed to the surface of the earth, measured from mean sea level.

**Ellipsoid height (Geodetic height).** The height related to the reference ellipsoid, measured along the ellipsoidal outer normal through the point in question.

**Embarkation.** The boarding of an aircraft for the purpose of commencing a flight, except by such crew or passengers as have embarked on a previous stage of the same through-flight.

**Emergency locator transmitter (ELT).** A generic term describing equipment which broadcast distinctive signals on designated frequencies and, depending on application, may be automatically activated by impact or be manually activated. An ELT may be any of the following:

- Automatic fixed ELT (ELT(AF)). An automatically activated ELT which is permanently attached to an aircraft.
- Automatic portable ELT (ELT(AP)). An automatically activated ELT which is rigidly attached to an aircraft but readily removable from the aircraft.
- Automatic deployable ELT (ELT(AD)). An ELT which is rigidly attached to an aircraft and which is automatically deployed and activated by impact, and, in some cases, also by hydrostatic sensors. Manual deployment is also provided.
- Survival ELT (ELT(S)). An ELT which is removable from an aircraft, stowed so as to facilitate its ready use in an emergency, and manually activated by survivors.

**Emergency phase.** A generic term meaning, as the case may be, uncertainty phase, alert phase or distress phase.

**Empty weight.** Means the empty weight of an aircraft, including—

- (1) the airframe, engines, propellers, and rotors of the aircraft; and
- (2) any fixed equipment on the aircraft; and
- (3) any fixed ballast on the aircraft; and
- (4) any unusable fuel on the aircraft; and
- (5) full operating fluids required for the normal operation of the aircraft's systems, except potable water, lavatory pre-charge water, and water intended for injection into the engines of the aircraft; and
- (6) items specified in the weight and balance section of the flight manual or flight manual and supplement.

**Emergency parachute.** Means a parachute assembly designed and intended to be used by persons in an emergency.

**eMRTD.** An MRTD (passport, visa or card) that has a contactless integrated circuit embedded in it and the capability of being used for biometric identification of the MRTD holder in accordance with the standards specified in the relevant *Part of Doc 9303 — Machine Readable Travel Documents*.

**End-to-end.** Pertaining or relating to an entire communication path, typically from (1) the interface between the information source and the communication system at the transmitting end to (2) the interface between the communication system and the information user or processor or application at the receiving end.

**End-user.** An ultimate source and/or consumer of information.

**Energy per symbol to noise density ratio ( $E_s/N_0$ ).** The ratio of the average energy transmitted per channel symbol to the average noise power in a 1 Hz bandwidth, usually expressed in dB. For A-BPSK and A-QPSK, one channel symbol refers to one channel bit.

**Engine.** A unit used or intended to be used for aircraft propulsion. It consists of at least those components and equipment necessary for functioning and control, but excludes the propeller/rotors (if applicable).

**Enhanced vision system (EVS).** A system to display electronic real-time images of the external scene achieved through the use of image sensors.

*Note — EVS does not include night vision imaging systems (NVIS).*

**En-route phase.** That part of the flight from the end of the take-off and initial climb phase to the commencement of the approach and landing phase.

*Note* — Where adequate obstacle clearance cannot be guaranteed visually, flights must be planned to ensure that obstacles can be cleared by an appropriate margin. In the event of failure of the critical engine, operators may need to adopt alternative procedures.

**Encounter.** For the purposes of defining the performance of the collision avoidance logic, an encounter consists of two simulated aircraft trajectories. The horizontal coordinates of the aircraft represent the actual position of the aircraft but the vertical coordinate represents an altimeter measurement of altitude.

**Encounter class.** Encounters are classified according to whether or not the aircraft are transitioning at the beginning and end of the encounter window, and whether or not the encounter is crossing.

**Encounter window.** The time interval [ $tca - 40$  s,  $tca + 10$  s].

**Equivalent airspeed.** Means the calibrated airspeed of an aircraft corrected for adiabatic compressible flow for the particular altitude. Equivalent airspeed is equal to calibrated airspeed in standard atmosphere at sea level.

**Equivalent isotropically radiated power (e.i.r.p.).** The product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna (absolute or isotropic gain).

**Equivalent procedure.** A test or analysis procedure which, while differing from the one specified in this volume of ICAO Annex 16, in the technical judgement of the certificating authority yields effectively the same CO<sub>2</sub> emissions evaluation metric value as the specified procedure.

**Error.** An action or inaction by an operational person that leads to deviations from organizational or the operational person's intentions or expectations.

*Note* — See Chapter 1 of ICAO Annex 19 — Safety Management for a definition of operational personnel.

**Error management.** The process of detecting and responding to errors with countermeasures that reduce or eliminate the consequences of errors and mitigate the probability of further errors or undesired states.

*Note* — See Attachment C to Chapter 3 of the Procedures for Air Navigation Services — Training (PANS-TRG, Doc 9868) and Circular 314 — Threat and Error Management (TEM) in Air Traffic Control for a description of undesired states.

**Escort.** An individual authorized by a Contracting State or an aircraft operator to accompany inadmissible persons or deportees being removed from that Contracting State.

**Essential radio navigation service.** A radio navigation service whose disruption has a significant impact on operations in the affected airspace or aerodrome.

**Estimated off-block time.** The estimated time at which the aircraft will commence movement associated with departure.

**Estimated time of arrival.** For IFR flights, the time at which it is estimated that the aircraft will arrive over that designated point, defined by reference to navigation aids, from which it is intended that an instrument approach procedure will be commenced, or, if no navigation aid is associated with the aerodrome, the time at which the aircraft will arrive over the aerodrome. For VFR flights, the time at which it is estimated that the aircraft will arrive over the aerodrome.

**Exception.** A provision in Annex 18 which excludes a specific item of dangerous goods from the requirements normally applicable to that item.

**Exemption.** An authorization, other than an approval, granted by an appropriate national authority providing relief

from the provisions of the Technical Instructions.

**Exhaust nozzle.** In the exhaust emissions sampling of gas turbine engines where the jet effluxes are not mixed (as in some turbofan engines for example) the nozzle considered is that for the gas generator (core) flow only. Where, however, the jet efflux is mixed the nozzle considered is the total exit nozzle.

**Exhaust Gas Temperature.** Means the average temperature of the exhaust gas stream.

**Extended Golay Code.** An error correction code capable of correcting multiple bit errors.

**Extended length message (ELM).** A series of Comm-C interrogations (uplink ELM) transmitted without the requirement for intervening replies, or a series of Comm-D replies (downlink ELM) transmitted without intervening interrogations.

**Expected approach time.** The time at which ATC expects that an arriving aircraft, following a delay, will leave the holding fix to complete its approach for a landing.

*Note — The actual time of leaving the holding fix will depend upon the approach clearance.*

**Extended diversion time operations (EDTO).** Any operation by an aeroplane with two or more turbine engines where the diversion time to an en-route alternate aerodrome is greater than the threshold time established by the State of the Operator.

*Note — EDTO may be referred to as ETOPS in some documents.*

**Extended flight over water.** A flight operated over water at a distance of more than 93 km (50 NM), or 30 minutes at normal cruising speed, whichever is the lesser, away from land suitable for making an emergency landing.

**Extended hybrid surveillance.** The process of using qualified ADS-B airborne position messages via 1 090 MHz extended squitter without validating 1 090 extended squitter data for the track by ACAS active interrogations.

**Extended range operation.** Any flight by an aeroplane with two turbine engines where the flight time at the one engine inoperative cruise speed (in ISA and still air conditions), from a point on the route to an adequate alternate aerodrome, is greater than the threshold time approved by the State of the Operator.

**External equipment (helicopter).** Any instrument, mechanism, part, apparatus, appurtenance, or accessory that is attached to or extends from the helicopter exterior but is not used nor is intended to be used for operating or controlling a helicopter in flight and is not part of an airframe or engine.

## Section F

**Facility availability.** The ratio of actual operating time to specified operating time.

**Facility failure.** Any unanticipated occurrence which gives rise to an operationally significant period during which a facility does not provide service within the specified tolerances.

**Facility reliability.** The probability that the ground installation operates within the specified tolerances.

*Note— This definition refers to the probability that the facility will operate for a specified period of time.*

**Facility Performance Category I — ILS.** An ILS which provides guidance information from the coverage limit of the ILS to the point at which the localizer course line intersects the ILS glide path at a height of 60 m (200 ft) or less above the horizontal plane containing the threshold.

*Note — This definition is not intended to preclude the use of Facility Performance Category I — ILS below the height of 60 m (200 ft), with visual reference where the quality of the guidance provided permits, and where satisfactory operational procedures have been established.*

**Facility Performance Category II — ILS.** An ILS which provides guidance information from the coverage limit of the ILS to the point at which the localizer course line intersects the ILS glide path at a height of 15 m (50 ft) or less above the horizontal plane containing the threshold.

**Facility Performance Category III — ILS.** An ILS which, with the aid of ancillary equipment where necessary, provides guidance information from the coverage limit of the facility to, and along, the surface of the runway.

**Factor of safety.** A design factor used to provide for the possibility of loads greater than those assumed, and for uncertainties in design and fabrication.

**Fan marker beacon.** A type of radio beacon, the emissions of which radiate in a vertical fan-shaped pattern.

**FAR.** the US Federal Aviation Regulation.

**Farad (F).** The capacitance of a capacitor between the plates of which there appears a difference of potential of 1 volt when it is charged by a quantity of electricity equal to 1 coulomb.

**Fatigue Risk Management System (FRMS).** A data-driven means of continuously monitoring and managing fatigue-related safety risks, based upon scientific principles and knowledge as well as operational experience that aims to ensure relevant personnel are performing at adequate levels of alertness.

**Fatigue.** A physiological state of reduced mental or physical performance capability resulting from sleep loss, extended wakefulness, circadian phase, and/or workload (mental and/or physical activity) that can impair a person's alertness and ability to perform safety-related operational duties.

**Feature.** Abstraction of real world phenomena (ISO 19101\*).

**Feature attribute.** Characteristic of a feature (ISO 19101\*).

*Note— A feature attribute has a name, a data type and a value domain associated with it.*

**Feature operation.** Operation that every instance of a feature type may perform (ISO 19110\*).

*Note— An operation upon the feature type dam is to raise the dam. The result of this operation is to raise the level of water in the reservoir.*

**Feature relationship.** Relationship that links instances of one feature type with instances of the same or a different feature type (ISO 19101\*).

**Feature type.** Class of real world phenomena with common properties (ISO 19110\*).

*Note — In a feature catalogue, the basic level of classification is the feature type.*

**Feature.** Abstraction of real world phenomena (ISO 19101\*).

**Filed flight plan.** The flight plan as filed with an ATS unit by the pilot or a designated representative, without any subsequent changes.

**Final approach.** That part of an instrument approach procedure which commences at the specified final approach fix or point, or where such a fix or point is not specified,

- (a) at the end of the last procedure turn, base turn or inbound turn of a racetrack procedure, if specified; or  
*ICAO Annex 4 — Aeronautical Charts Chapter 119/11/09 1-4*
- (b) at the point of interception of the last track specified in the approach procedure; and ends at a point in the vicinity of an aerodrome from which:
  - (1) a landing can be made; or
  - (2) a missed approach procedure is initiated.

**Final approach (FA) mode.** The condition of DME/P operation which supports flight operations in the final approach and runway regions.

**Final approach and take-off area (FATO).** A defined area over which the final phase of the approach manoeuvre to hover or landing is completed and from which the take-off manoeuvre is commenced. Where the FATO is to be used by performance Class 1 helicopters, the defined area includes the rejected take-off area available.

**Final approach fix or point.** That fix or point of an instrument approach procedure where the final approach segment commences.

**Final approach segment.** That segment of an instrument approach procedure in which alignment and descent for landing are accomplished.

**Final approach segment (FAS).** That segment of an instrument approach procedure in which alignment and descent for landing are accomplished.

**Final reserve fuel.** means the minimum quantity of fuel required to provide a margin to secure the safe completion of a flight in the event of any unplanned manoeuvring in the vicinity of the destination or alternate or a suitable aerodrome, as the case may be, and in ordinary circumstances remains on board until completion of the landing

**Final take-off speed.** means the speed of the aeroplane that exists at the end of the take-off path in the en-route configuration with one engine inoperative.

**Fire resistant.** The capability to withstand the application of heat by a flame for a period of 5 minutes.

*Note— The characteristics of an acceptable flame can be found in ISO 2685.*

**First aid oxygen.** Means the additional oxygen provided for the use of passengers, who do not satisfactorily recover following subjection to excessive cabin altitudes, during which they had been provided with supplemental oxygen.

**Fireproof.** The capability to withstand the application of heat by a flame for a period of 15 minutes.

*Note— The characteristics of an acceptable flame can be found in ISO 2685.*

**Fireproof material.** A material capable of withstanding heat as well as or better than steel when the dimensions in both cases are appropriate for the specific purpose.

**Fixed light.** A light having constant luminous intensity when observed from a fixed point.

**Flight crew-member.** A licensed crew-member charged with duties essential to the operation of an aircraft during a flight duty period.

**Flight data analysis.** A process of analysing recorded flight data in order to improve the safety of flight operations.

**Flight documentation.** Written or printed documents, including charts or forms, containing meteorological information for a flight.

**Flight duty period.** A period which commences when a flight or cabin crew-member is required to report for duty that includes a flight or a series of flights and which finishes when the aeroplane finally comes to rest and the engines are shut down at the end of the last flight on which he/she is a crew-member.

*Note— This definition is according to ICAO Annex 6, Part 1.*

**Flight duty period.** the total time from the moment a flight crew-member commences duty, immediately subsequent to a rest period and prior to making a flight or a series of flights, to the moment the flight crew-member is relieved of all duties having completed such flight or series of flights.

*Note— This definition is according to ICAO Annex 6, Part 3.*

**Flight information centre (FIC).** A unit established to provide flight information service and alerting service.

**Flight information region.** An airspace of defined dimensions within which flight information service and alerting service are provided.

**Flight information region (FIR).** An airspace of defined dimensions within which flight information service and alerting service are provided.

**Flight information service (FIS).** A service provided for the purpose of giving advice and information useful for the safe and efficient conduct of flights.

**Flight instruction.** Means instruction in the control of aircraft in basic and advanced flight manoeuvres and includes instruction in respect of conversion from fixed-wing to rotary-wing aircraft or from rotary-wing to fixed-wing aircraft.

**Flight following service.** Means a service providing a flight watch over an aircraft, which initiates emergency action in the event of a missed report or non-arrival of the aircraft within a specific time-frame.

**Flight level.** A surface of constant atmospheric pressure which is related to a specific pressure datum, 1 013.2 hectopascals (hPa), and is separated from other such surfaces by specific pressure intervals.

*Note 1. — A pressure type altimeter calibrated in accordance with the Standard Atmosphere:*

*(a) when set to a QNH altimeter setting, will indicate altitude;*

*(b) when set to a QFE altimeter setting, will indicate height above the QFE reference datum;*

*(c) when set to a pressure of 1 013.2 hPa, may be used to indicate flight levels.*

*Note 2. — The terms “height” and “altitude”, used in Note 1 above, indicate altimetric rather than geometric heights and altitudes.*

**Flight manual.** A manual, associated with the certificate of airworthiness, containing limitations within which the aircraft is to be considered airworthy, and instructions and information necessary to the flight crew-members for the safe operation of the aircraft.

**Flight operations officer/flight dispatcher.** A person designated by the operator to engage in the control and supervision of flight operations, whether licensed or not, suitably qualified in accordance with ICAO Annex 1, who supports, briefs and/or assists the pilot-in-command in the safe conduct of the flight.

**Flight plan.** Specified information provided to air traffic services units, relative to an intended flight or portion of a flight of an aircraft.

*Note— Specifications for flight plans are contained in ICAO Annex 2. When the expression “flight plan form” is used it denotes the model flight plan form at Appendix 2 to the PANS-ATM (Doc 4444).*

**Flight procedures trainer.** See Flight simulation training device.

**Flight procedure design process.** The process which is specific to the design of instrument flight procedures leading to the creation or modification of an instrument flight procedure.

**Flight procedure designer.** A person responsible for flight procedure design who meets the competency requirements as laid down by the State.

**Flight recorder.** Any type of recorder installed in the aircraft for the purpose of complementing accident/incident investigation.

- *Automatic deployable flight recorder (ADFR).* A combination flight recorder installed on the aircraft which is capable of automatically deploying from the aircraft.

**Flight safety documents system.** A set of interrelated documentation established by the operator, compiling and organizing information necessary for flight and ground operations, and comprising, as a minimum, the operations manual and the operator’s maintenance control manual.

**Flight simulation training device.** Any one of the following three types of apparatus in which flight conditions are simulated on the ground:

- *A flight simulator,* which provides an accurate representation of the flight deck of a particular aircraft type to the extent that the mechanical, electrical, electronic, etc. aircraft systems control functions, the normal environment of flight crew-members, and the performance and flight characteristics of that type of aircraft are realistically simulated;
- *A flight procedures trainer,* which provides a realistic flight deck environment, and which simulates instrument responses, simple control functions of mechanical, electrical, electronic, etc. aircraft systems, and the performance and flight characteristics of aircraft of a particular class;
- *A basic instrument flight trainer,* which is equipped with appropriate instruments, and which simulates the flight deck environment of an aircraft in flight in instrument flight conditions.

**Flight simulator.** See Flight simulation training device.

**Flight time — aeroplanes.** The total time from the moment an aeroplane first moves for the purpose of taking off until the moment it finally comes to rest at the end of the flight.

*Note— Flight time as here defined is synonymous with the term “block to block” time or “chock to chock” time in general usage which is measured from the time an aeroplane first moves for the purpose of taking off until it finally stops at the end of the flight.*

**Flight time — helicopters.** The total time from the moment a helicopter’s rotor blades start turning until the moment the helicopter finally comes to rest at the end of the flight, and the rotor blades are stopped.

*Note 1.— The State may provide guidance in those cases where the definition of flight time does not describe or permit normal practices. Examples are: crew change without stopping the rotors; and rotors running engine wash procedure following a flight. In any case, the time when rotors are running between sectors of a flight is included within the calculation of flight time.*

*Note 2.— This definition is intended only for the purpose of flight and duty time regulations.*

**Formation flight.** Means more than one aircraft which—

- (1) navigate and report as a single aircraft and
- (2) are no more than one nautical mile laterally and within 100 feet vertically from the formation leader.

**Flight visibility.** The visibility forward from the cockpit of an aircraft in flight.

**Foot (ft).** The length equal to 0.3048 metre exactly.

**Forecast.** A statement of expected meteorological conditions for a specified time or period, and for a specified area or portion of airspace.

**Foreign object debris (FOD).** An inanimate object within the movement area which has no operational or aeronautical function and which has the potential to be a hazard to aircraft operations.

**Forward error correction (FEC).** The process of adding redundant information to the transmitted signal in a manner which allows correction, at the receiver, of errors incurred in the transmission.

**Frangible object.** An object of low mass designed to break, distort or yield on impact so as to present the minimum hazard to aircraft.

*Note — Guidance on design for frangibility is contained in the Aerodrome Design Manual (Doc 9157), Part 6.*

**Frame.** The basic unit of transfer at the link level. In the context of Mode S subnetwork, a frame can include from one (1) to four (4) Comm-A or Comm-B segments, from two (2) to sixteen (16) Comm-C segments, or from one (1) to sixteen (16) Comm-D segments.

**Frame.** The link layer frame is composed of a sequence of address, control, FCS and information fields. For VDL Mode 2, these fields are bracketed by opening and closing flag sequences, and a frame may or may not include a variable-length information field.

**Free text message element.** Part of a message that does not conform to any standard message element in the PANS-ATM (Doc 4444).

**Free zone.** A part of the territory of a Contracting State where any goods introduced are generally regarded, insofar as import duties and taxes are concerned, as being outside the customs territory.

**Frequency assignment.** A logical assignment of centre frequency and channel bandwidth programmed to the base station (BS).

**Frequency channel.** A continuous portion of the frequency spectrum appropriate for a transmission utilizing a specified class of emission.

*Note— The classification of emissions and information relevant to the portion of the frequency spectrum appropriate for a given type of transmission (bandwidths) are specified in the Radio Regulations, Article 2 and Appendix 1.*

**Front course sector.** The course sector which is situated on the same side of the localizer as the runway.

**Fully Automatic relay installation.** A teletypewriter installation where interpretation of the relaying responsibility in respect of incoming message and the resultant setting up of the connection required to affect the appropriate retransmission is carried out automatically, as well as all other normal operation of relay, thus obviating the need for operator intervention, except for supervisory purposes.

**Function.** A particular service provided by the MLS, e.g. approach azimuth guidance, back azimuth guidance or basic data, etc.

## Section G

**Gain-to-noise temperature ratio.** The ratio, usually expressed in dB/K, of the antenna gain to the noise at the receiver output of the antenna subsystem. The noise is expressed as the temperature that a 1 ohm resistor must be raised to produce the same noise power density.

**GAMET area forecast.** An area forecast in abbreviated plain language for low-level flights for a flight information region or sub-area thereof, prepared by the meteorological office designated by the meteorological authority concerned and exchanged with meteorological offices in adjacent flight information regions, as agreed between the meteorological authorities concerned.

**Gaussian filtered frequency shifts keying (GFSK).** A continuous-phase, frequency shift keying technique using two tones and a Gaussian pulse shape filter.

**GBAS/E.** A ground-based augmentation system transmitting an elliptically-polarized VHF data broadcast.

**GBAS/H.** A ground-based augmentation system transmitting a horizontally-polarized VHF data broadcast.

**General aviation operation.** An aircraft operation other than a commercial air transport operation or an aerial work operation.

**General aviation area.** Means an airspace, of defined dimensions, in which intensive VFR activity may occur and the rules of Class G airspace apply.

**General formatter/manager (GFM).** The aircraft function responsible for formatting messages to be inserted in the transponder registers. It is also responsible for detecting and handling error conditions such as the loss of input data.

**General purpose system (GP).** Air-ground radiotelephony facilities providing for all categories of traffic listed in ICAO annex 10 Volume 2 chapter 5.1.8.

*Note— In this system communication is normally indirect, i.e. exchanged through the intermediary of a third person.*

**Geodesic distance.** The shortest distance between any two points on a mathematically defined ellipsoidal surface.

**Geodetic datum.** A minimum set of parameters required to define location and orientation of the local reference system with respect to the global reference system/frame.

**Geoid.** The equipotential surface in the gravity field of the Earth which coincides with the undisturbed mean sea level (MSL) extended continuously through the continents.

*Note — The geoid is irregular in shape because of local gravitational disturbances (wind tides, salinity, current, etc.) and the direction of gravity is perpendicular to the geoid at every point.*

**Geoid undulation.** The distance of the geoid above (positive) or below (negative) the mathematical reference ellipsoid.

*Note — In respect to the World Geodetic System — 1984 (WGS-84) defined ellipsoid, the difference between the WGS-84 ellipsoidal height and orthometric height represents WGS-84 geoid undulation.*

**Glide path.** A descent profile determined for vertical guidance during a final approach.

**Glider.** A non-power-driven heavier-than-air aircraft, deriving its lift in flight chiefly from aerodynamic reactions on surfaces which remain fixed under given conditions of flight.

**Glider flight time.** The total time occupied in flight, whether being towed or not, from the moment the glider first moves for the purpose of taking off until the moment it comes to rest at the end of the flight.

**Global navigation satellite system (GNSS).** A worldwide position and time determination system that includes one or more satellite constellations, aircraft receivers and system integrity monitoring, augmented as necessary to support the required navigation performance for the intended operation.

**Global navigation satellite system (GLONASS).** The satellite navigation system operated by the Russian Federation.

**Global signaling channel (GSC).** A channel available on a worldwide basis which provides for communication control.

**Global positioning system (GPS).** The satellite navigation system operated by the United States.

**GNSS position error.** The difference between the true position and the position determined by the GNSS receiver.

**Gold code.** A class of unique codes used by GPS, which exhibit bounded cross-correlation and off-peak auto-correlation values.

**Gray (Gy).** The energy imparted by ionizing radiation to a mass of matter corresponding to 1 joule per kilogram.

**Gregorian calendar.** Calendar in general use; first introduced in 1582 to define a year that more closely approximates the tropical year than the Julian calendar (ISO 19108\*\*\*).

*Note — In the Gregorian calendar, common years have 365 days and leap years 366 days divided into twelve sequential months.*

**Grid point data in digital form.** Computer processed meteorological data for a set of regularly spaced points on a chart, for transmission from a meteorological computer to another computer in a code form suitable for automated use.

*Note — In most cases, such data are transmitted on medium- or high-speed telecommunications channels.*

**Ground-based augmentation system (GBAS).** An augmentation system in which the user receives augmentation information directly from a ground-based transmitter.

**Ground-based regional augmentation system (GRAS).** An augmentation system in which the user receives augmentation information directly from one of a group of ground-based transmitters covering a region.

**Ground earth station (GES).** An earth station in the fixed satellite service, or, in some cases, in the aeronautical mobile-satellite service, located at a specified fixed point on land to provide a feeder link for the aeronautical mobile satellite service.

*Note — This definition is used in the ITU's Radio Regulations under the term "aeronautical earth station". The definition herein as "GES" for use in the SARPs is to clearly distinguish it from an aircraft earth station (AES), which is a mobile station on an aircraft.*

**Ground data circuit-terminating equipment (GDCE).** A ground specific data circuit-terminating equipment associated with a ground data link processor (GDLP). It operates a protocol unique to Mode S data link for data transfer between air and ground.

**Ground data link processor (GDLP).** A ground-resident processor that is specific to a particular air-ground data link (e.g. Mode S), and which provides channel management, and segments and/or reassembles messages for transfer. It is connected on one side (by means of its DCE) to ground elements common to all data link systems, and on the other side to the air-ground link itself.

**Ground-initiated Comm-B (GICB).** The ground-initiated Comm-B protocol allows the interrogator to extract Comm-B replies containing data from a defined source in the MB field.

**Ground-initiated protocol.** A procedure initiated by a Mode S interrogator for delivering standard length or extended length messages to a Mode S aircraft installation.

**Ground equipment.** Articles of a specialized nature for use in the maintenance, repair and servicing of an aircraft on the ground, including testing equipment and cargo- and passenger-handling equipment.

**Ground handling.** Services necessary for an aircraft's arrival at, and departure from, an airport, other than air traffic services.

**Ground visibility.** The visibility at an aerodrome as reported by an accredited observer or by automatic systems.

**Ground-to-air communication.** One-way communication from stations or locations on the surface of the earth to aircraft.

**Gyroplane.** A heavier-than-air aircraft supported in flight by the reactions of the air on one or more rotors which rotate freely on substantially vertical axes.

## Section H

**Half course sector.** The sector, in a horizontal plane containing the course line and limited by the loci of points nearest to the course line at which the DDM is 0.0775.

**Half ILS glide path sector.** The sector in the vertical plane containing the ILS glide path and limited by the loci of points nearest to the glide path at which the DDM is 0.0875.

**Hang glider.** Means a glider, including a powered glider, that is capable of being launched and landed solely by the use of the pilot's legs, and includes paragliders:

**Hang gliding organisation.** Means the holder of an aviation recreation organisation certificate issued by the Authority that authorises specified privileges associated with the operation of hang gliders.

**Harness.** means the equipment, consisting of two shoulder straps and a lap belt, which is provided to restrain a member of the flight crew against inertia loads occurring in emergency conditions.

**Hazard.** A condition or an object with the potential to cause or contribute to an aircraft incident or accident.

**Hazard beacon.** An aeronautical beacon used to designate a danger to air navigation.

**Heavier-than-air aircraft.** Means any aircraft deriving its lift in flight chiefly from aerodynamic forces

**Heading.** The direction in which the longitudinal axis of an aircraft is pointed, usually expressed in degrees from North (true, magnetic, compass or grid).

**Head-up display (HUD).** A display system that presents flight information into the pilot's forward external field of view.

**Heavier-than-air aircraft.** Any aircraft deriving its lift in flight chiefly from aerodynamic forces.

**Height.** The vertical distance of a level, point or an object considered as a point, measured from a specific datum.

**Helicopter air taxiway.** A defined path on the surface established for the air taxiing of helicopters.

**Helicopter clearway.** A defined area on the ground or water, selected and/or prepared as a suitable area over which a helicopter operated in performance class 1 may accelerate and achieve a specific height.

**Helicopter ground taxiway.** A ground taxiway intended for the ground movement of wheeled undercarriage helicopters.

**Helicopter stand.** An aircraft stand which provides for parking a helicopter and where ground taxi operations are completed or where the helicopter touches down and lifts off for air taxi operations.

**Helicopter taxi-route.** A defined path established for the movement of helicopters from one part of a heliport to another. A taxi-route includes a helicopter air or ground taxiway which is centred on the taxi-route.

**Helicopter.** A heavier-than-air aircraft supported in flight chiefly by the reactions of the air on one or more power-driven rotors on substantially vertical axes.

*Note — Some States use the term "rotorcraft" as an alternative to "helicopter".*

**Helicopter Class external loads.** Means the combination of a helicopter and an external-load, including the external load attaching means. Helicopter-load combinations are designated as Class A, Class B, Class C and Class D as follows:

- (1) Class A helicopter-load combination means one in which the external load cannot move freely, cannot be jettisoned, and does not extend below the landing gear.

- (2) Class B helicopter-load combination means one in which the external load is jettisonable and is lifted free of land or water during the helicopter operation.
- (3) Class C helicopter-load combination means one in which the external load is jettisonable and remains in contact with land or water during the helicopter operation.
- (4) Class D helicopter-load combination means one in which the external load is other than a Class A, B or C and has been specifically approved for that operation.

**Helideck.** A heliport located on a fixed or floating offshore facility such as an exploration and/or production unit used for the exploitation of oil or gas.

**Heliport elevation.** The elevation of the highest point of the FATO.

**Heliport operating minima.** The limits of usability of a heliport for:

- (a) take-off, expressed in terms of runway visual range and/or visibility and, if necessary, cloud conditions;
- (b) landing in 2D instrument approach operations, expressed in terms of visibility and/or runway visual range, minimum descent altitude/height (MDA/H) and, if necessary, cloud conditions; and
- (c) landing in 3D instrument approach operations, expressed in terms of visibility and/or runway visual range and decision altitude/height (DA/H) as appropriate to the type and/or category of the operation.

**Heliport reference point (HRP).** The designated location of a heliport or a landing location.

**Heliport.** An aerodrome or a defined area on a structure intended to be used wholly or in part for the arrival, departure and surface movement of helicopters.

*Note — Throughout this Part, when the term “heliport” is used, it is intended that the term also applies to aerodromes primarily meant for the use of aeroplanes.*

*Note — Helicopters may be operated to and from areas other than heliports.*

**Henry (H).** The inductance of a closed circuit in which an electromotive force of 1 volt is produced when the electric current in the circuit varies uniformly at a rate of 1 ampere per second.

**Hertz (Hz).** The frequency of a periodic phenomenon of which the period is 1 second.

**High-risk cargo or mail.** Cargo or mail presented by an unknown entity or showing signs of tampering shall be considered high risk if, in addition, it meets one of the following criteria:

- (a) specific intelligence indicates that the cargo or mail poses a threat to civil aviation; or
- (b) the cargo or mail shows anomalies that give rise to suspicion; or
- (c) the nature of the cargo or mail is such that baseline security measures alone are unlikely to detect prohibited items that could endanger the aircraft.

Regardless of whether the cargo or mail comes from a known or unknown entity, a State’s specific intelligence about a consignment may render it as high risk.

**High frequency network protocol data unit (HFNPDU).** User data packet.

**High performance receiver.** A UAT receiver with enhanced selectivity to further improve the rejection of adjacent frequency DME interference (see ICAO Annex 10 Volume III, 12.3.2.2 for further details).

**Holding bay.** A defined area where aircraft can be held, or bypassed, to facilitate efficient surface movement of aircraft.

**Holdover time.** The estimated time the anti-icing fluid (treatment) will prevent the formation of ice and frost and the accumulation of snow on the protected (treated) surfaces of an aeroplane.

**Holding procedure.** A predetermined manoeuvre which keeps an aircraft within a specified airspace while awaiting further clearance.

**Homing.** The procedure of using the direction-finding equipment of one radio station with the emission of another radio station, where at least one of the stations is mobile, and whereby the mobile station proceeds continuously towards the other station.

**Hostile environment.** An environment in which:

- (a) a safe forced landing cannot be accomplished because the surface and surrounding environment are inadequate; or
- (b) the helicopter occupants cannot be adequately protected from the elements; or
- (c) search and rescue response/capability is not provided consistent with anticipated exposure; or
- (d) there is an unacceptable risk of endangering persons or property on the ground

**Horizontal miss distance (HMD).** The minimum horizontal separation observed in an encounter.

**Hot spot.** A location on an aerodrome movement area with a history or potential risk of collision or runway incursion, and where heightened attention by pilots/drivers is necessary.

**Hover.** Means a helicopter flight at a constant height and position over the surface

**Hire or reward.** Means any payment, consideration, gratuity or benefit, directly or indirectly charged, demanded, received or collected by any person for the use of an aircraft;

**Human Factors principles.** Principles which apply to aeronautical design, certification, training, operations and maintenance and which seek safe interface between the human and other system components by proper consideration to human performance.

**Human performance.** Human capabilities and limitations which have an impact on the safety and efficiency of aeronautical operations.

**Hybrid surveillance.** The process of using a combination of active surveillance and passive surveillance with validated data to update an ACAS track in order to preserve ACAS independence.

**Hypsometric tints.** A succession of shades or colour gradations used to depict ranges of elevation.

## Section I

**ICAO meteorological information exchange model (IWXXM).** A data model for representing aeronautical meteorological information.

**ICAO Public Key Directory (ICAO PKD).** The central database serving as the repository of Document Signer Certificates (CDS) (containing Document Signer Public Keys), CSCA Master List (MLCSCA), Country Signing CA Link Certificates (ICSCA) and Certificate Revocation Lists issued by Participants, together with a system for their distribution worldwide, maintained by ICAO on behalf of Participants in order to facilitate the validation of data in eMRTDs.

**Identification beacon.** An aeronautical beacon emitting a coded signal by means of which a particular point of reference can be identified.

**IFR flight.** A flight conducted in accordance with the instrument flight rules.

**IFR.** The symbol used to designate the instrument flight rules.

**ILS continuity of service.** That quality which relates to the rarity of radiated signal interruptions. The level of continuity of service of the localizer or the glide path is expressed in terms of the probability of not losing the radiated guidance signals.

**ILS glide path.** That locus of points in the vertical plane containing the runway center line at which the DDM is zero, which, of all such loci, is the closest to the horizontal plane.

**ILS glide path angle.** The angle between a straight line which represents the mean of the ILS glide path and the horizontal.

**ILS glide path bend.** An ILS glide path bend is an aberration of the ILS glide path with respect to its nominal position.

**ILS glide path sector.** The sector in the vertical plane containing the ILS glide path and limited by the loci of points nearest to the glide path at which the DDM is 0.175.

*Note — The ILS glide path sector is located in the vertical plane containing the runway center line, and is divided by the radiated glide path in two parts called upper sector and lower sector, referring respectively to the sectors above and below the glide path.*

**ILS integrity.** That quality which relates to the trust which can be placed in the correctness of the information supplied by the facility. The level of integrity of the localizer or the glide path is expressed in terms of the probability of not radiating false guidance signals.

**ILS Point "A".** A point on the ILS glide path measured along the extended runway center line in the approach direction a distance of 7.5 km (4 NM) from the threshold.

**ILS Point "B".** A point on the ILS glide path measured along the extended runway center line in the approach direction a distance of 1 050 m (3 500 ft) from the threshold.

**ILS Point "C".** A point through which the downward extended straight portion of the nominal ILS glide path passes at a height of 30 m (100 ft) above the horizontal plane containing the threshold.

**ILS Point “D”.** A point 4 m (12 ft) above the runway center line and 900 m (3 000 ft) from the threshold in the direction of the localizer.

**ILS Point “E”.** A point 4 m (12 ft) above the runway center line and 600 m (2 000 ft) from the stop end of the runway in the direction of the threshold.

*Note* — See ICAO Annex 10 Attachment C, Figure C-1.

**ILS reference datum (Point “T”).** A point at a specified height located above the intersection of the runway center line and the threshold and through which the downward extended straight portion of the ILS glide path passes.

**IMC.** The symbol used to designate instrument meteorological conditions.

**Immigration control.** Measures adopted by States to control the entry into, transit through and departure from their territories of persons travelling by air.

**Import duties and taxes.** Customs duties and all other duties, taxes or charges, which are collected on or in connection with the importation of goods. Not included are any charges which are limited in amount to the approximate cost of services rendered or collected by the customs on behalf of another national authority.

**Imposter.** A person who impersonates the rightful holder of a genuine travel document.

**Improperly documented person.** A person who travels, or attempts to travel: (a) with an expired travel document or an invalid visa; (b) with a counterfeit, forged or altered travel document or visa; (c) with someone else’s travel document or visa; (d) without a travel document; or (e) without a visa, if required.

**Inadmissible person.** A person who is or will be refused admission to a State by its authorities.

**INCERFA.** The code word used to designate an uncertainty phase.

**Incident.** An occurrence, other than an accident, associated with the operation of an aircraft which affects or could affect the safety of operation.

*Note* — The types of incidents which are of interest for safety-related studies include the incidents listed in ICAO Annex 13, Attachment C.

**Independent Approved Procedure Designer (IAPD).** An APD who has not been involved in the design of the IFP which is being validated.

**Independent parallel approaches.** Simultaneous approaches to parallel or near-parallel instrument runways where radar separation minima between aircraft on adjacent extended runway centre lines are not prescribed.

**Independent parallel departures.** Simultaneous departures from parallel or near-parallel instrument runways.

**Indicated course line.** The locus of points in any horizontal plane at which the receiver indicator deflection is zero.

**Indicated course sector.** A sector in any horizontal plane containing the indicated course line in which the receiver indicator deflection remains within full- scale values.

**Industry codes of practice.** Guidance material developed by an industry body, for a particular sector of the aviation industry to comply with the requirements of the International Civil Aviation Organization’s Standards and Recommended Practices, other aviation safety requirements and the best practices deemed appropriate.

*Note* — Some States accept and reference industry codes of practice in the development of regulations to meet the requirements of ICAO Annex 6, Part II, and make available, for the industry codes of practice, their sources and how they may be obtained.

***In-flight security officer.*** A person who is authorized by the government of the State of the Operator and the government of the State of Registration to be deployed on an aircraft with the purpose of protecting that aircraft and its occupants against acts of unlawful interference. This excludes persons employed to provide exclusive personal protection for one or more specific people travelling on the aircraft, such as personal bodyguards.

***Initial approach (IA) mode.*** The condition of DME/P operation which supports those flight operations outside the final approach region and which is interoperable with DME/N.

***Initial approach segment.*** That segment of an instrument approach procedure between the initial approach fix and the intermediate approach fix or, where applicable, the final approach fix or point.

***Instrument approach operations.*** An approach and landing using instruments for navigation guidance based on an instrument approach procedure. There are two methods for executing instrument approach operations:

- (1) a two-dimensional (2D) instrument approach operation, using lateral navigation guidance only; and
- (2) a three-dimensional (3D) instrument approach operation, using both lateral and vertical navigation guidance.

*Note* — *Lateral and vertical navigation guidance refers to the guidance provided either by:*

- (a) *a ground-based radio navigation aid; or*
- (b) *computer-generated navigation data from ground-based, space-based, self-contained navigation aids or a combination of these.*

***Instrument approach procedure (IAP).*** A series of predetermined manoeuvres by reference to flight instruments with specified protection from obstacles from the initial approach fix, or where applicable, from the beginning of a defined arrival route to a point from which a landing can be completed and thereafter, if a landing is not completed, to a position at which holding or en-route obstacle clearance criteria apply. Instrument approach procedures are classified as follows:

- Non-precision approach (NPA) procedure. An instrument approach procedure designed for 2D instrument approach operations Type A.

*Note* — *Non-precision approach procedures may be flown using a continuous descent final approach (CDFA) technique. CDFAs with advisory vertical navigation (VNAV) guidance calculated by on-board equipment (see PANS- OPS (Doc 8168), Volume I, Part I, Section 4, Chapter 1, 1.8.1) are considered 3D instrument approach operations. CDFAs with manual calculation of the required rate of descent are considered 2D instrument approach operations. For more information on CDFAs, refer to PANS-OPS (Doc 8168), Volume I, Part I, Section 4, Chapter 1, 1.7 and 1.8.*

- Approach procedure with vertical guidance (APV). A performance-based navigation (PBN) instrument approach procedure designed for 3D instrument approach operations Type A.
- *Precision approach (PA) procedure.* An instrument approach procedure based on navigation systems (ILS, MLS, GLS and SBAS CAT I) designed for 3D instrument approach operations Type A or B.

*Note* — *Refer to ICAO ANNEX 6 Part 1 4.2.8.3 for instrument approach operation types.*

***Instrument flight procedure design service (IFPDS).*** A service established for the design, documentation, validation, continuous maintenance and periodic review of instrument flight procedures necessary for the safety, regularity and efficiency of air navigation.

***Instrument flight procedure design service provider (IFPDSP).*** A body that provides an IFPDS.

***Instrument flight time.*** Time during which a pilot is piloting an aircraft solely by reference to instruments and without external reference points.

**Instrument ground time.** Time during which a pilot is practising, on the ground, simulated instrument flight in a flight simulation training device approved by the Licensing Authority.

**Instrument meteorological conditions (IMC).** Meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling, \* less than the minima specified for visual meteorological conditions.

*Note — The specified minima for visual meteorological conditions are contained in Chapter 4 of ICAO Annex 2.*

**Instrument runway.** One of the following types of runways intended for the operation of aircraft using instrument approach procedures:

- (a) *Non-precision approach runway.* A runway served by visual aids and non-visual aid(s) intended for landing operations following an instrument approach operation type A and a visibility not less than 1 000 m.
- (b) *Precision approach runway, category I.* A runway served by visual aids and non-visual aid(s) intended for landing operations following an instrument approach operation type B with a decision height (DH) not lower than 60 m (200 ft) and either a visibility not less than 800 m or a runway visual range not less than 550 m.
- (c) *Precision approach runway, category II.* A runway served by visual aids and non-visual aid(s) intended for landing operations following an instrument approach operation type B with a decision height (DH) lower than 60 m (200 ft) but not lower than 30 m (100 ft) and a runway visual range not less than 300 m.
- (d) *Precision approach runway, category III.* A runway served by visual aids and non-visual aid(s) intended for landing operations following an instrument approach operation type B to and along the surface of the runway and:
  - A. intended for operations with a decision height (DH) lower than 30 m (100 ft), or no decision height and a runway visual range not less than 175 m.
  - B. intended for operations with a decision height (DH) lower than 15 m (50 ft), or no decision height and a runway visual range less than 175 m but not less than 50 m.
  - C. intended for operations with no decision height (DH) and no runway visual range limitations.

*Note 1. — Visual aids need not necessarily be matched to the scale of non-visual aids provided. The criterion for the selection of visual aids is the conditions in which operations are intended to be conducted.*

*Note 2. — Refer to ICAO Annex 6 — Operation of Aircraft for instrument approach operation types.*

**Instrument time.** Instrument flight time or instrument ground time.

**Integrated Aeronautical Information Package.** A package in paper, or electronic media which consists of the following elements:

- AIP, including amendment service;
- Supplements to the AIP;
- NOTAM and PIB;
- AIC; and
- checklists and lists of valid NOTAM.

**Integrated survival suit.** A survival suit which meets the combined requirements of the survival suit and life jacket.

**Integrity (aeronautical data).** A degree of assurance that an aeronautical data and its value has not been lost nor altered since the data origination or authorized amendment.

**Integrity.** A measure of the trust that can be placed in the correctness of the information supplied by the total system. Integrity includes the ability of a system to provide timely and valid warnings to the user (alerts).

**Integrity classification (aeronautical data).** Classification based upon the potential risk resulting from the use of corrupted data. Aeronautical data is classified as:

- (a) *routine data*: there is a very low probability when using corrupted routine data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe;
- (b) *essential data*: there is a low probability when using corrupted essential data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe; and
- (c) *critical data*: there is a high probability when using corrupted critical data that the continued safe flight and landing of an aircraft would be severely at risk with the potential for catastrophe.

**Interactive API (iAPI) system.** An electronic system that transmits, during check-in, API data elements collected by the aircraft operator to public authorities who, within existing business processing times for passenger check-in, return to the operator a response message for each passenger and/or crew-member.

**Intermediate approach segment.** That segment of an instrument approach procedure between either the intermediate approach fix and the final approach fix or point, or between the end of a reversal, racetrack or dead reckoning track procedure and the final approach fix or point, as appropriate.

**Intermediate holding position.** A designated position intended for traffic control at which taxiing aircraft and vehicles shall stop and hold until further cleared to proceed, when so instructed by the aerodrome control tower.

**International airport.** Any airport designated by the Contracting State in whose territory it is situated as an airport of entry and departure for international air traffic, where the formalities incident to customs, immigration, public health, animal and plant quarantine and similar procedures are carried out.

**International airways volcano watch (IAVW).** International arrangements for monitoring and providing warnings to aircraft of volcanic ash in the atmosphere.

*Note — The IAVW is based on the cooperation of aviation and non-aviation operational units using information derived from observing sources and networks that are provided by States. The watch is coordinated by ICAO with the cooperation of other concerned international organizations.*

**International NOTAM office (NOF).** An office designated by a State for the exchange of NOTAM internationally.

**International operating agency.** An agency of the kind contemplated in Article 77 of the Convention.

**International telecommunication service.** A telecommunication service between offices or stations of different States, or between mobile stations which are not in the same State, or are subject to different States.

**Interpilot air-to-air communication.** Two-way communication on the designated air-to-air channel to enable aircraft engaged in flights over remote and oceanic areas out of range of VHF ground stations to exchange necessary operational information and to facilitate the resolution of operational problems.

**Isogonal.** A line on a map or chart on which all points have the same magnetic variation for a specified epoch.

**Isogriv.** A line on a map or chart which joins points of equal angular difference between the North of the navigation grid and Magnetic North.

**Isolated aerodrome.** A destination aerodrome for which there is no destination alternate aerodrome suitable for a given aeroplane type.

## Section J

**JAA.** the 'Joint Aviation Authorities'

**JAR.** 'Joint Aviation Requirements'.

**Joint rescue coordination centre (JRCC).** A rescue coordination centre responsible for both aeronautical and maritime search and rescue operations.

**Joule (J).** The work done when the point of application of a force of 1 newton is displaced a distance of 1 metre in the direction of the force.

## Section K

**Kelvin (K).** A unit of thermodynamic temperature which is the fraction  $1/273.16$  of the thermodynamic temperature of the triple point of water.

**Key down time.** The time during which a dot or dash of a Morse character is being transmitted.

**Kilogram (kg).** The unit of mass equal to the mass of the international prototype of the kilogram.

**Knot (kt).** The speed equal to 1 nautical mile per hour.

**Known consignor.** A consignor who originates cargo or mail for its own account and whose procedures meet common security rules and standards sufficient to allow the carriage of cargo or mail on any aircraft.

## Section L

**Lading.** The placing of cargo, mail, baggage or stores on board an aircraft to be carried on a flight.

**Landing area.** That part of a movement area intended for the landing or take-off of aircraft.

**Landing decision point (LDP).** The point used in determining landing performance from which, an engine failure occurring at this point, the landing may be safely continued or a balked landing initiated.

*Note— LDP applies only to helicopters operating in performance Class 1.*

**Landing direction indicator.** A device to indicate visually the direction currently designated for landing and for take-off.

**Landing distance available (LDA).** The length of runway which is declared available and suitable for the ground run of an aeroplane landing.

**Landing location.** A marked or unmarked area that has the same physical characteristics as a visual heliport final approach and take-off area (FATO).

**Landing surface.** That part of the surface of an aerodrome which the aerodrome authority has declared available for the normal ground or water run of aircraft landing in a particular direction.

**Large aeroplane.** An aeroplane of a maximum certificated take-off mass of over 5700 kg.

**Laser-beam critical flight zone (LCFZ).** Airspace in the proximity of an aerodrome but beyond the LFFZ where the irradiance is restricted to a level unlikely to cause glare effects.

**Laser-beam free flight zone (LFFZ).** Airspace in the immediate proximity of the aerodrome where the irradiance is restricted to a level unlikely to cause any visual disruption.

**Laser-beam sensitive flight zone (LSFZ).** Airspace outside, and not necessarily contiguous with, the LFFZ and LCFZ where the irradiance is restricted to a level unlikely to cause flash-blindness or after-image effects.

**Level.** A generic term relating to the vertical position of an aircraft in flight and meaning variously, height, altitude or flight level.

**Level aircraft.** An aircraft that is not transitioning

**Licensing Authority.** The Authority designated by a Contracting State as responsible for the licensing of personnel.

*Note— In the provisions of this ICAO Annex 1, the Licensing Authority is deemed to have been given the following responsibilities by the Contracting State:*

- (a) assessment of an applicant's qualifications to hold a license or rating;*
- (b) issue and endorsement of licenses and ratings;*
- (c) designation and authorization of approved persons;*
- (d) approval of training courses;*
- (e) approval of the use of flight simulation training devices and authorization for their use in gaining the experience or in demonstrating the skill required for the issue of a license or rating; and*
- (f) validation of licenses issued by other Contracting States.*

**Lighter-than-air aircraft.** Any aircraft supported chiefly by its buoyancy in the air.

**Lighting system reliability.** The probability that the complete installation operates within the specified tolerances and that the system is operationally usable.

**Likely.** In the context of the medical provisions in Chapter 6 of ICAO ANNEX 1, *likely* means with a probability of occurring that is unacceptable to the medical assessor.

**Limit loads.** The maximum loads assumed to occur in the anticipated operating conditions.

**Litre (L).** A unit of volume restricted to the measurement of liquids and gases which is equal to 1 cubic decimetre.

**Link layer.** The layer that lies immediately above the physical layer in the Open Systems Interconnection protocol model. The link layer provides for the reliable transfer of information across the physical media. It is subdivided into the data link sublayer and the media access control sublayer.

**Link management entity (LME).** A protocol state machine capable of acquiring, establishing and maintaining a connection to a single peer system. An LME establishes data link and subnetwork connections, “hands-off” those connections, and manages the media access control sublayer and physical layer. An aircraft LME tracks how well it can communicate with the ground stations of a single ground system. An aircraft VME instantiates an LME for each ground station that it monitors. Similarly, the ground VME instantiates an LME for each aircraft that it monitors. An LME is deleted when communication with the peer system is no longer viable.

**Link protocol data unit (LPDU).** Data unit which encapsulates a segment of an HFNPDU.

**Link.** A link connects an aircraft DLE and a ground DLE and is uniquely specified by the combination of aircraft DLS address and the ground DLS address. A different subnetwork entity resides above every link endpoint.

**Load factor.** The ratio of a specified load to the weight of the aircraft, the former being expressed in terms of aerodynamic forces, inertia forces, or ground reactions.

**Location indicator.** A four-letter code group formulated in accordance with rules prescribed by ICAO and assigned to the location of an aeronautical fixed station.

**Locator.** An LF/MF NDB used as an aid to final approach.

*Note— A locator usually has an average radius of rated coverage of between 18.5 and 46.3 km (10 and 25 NM).*

**Localizer course bend.** A course bend is an aberration of the localizer course line with respect to its nominal position.

**Logon address.** A specified code used for data link logon to an ATS unit.

**Low modulation rates.** Modulation rates up to and including 300 bauds.

**Lumen (lm).** The luminous flux emitted in a solid angle of 1 steradian by a point source having a uniform intensity of 1 candela.

**Lux (lx).** The illuminance produced by a luminous flux of 1 lumen uniformly distributed over a surface of 1 square metre.

## Section M

**M burst.** A management channel data block of bits used in VDL Mode 3. This burst contains signalling information needed for media access and link status monitoring.

**M-ary phase shift keying (M-PSK) modulation.** A digital phase modulation that causes the phase of the carrier waveform to take on one of a set of M values.

**Magnetic variation.** The angular difference between True North and Magnetic North.

*Note — The value given indicates whether the angular difference is East or West of True North.*

**Major modification.** Means a modification that could potentially affect the safety of an aircraft or its occupants where, as a result of its embodiment, one or more of the following incidents may occur:

- (1) structural collapse:
- (2) loss of control:
- (3) failure of motive power:
- (4) unintentional operation of, or inability to operate, any systems or equipment essential to the safety or operational function of the aircraft:
- (5) incapacitating injury to any occupant:
- (6) unacceptable unserviceability or maintainability.

**Major repair.** Means a repair that could potentially affect the safety of an aircraft or its occupants where, as a result of its embodiment, one or more of the following incidents may occur:

- (1) structural collapse:
- (2) loss of control:
- (3) failure of motive power:
- (4) unintentional operation of, or inability to operate, any systems or equipment essential to the safety or operational function of the aircraft:
- (5) incapacitating injury to any occupant:
- (6) unacceptable unserviceability or maintainability:

**Mail.** Dispatches of correspondence and other items tendered by and intended for delivery to postal services in accordance with the rules of the Universal Postal Union (UPU).

**Main parachute.** Means a parachute, other than an emergency parachute, that is designed and intended to be used as a primary parachute.

**Maintenance.**<sup>†</sup> The performance of tasks required to ensure the continuing airworthiness of an aircraft, including any one or combination of overhaul, inspection, replacement, defect rectification, and the embodiment of a modification or repair.

<sup>†</sup> Applicable until 4 November 2020.

**Maintenance.**<sup>††</sup> The performance of tasks on an aircraft, engine, propeller or associated part required to ensure the continuing airworthiness of an aircraft engine, propeller or associated part including any one or combination of overhaul, inspection, replacement, defect rectification, and the embodiment of a modification or repair.

<sup>††</sup> Applicable as of 5 November 2020.

**Maintenance.** Means any one or combination of the following activities: overhaul, repair, inspection, replacement, modification or defect rectification of an aircraft or component, with the exception of pre-flight inspection.

**Maintenance organization's procedures manual.\*\*** A document endorsed by the head of the maintenance organization which details the maintenance organization's structure and management responsibilities, scope of work, description of facilities, maintenance procedures and quality assurance or inspection systems.

\*\* Applicable as of 5 November 2020.

**Maintenance programme.** A document which describes the specific scheduled maintenance tasks and their frequency of completion and related procedures, such as a reliability programme, necessary for the safe operation of those aircraft to which it applies.

**Maintenance records.\*\*** Records that set out the details of the maintenance carried out on an aircraft, engine, propeller or associated part.

\*\* Applicable as of 5 November 2020.

**Maintenance release.\*\*** A document which contains a certification confirming that the maintenance work to which it relates has been completed in a satisfactory manner in accordance with appropriate airworthiness requirements.

\*\* Applicable as of 5 November 2020.

**Manoeuvring area.** That part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, excluding aprons.

**Marker.** An object displayed above ground level in order to indicate an obstacle or delineate a boundary.

**Marking.** A symbol or group of symbols displayed on the surface of the movement area in order to convey aeronautical information.

**Margin.** The maximum degree of distortion of the circuit at the end of which the apparatus is situated which is compatible with the correct translation of all the signals which it may possibly receive.

**Maximum diversion time.** Maximum allowable range, expressed in time, from a point on a route to an en-route alternate aerodrome.

**Maximum mass.** Maximum certificated take-off mass.

**Maximum certificated take-off weight.** in relation to an aircraft, means the weight specified as the maximum take-off weight of the aircraft in a flight manual or airworthiness certificate relating to the aircraft.

**Maximum passenger seating capacity.** The maximum certificated number of passengers for the aeroplane type design.

**Maximum Zero Fuel Weight.** Means the maximum permissible weight of an aircraft with no disposable fuel or oil. The zero fuel weight figure may be found in either the aircraft type certificate data sheet, the approved Aircraft Flight Manual, or both.

**Mean course error.** The mean value of the azimuth error along the runway extended centre line.

**Mean glide path error.** The mean value of the elevation error along the glide path of an elevation function.

**Mean power (of a radio transmitter).** The average power supplied to the antenna transmission line by a transmitter during an interval of time sufficiently long compared with the lowest frequency encountered in the modulation taken under normal operating conditions.

**Mean time between failures (MTBF).** The actual operating time of a facility divided by the total number of failures of the facility during that period of time.

*Note— The operating time is in general chosen so as to include at least five, and preferably more, facility failures in order to give a reasonable measure of confidence in the figure derived.*

**Medical Assessment.** The evidence issued by a Contracting State that the license holder meets specific requirements of medical fitness.

**Medical assessor.** A physician, appointed by the Licensing Authority, qualified and experienced in the practice of aviation medicine and competent in evaluating and assessing medical conditions of flight safety significance.

*Note 1. — Medical assessors evaluate medical reports submitted to the Licensing Authority by medical examiners.*

*Note 2. — Medical assessors are expected to maintain the currency of their professional knowledge.*

**Medical examiner.** A physician with training in aviation medicine and practical knowledge and experience of the aviation environment, who is designated by the Licensing Authority to conduct medical examinations of fitness of applicants for licenses or ratings for which medical requirements are prescribed.

**Media access control (MAC).** The sublayer that acquires the data path and controls the movement of bits over the data path. **Mode 2.** A data-only VDL mode that uses D8PSK modulation and a carrier sense multiple access (CSMA) control scheme.

**Media access protocol data unit (MPDU).** Data unit which encapsulates one or more LPDUs. **M-PSK symbol.** One of the M possible phase shifts of the M-PSK modulated carrier representing a group of  $\log_2 M$  coded chips.

**Medium modulation rates.** Modulation rates above 300 and up to and including 3 000 bauds.

**Message field.** An assigned area of a message containing specified elements of data.

**Metadata.** Data about data (ISO 19115\*).

*Note— A structured description of the content, quality, condition or other characteristics of data.*

**Meteorological authority.** The authority providing or arranging for the provision of meteorological service for international air navigation on behalf of a Contracting State.

**Meteorological bulletin.** A text comprising meteorological information preceded by an appropriate heading.

**Meteorological information.** Meteorological report, analysis, forecast, and any other statement relating to existing or expected meteorological conditions.

**Meteorological office.** An office designated to provide meteorological service for international air navigation.

**Meteorological operational channel.** A channel of the aeronautical fixed service (AFS), for the exchange of aeronautical meteorological information.

**Meteorological operational telecommunication network.** An integrated system of meteorological operational channels, as part of the aeronautical fixed service (AFS), for the exchange of aeronautical meteorological information between the aeronautical fixed stations within the network.

*Note — “integrated” is to be interpreted as a mode of operation necessary to ensure that the information can be transmitted and received by the stations within the network in accordance with pre-established schedules.*

**Meteorological report.** A statement of observed meteorological conditions related to a specified time and location.

**Meteorological satellite.** An artificial Earth satellite making meteorological observations and transmitting these observations to Earth.

**Meteorological watch office (MWO).** An office designated to provide information concerning the occurrence or expected occurrence of specified en-route weather and other phenomena in the atmosphere that may affect the safety of aircraft operations within its specified area of responsibility.

**Metre (m).** The distance travelled by light in a vacuum during 1/299 792 458 of a second.

**Minimum descent altitude.** Means a specified altitude, referenced to mean sea level, in a non-precision approach or circling approach below which descent may not be made without visual reference

**Minimum descent altitude (MDA) or minimum descent height (MDH).** A specified altitude or height in a 2D instrument approach operation or circling approach operation below which descent must not be made without the required visual reference.

*Note 1.— Minimum descent altitude (MDA) is referenced to mean sea level and minimum descent height (MDH) is referenced to the aerodrome elevation or to the threshold elevation if that is more than 2 m (7 ft) below the aerodrome elevation. A minimum descent height for a circling approach is referenced to the aerodrome elevation.*

*Note 2.— The required visual reference means that section of the visual aids or of the approach area which should have been in view for sufficient time for the pilot to have made an assessment of the aircraft position and rate of change of position, in relation to the desired flight path. In the case of a circling approach the required visual reference is the runway environment.*

*Note 3.— For convenience when both expressions are used they may be written in the form “minimum descent altitude/height” and abbreviated “MDA/H”.*

**Minimum en-route altitude (MEA).** The altitude for an en-route segment that provides adequate reception of relevant navigation facilities and ATS communications, complies with the airspace structure and provides the required obstacle clearance.

**Minimum glide path.** The lowest angle of descent along the zero-degree azimuth that is consistent with published approach procedures and obstacle clearance criteria.

*Note — This is the lowest elevation angle which has been approved and promulgated for the instrument runway.*

**Minimum equipment list (MEL).** A list which provides for the operation of aircraft, subject to specified conditions, with particular equipment inoperative, prepared by an operator in conformity with, or more restrictive than, the MMEL established for the aircraft type.

**Master minimum equipment list (MMEL).** A list established for a particular aircraft type by the organization responsible for the type design with the approval of the State of Design containing items, one or more of which is permitted to be unserviceable at the commencement of a flight. The MMEL may be associated with special operating conditions, limitations or procedures.

**Minimum obstacle clearance altitude (MOCA).** The minimum altitude for a defined segment of flight that provides the required obstacle clearance.

**Minimum sector altitude (MSA).** The lowest altitude which may be used which will provide a minimum clearance of 300 m (1 000 ft) above all objects located in an area contained within a sector of a circle of 46 km (25 NM) radius centred on a significant point, the aerodrome reference point (ARP) or the heliport reference point (HRP).

**Minimum sector altitude.** The lowest altitude which may be used which will provide a minimum clearance of 300 m (1 000 ft) above all objects located in an area contained within a sector of a circle of 46 km (25 NM) radius centred on a radio aid to navigation.

**Mishandled baggage.** Baggage involuntarily, or inadvertently, separated from passengers or crew.

**Missed approach point (MAPt).** That point in an instrument approach procedure at or before which the prescribed missed approach procedure must be initiated in order to ensure that the minimum obstacle clearance is not infringed.

**Microlight.** An aeroplane having no more than two seats, V<sub>SO</sub> not exceeding 35 knots (65 KM/h) CAS, and a maximum take-off mass of no more than-

- 300 kg for a landplane, single seater or
- 450 kg for a landplane, two-seater or
- 330 kg for an amphibian or floatplane, single seater or
- 495 kg for an amphibian or floatplane, two-seater, provided that a microlight capable of operating as both a floatplane and a landplane falls below both MTOM limits, as appropriate.

*Note— Foot-launched aircraft are excluded from this definition.*

**Missed approach procedure.** The procedure to be followed if the approach cannot be continued.

**MLS approach reference datum.** A point on the minimum glide path at a specified height above the threshold. (See ICAO Annex 10 Volume 1 Chapter 3.11.)

**MLS datum point.** The point on the runway centre line closest to the phase centre of the approach elevation antenna. (See ICAO Annex 10 Volume 1 Chapter 3.11.)

**MLS antenna boresight.** The plane passing through the antenna phase centre perpendicular to the horizontal axis contained in the plane of the antenna array.

*Note— In the azimuth case, the boresight of the antenna and the zero-degree azimuth are normally aligned. However, the preferred designation in a technical context is “boresight” whereas the preferred designation in an operational context is “zero-degree azimuth” (see definition below).*

**MLS point D.** A point 2.5 m (8 ft) above the runway centre line and 900 m (3 000 ft) from the threshold in the direction of the azimuth antenna.

**MLS point E.** A point 2.5 m (8 ft) above the runway centre line and 600 m (2 000 ft) from the stop end of the runway in the direction of the threshold.

**MLS azimuth.** The locus of points in any horizontal plane where the decoded guidance angle is constant. MLS approach reference datum. A point at a specified height above the intersection of the runway centre line and the threshold.

**MLS back azimuth reference datum.** A point at a specified height above the runway centre line at the runway midpoint. MLS datum point. The point on the runway centre line closest to the phase centre of the approach elevation antenna. MLS elevation. The locus of points in any vertical plane where the decoded guidance angle is constant.

**MLS zero-degree azimuth.** The MLS azimuth where the decoded guidance angle is zero degrees.

**Mobile surface station.** A station in the aeronautical telecommunication service, other than an aircraft station, intended to be used while in motion or during halts at unspecified points.

**Mobile station (MS).** A station in the mobile service intended to be used while in motion or during halts at unspecified points. An MS is always a subscriber station (SS).

**Mode S subnetwork.** A means of performing an interchange of digital data through the use of secondary surveillance radar (SSR) Mode S interrogators and transponders in accordance with defined protocols.

**Mode 3.** A voice and data VDL mode that uses D8PSK modulation and a TDMA media access control scheme.

**Mode 4.** A data-only VDL mode using a GFSK modulation scheme and self-organizing time division multiple access (STDMA).

**Mode S air-initiated Comm-B (AICB) protocol.** A procedure initiated by a Mode S transponder for transmitting a single Comm-B segment from the aircraft installation.

**Mode S broadcast protocols.** Procedures allowing standard length uplink or downlink messages to be received by more than one transponder or ground interrogator respectively.

**Mode S ground-initiated Comm-B (GICB) protocol.** A procedure initiated by a Mode S interrogator for eliciting a single Comm-B segment from a Mode S aircraft installation, incorporating the contents of one of 255 Comm-B registers within the Mode S transponder.

**Mode S multisite-directed protocol.** A procedure to ensure that extraction and close-out of a downlink standard length or extended length message is affected only by the particular Mode S interrogator selected by the aircraft.

**Mode S packet.** A packet conforming to the Mode S subnetwork standard, designed to minimize the bandwidth required from the air-ground link. ISO 8208 packets may be transformed into Mode S packets and vice-versa.

**Mode S specific protocol (MSP).** A protocol that provides restricted datagram service within the Mode S subnetwork.

**Mode S specific services entity (SSE).** An entity resident within an XDLP to provide access to the Mode S specific services.

**Mode S specific services.** A set of communication services provided by the Mode S system which are not available from other air-ground subnetworks, and therefore not interoperable.

**Modification.** A change to the type design of an aircraft, engine or propeller.

*Note: A modification may also include the embodiment of the modification, which is a maintenance task subject to a maintenance release. Further guidance on aircraft maintenance, modification and repair is contained in the Airworthiness Manual (Doc 9760).*

**Modulation rate.** The reciprocal of the unit interval measured in seconds. This rate is expressed in bauds.

*Note — Telegraph signals are characterized by intervals of time of duration equal to or longer than the shortest or unit interval. The modulation rate (formerly telegraph speed) is therefore expressed as the inverse of the value of this unit interval. If, for example, the unit interval is 20 milliseconds, the modulation rate is 50 bauds.*

**Mode W, X, Y, Z.** A method of coding the DME transmissions by time spacing pulses of a pulse pair, so that each frequency can be used more than once.

**Mole (mol).** The amount of substance of a system which contains as many elementary entities as there are atoms in 0.012 kilogram of carbon-12.

*Note — When the mole is used, the elementary entities must be specified and may be atoms, molecules, ions, electrons, other particles or specified groups of such particles.*

**Movement area.** That part of an aerodrome to be used for the take-off, landing and taxiing of aircraft, consisting of the manoeuvring area and the apron.

**Multilateration (MLAT) System.** A group of equipment configured to provide position derived from the secondary surveillance radar (SSR) transponder signals (replies or squitters) primarily using time difference of arrival (TDOA) techniques. Additional information, including identification, can be extracted from the received signals.

**Multi-pilot aircraft.** means an aircraft other than a single-pilot aircraft.

## Section N

**Narcotics control.** Measures to control the illicit movement of narcotics and psychotropic substances by air.

**Nautical mile (NM).** The length equal to 1 852 metres exactly.

**Navigation specification.** A set of aircraft and flight crew requirements needed to support performance-based navigation operations within a defined airspace. There are two kinds of navigation specifications:

- *Required navigation performance (RNP) specification.* A navigation specification based on area navigation that includes the requirement for performance monitoring and alerting, designated by the prefix RNP, e.g. RNP 4, RNP APCH.
- *Area navigation (RNAV) specification.* A navigation specification based on area navigation that does not include the requirement for performance monitoring and alerting, designated by the prefix RNAV, e.g. RNAV 5, RNAV 1.

*Note 1. — The Performance-based Navigation (PBN) Manual (Doc 9613), Volume II, contains detailed guidance on navigation specifications.*

*Note 2. — The term RNP, previously defined as “a statement of the navigation performance necessary for operation within a defined airspace”, has been removed from ICAO Annex 6 Part 1 as the concept of RNP has been overtaken by the concept of PBN. The term RNP in ICAO Annex 6 is now solely used in the context of navigation specifications that require performance monitoring and alerting, e.g. RNP 4 refers to the aircraft and operating requirements, including a 4 NM lateral performance with on-board performance monitoring and alerting that are detailed in Doc 9613.*

**Near-parallel runways.** Non-intersecting runways whose extended centre lines have an angle of convergence/divergence of 15 degrees or less.

**Newly overhauled.** Means a product that has not been operated or placed in service, except for functional testing, since having been overhauled:

**Necessary precautions.** Verifications carried out by adequately trained staff members of the aircraft operator or the company operating on behalf of the aircraft operator, at the point of embarkation, in order to ensure that every person holds a valid travel document and, where applicable, the visa or residence permit required to enter the State of transit and/or receiving State. These verifications are designed to ensure that irregularities (e.g. obvious document alteration) are detected.

**Network (N).** The word “network” and its abbreviation “N” in ISO 8348 are replaced by the word “subnetwork” and its abbreviation “SN”, respectively, wherever they appear in relation to the subnetwork layer packet data performance.

*Note — The start of a burst may occur only at quantized time intervals and this constraint allows the propagation delay between the transmission and reception to be derived.*

**Network station.** An aeronautical station forming part of a radiotelephony network.

**Newton (N).** The force which when applied to a body having a mass of 1 kilogram gives it an acceleration of 1 metre per second squared.

**Next data authority.** The ground system so designated by the current data authority through which an onward

transfer of communications and control can take place.

**Next intended user.** The entity that receives the aeronautical data or information from the Aeronautical Information Service.

**Night.** The hours between the end of evening civil twilight and the beginning of morning civil twilight or such other period between sunset and sunrise, as may be prescribed by the appropriate authority.

*Note — Civil twilight ends in the evening when the centre of the sun's disc is 6 degrees below the horizon and begins in the morning when the centre of the sun's disc is 6 degrees below the horizon.*

**Non-congested hostile environment.** A hostile environment outside a congested area.

**Non-hostile environment.** An environment in which:

- (a) a safe forced landing can be accomplished because the surface and surrounding environment are adequate;
- (b) the helicopter occupants can be adequately protected from the elements;
- (c) search and rescue response/capability is provided consistent with anticipated exposure; and
- (d) the assessed risk of endangering persons or property on the ground is acceptable.

*Note — Those parts of a congested area satisfying the above requirements are considered non-hostile.*

**Non-instrument runway.** A runway intended for the operation of aircraft using visual approach procedures or an instrument approach procedure to a point beyond which the approach may continue in visual meteorological conditions.

*Note — Visual meteorological conditions (VMC) are described in Chapter 3 of ICAO Annex 2 — Rules of the Air.*

**Normal operating differential pressure.** Means the pressure differential between the cabin pressure and the outside ambient pressure, including the tolerances of the normal pressure regulating system.

**Non-network communications.** Radiotelephony communications conducted by a station of the aeronautical mobile service, other than those conducted as part of a radiotelephony network.

**Non-volatile particulate matter (nvPM).** Emitted particles that exist at a gas turbine engine exhaust nozzle exit plane that do not volatilize when heated to a temperature of 350°C.

**Normal flight zone (NFZ).** Airspace not defined as LFFZ, LCFZ or LSFZ but which must be protected from laser radiation capable of causing biological damage to the eye.

**NOTAM.** A notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations.

## Section O

**Observation (meteorological).** The exercise of authority over the initiation, continuation, diversion or termination of a flight in the interest of the safety of the aircraft and the regularity and efficiency of the flight.

**Obstacle.** All fixed (whether temporary or permanent) and mobile objects, or parts thereof, that:

- (a) are located on an area intended for the surface movement of aircraft; or
- (b) extend above a defined surface intended to protect aircraft in flight; or
- (c) stand outside those defined surfaces and that have been assessed as being a hazard to air navigation.

*Note — The term obstacle is used in Annex 4 solely for the purpose of specifying the charting of objects that are considered a potential hazard to the safe passage of aircraft in the type of operation for which the individual chart series is designed.*

**Obstacle clearance altitude (OCA) or obstacle clearance height (OCH).** The lowest altitude or the lowest height above the elevation of the relevant runway threshold or the aerodrome elevation as applicable, used in establishing compliance with appropriate obstacle clearance criteria.

*Note 1. — Obstacle clearance altitude is referenced to mean sea level and obstacle clearance height is referenced to the threshold elevation or in the case of non-precision approaches to the aerodrome elevation or the threshold elevation if that is more than 2 m (7 ft) below the aerodrome elevation. An obstacle clearance height for a circling approach is referenced to the aerodrome elevation.*

*Note 2. — For convenience when both expressions are used they may be written in the form “obstacle clearance altitude/height” and abbreviated “OCA/H”.*

*Note 3. — See Procedures for Air Navigation Services — Aircraft Operations (Doc 8168), Volume I, Part I, Section 4, Chapter 1, 1.5, and Volume II, Part I, Section 4, Chapter 5, 5.4, for specific applications of this definition.*

**Obstacle free zone (OFZ).** The airspace above the inner approach surface, inner transitional surfaces, and balked landing surface and that portion of the strip bounded by these surfaces, which is not penetrated by any fixed obstacle other than a low-mass and frangibly mounted one required for air navigation purposes.

**Obstacle/terrain data collection surface.** A defined surface intended for the purpose of collecting obstacle/terrain data.

**Offset frequency simplex.** A variation of single channel simplex wherein telecommunication between two stations is effected by using in each direction frequencies that are intentionally slightly different but contained within a portion of the spectrum allotted for the operation.

**Offshore operations.** Operations which routinely have a substantial proportion of the flight conducted over sea areas to or from offshore locations. Such operations include, but are not limited to, support of offshore oil, gas and mineral exploitation and sea-pilot transfer.

**Ohm ( $\Omega$ ).** The electric resistance between two points of a conductor when a constant difference of potential of 1 volt, applied between these two points, produces in this conductor a current of 1 ampere, this conductor not being the source of any electromotive force.

**One engine inoperative cruise speed.** Means a speed within the certified limits of the aeroplane, selected by the certificate holder and approved by the Director, that is used for calculating fuel reserve requirements and the still air distance associated with a one-engine inoperative maximum diversion time for the flight.

**Operating base.** The location from which operational control is exercised.

*Note — An operating base is normally the location where personnel involved in the operation of the aeroplane work and the records associated with the operation are located. An operating base has a degree of permanency beyond that of a regular point of call.*

**Operable.** In relation to equipment and instruments, means fully functional, calibrated, and meeting the applicable airworthiness requirements.

**Operate.** In relation to an aircraft, means to fly or use the aircraft, or to cause or permit the aircraft to fly, be used, or be in any place, whether or not the person is present with the aircraft and “operator” has a corresponding meaning.

**Operation.** An activity or group of activities which are subject to the same or similar hazards and which require a set of equipment to be specified, or the achievement and maintenance of a set of pilot competencies, to eliminate or mitigate the risk of such hazards.

*Note — Such activities could include, but would not be limited to, offshore operations, heli-hoist operations or emergency medical service.*

**Operational control communications.** Communications required for the exercise of authority over the initiation, continuation, diversion or termination of a flight in the interest of the safety of the aircraft and the regularity and efficiency of a flight.

*Note — Such communications are normally required for the exchange of messages between aircraft and aircraft operating agencies.*

**Operational control.** The exercise of authority over the initiation, continuation, diversion or termination of a flight in the interest of the safety of the aircraft and the regularity and efficiency of the flight.

**Operational flight plan.** The operator’s plan for the safe conduct of the flight based on considerations of helicopter performance, other operating limitations and relevant expected conditions on the route to be followed and at the heliports concerned.

**Operational personnel.** Personnel involved in aviation activities who are in a position to report safety information.

*Note — Such personnel include, but are not limited to: flight crews; air traffic controllers; aeronautical station operators; maintenance technicians; personnel of aircraft design and manufacturing organizations; cabin crews; flight dispatchers, apron personnel and ground handling personnel.*

**Operational flight planning.** Means the certificate holders plan for the safe conduct of the flight based on considerations of aeroplane performance, other operating limitations, and relevant expected conditions, on the route to be followed and at the aerodromes concerned.

**Operating cycle.** Means a complete flight segment consisting of a takeoff, climb, en-route portion, descent, and landing.

**Operations in performance Class 1.** Operations with performance such that, in the event of a critical engine failure, performance is available to enable the helicopter to safely continue the flight to an appropriate landing area, unless the failure occurs prior to reaching the take-off decision point (TDP) or after passing the landing

decision point (LDP), in which cases the helicopter must be able to land within the rejected take-off or landing area.

**Operations in performance Class 2.** Operations with performance such that, in the event of critical engine failure, performance is available to enable the helicopter to safely continue the flight to an appropriate landing area, except when the failure occurs early during the take-off manoeuvre or late in the landing manoeuvre, in which cases a forced landing may be required.

**Operations in performance Class 3.** Operations with performance such that, in the event of an engine failure at any time during the flight, a forced landing will be required.

**Operations manual.** A manual containing procedures, instructions and guidance for use by operational personnel in the execution of their duties.

**Operations specifications.** The authorizations, conditions and limitations associated with the air operator certificate and subject to the conditions in the operations manual.

**Operator.** A person, organization or enterprise engaged in or offering to engage in an aircraft operation.

*Note — In the context of remotely piloted aircraft, an aircraft operation includes the remotely piloted aircraft system.*

**Operator's maintenance control manual.** A document which describes the operator's procedures necessary to ensure that all scheduled and unscheduled maintenance is performed on the operator's aircraft on time and in a controlled and satisfactory manner.

*Note — Continuing Airworthiness Management Exposition (CAME) has the same definition as Operator's maintenance control manual)*

**Optimum conditions.** The combinations of altitude and airspeed within the approved operating envelope defined in the aeroplane flight manual that provides the highest specific air range value at each reference aeroplane mass.

**Optimum sampling point.** The optimum sampling point of a received UAT bit stream is at the nominal centre of each bit period, when the frequency offset is either plus or minus 312.5 kHz.

**Organization responsible for the type design.** The organization that holds the type certificate, or equivalent document, for an aircraft, engine or propeller type, issued by a Contracting State.

**Origination (aeronautical data or aeronautical information).** The creation of the value associated with new data or information or the modification of the value of an existing data or information.

**Ornithopter.** A heavier-than-air aircraft supported in flight chiefly by the reactions of the air on planes to which a flapping motion is imparted.

**Orphan aircraft type.** An aircraft which has its Type Certificate revoked by the State of Design, and no longer has a designated State of Design in accordance with Annex 8. These aircraft do not meet the Standards of Annex 8.

**Orthometric height.** Height of a point related to the geoid, generally presented as an MSL elevation.

**Original rate.** The original rate of an ACAS-equipped aircraft at any time is its altitude rate at the same time when it followed the original trajectory.

**Original trajectory.** The original trajectory of an ACAS-equipped aircraft is that followed by the aircraft in the same encounter when it was not ACAS equipped.

**ortrayal.** Presentation of information to humans (ISO 19117\*).

**Outer main gear wheel span (OMGWS).** The distance between the outside edges of the main gear wheels.

**Out-of-coverage indication signal.** A signal radiated into areas outside the intended coverage sector where required to specifically prevent invalid removal of an airborne warning indication in the presence of misleading guidance information.

**Overpack.** An enclosure used by a single shipper to contain one or more packages and to form one handling unit for convenience of handling and stowage.

*Note — A unit load device is not included in this definition.*

**Overhaul.** In relation to an aircraft or aircraft component, means to perform a major work operation which involves dismantling and complete testing to specification and renewal of operational life

**Owner.** In relation to any aircraft, includes any person lawfully entitled to the possession of the aircraft for 28 days or longer.

**Oxides of nitrogen.** The sum of the amounts of the nitric oxide and nitrogen dioxide contained in a gas sample calculated as if the nitric oxide were in the form of nitrogen dioxide.

## Section P

**Package.** The complete product of the packing operation consisting of the packaging and its contents prepared for transport.

**Packaging.** Receptacles and any other components or materials necessary for the receptacle to perform its containment function.

*Note— For radioactive material, see Part 2, paragraph 7.2 of the IATA Technical Instructions.*

**Packet.** The basic unit of data transfer among communication devices within the network layer (e.g. an ISO 8208 packet or a Mode S packet).

**Parachute.** Means any device, without a motor in operation, comprising a flexible drag, or lift/drag, surface from which a load is suspended by shroud lines capable of controlled deployment from a packed condition.

**Parachute assembly.** Means any parachute and its associated harness and container system and other component parts for use by persons

**Parachute landing area.** Means an area onto which parachute landings are intended to be made.

**Paraglider.** Means a hang glider with no rigid primary structure

**Partial rise time.** The time as measured between the 5 and 30 per cent amplitude points on the leading edge of the pulse envelope, i.e. between points h and i on ICAO Annex 10 Chapter Figures 3-1 and 3-2.

**Partial usage sub-channelization (PUSC).** A technique in which the orthogonal frequency division multiplexing (OFDM) symbol subcarriers are divided and permuted among a subset of sub-channels for transmission, providing partial frequency diversity.

**Pascal (Pa).** The pressure or stress of 1 newton per square metre.

**Passenger aircraft.** An aircraft that carries any person other than a crew-member, an operator's employee in an official capacity, an authorized representative of an appropriate national authority or a person accompanying a consignment or other cargo.

**Passenger amenities.** Facilities provided for passengers which are not essential for passenger processing.

**Passive surveillance.** The process of tracking another aircraft without interrogating it, by using the other aircraft's extended squitter. ACAS uses the information obtained via 1.090 MHz extended squitter to monitor the need for active surveillance, but not for any other purpose. Passive surveillance applies to both hybrid and extended hybrid surveillance.

**Pavement classification number (PCN).** A number expressing the bearing strength of a pavement for unrestricted operations.

**Path following error (PFE).** That portion of the guidance signal error, which could cause aircraft displacement from the desired course and/or glide path. (See ICAO Annex 10 Volume 1 Chapter 3.11.)

**Path following noise (PFN).** That portion of the guidance signal error which could cause aircraft displacement from the mean course line or mean glide path as appropriate.

**Peak envelope power (PEP).** The peak power of the modulated signal supplied by the transmitter to the antenna transmission line.

**Performance Class 1 helicopter.** A helicopter with performance such that, in case of engine failure, it is able to land on the rejected take-off area or safely continue the flight to an appropriate landing area.

**Performance Class 2 helicopter.** A helicopter with performance such that, in case of engine failure, it is able to safely continue the flight, except when the failure occurs prior to a defined point after take-off or after a defined point before landing, in which cases a forced landing may be required.

**Performance Class 3 helicopter.** A helicopter with performance such that, in case of engine failure at any point in the flight profile, a forced landing must be performed.

**Performance criteria.** Simple, evaluative statements on the required outcome of the competency element and a description of the criteria used to judge whether the required level of performance has been achieved.

**Performance-based communication (PBC).** Communication based on performance specifications applied to the provision of air traffic services.

*Note — An RCP specification includes communication performance requirements that are allocated to system components in terms of the communication to be provided and associated transaction time, continuity, availability, integrity, safety and functionality needed for the proposed operation in the context of a particular airspace concept.*

**Performance-based navigation (PBN).** Area navigation based on performance requirements for aircraft operating along an ATS route, on an instrument approach procedure or in a designated airspace.

*Note — Performance requirements are expressed in navigation specifications (RNAV specification, RNP specification) in terms of accuracy, integrity, continuity, availability and functionality needed for the proposed operation in the context of a particular airspace concept.*

**Performance-based surveillance (PBS).** Surveillance based on performance specifications applied to the provision of air traffic services.

*Note — An RSP specification includes surveillance performance requirements that are allocated to system components in terms of the surveillance to be provided and associated data delivery time, continuity, availability, integrity, accuracy of the surveillance data, safety and functionality needed for the proposed operation in the context of a particular airspace concept.*

**Performance model.** An analytical tool or method validated from corrected flight test data that can be used to determine the SAR values for calculating the CO2 emissions evaluation metric value at the reference conditions.

**Person with disabilities.** Any person whose mobility is reduced due to a physical incapacity (sensory or locomotor), an intellectual deficiency, age, illness or any other cause of disability when using transport and whose situation needs special attention and the adaptation to the person's needs of the services made available to all passengers.

**Physical layer protocol data unit (PPDU).** Data unit passed to the physical layer for transmission or decoded by the physical layer after reception.

**Physical layer.** The lowest level layer in the Open Systems Interconnection protocol model. The physical layer is concerned with the transmission of binary information over the physical medium (e.g. VHF radio).

**Pilot (to).** To manipulate the flight controls of an aircraft during flight time.

**Pilot flying (PF).** Means the pilot, who for the time being, is in charge of the controls of an aircraft.

**Pilot not flying (PNF).** Means the pilot who is assisting the Pilot flying in accordance with the multi-crew co-operation concept, when the required flight crew is more than one.

**Pilot-in-command.** The pilot responsible for the operation and safety of the aircraft during flight time.

**Pilot-in-command.** The pilot designated by the operator, or in the case of general aviation, the owner, as being in command and charged with the safe conduct of a flight.

**Pilot-in-command under supervision.** Co-pilot performing, under the supervision of the pilot-in-command, the duties and functions of a pilot-in-command, in accordance with a method of supervision acceptable to the Licensing Authority.

**Pilot-controller” system.** Air-ground radiotelephony facilities implemented primarily to provide a means of direct communication between pilots and controllers.

**Point light.** A luminous signal appearing without perceptible length.

**Point of no return.** The last possible geographic point at which an aircraft can proceed to the destination aerodrome as well as to an available en-route alternate aerodrome for a given flight.

**Point-in-space (PinS) visual segment.** This is the segment of a helicopter PinS approach procedure from the MAPt to the landing location for a PinS “proceed visually” procedure. This visual segment connects the Point-in-space (PinS) to the landing location.

*Note— The procedure design criteria for a PinS approach and the detailed design requirements for a visual segment are established in the Procedures for Air Navigation Services — Aircraft Operations, (PANS-OPS, Doc 8168).*

**Point-in-space approach (PinS).** The Point-in-space approach is based on GNSS and is an approach procedure designed for helicopter only. It is aligned with a reference point located to permit subsequent flight manoeuvring or approach and landing using visual manoeuvring in adequate visual conditions to see and avoid obstacles.

**Point-to-point.** Pertaining or relating to the interconnection of two devices, particularly end-user instruments. A communication path of service intended to connect two discrete end-users; as distinguished from broadcast or multipoint service.

**Polar area.** Means an area north of 78 degrees north latitude or an area south of 60 degrees south latitude.

**Portrayal.** Presentation of information to humans (ISO 19117\*).

**Position (geographical).** Set of coordinates (latitude and longitude) referenced to the mathematical reference ellipsoid, which defines the position of a point on the surface of the Earth.

**Post spacing.** Angular or linear distance between two adjacent elevation points.

**Power measurement point (PMP).** A cable connects the antenna to the UAT equipment. The PMP is the end of that cable that attaches to the antenna. All power measurements are considered as being made at the PMP unless otherwise specified. The cable connecting the UAT equipment to the antenna is assumed to have 3 dB of loss.

**Powered-lift.** A heavier-than-air aircraft capable of vertical take-off, vertical landing, and low-speed flight, which depends principally on engine-driven lift devices or engine thrust for the lift during these flight regimes and on non-rotating aerofoil(s) for lift during horizontal flight.

**Power-plant.** The system consisting of all the engines, drive system components (if applicable), and propellers (if installed), their accessories, ancillary parts, and fuel and oil systems installed on an aircraft but excluding the rotors for a helicopter.

**Powered sailplane.** Means an aircraft, equipped with one or more engines having, with engine(s) inoperative, the characteristics of a sailplane.

**Powered glider.** Means an aircraft equipped with one or more engines which has, with the engine or engines not operating, the performance characteristics of a glider

**Precision approach procedure.** An instrument approach procedure utilizing azimuth and glide path information provided by ILS or PAR.

**Precision.** The smallest difference that can be reliably distinguished by a measurement process.

*Note— In reference to geodetic surveys, precision is a degree of refinement in performance of an operation or a degree of perfection in the instruments and methods used when taking measurements.*

**Pre-flight information bulletin (PIB).** A presentation of current NOTAM information of operational significance, prepared prior to flight.

**Pressure-altitude.** An atmospheric pressure expressed in terms of altitude which corresponds to that pressure in the Standard Atmosphere\*

**Prevailing visibility.** The greatest visibility value, observed in accordance with the definition of “visibility”, which is reached within at least half the horizon circle or within at least half of the surface of the aerodrome. These areas could comprise contiguous or non-contiguous sectors.

*Note — This value may be assessed by human observation and/or instrumented systems. When instruments are installed, they are used to obtain the best estimate of the prevailing visibility.*

**Primary frequency.** The radiotelephony frequency assigned to an aircraft as a first choice for air-ground communication in a radiotelephony network.

**Primary means of communication.** The means of communication to be adopted normally by aircraft and ground stations as a first choice where alternative means of communication exist.

**Primary runway(s).** Runway(s) used in preference to others whenever conditions permit.

**Printed communications.** Communications, which automatically provide a permanent printed record at each terminal of a circuit of all messages, which pass over such circuit.

**Problematic use of substances.** The use of one or more psychoactive substances by aviation personnel in a way that:

- (a) constitutes a direct hazard to the user or endangers the lives, health or welfare of others; and/or
- (b) causes or worsens an occupational, social, mental or physical problem or disorder.

**Priority part.** Means a part or assembly in a type-certificated product, the failure of which is likely to cause an unsafe condition in an aircraft, aircraft engine or propeller:

**Procedure altitude/height.** A specified altitude/height flown operationally at or above the minimum altitude/height and established to accommodate a stabilized descent at a prescribed descent gradient/angle in the intermediate/final approach segment.

**Product.** Means an aircraft, aircraft engine, or propeller.

**Procedure turn.** A manoeuvre in which a turn is made away from a designated track followed by a turn in the opposite direction to permit the aircraft to intercept and proceed along the reciprocal of the designated track.

*Note 1. — Procedure turns are designated “left” or “right” according to the direction of the initial turn.*

*Note 2. — Procedure turns may be designated as being made either in level flight or while descending, according to the circumstances of each individual procedure.*

**Progressive inspection.** Means an inspection of a complete aircraft that is split into a number of smaller inspections.

**Prognostic chart.** A forecast of a specified meteorological element(s) for a specified time or period and a specified surface or portion of airspace, depicted graphically on a chart.

**Proportional guidance sector.** The volume of airspace within which the angular guidance information provided by a function is directly proportional to the angular displacement of the airborne antenna with respect to the zero-angle reference.

**Propeller.** Means a device, for propelling an aircraft, that has blades on an engine-driven shaft and that when rotated produces by its action on the air, a thrust approximately perpendicular to its plane of rotation. It includes control components normally supplied by its manufacturer, but does not include main and auxiliary rotors or rotating airfoils of engines

**Propulsion system.** Means an engine and includes any associated item of equipment utilised for sustaining, monitoring and controlling the power or thrust output of an engine installed on the airframe.

**Prohibited area.** An airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is prohibited.

**Protected flight zones.** Airspace specifically designated to mitigate the hazardous effects of laser radiation.

**Protected service volume.** A part of the facility coverage where the facility provides a particular service in accordance with relevant SARPs and within which the facility is afforded frequency protection.

**Protective breathing equipment.** Means breathing equipment for protection against smoke, fumes and other harmful gases.

**Protection area.** An area within a taxi-route and around a helicopter stand which provides separation from objects, the FATO, other taxi-routes and helicopter stands, for safe manoeuvring of helicopters.

**Pseudo-range.** The difference between the time of transmission by a satellite and reception by a GNSS receiver multiplied by the speed of light in a vacuum, including bias due to the difference between a GNSS receiver and satellite time reference.

**Pseudorandom message data block.** Several UAT requirements state that performance will be tested using pseudorandom message data blocks. Pseudorandom message data blocks should have statistical properties that are nearly indistinguishable from those of a true random selection of bits. For instance, each bit should have (nearly) equal probability of being a ONE or a ZERO, independent of its neighboring bits. There should be a large number of such pseudorandom message data blocks for each message type (Basic ADS-B, Long ADS-B or Ground Uplink) to provide sufficient independent data for statistical performance measurements. See Section 2.3 of Part I of the *Manual on the Universal Access Transceiver (UAT)* (Doc 9861) for an example of how to provide suitable pseudorandom message data blocks.

**Psychoactive substances.** Alcohol, opioids, cannabinoids, sedatives and hypnotics, cocaine, other psychostimulants, hallucinogens, and volatile solvents, whereas coffee and tobacco are excluded.

**Public authorities.** The agencies or officials of a Contracting State responsible for the application and enforcement of the particular laws and regulations of that State that relate to any aspect of these Standards and Recommended Practices.

**Public health emergency of international concern.** An extraordinary event which is determined, as provided in the *International Health Regulations* (2005) of the World Health Organization:

- (a) to constitute a public health risk to other States through the international spread of disease and
- (b) to potentially require a coordinated international response.

**Public health risk.** A likelihood of an event that may affect adversely the health of human populations, with an emphasis on one which may spread internationally or may present a serious and direct danger.

**Pulse amplitude.** The maximum voltage of the pulse envelope, i.e. A in Figure 3-1, ICAO Annex 10 Volume 1.

**Pulse decay time.** The time as measured between the 90 and 10 per cent amplitude points on the trailing edge of the pulse envelope, i.e. between points e and g on Figure 3-1, ICAO Annex 10 Volume 1.

**Pulse code.** The method of differentiating between W, X, Y and Z modes and between FA and IA modes.

**Pulse duration.** The time interval between the 50 per cent amplitude point on leading and trailing edges of the pulse envelope, i.e. between points b and f on Figure 3-1, ICAO Annex 10 Volume 1

**Pulse rise time.** The time as measured between the 10 and 90 per cent amplitude points on the leading edge of the pulse envelope, i.e. between points A and C on Figure 3-1, ICAO Annex 10 Volume 1.

## Section Q

**Quality assurance.** Part of quality management focused on providing confidence that quality requirements will be fulfilled (ISO 9000\*).

**Quality control.** Part of quality management focused on fulfilling quality requirements (ISO 9000\*).

**Quality management.** Coordinated activities to direct and control an organization with regard to quality (ISO 9000\*).

*\* ISO Standard 9000 — Quality Management Systems — Fundamentals and Vocabulary.*

**Quality system.** Documented organizational procedures and policies; internal audit of those policies and procedures; management review and recommendation for quality improvement.

**Quality of service (QOS).** The information relating to data transfer characteristics used by various communications protocols to achieve various levels of performance for network users.

**Quality of service.** The information relating to data transfer characteristics used by various communication protocols to achieve various levels of performance for network users.

**Quality.** Degree to which a set of inherent characteristics fulfils requirements (ISO 9000\*).

*Note 1. — The term “quality” can be used with adjectives such as poor, good or excellent.*

*Note 2.— “Inherent”, as opposed to “assigned”, means existing in something, especially as a permanent characteristic.*

## Section R

**Radian (rad).** The plane angle between two radii of a circle which cut off on the circumference an arc equal in length to the radius.

**Radio bearing.** The angle between the apparent direction of a definite source of emission of electro-magnetic waves and a reference direction, as determined at a radio direction-finding station. A true radio bearing is one for which the reference direction is that of true North. A magnetic radio bearing is one for which the reference direction is that of magnetic North.

**Radio direction finding (RR S1.12).** Radio determination using the reception of radio waves for the purpose of determining the direction of a station or object.

**Radio direction-finding station (RR S1.91).** A radio determination station using radio direction finding.

*Note— The aeronautical application of radio direction finding is in the aeronautical radio navigation service*

**Radio navigation service.** A service providing guidance information or position data for the efficient and safe operation of aircraft supported by one or more radio navigation aids.

**Radiotelephony network.** A group of radiotelephony aeronautical stations which operate on and guard frequencies from the same family and which support each other in a defined manner to ensure maximum dependability of air-ground communications and dissemination of air-ground traffic.

**Radiotelephony.** A form of radio communication primarily intended for the exchange of information in the form of speech.

**Rated air traffic controller.** An air traffic controller holding a license and valid ratings appropriate to the privileges to be exercised.

**Rated coverage.** The area surrounding an NDB within which the strength of the vertical field of the ground wave exceeds the minimum value specified for the geographical area in which the radio beacon is situated.

*Note — The above definition is intended to establish a method of rating radio beacons on the normal coverage to be expected in the absence of sky wave transmission and/or anomalous propagation from the radio beacon concerned or interference from other LF/MF facilities, but taking into account the atmospheric noise in the geographical area concerned.*

**Rated thrust.** For engine emissions purposes, the maximum take-off thrust approved by the certificating authority for use under normal operating conditions at ISA sea level static conditions, and without the use of water injection. Thrust is expressed in kilo-newtons.

**Rating.** An authorization entered on or associated with a license and forming part thereof, stating special conditions, privileges or limitations pertaining to such license.

**Readback.** A procedure whereby the receiving station repeats a received message or an appropriate part thereof back to the transmitting station so as to obtain confirmation of correct reception.

**Recertification.** Certification of an aircraft with or without a revision to its certification noise levels, to a Standard different to that to which it was originally certificated.

**Receiver.** A subsystem that receives GNSS signals and includes one or more sensors.

**Reed-Solomon code.** An error correction code capable of correcting symbol errors. Since symbol errors are collections of bits, these codes provide good burst error correction capabilities.

**Reference datum height.** The height of the extended glide path or a nominal vertical path at the runway threshold.

**Reference pressure ratio.** The ratio of the mean total pressure at the last compressor discharge plane of the compressor to the mean total pressure at the compressor entry plane when the engine is developing take-off thrust rating in ISA sea level static conditions.

*Note— Methods of measuring reference pressure ratio are given in Appendix 1 of ICAO Annex 16 Volume II.*

**Reference landing speed.** Means the speed of the aeroplane, in a specified landing configuration, at the point where it descends through the landing screen height in the determination of the landing distance for manual landings.

**Reference geometric factor.** An adjustment factor based on a measurement of aeroplane fuselage size derived from a two-dimensional projection of the fuselage.

**Regional air navigation agreement.** Agreement approved by the Council of ICAO normally on the advice of a regional air navigation meeting.

**Regular station.** A station selected from those forming an en-route air-ground radiotelephony network to communicate with or to intercept communications from aircraft in normal conditions.

**Regulated air cargo agent.** Means the holder of a regulated air cargo agent certificate

**Regulated agent.** An agent, freight forwarder or any other entity who conducts business with an operator and provides security controls that are accepted or required by the appropriate authority in respect of cargo or mail.

**Rejected take-off area.** A defined area on a heliport suitable for helicopters operating in performance class 1 to complete a rejected take-off.

**Release of goods.** The action by the customs authorities to permit goods undergoing clearance to be placed at the disposal of the persons concerned.

**Relief.** The inequalities in elevation of the surface of the Earth represented on aeronautical charts by contours, hypsometric tints, shading or spot elevations.

**Relief flights.** Flights operated for humanitarian purposes which carry relief personnel and relief supplies such as food, clothing, shelter, medical and other items during or after an emergency and/or disaster and/or are used to evacuate persons from a place where their life or health is threatened by such emergency and/or disaster to a safe haven in the same State or another State willing to receive such persons.

**Reliable link service (RLS).** A data communications service provided by the subnetwork which automatically provides for error control over its link through error detection and requested retransmission of signal units found to be in error.

**Remote pilot station.** The component of the remotely piloted aircraft system containing the equipment used to pilot the remotely piloted aircraft.

**Remote pilot.** A person charged by the operator with duties essential to the operation of a remotely piloted aircraft and who manipulates the flight controls, as appropriate, during flight time.

**Remotely piloted aircraft (RPA).** An unmanned aircraft which is piloted from a remote pilot station.

**Remotely piloted aircraft system (RPAS).** A remotely piloted aircraft, its associated remote pilot station(s), the required command and control links and any other components as specified in the type design.

**Removal of a person.** Action by the public authorities of a State, in accordance with its laws, to direct a person to leave that State.

**Removal order.** A written order served by a State on the operator on whose flight an inadmissible person travelled into that State, directing the operator to remove that person from its territory.

**Rendering (a Certificate of Airworthiness) valid.** The action taken by a Contracting State, as an alternative to issuing its own Certificate of Airworthiness, in accepting a Certificate of Airworthiness issued by any other Contracting State as the equivalent of its own Certificate of Airworthiness.

**Rendering (a license) valid.** The action taken by a Contracting State, as an alternative to issuing its own license, in accepting a license issued by any other Contracting State as the equivalent of its own license.

**Repair.** The restoration of an aeronautical product to an airworthy condition to ensure that the aircraft continues to comply with the design aspects of the appropriate airworthiness requirements used for the issuance of the type certificate for the respective aircraft type, after it has been damaged or subjected to wear.

**Repair.<sup>††</sup>** The restoration of an aircraft, engine, propeller or associated part to an airworthy condition in accordance with the appropriate airworthiness requirements after it has been damaged or subjected to wear.

†† Applicable as of 5 November 2020.

**Repair.** The restoration of an aeronautical product to an airworthy condition as defined by the appropriate airworthiness requirements.

**Repetitive flight plan (RPL).** A flight plan related to a series of frequently recurring, regularly operated individual flights with identical basic features, submitted by an operator for retention and repetitive use by ATS units.

**Reply efficiency.** The ratio of replies transmitted by the transponder to the total of received valid interrogations.

**Reporting point.** A specified (named) geographical location in relation to which the position of an aircraft can be reported.

*Note — There are three categories of reporting points: ground-based navigation aid, intersection and waypoint. In the context of this definition, intersection is a significant point expressed as radials, bearings and/or distances from ground-based navigation aids. A reporting point can be indicated as “on request” or as “compulsory”.*

**Reporting point.** A specified geographical location in relation to which the position of an aircraft can be reported.

**Required communication performance (RCP) specification.** A set of requirements for air traffic service provision and associated ground equipment, aircraft capability, and operations needed to support performance-based communication.

**Required communication performance type.** Means a label (e.g. RCP 240) that represents the values assigned to RCP parameters for communication transaction time, continuity, availability and integrity.

**Required navigation performance.** Means a statement of the navigation performance accuracy necessary for operation within a defined area of airspace.

**Required inspection.** Means any inspection required by the CAR, an airworthiness directive, or by an approved maintenance manual, programme or schedule.

**Required surveillance performance (RSP) specification.** A set of requirements for air traffic service provision and associated ground equipment, aircraft capability, and operations needed to support performance-based surveillance.

**Requirement.** Need or expectation that is stated, generally implied or obligatory (ISO 9000\*).

*Note 1. — “Generally implied” means that it is custom or common practice for the organization, its customers and other interested parties, that the need or expectation under consideration is implied.*

*Note 2. — A qualifier can be used to denote a specific type of requirement, e.g. product requirement, quality management requirement, customer requirement.*

*Note 3. — A specified requirement is one which is stated, for example, in a document.*

*Note 4. — Requirements can be generated by different interested parties.*

**Required communication performance (RCP).** A statement of the performance requirements for operational communication in support of specific ATM functions (see *Manual on Required Communication Performance (RCP)* (Doc 9869)).

**Residual error rate.** The ratio of incorrect, lost and duplicate subnetwork service data units (SNSDUs) to the total number of SNSDUs that were sent.

**Residual error rate.** The ratio of incorrect, lost and duplicate subnetwork service data units (SNSDUs) to the total number of SNSDUs that were sent.

**Required rate.** For the standard pilot model, the required rate is that closest to the original rate consistent with the RA.

**Reserve parachute.** Means a parachute assembly designed and intended to be used as a secondary parachute in the event of the failure of the main parachute.

**Reserved (bits/words/fields).** Bits/words/fields that are not allocated, but which are reserved for a particular GNSS application.

**Rest period.** Means any period of time on the ground during which a flight crew-member is relieved of all duties by the operator.

**Rest period.** A continuous and defined period of time, subsequent to and/or prior to duty, during which flight or cabin crew-members are free of all duties.

**Rescue.** An operation to retrieve persons in distress, provide for their initial medical or other needs, and deliver them to a place of safety.

**Rescue coordination centre (RCC).** A unit responsible for promoting efficient organization of search and rescue services and for coordinating the conduct of search and rescue operations within a search and rescue region.

**Rescue sub-centre (RSC).** A unit subordinate to a rescue coordination centre, established to complement the latter according to particular provisions of the responsible authorities.

**Resolution.** A number of units or digits to which a measured or calculated value is expressed and used.

**Rest period.** A continuous and defined period of time, subsequent to and/or prior to duty, during which flight or cabin crew-members are free of all duties.

**Restricted area.** An airspace of defined dimensions, above the land areas or territorial waters of a State, within which the flight of aircraft is restricted in accordance with certain specified conditions.

**Reversal procedure.** A procedure designed to enable aircraft to reverse direction during the initial approach segment of an instrument approach procedure. The sequence may include procedure turns or base turns.

**Risk assessment.** An assessment by a deporting State of a deportee's suitability for escorted or unescorted removal via commercial air services. The assessment should take into account all pertinent factors, including medical, mental and physical fitness for carriage on a commercial flight, willingness or unwillingness to travel, behavioral patterns and any history of violence.

**Risk management.** The systematic application of management procedures and practices, which provide border inspection agencies with the necessary information to address movements or consignments which represent a risk.

**Road.** An established surface route on the movement area meant for the exclusive use of vehicles.

**Road-holding position.** A designated position at which vehicles may be required to hold.

**Rotorcraft.** A power-driven heavier-than-air aircraft supported in flight by the reactions of the air on one or more rotors.

**Rotational Direction of Equipment.** Means the direction of rotation as observed when looking at the drive face of the equipment (usually described as 'clockwise' or 'anti-clockwise').

**Route (AFTN).** The path followed by a particular channel of a circuit.

**Routing (AFTN).** The chosen itinerary to be followed by messages on the AFTN between acceptance and delivery.

**Routing List.** A list in a communication centre indicating for each addressee the outgoing circuit to be used.

**Route segment.** A route or portion of route usually flown without an intermediate stop.

**Route stage.** A route or portion of a route flown without an intermediate landing.

**Routing Directory.** A list in a communication centre indicating for each addressee the outgoing circuit to be used.

**Routine inspection.** In relation to a progressive inspection, means a visual inspection of an aircraft and its components, systems and equipment as far as practicable without disassembly

**RNP performance.** Means a containment value, expressed as a distance in nautical miles from the intended position, within which flights would be for at least 95% of the total flying time

**RPA observer.** A trained and competent person designated by the operator who, by visual observation of the remotely piloted aircraft, assists the remote pilot in the safe conduct of the flight.

**Runway.** A defined rectangular area on a land aerodrome prepared for the landing and take-off of aircraft.

**Runway end safety area (RESA).** An area symmetrical about the extended runway centre line and adjacent to the end of the strip primarily intended to reduce the risk of damage to an aeroplane undershooting or overrunning the runway.

**Runway Safety Team.** A team comprised of representatives from [the aerodrome operator], air traffic service providers, airlines or aircraft operators, pilot and air traffic controllers associations and any other group with a direct involvement in runway operations [at a specific aerodrome,] that advise the appropriate management on the potential runway [safety] issues and recommend mitigation strategies.

**Runway guard lights.** A light system intended to caution pilots or vehicle drivers that they are about to enter an active runway.

**Runway strip.** A defined area including the runway and stopway, if provided, intended:

- (a) to reduce the risk of damage to aircraft running off a runway; and
- (b) to protect aircraft flying over it during take-off or landing operations.

**Runway turn pad.** A defined area on a land aerodrome adjacent to a runway for the purpose of completing a 180-degree turn on a runway.

**Runway visual range (RVR).** The range over which the pilot of an aircraft on the centre line of a runway can see the runway surface markings or the lights delineating the runway or identifying its centre line.

**Runway-holding position.** A designated position intended to protect a runway, an obstacle limitation surface, or an ILS/MLS critical/sensitive area at which taxiing aircraft and vehicles shall stop and hold, unless otherwise authorized by the aerodrome control tower.

*Note — In radiotelephony phraseologies, the expression “holding point” is used to designate the runway-holding position.*

**Runway-type FATO.** A FATO having characteristics similar in shape to a runway.

## Section S

**Safe forced landing.** Unavoidable landing or ditching with a reasonable expectancy of no injuries to persons in the aircraft or on the surface.

**Safety area.** A defined area on a heliport surrounding the FATO which is free of obstacles, other than those required for air navigation purposes, and intended to reduce the risk of damage to helicopters accidentally diverging from the FATO.

**Safety management system (SMS).** A systematic approach to managing safety including the necessary organizational structure, accountabilities, policies and procedures.

**Safety performance indicator.** A data-based parameter used for monitoring and assessing safety performance.

**Safety performance.** A State or a service provider's safety achievement as defined by its safety performance targets and safety performance indicators.

**Safety risk.** The predicted probability and severity of the consequences or outcomes of a hazard.

**Safety.** The state in which risks associated with aviation activities, related to, or in direct support of the operation of aircraft, are reduced and controlled to an acceptable level.

**Safety catch.** Means a mechanism which locks an operating control in a given position. It engages automatically whenever the operating control is put into that position but has to be manually taken out of engagement in order to move the operating control away from that position.

**Safety data.** A defined set of facts or set of safety values collected from various aviation-related sources, which is used to maintain or improve safety.

*Note — Such safety data is collected from proactive or reactive safety-related activities, including but not limited to:*

- (a) *accident or incident investigations;*
- (b) *safety reporting;*
- (c) *continuing airworthiness reporting;*
- (d) *operational performance monitoring;*
- (e) *inspections, audits, surveys; or*
- (f) *safety studies and reviews.*

**Safety information.** Safety data processed, organized or analysed in a given context so as to make it useful for safety management purposes.

**Safety oversight.** A function performed by a State to ensure that individuals and organizations performing an aviation activity comply with safety-related national laws and regulations.

**Safety performance target.** The State or service provider's planned or intended target for a safety performance indicator over a given period that aligns with the safety objectives.

**Safety-sensitive personnel.** Persons who might endanger aviation safety if they perform their duties and functions improperly including, but not limited to, crew-members, aircraft maintenance personnel and air traffic controllers.

**Sailplane.** Means a heavier-than-air aircraft that is supported in flight by the dynamic reaction of the air against its fixed lifting surfaces, the free flight of which does not depend on an engine.

**Satisfactory evidence.** A set of documents or activities that a Contracting State accepts as sufficient to show compliance with an airworthiness requirement.

**SARTIME.** Means the time nominated by a pilot for the initiation of alerting action.

**Screening.** The application of technical or other means which are intended to identify and/or detect weapons, explosives or other dangerous devices, articles or substances which may be used to commit an act of unlawful interference.

*Note — Certain dangerous articles or substances are classified as dangerous goods by ICAO Annex 18 and the associated Technical Instructions for the Safe Transport of Dangerous Goods by Air (Doc 9284) and must be transported in accordance with those instructions. In addition, the Aviation Security Manual (Doc 8973 — Restricted) provides a list of prohibited items that must never be carried in the cabin of an aircraft.*

**Satellite-based augmentation system (SBAS).** A wide coverage augmentation system in which the user receives augmentation information from a satellite-based transmitter.

**Search.** An operation normally coordinated by a rescue coordination centre or rescue subcentre using available personnel and facilities to locate persons in distress.

*Note — This definition applies to ICAO Annex 12*

**Search.** The condition which exists when the DME interrogator is attempting to acquire and lock onto the response to its own interrogations from the selected transponder.

*Note — This definition applies to ICAO Annex 10*

**Search and rescue aircraft.** An aircraft provided with specialized equipment suitable for the efficient conduct of search and rescue missions.

**Search and rescue facility.** Any mobile resource, including designated search and rescue units, used to conduct search and rescue operations.

**Search and rescue region (SRR).** An area of defined dimensions, associated with a rescue coordination centre, within which search and rescue services are provided.

**Search and rescue service.** The performance of distress monitoring, communication, coordination and search and rescue functions, initial medical assistance or medical evacuation, through the use of public and private resources, including cooperating aircraft, vessels and other craft and installations.

**Search and rescue services unit.** A generic term meaning, as the case may be, rescue coordination centre, rescue sub-centre or alerting post.

**Search and rescue unit.** A mobile resource composed of trained personnel and provided with equipment suitable for the expeditious conduct of search and rescue operations.

**Second (s).** The duration of 9 192 631 770 periods of the radiation corresponding to the transition between the two hyperfine levels of the ground state of the caesium-133 atom.

**Secondary frequency.** The radiotelephony frequency assigned to an aircraft as a second choice for air-ground communication in a radiotelephony network.

**Secondary surveillance radar (SSR).** A surveillance radar system which uses transmitters/receivers (interrogators) and transponders.

*Note — The requirements for interrogators and transponders are specified in Chapter 3 in ICAO Annex 10 Volume IV.*

**Security.** Safeguarding civil aviation against acts of unlawful interference. This objective is achieved by a combination of measures and human and material resources.

**Security audit.** An in-depth compliance examination of all aspects of the implementation of the national civil aviation security programme.

**Security area.** Means an area that the Authority has declared to be a security area.

**Security control.** Means by which the introduction of weapons, explosives or other dangerous devices, articles or substances which may be used to commit an act of unlawful interference can be prevented.

**Security equipment.** Devices of a specialized nature for use, individually or as part of a system, in the prevention or detection of acts of unlawful interference with civil aviation and its facilities.

**Security inspection.** An examination of the implementation of relevant national civil aviation security programme requirements by an airline, airport, or other entity involved in security.

**Security restricted area.** Those areas of the airside of an airport which are identified as priority risk areas where in addition to access control, other security controls are applied. Such areas will normally include, *inter alia*, all commercial aviation passenger departure areas between the screening checkpoint and the aircraft, the ramp, baggage make-up areas, including those where aircraft are being brought into service and screened baggage and cargo are present, cargo sheds, mail centres, airside catering and aircraft cleaning premises.

**Security designated aerodrome.** Means an aerodrome for the time being designated as a security aerodrome.

**Security survey.** An evaluation of security needs including the identification of vulnerabilities which could be exploited to carry out an act of unlawful interference, and the recommendation of corrective actions.

**Security test.** A covert or overt trial of an aviation security measure which simulates an attempt to commit an unlawful act.

**Security enhanced area.** Means an area that the Authority has declared to be a security enhanced area.

**SEIFR passenger operation.** Means an air transport operation carrying passengers in a single-engine aeroplane under IFR.

**Selective availability (SA).** A set of techniques for denying the full accuracy and selecting the level of positioning, velocity and time accuracy of GPS available to users of the standard positioning service signal.

*Note — GPS SA was discontinued at midnight on 1 May 2000.*

**Segregated parallel operations.** Simultaneous operations on parallel or near-parallel instrument runways in which one runway is used exclusively for approaches and the other runway is used exclusively for departures.

**Segment.** A portion of a message that can be accommodated within a single MA/MB field in the case of a standard length message, or MC/MD field in the case of an extended length message. This term is also applied to the Mode S transmissions containing these fields.

**Self-sustaining powered sailplane.** A powered aeroplane with available engine power which allows it to maintain level flight but not to take off under its own power.

**Self-organizing time division multiple access (STDMA).** A multiple access scheme based on time-shared use of a radio frequency (RF) channel employing: (1) discrete contiguous time slots as the fundamental shared resource; and (2) a set of operating protocols that allows users to mediate access to these time slots without reliance on a master control station.

**Semi-automatic relay installation.** A teletypewriter installation where interpretation of the relaying responsibility

in respect of an incoming message and the resultant setting-up of the connections required to effect the appropriate retransmissions require the intervention of an operator but where all other normal operations of relay are carried out automatically.

**Series of flights.** Series of flights are consecutive flights that:

- (a) begin and end within a period of 24 hours; and
- (b) are all conducted by the same pilot-in-command.

**Serious injury.** An injury which is sustained by a person in an accident and which:

- (a) requires hospitalization for more than 48 hours, commencing within seven days from the date the injury was received; or
- (b) results in a fracture of any bone (except simple fractures of fingers, toes or nose); or
- (c) involves lacerations which cause severe hemorrhage, nerve, muscle or tendon damage; or
- (d) involves injury to any internal organ; or
- (e) involves second or third degree burns, or any burns affecting more than 5 per cent of the body surface; or
- (f) involves verified exposure to infectious substances or injurious radiation.

**Service data unit (SDU).** A unit of data transferred between adjacent layer entities, which is encapsulated within a protocol data unit (PDU) for transfer to a peer layer.

**Service flow.** A unidirectional flow of media access control layer (MAC) service data units (SDUs) on a connection that is providing a particular quality of service (QoS).

**Service volume.** A part of the facility coverage where the facility provides a particular service in accordance with relevant SARPs and within which the facility is afforded frequency protection.

**Shore.** Means that area of the land adjacent to the water that is above the high-water mark and excludes land areas that are intermittently under water.

**Shipboard heliport.** A heliport located on a ship that may be purpose or non-purpose-built. A purpose-built shipboard heliport is one designed specifically for helicopter operations. A non-purpose-built shipboard heliport is one that utilizes an area of the ship that is capable of supporting a helicopter but not designed specifically for that task.

**Shoulder.** An area adjacent to the edge of a pavement so prepared as to provide a transition between the pavement and the adjacent surface.

**Siemens (S).** The electric conductance of a conductor in which a current of 1 ampere is produced by an electric potential difference of 1 volt.

**Sievert (Sv).** The unit of radiation dose equivalent corresponding to 1 joule per kilogram.

**SIGMET information.** Information issued by a meteorological watch office concerning the occurrence or expected occurrence of specified en-route weather and other phenomena in the atmosphere that may affect the safety of aircraft operations.

**Sign.**

- (a) *Fixed message sign.* A sign presenting only one message.
- (b) *Variable message sign.* A sign capable of presenting several predetermined messages or no message, as applicable.

**Single-pilot aircraft.** Means an aircraft that is authorised in its flight manual to be operated with a minimum flight crew of one (1) pilot for the type of flight.

**Sign a maintenance release to service.** To certify that maintenance work has been completed satisfactorily in accordance with the applicable Standards of airworthiness, by issuing the maintenance release referred to in ICAO Annex 6.

**Signal area.** An area on an aerodrome used for the display of ground signals.

**Signal reliability.** The probability that a signal-in-space of specified characteristics is available to the aircraft.

*Note— This definition refers to the probability that the signal is present for a specified period of time.*

**Significant.** In the context of the medical provisions in Chapter 6 of the ICAO Annex1, *significant* means to a degree or of a nature that is likely to jeopardize flight safety.

**Significant point.** A specified geographical location used in defining an ATS route or the flight path of an aircraft and for other navigation and ATS purposes.

*Note — There are three categories of significant points: ground-based navigation aid, intersection and waypoint. In the context of this definition, intersection is a significant point expressed as radials, bearings and/or distances from ground-based navigation aids.*

**Simplex.** A method in which telecommunication between two stations takes place in one direction at a time.

*Note — In application to the aeronautical mobile service, this method may be subdivided as follows:*

- (a) single channel simplex.*
- (b) double channel simplex.*
- (c) offset frequency simplex.*

**Single channel simplex.** Simplex using the same frequency channel in each direction.

**Single Window.** A facility that allows parties involved in trade and transport to lodge standardized information and documents with a single entry point to fulfil all import, export, and transit-related regulatory requirements. If information is electronic then individual data elements should only be submitted once.

**Slot.** One of a series of consecutive time intervals of equal duration. Each burst transmission starts at the beginning of a slot.

**Subnetwork connection.** A long-term association between an aircraft DTE and a ground DTE using successive virtual calls to maintain context across link handoff.

**Slotted aloha.** A random access strategy whereby multiple users access the same communications channel independently, but each communication must be confined to a fixed time slot. The same timing slot structure is known to all users, but there is no other coordination between the users.

**Slush.** Water-saturated snow which with a heel-and-toe slap-down motion against the ground will be displaced with a splatter; specific gravity: 0.5 up to 0.8.

*Note — Combinations of ice, snow and/or standing water may, especially when rain, rain and snow, or snow is falling, produce substances with specific gravities in excess of 0.8. These substances, due to their high water/ice content, will have a transparent rather than a cloudy appearance and, at the higher specific gravities, will be readily distinguishable from slush.*

**Small aeroplane.** An aeroplane of a maximum certificated take-off mass of 5700 kg or less.

**Smoke.** The carbonaceous materials in exhaust emissions which obscure the transmission of light.

**Smoke Number.** The dimensionless term quantifying smoke emissions (*see 3 of Appendix 2 of ICAO Annex 16 Volume II*).

**Snow (on the ground).**

- (a) *Dry snow.* Snow which can be blown if loose or, if compacted by hand, will fall apart again upon release; specific gravity: up to but not including 0.35.
- (b) *Wet snow.* Snow which, if compacted by hand, will stick together and tend to or form a snowball; specific gravity: 0.35 up to but not including 0.5.
- (c) *Compacted snow.* Snow which has been compressed into a solid mass that resists further compression and will hold together or break up into lumps if picked up; specific gravity: 0.5 and over.

**SNOWTAM.** A special series NOTAM notifying the presence or removal of hazardous conditions due to snow, ice, slush or standing water associated with snow, slush and ice on the movement area, by means of a specific format.

**Solo flight.** Time means flight time during which a student pilot is the sole occupant of an aircraft.

**Solo flight time.** Flight time during which a student pilot is the sole occupant of an aircraft.

**Space weather centre (SWXC).** A centre designated to monitor and provide advisory information on space weather phenomena expected to affect high-frequency radio communications, communications via satellite, GNSS-based navigation and surveillance systems and/or pose a radiation risk to aircraft occupants.

*Note – A space weather centre is designated as global and/or regional.*

**Spare (bits/words/fields).** Bits/words/fields that are not allocated or reserved, and which are available for future allocation.

*Note— All spare bits are set to zero.*

**Spare parts.** Articles, including engines and propellers, of a repair or replacement nature for incorporation in an aircraft.

**Specific air range.** The distance an aeroplane travels in the cruise flight phase per unit of fuel consumed.

**Specification.** Is the minimum performance standard specific to an article used on an aircraft.

**Special VFR flight.** A VFR flight cleared by air traffic control to operate within a control zone in meteorological conditions below VMC.

**Sponsor.** Aerodrome license holder or an ANSP, who proposes a new design, changes to, or withdrawal of an instrument flight procedure.

**Spot beam.** Satellite antenna directivity whose main lobe encompasses significantly less than the earth's surface that is within line-of-sight view of the satellite. May be designed so as to improve system resource efficiency with respect to geographical distribution of user earth stations.

**Squitter protocol data unit (SPDU).** Data packet which is broadcast every 32 seconds by an HF DL ground station on each of its operating frequencies, and which contains link management information.

**Standard isobaric surface.** An isobaric surface used on a worldwide basis for representing and analysing the conditions in the atmosphere.

**Standard instrument arrival.** A designated instrument flight rule (IFR) arrival route linking a significant point, normally on an ATS route, with a point from which a published instrument approach procedure can be commenced.

**Standard instrument departure.** A designated instrument flight rule (IFR) departure route linking the aerodrome or a specified runway of the aerodrome with a specified significant point, normally on a designated ATS route, at which the en-route phase of a flight commences.

**Standard atmosphere.** An atmosphere defined as follows:

- (a) the air is a perfect dry gas;
- (b) the physical constants are:
  - Sea level mean molar mass:  $M_0 = 28.964\ 420 \cdot 10^{-3}$  kg mol<sup>-1</sup>
  - Sea level atmospheric pressure:  $P_0 = 1\ 013.250$  hPa
  - Sea level temperature:  $t_0 = 15^\circ\text{C}$ ,  $T_0 = 288.15$  K
  - Sea level atmospheric density:  $\rho_0 = 1.225\ 0$  kg m<sup>-3</sup>
  - Temperature of the ice point:  $T_i = 273.15$  K
  - Universal gas constant:  $R^* = 8.314\ 32$  JK<sup>-1</sup>mol<sup>-1</sup>
- (c) the temperature gradients are:

Geopotential altitude (km)		Temperature gradient (Kelvin per standard geopotential kilometre)
From	To	
-5.0	11.0	-6.5
11.0	20.0	0.0
20.0	32.0	+1.0
32.0	47.0	+2.8
47.0	51.0	0.0
51.0	71.0	-2.8
71.0	80.0	-2.0

Note 1.— The standard geopotential metre has the value 9.80665 m2 s<sup>-2</sup>.

Note 2.— See Doc 7488 for the relationship between the variables and for tables giving the corresponding values of temperature, pressure, density and geopotential.

Note 3.— Doc 7488 also gives the specific weight, dynamic viscosity, kinematic viscosity and speed of sound at various altitudes.

**Standard message element.** Part of a message defined in the PANS-ATM (Doc 4444) in terms of display format, intended use and attributes.

**Standard part.** Means a part that—

- (1) is not the subject of a specific product approval and
- (2) is made to a national or international aeronautical specification and
- (3) is identified as such by the manufacturer

**Standard positioning service (SPS).** The specified level of positioning, velocity and timing accuracy that is available to any global positioning system (GPS) user on a continuous, worldwide basis.

**Standard length message (SLM).** An exchange of digital data using selectively addressed Comm-A interrogations and/or Comm-B replies (see “Comm-A” and “Comm-B”).

**Standard UAT receiver.** A general purpose UAT receiver satisfying the minimum rejection requirements of interference from adjacent frequency distance measuring equipment (DME) (see ICAO Annex 10 Volume 3 Chapter 12.3.2.2 for further details).

**State of Design.** The State having jurisdiction over the organization responsible for the type design.

**State of Destination.** The State in the territory of which the consignment is finally to be unloaded from an aircraft.

**State of Manufacture.** The State having jurisdiction over the organization responsible for the final assembly of the aircraft, engine or propeller.

**State of Origin.** The State in the territory of which the consignment is first to be loaded on an aircraft.

**State of Registry.** The State on whose register the aircraft is entered.

*Note — In the case of the registration of aircraft of an international operating agency on other than a national basis, the States constituting the agency are jointly and severally bound to assume the obligations which, under the Chicago Convention, attach to a State of Registry. See, in this regard, the Council Resolution of 14 December 1967 on Nationality and Registration of Aircraft Operated by International Operating Agencies which can be found in Policy and Guidance Material on the Economic Regulation of International Air Transport (Doc 9587).*

**Standard receiver.** The airborne receiver model assumed in partitioning the MLS error budgets.

The salient characteristics are:

- (1) signal processing based on the measurement of beam centers;
- (2) negligible centering error;
- (3) control motion noise (CMN) less than or equal to the values contained in ICAO Annex 10 Volume 1, Chapter 3, 3.11.6.1.1.2;
- (4) a 26 kHz bandwidth 2-pole low pass beam envelope filter;
- (5) angle data output filtering by a single pole, low pass filter with a corner frequency of 10 radians per second.

**State of the Aerodrome.** The State in whose territory the aerodrome is located.

*Note — State of the Aerodrome includes heliports and landing locations.*

**State of the Operator.** The State in which the operator's principal place of business is located or, if there is no such place of business, the operator's permanent residence.

**Synthetic vision system (SVS).** A system to display data-derived synthetic images of the external scene from the perspective of the flight deck.

**State safety programme (SSP).** An integrated set of regulations and activities aimed at improving safety.

**State volcano observatory.** A volcano observatory, designated by regional air navigation agreement, to monitor active or potentially active volcanoes within a State and to provide information on volcanic activity to its associated area control centre/flight information centre, meteorological watch office and volcanic ash advisory centre.

**Static load-bearing surface.** A surface capable of supporting the mass of a helicopter situated upon it.

**Station declination.** An alignment variation between the zero degree radial of a VOR and true north, determined at the time the VOR station is calibrated.

**Steradian (sr).** The solid angle which, having its vertex in the centre of a sphere, cuts off an area of the surface of the sphere equal to that of a square with sides of length equal to the radius of the sphere.

**Stopway.** A defined rectangular area on the ground at the end of take-off run available prepared as a suitable area in which an aircraft can be stopped in the case of an abandoned take-off.

**Stores (Supplies).** a) Stores (supplies) for consumption; and b) Stores (supplies) to be taken away.

**Stores (Supplies) for consumption.** Goods, whether or not sold, intended for consumption by the passengers and the crew on board aircraft, and goods necessary for the operation and maintenance of aircraft, including fuel and lubricants.

**Stores (Supplies) to be taken away.** Goods for sale to the passengers and the crew of aircraft with a view to being landed.

**Subsonic aeroplane.** An aeroplane incapable of sustaining level flight at speeds exceeding flight Mach number of 1.

**Subnetwork (SN).** See **Network (N)**.

**Subnetwork dependent convergence function (SNDCF).** A function that matches the characteristics and services of a particular subnetwork to those characteristics and services required by the internetwork facility.

**Subnetwork entity.** In this document, the phrase “ground DCE” will be used for the subnetwork entity in a ground station communicating with an aircraft; the phrase “ground DTE” will be used for the subnetwork entity in a ground router communicating with an aircraft station; and, the phrase “aircraft DTE” will be used for the subnetwork entity in an aircraft communicating with the station. A subnetwork entity is a packet layer entity as defined in ISO 8208.

**Subnetwork entry time.** The time from when the mobile station starts the scanning for BS transmission, until the network link establishes the connection, and the first network user “protocol data unit” can be sent.

**Subnetwork layer.** The layer that establishes, manages and terminates connections across a subnetwork.

**Subnetwork management entity (SNME).** An entity resident within a GDLP that performs subnetwork management and communicates with peer entities in intermediate or end-systems.

**Subnetwork service data unit (SNSDU).** An amount of subnetwork user data, the identity of which is preserved from one end of a subnetwork connection to the other.

**Subnetwork service data unit (SNSDU).** An amount of subnetwork user data, the identity of which is preserved from one end of a subnetwork connection to the other.

**Subnetwork.** An actual implementation of a data network that employs a homogeneous protocol and addressing plan, and is under the control of a single authority.

**Subscriber station (SS).** A generalized equipment set providing connectivity between subscriber equipment and a base station (BS).

**Surface-level heliport.** A heliport located on the ground or on a structure on the surface of the water.

**Surveillance radar.** Radar equipment used to determine the position of an aircraft in range and azimuth.

**Supplemental oxygen.** Means the additional oxygen required to protect each occupant against the adverse effects of excessive cabin altitude and to maintain acceptable physiological conditions.

**Switch-over time (light).** The time required for the actual intensity of a light measured in a given direction to fall from 50 per cent and recover to 50 per cent during a power supply changeover, when the light is being operated at intensities of 25 per cent or above.

**Successful message reception (SMR).** The function within the UAT receiver for declaring a received message as valid for passing to an application that uses received UAT messages. See Section 4 of Part I of the *Manual on the Universal Access Transceiver (UAT)* (Doc 9861) for a detailed description of the procedure to be used by the UAT receiver for declaring successful message reception.

**Synchronous operation.** Operation in which the time interval between code units is a constant.

**System.** A VDL-capable entity. A system comprises one or more stations and the associated VDL management entity. A system may either be an aircraft system or a ground system.

**Synthetic vision system (SVS).** A system to display data-derived synthetic images of the external scene from the perspective of the flight deck.

**Synthetic Training Device.** Means equipment in which flight conditions are simulated on the ground and includes—

- (1) a flight simulator, being an apparatus which provides an accurate representation of the flight deck of a particular aircraft type to the extent that the normal environment of flight crew-members, the systems, and the performance and flight characteristics of that type are realistically simulated
- (2) a flight procedure trainer, being an apparatus that provides a representation of aircraft to the extent that realistic flight deck environment, instrument responses, simple systems, and the performance and flight characteristics of aircraft of a particular class or type are simulated.
- (3) A basic instrument flight trainer, being an apparatus equipped with appropriate instruments, simulating the flight deck environment of an aircraft in flight in instrument flight conditions, in which a pilot may be instructed or tested in basic instrument flight manoeuvres and procedures.

**System efficiency.** The ratio of valid replies processed by the interrogator to the total of its own interrogations.

## Section T

**Take-off and initial climb phase.** That part of the flight from the start of take-off to 300 m (1 000 ft) above the elevation of the FATO, if the flight is planned to exceed this height, or to the end of the climb in the other cases.

**Take-off distance available.** Means the length of the take-off run available plus the length of any clearway

**Take-off run available.** Means the length of the runway declared by the aerodrome operator as available and suitable for the ground run of an aeroplane taking-off

**Take-off safety speed.** Means a referenced airspeed obtained after lift-off at which the required one engine-inoperative climb performance can be achieved.

**Take-off decision point (TDP).** The point used in determining take-off performance from which, an engine failure occurring at this point, either a rejected take-off may be made or a take-off safely continued.

*Note — TDP applies only to helicopters operating in performance Class 1.*

**Take-off phase.** The operating phase defined by the time during which the engine is operated at the rated thrust.

**Take-off weight.** Means the weight of the aeroplane at the commencement of the take-off run and includes everything and everyone carried in or on the aeroplane at the commencement of the take-off run.

**Take-off runway.** A runway intended for take-off only.

**Take-off surface.** That part of the surface of an aerodrome which the aerodrome authority has declared available for the normal ground or water run of aircraft taking off in a particular direction.

**Target level of safety (TLS).** A generic term representing the level of risk which is considered acceptable in particular circumstances.

**Taxi/ground idle.** The operating phases involving taxi and idle between the initial starting of the propulsion engine(s) and the initiation of the take-off roll and between the time of runway turn-off and final shutdown of all propulsion engine(s).

**Taxiing.** Movement of an aircraft on the surface of an aerodrome under its own power, excluding take-off and landing.

**Taxi-route.** A defined path established for the movement of helicopters from one part of a heliport to another. A taxi-route includes a helicopter air or ground taxiway which is centred on the taxi-route.

**Taxi fuel.** Means the fuel required for the operation of an aircraft between the engine start to commencement of the take off run and between the runway turnoff following completion of landing run to engine shut down:

**Taxiway.** A defined path on a land aerodrome established for the taxiing of aircraft and intended to provide a link between one part of the aerodrome and another, including:

- (a) *Aircraft stand taxilane.* A portion of an apron designated as a taxiway and intended to provide access to aircraft stands only.
- (b) *Apron taxiway.* A portion of a taxiway system located on an apron and intended to provide a through taxi-route across the apron.
- (c) *Rapid exit taxiway.* A taxiway connected to a runway at an acute angle and designed to allow landing aeroplanes to turn off at higher speeds than are achieved on other exit taxiways thereby minimizing runway occupancy times.

**Taxiway intersection.** A junction of two or more taxiways.

**Tca.** Nominally, the time of closest approach. For encounters in the standard encounter model in chapter (4.4.2.6) found in ICAO Annex 10 Volume IV, a reference time for the construction of the encounter at which various parameters, including the vertical and horizontal separation (vmd and hmd), are specified.

*Note— Encounters in the standard encounter model (4.4.2.6) are constructed by building the trajectories of the two aircraft outwards starting at tca. When the process is complete, tca may not be the precise time of closest approach and differences of a few seconds are acceptable.*

**Taxiway strip.** An area including a taxiway intended to protect an aircraft operating on the taxiway and to reduce the risk of damage to an aircraft accidentally running off the taxiway.

**Technical log.** Means the technical log that is required for every applicable aircraft;

**Technical Instructions.** The *Technical Instructions for the Safe Transport of Dangerous Goods by Air* (Doc 9284), approved and issued periodically in accordance with the procedure established by the ICAO Council.

**Telecommunication (RR S1.3).** Any transmission, emission, or reception of signs, signals, writing, images and sounds or intelligence of any nature by wire, radio, optical or other electromagnetic systems.

**Teletypewriter tape.** A tape on which signals are recorded in the 5-unit Start-Stop code by completely severed perforations (Chad Type) or by partially severed perforations (Chadless Type) for transmission over teletypewriter circuits.

**Temporary admission.** The customs procedure under which certain goods can be brought into a customs territory conditionally relieved totally or partially from payment of import duties and taxes; such goods must be imported for a specific purpose and must be intended for re-exportation within a specified period and without having undergone any change except normal depreciation due to the use made of them.

**Terminal arrival altitude (TAA).** The lowest altitude that will provide a minimum clearance of 300 m (1 000 ft) above all objects located in an arc of a circle defined by a 46 km (25 NM) radius centred on the initial approach fix (IAF), or where there is no IAF on the intermediate approach fix (IF), delimited by straight lines joining the extremity of the arc to the IF. The combined TAAs associated with an approach procedure shall account for an area of 360 degrees around the IF.

**Terminal control area.** A control area normally established at the confluence of ATS routes in the vicinity of one or more major aerodromes.

**Terrain.** The surface of the Earth containing naturally occurring features such as mountains, hills, ridges, valleys, bodies of water, permanent ice and snow, and excluding obstacles.

*Note — In practical terms, depending on the method of data collection, terrain represents the continuous surface that exists at the bare Earth, the top of the canopy or something in-between, also known as “first reflective surface”.*

**Tesla (T).** The magnetic flux density given by a magnetic flux of 1 weber per square metre.

**Threat.** Events or errors that occur beyond the influence of an operational person, increase operational complexity and must be managed to maintain the margin of safety.

*Note — See Chapter 1 of ICAO Annex 19 — Safety Management for a definition of operational personnel.*

**Threat management.** The process of detecting and responding to threats with countermeasures that reduce or eliminate the consequences of threats and mitigate the probability of errors or undesired states.

*Note — See Attachment C to Chapter 3 of the Procedures for Air Navigation Services — Training (PANS-TRG, Doc 9868) and Circular 314 — Threat and Error Management (TEM) in Air Traffic Control for a description of undesired states.*

**Threshold.** The beginning of that portion of the runway usable for landing.

**Threshold time.** The range, expressed in time, established by the State of the Operator, to an en-route alternate aerodrome, whereby any time beyond requires an EDTO approval from the State of the Operator.

**Through-flight.** A particular operation of aircraft, identified by the operator by the use throughout of the same symbol, from point of origin via any intermediate points to point of destination.

**Tilt-rotor.** A powered-lift capable of vertical take-off, vertical landing, and sustained low-speed flight, which depends principally on engine-driven rotors mounted on tiltable nacelles for the lift during these flight regimes and on non-rotating aerofoil(s) for lift during high-speed flight.

**Time division multiple access (TDMA).** A multiple access scheme based on time-shared use of an RF channel employing: (1) discrete contiguous time slots as the fundamental shared resource; and (2) a set of operating protocols that allows users to interact with a master control station to mediate access to the channel.

**Time division multiplex (TDM).** A channel sharing strategy in which packets of information from the same source but with different destinations are sequenced in time on the same channel.

**Time in service.** Means, for maintenance time records, aircraft log records, and similar purposes, the elapsed time from the aircraft leaving the surface until touching it again on landing:

**Time limited system.** Means any system on an aeroplane that has a defined time limited capability and on which the duration of the available flight time of the aeroplane is dependent on.

**Time-to-alert.** The maximum allowable time elapsed from the onset of the navigation system being out of tolerance until the equipment enunciates the alert.

**Time Difference of Arrival (TDOA).** The difference in relative time that a transponder signal from the same aircraft (or ground vehicle) is received at different receivers.

**Time division duplex (TDD).** A duplex scheme where uplink and downlink transmissions occur at different times but may share the same frequency.

**Time division multiple access (TDMA).** A multiple access scheme based on time-shared use of an RF channel employing: (1) discrete contiguous time slots as the fundamental shared resource; and (2) a set of operating protocols that allows users to interact with a master control station to mediate access to the channel.

**Timeout.** The cancellation of a transaction after one of the participating entities has failed to provide a required response within a pre-defined period of time.

**Tonne (t).** The mass equal to 1 000 kilograms.

**Torn-tape relay installation.** A teletypewriter installation where messages are received and relayed in teletypewriter tape form and where all operations of relay are performed as the result of operator intervention.

**Total estimated elapsed time.** For IFR flights, the estimated time required from take-off to arrive over that designated point, defined by reference to navigation aids, from which it is intended that an instrument approach procedure will be commenced, or, if no navigation aid is associated with the destination aerodrome, to arrive over the destination aerodrome. For VFR flights, the estimated time required from take-off to arrive over the destination aerodrome.

**Total vertical error (TVE).** The vertical geometric difference between the actual pressure altitude flown by an aircraft and its assigned pressure altitude (flight level).

**Total voice transfer delay.** The elapsed time commencing at the instant that speech is presented to the AES or GES and concluding at the instant that the speech enters the interconnecting network of the counterpart GES or AES. This delay includes vocoder processing time, physical layer delay, RF propagation delay and any other delays within an AMS(R)S subnetwork.

*Note — The following terms are defined in ICAO Annex 10 as follows:*

- (a) *Aeronautical telecommunication network (ATN): Volume III, Chapter 1.*
- (b) *Aeronautical mobile-satellite (route) service (AMS(R)S): Volume II, Chapter 1.1.*
- (c) *Aircraft earth station (AES): Volume III, Chapter 1.*
- (d) *Ground earth station (GES): Volume III, Chapter 1.*
- (e) *Subnetwork layer: Volume III, Chapter 6.1.*

**Touchdown.** The point where the nominal glide path intercepts the runway.

*Note — “Touchdown” as define above is only a datum and is not necessarily the actual point at which the aircraft will touch the runway.*

**Touchdown and lift-off area (TLOF).** An area on which a helicopter may touch down or lift off.

**Touchdown zone.** The portion of a runway, beyond the threshold, where it is intended landing aeroplanes first contact the runway.

**Traceability.** Ability to trace the history, application or location of that which is under consideration (ISO 9000\*).

*Note — When considering product, traceability can relate to:*

- (a) *the origin of materials and parts;*
- (b) *the processing history; and*
- (c) *the distribution and location of the product after delivery.*

**Track.** The projection on the earth’s surface of the path of an aircraft, the direction of which path at any point is usually expressed in degrees from North (true, magnetic or grid).

*Note — This definition applies to Annex 2, Annex 4, Annex 11.*

**Track.** The condition which exists when the DME interrogator has locked onto replies in response to its own interrogations and is continuously providing a distance measurement.

*Note — This definition applies to Annex 10.*

**Traffic avoidance advice.** Advice provided by an air traffic services unit specifying manoeuvres to assist a pilot to avoid a collision.

**Traffic information service – broadcast (TIS-B) OUT.** A function on the ground that periodically broadcasts the surveillance information made available by ground sensors in a format suitable for TIS-B IN capable receivers.

*Note — This technique can be achieved through different data links. The requirements for Mode S extended squitters are specified in ICAO Annex 10, Volume IV, Chapter 5. The requirements for VHF digital link (VDL) Mode 4 and universal access transceiver (UAT) are specified in ICAO Annex 10, Volume III, Part I.*

**Traffic information.** Information issued by an air traffic services unit to alert a pilot to other known or observed air traffic which may be in proximity to the position or intended route of flight and to help the pilot avoid a collision.

**Traffic information service – broadcast (TIS-B) IN.** A surveillance function that receives and processes surveillance data from TIS-B OUT data sources.

**Transfer cargo and mail.** Cargo and mail departing on an aircraft other than that on which it arrived.

**Transfer of control point.** A defined point located along the flight path of an aircraft, at which the responsibility for providing air traffic control service to the aircraft is transferred from one control unit or control position to the next.

**Transferring unit.** Air traffic control unit in the process of transferring the responsibility for providing air traffic control service to an aircraft to the next air traffic control unit along the route of flight.

**Transit delay.** In packet data systems, the elapsed time between a request to transmit an assembled data packet and an indication at the receiving end that the corresponding packet has been received and is ready to be used or forwarded.

**Transit baggage.** Means baggage that—

- (1) is on board an aircraft that arrives at an aerodrome; and
- (2) is still on board that aircraft when that aircraft leaves the aerodrome.

**Transition altitude.** The altitude at or below which the vertical position of an aircraft is controlled by reference to altitudes.

**Transition level.** The lowest flight level available for use above the transition altitude.

**Translation circuit.** Means a circuit in a helicopter that includes translation to forward flight

**Transmission rate.** The average number of pulse pairs transmitted from the transponder per second.

**Transitioning aircraft.** An aircraft having an average vertical rate with a magnitude exceeding 400 feet per minute (ft/min), measured over some period of interest.

**Transponder occupancy.** A state of unavailability of the transponder from the time it detects an incoming signal that appears to cause some action or from the time of a self-initiated transmission, to the time that it is capable of replying to another interrogation.

*Note.*— Signals from various systems that contribute to transponder occupancy are described in the Aeronautical Surveillance Manual (Doc 9924), Appendix M.

**Travel document.** A passport or other official document of identity issued by a State or organization, which may be used by the rightful holder for international travel.

**Tributary station.** An aeronautical fixed station that may receive or transmit messages and/or digital data but which does not relay except for the purpose of serving similar stations connected through it to a communication centre.

**Tropical cyclone advisory centre (TCAC).** A meteorological centre designated by regional air navigation agreement to provide advisory information to meteorological watch offices, world area forecast centres and international OPMET databanks regarding the position, forecast direction and speed of movement, central pressure and maximum surface wind of tropical cyclones.

**Trip fuel.** Means the fuel required for the planned flight from the commencement of the take off run to the completion of landing run prior to runway turnoff

**Tropical cyclone.** Generic term for a non-frontal synoptic-scale cyclone originating over tropical or sub-tropical waters with organized convection and definite cyclonic surface wind circulation.

**True airspeed.** Means the airspeed of an aircraft relative to undisturbed air. True airspeed is equal to equivalent airspeed multiplied by  $(\rho/\rho_0)^{1/2}$ .

**Turbine powered.** Means powered by turbojet, or turbofan, or turboprop, or turboshaft

**Turbofan.** Means a turbojet core engine that uses a proportion of the residual gas flow energy to drive a compressor ducting gas flow around the core engine as additional propulsion

**Turbojet.** Means a gas turbine engine that uses the residual gas flow energy directly as propulsion

**Turboprop.** Means a gas turbine engine that uses the residual gas flow energy to drive a propeller

**Turboshaft.** Means a gas turbine engine that uses the residual gas flow energy to drive a shaft

**Turn extent.** A heading difference defined as an aircraft's ground heading at the end of a turn minus its ground heading at the beginning of the turn.

**Two-frequency glide path system.** An ILS glide path in which coverage is achieved by the use of two independent radiation field patterns spaced on separate carrier frequencies within the particular glide path channel.

**Two-frequency localizer system.** A localizer system in which coverage is achieved by the use of two independent radiation field patterns spaced on separate carrier frequencies within the particular localizer VHF channel.

**Type:**

- (1) in relation to the licensing of aviation personnel means all aircraft of the same basic design, including all modifications thereto except those modifications which result in a significant change in handling or flight characteristics or
- (2) in relation to the certification of aircraft, aircraft engines, or propellers, means those aircraft, aircraft engines or propellers which are similar in design.

**Type Certificate.** A document issued by a Contracting State to define the design of an aircraft, engine or propeller type and to certify that this design meets the appropriate airworthiness requirements of that State.

*Note — In some Contracting States a document equivalent to a Type Certificate may be issued for an engine or propeller type.*

**Type design.** The set of data and information necessary to define an aircraft, engine or propeller type for the purpose of airworthiness determination.

## Section U

**UAT ADS-B message.** A message broadcasted once per second by each aircraft to convey state vector and other information. UAT ADS-B messages can be in one of two forms depending on the amount of information to be transmitted in a given second: The *Basic UAT ADS-B Message* or the *Long UAT ADS-B Message* (see ICAO Annex 10 Volume 3 Chapter 12.4.4.1 for definition of each). UAT ground stations can support traffic information service-broadcast (TIS-B) through transmission of individual ADS-B messages in the ADS-B segment of the UAT frame.

**UAT ground uplink message.** A message broadcasted by ground stations, within the ground segment of the UAT frame, to convey flight information such as text and graphical weather data, advisories, and other aeronautical information, to aircraft that are in the service volume of the ground station (see ICAO Annex 10 Volume 3 Chapter 12.4.4.2 for further details).

**Ultimate load.** The limit load multiplied by the appropriate factor of safety.

**UN number.** The four-digit number assigned by the United Nations Committee of Experts on the Transport of Dangerous Goods and on the Globally Harmonized System of Classification and Labelling of Chemicals to identify an article or substance or a particular group of articles or substances.

**Unaccompanied baggage.** Baggage that is transported as cargo and may or may not be carried on the same aircraft with the person to whom it belongs.

**Unburned hydrocarbons.** The total of hydrocarbon compounds of all classes and molecular weights contained in a gas sample, calculated as if they were in the form of methane.

**Uncertainty phase.** A situation wherein uncertainty exists as to the safety of an aircraft and its occupants.

**Unclaimed baggage.** Baggage that arrives at an airport and is not picked up or claimed by a passenger.

**Unidentified baggage.** Baggage at an airport, with or without a baggage tag, which is not picked up by or identified with a passenger.

**Unit load device.** Any type of freight container, aircraft container, aircraft pallet with a net, or aircraft pallet with a net over an igloo.

*Note — An overpack is not included in this definition.*

**Universal access transceiver (UAT).** A broadcast data link operating on 978 MHz, with a modulation rate of 1.041667 Mbps.

**Unlading.** The removal of cargo, mail, baggage or stores from an aircraft after a landing.

**Unlawful interference.** Means an act or attempted act endangering a passenger, crew-member, ground personnel, aircraft, or facility.

**Unmanned free balloon.** A non-power-driven, unmanned, lighter-than-air aircraft in free flight.

*Note—* Unmanned free balloons are classified as heavy, medium or light in accordance with specifications contained in ICAO Annex 2, Appendix 5.

**Unserviceable Area.** A part of the movement area that is unfit and unavailable for use by aircraft.

**Unpredictability.** The implementation of security measures in order to increase their deterrent effect and their efficiency, by applying them at irregular frequencies, different locations and/or with varying means, in accordance with a defined framework.

**Upper-air chart.** A meteorological chart relating to a specified upper-air surface or layer of the atmosphere.

**Uplink ELM (UELM).** A term referring to extended length uplink communication by means of 112-bit Mode S Comm-C interrogations, each containing the 80-bit Comm-C message field (MC).

**Uplink.** A term referring to the transmission of data from the ground to an aircraft. Mode S ground-to-air signals are transmitted on the 1 030 MHz interrogation frequency channel.

**Usability factor.** The percentage of time during which the use of a runway or system of runways is not restricted because of the crosswind component.

*Note — Crosswind component means the surface wind component at right angles to the runway centre line.*

**User group.** A group of ground and/or aircraft stations which share voice and/or data connectivity. For voice communications, all members of a user group can access all communications. For data, communications include point-to-point connectivity for air-to-ground messages, and point-to-point and broadcast connectivity for ground-to-air messages.

## Section V

### **Valid.**

- (1) in respect of a license or rating, the document has been issued in accordance with the Civil Aviation Regulations, and is not expired, suspended, or revoked and
- (2) in respect of a medical certificate, the medical certificate has been issued in accordance with the Civil Aviation Regulations, and is not expired, suspended, or revoked

**Validation.** Confirmation, through the provision of objective evidence, that the requirements for a specific intended use or application have been fulfilled (ISO 9000\*).

*Note* — this definition applies to Annex 15.

**Validation.** The process of verifying the relative position of an intruder using passive information via 1 090 MHz extended squitter by comparing it to the relative position obtained by ACAS active interrogation.

*Note* — this definition applies to Annex 10.

**Variation.** Means a specifically configured aeroplane for which the Authority has identified training and qualification requirements that are significantly different from those applicable to an aeroplane of the same make, model, and series

**VDL management entity (VME).** A VDL-specific entity that provides the quality of service requested by the ATN-defined SN\_SME. A VME uses the LMEs (that it creates and destroys) to enquire the quality of service available from peer systems.

**VDL Mode 4 burst.** A VHF digital link (VDL) Mode 4 burst is composed of a sequence of source address, burst ID, information, slot reservation and frame check sequence (FCS) fields, bracketed by opening and closing flag sequences.

**VDL Mode 4 DLS system.** A VDL system that implements the VDL Mode 4 DLS and subnetwork protocols to carry ATN packets or other packets.

**VDL Mode 4 specific services (VSS) sublayer.** The sublayer that resides above the MAC sublayer and provides VDL Mode 4 specific access protocols including reserved, random and fixed protocols.

**VDL station.** An aircraft-based or ground-based physical entity, capable of VDL Mode 2, 3 or 4.

*Note* — In the context of this chapter, a VDL station is also referred to as a “station”.

**Vectoring.** Provision of navigational guidance to aircraft in the form of specific headings, based on the use of an ATS surveillance system.

**Verification.** Confirmation, through the provision of objective evidence, that specified requirements have been fulfilled (ISO 9000\*).

*Note 1.* — The term “verified” is used to designate the corresponding status.

*Note 2.* — Confirmation can comprise activities such as:

- performing alternative calculations;
- comparing a new design specification with a similar proven design specification;
- undertaking tests and demonstrations; and
- reviewing documents prior to issue.

**Vertical miss distance (vmd).** Notionally, the vertical separation at closest approach. For encounters in the standard encounter model chapter (4.4.2.6) found in ICAO Annex 10 Volume IV, by construction the vertical separation at the time tca.

**VFR flight.** A flight conducted in accordance with the visual flight rules.

**VFR.** The symbol used to designate the visual flight rules.

**VHF digital link (VDL).** A constituent mobile subnetwork of the aeronautical telecommunication network (ATN), operating in the aeronautical mobile VHF frequency band. In addition, the VDL may provide non-ATN functions such as, for instance, digitized voice.

**Virtual origin.** The point at which the straight line through the 30 per cent and 5 per cent amplitude points on the pulse leading edge intersects the 0 per cent amplitude axis (see Figure 3-2, ICAO Annex 10 Volume 1).

**Visibility.** Visibility for aeronautical purposes is the greater of:

- a) the greatest distance at which a black object of suitable dimensions, situated near the ground, can be seen and recognized when observed against a bright background;
- b) the greatest distance at which lights in the vicinity of 1 000 candelas can be seen and identified against an unlit background.

*Note 1. — The two distances have different values in air of a given extinction coefficient, and the latter b) varies with the background illumination. The former a) is represented by the meteorological optical range (MOR).*

*Note. 2.— The definition applies to the observations of visibility in local routine and special reports, to the observations of prevailing and minimum visibility reported in METAR and SPECI and to the observations of ground visibility.*

**Visitor.** Any person who disembarks and enters the territory of a Contracting State other than that in which that person normally resides; remains there lawfully as prescribed by that Contracting State for legitimate non-immigrant purposes, such as touring, recreation, sports, health, family reasons, religious pilgrimages, or business; and does not take up any gainful occupation during his stay in the territory visited.

**Visual approach procedure.** A series of predetermined manoeuvres by visual reference, from the initial approach fix, or where applicable, from the beginning of a defined arrival route to a point from which a landing can be completed and thereafter, if a landing is not completed, a go-around procedure can be carried out.

**Visual line-of-sight (VLOS) operation.** An operation in which the remote pilot or RPA observer maintains direct unaided visual contact with the remotely piloted aircraft

**Visual meteorological conditions (VMC).** Meteorological conditions expressed in terms of visibility, distance from cloud, and ceiling\*, equal to or better than specified minima.

*Note — The specified minima are contained in Chapter 4 of ICAO Annex 2.*

**VMC.** The symbol used to designate visual meteorological conditions.

**Vocoder.** A low bit rate voice encoder/decoder.

**Voice unit.** A device that provides a simplex audio and signaling interface between the user and VDL.

**Volcanic ash advisory centre (VAAC).** A meteorological centre designated by regional air navigation agreement to provide advisory information to meteorological watch offices, area control centres, flight information centres,

world area forecast centres and international OPMET databanks regarding the lateral and vertical extent and forecast movement of volcanic ash in the atmosphere following volcanic eruptions.

**VOLMET.** Meteorological information for aircraft in flight.

- *Data link-VOLMET (D-VOLMET):* Provision of current aerodrome routine meteorological reports (METAR) and aerodrome special meteorological reports (SPECI), aerodrome forecasts (TAF), SIGMET, special air-reports not covered by a SIGMET and, where available, AIRMET via data link.
- *VOLMET broadcast:* Provision, as appropriate, of current METAR, SPECI, TAF and SIGMET by means of continuous and repetitive voice broadcasts.

**Volt (V).** The unit of electric potential difference and electromotive force which is the difference of electric potential between two points of a conductor carrying a constant current of 1 ampere, when the power dissipated between these points is equal to 1 watt.

**VSS user.** A user of the VDL Mode 4 specific services. The VSS user could be higher layers in the VDL Mode 4 SARPs or an external application using VDL Mode 4.

**VTOSS.** The minimum speed at which climb shall be achieved with the critical engine inoperative, the remaining engines operating within approved operating limits.

*Note — The speed referred to above may be measured by instrument indications or achieved by a procedure specified in the flight manual.*

## Section W

**Watt (W).** The power which gives rise to the production of energy at the rate of 1 joule per second.

**Waypoint.** A specified geographical location used to define an area navigation route or the flight path of an aircraft employing area navigation. Waypoints are identified as either:

- *Fly-by waypoint.* A waypoint which requires turn anticipation to allow tangential interception of the next segment of a route or procedure; or
- *Flyover waypoint.* A waypoint at which a turn is initiated in order to join the next segment of a route or procedure.

**Wet.** In relation to a runway, means a runway with sufficient moisture on its surface to cause it to appear reflective but without significant areas of standing water

**Weber (Wb).** The magnetic flux which, linking a circuit of one turn, produces in it an electromotive force of 1 volt as it is reduced to zero at a uniform rate in 1 second.

**Wide area multilateration (WAM) system.** A multilateration system deployed to support en-route surveillance, terminal area surveillance and other applications such as height monitoring and precision runway monitoring (PRM).

**Winching area.** An area provided for the transfer by helicopter of personnel or stores to or from a ship.

**Work Area.** A part of an aerodrome in which maintenance or construction works are in progress.

*Note— Crosswind component means the surface wind component at right angles to the runway centre line.*

**World area forecast centre (WAFc).** A meteorological centre designated to prepare and issue significant weather forecasts and upper-air forecasts in digital form on a global basis direct to States using the aeronautical fixed service Internet based services.

**World area forecast system (WAFS).** A worldwide system by which world area forecast centres provide aeronautical meteorological en-route forecasts in uniform standardized formats.

Section X

***XDCE.*** A general term referring to both the ADCE and the GDCE.

***XDLP.*** A general term referring to both the ADLP and the GDLP.

**Section Y**

*This page section was intentionally left blank*

**Section Z**

**Z marker beacon.** A type of radio beacon, the emissions of which radiate in a vertical cone-shaped pattern.

**ZFT simulator.** Means a synthetic flight trainer which—

- (1) meets the standard of level D as described in CAR-60
- (2) meets the standard of level D/phase III as described in Appendix H (dated 30 July 1980) to Part 121 of the United States Federal Aviation Regulations; or
- (3) meets an equivalent standard acceptable to the Authority.

## Part 2- ABBREVIATIONS

ABBREVIATIONS

DECODE

<b>A</b>		ADIZ <sup>†</sup>	<i>(to be pronounced "AY-DIZ")</i> Air defence identification zone
A	Amber	ADJ	Adjacent
AAA	<i>(or AAB, AAC . . . etc., in sequence)</i>	ADO	Aerodrome office <i>(specify service)</i>
	Amended meteorological message	ADR	Advisory route
	<i>(message type designator)</i>	ADS*	Address <i>(when this abbreviation is used to request a repetition, the question mark (IMI) precedes the abbreviation, e.g. IMI ADS) (to be used in AFS as a procedure signal)</i>
A/A	Air-to-air		Automatic dependent surveillance —
AAD	Assigned altitude deviation	ADS-B‡	broadcast
AAR	Air to air refuelling		Automatic dependent surveillance —
AAIM	Aircraft autonomous integrity monitoring	ADS-C‡	contract
AAL	Above aerodrome level		Automatic dependent surveillance unit
ABI	Advance boundary information		Advisory service
ABM	Abeam		Advise
ABN	Aerodrome beacon	ADSU	Aircraft earth station
ABT	About	ADVS	Flight plan filed in the air
ABV	Above	ADZ	Aerodrome flight information service
AC	Altocumulus	AES	Yes or affirm or affirmative or that is
ACARS <sup>†</sup>	<i>(to be pronounced "AY-CARS")</i>	AFIL	correct
	Aircraft communication	AFIS	
	addressing and reporting system	AFM	
ACAS <sup>†</sup>	<i>(to be pronounced "AY-CAS")</i>		

	Airborne collision avoidance system	AFS	Aeronautical fixed service
		AFT . . .	After ( <i>followed by time or place</i> )
ACC‡	Area control centre <i>or</i> area control	AFTN‡	Aeronautical fixed telecommunication network
ACCID	Notification of an aircraft accident		
ACFT	Aircraft	A/G	Air-to-ground
ACK	Acknowledge	AGA	Aerodromes, air routes and ground aids
ACL	Altimeter check location		
ACN	Aircraft classification number	AGL	Above ground level
ACP	Acceptance ( <i>message type designator</i> )	AGN	Again
ACPT	Accept <i>or</i> accepted	AIC	Aeronautical information circular
ACT	Active <i>or</i> activated <i>or</i> activity	AIDC	Air traffic services interfacility data communications
AD	Aerodrome		
ADA	Advisory area	AIM	Aeronautical information management
ADC	Aerodrome chart	AIP	Aeronautical information publication
ADDN	Addition <i>or</i> additional	AIRAC	Aeronautical information regulation and control
ADF‡	Automatic direction-finding equipment	AIREP†	Air-report

† When radiotelephony is used, the abbreviations and terms are transmitted as spoken words.

‡ When radiotelephony is used, the abbreviations and terms are transmitted using the individual letters in non-phonetic form. \* Signal is also available for use in communicating with stations of the maritime mobile service.

# Signal for use in the teletypewriter service only.

AIRMET <sup>†</sup>	Information concerning en-route weather phenomena which may affect the safety of low-level aircraft operations	APV	Approach procedure with vertical guidance
AIS	Aeronautical information services	ARC	Area chart
ALA	Alighting area	ARNG	Arrange
ALERFA <sup>†</sup>	Alert phase	ARO	Air traffic services reporting office
ALR	Alerting ( <i>message type designator</i> )	ARP	Aerodrome reference point
ALRS	Alerting service	ARP	Air-report ( <i>message type designator</i> )
ALS	Approach lighting system	ARQ	Automatic error correction
ALT	Altitude	ARR	Arrival ( <i>message type designator</i> )
ALTN	Alternate or alternating ( <i>light alternates in colour</i> )	ARR	Arrive or arrival
ALTN	Alternate ( <i>aerodrome</i> )	ARS	Special air-report ( <i>message type designator</i> )
AMA	Area minimum altitude	ARST	Arresting ( <i>specify (part of) aircraft arresting equipment</i> )
AMD	Amend or amended ( <i>used to indicate amended meteorological message; message type designator</i> )	AS	Altostratus
AMDT	Amendment ( <i>AIP Amendment</i> )	ASAP	As soon as possible
AMS	Aeronautical mobile service	ASC	Ascend to or ascending to
AMSL	Above mean sea level	ASDA	Accelerate-stop distance available
AMSS	Aeronautical mobile satellite service	ASE	Altimetry system error
ANC . . .	Aeronautical chart — 1:500 000 ( <i>followed by name/title</i> )	ASHTAM	Special series NOTAM notifying by means of a specific format change in activity of a volcano, a volcanic eruption and/or volcanic ash cloud that is of significance to aircraft operations
ANCS . . .	Aeronautical navigation chart — small scale ( <i>followed by name/title and</i>	ASPH	Asphalt

	<i>scale)</i>	AT . . .	<i>At (followed by time at which weather</i>
ANS	Answer		<i>change is forecast to occur)</i>
AO	Aircraft operator	ATA‡	Actual time of arrival
AOC . . .	Aerodrome obstacle chart <i>(followed by</i>	ATC‡	Air traffic control <i>(in general)</i>
	<i>type and name/title)</i>	ATCSMAC . . .	Air traffic control surveillance
AP	Airport		minimum altitude chart <i>(followed</i>
APAPI†	<i>(to be pronounced “AY-PAPI”)</i>		<i>by name/title)</i>
	Abbreviated precision approach	ATD‡	Actual time of departure
	path indicator	ATFM	Air traffic flow management
APCH	Approach	ATIS†	<i>(to be pronounced “AY-TIS”)</i>
APDC . . .	Aircraft parking/docking chart		Automatic terminal information
	<i>(followed by name/title)</i>		service
APN	Apron	ATM	Air traffic management
APP	Approach control office <i>or</i> approach	ATN	Aeronautical telecommunication
	control <i>or</i> approach control		network
	service	ATP . . .	<i>At (followed by time or place)</i>
APR	April	ATS	Air traffic services
APRX	Approximate <i>or</i> approximately	ATTN	Attention
APSG	After passing		
APU	Auxiliary power unit		

† *When radiotelephony is used, the abbreviations and terms are transmitted as spoken words.*

‡ *When radiotelephony is used, the abbreviations and terms are transmitted using the individual letters in non-phonetic form. \* Signal is also available for use in communicating with stations of the maritime mobile service.*

# *Signal for use in the teletypewriter service only.*

## Abbreviations — Decode

AT-VASIS <sup>†</sup>	<i>(to be pronounced “AY-TEE-VASIS”)</i> Abbreviated T visual approach slope indicator system	BTL	Between layers
		BTN	Between
		BUFR	Binary universal form for the representation of meteorological data
ATZ	Aerodrome traffic zone		
AUG	August		
AUTH	Authorized <i>or</i> authorization		
AUTO	Automatic		
AUW	All up weight		
AUX	Auxiliary		
AVBL	Available <i>or</i> availability		
AVG	Average		
AVGAS <sup>†</sup>	Aviation gasoline		
AWOS	Automated weather observation system		
AWTA	Advise at what time able		
AWY	Airway		
AZM	Azimuth		
<b>B</b>		<b>C</b>	
B	Blue	. . . C	Centre <i>(preceded by runway designation number to identify a parallel runway)</i>
BA	Braking action	C	Degrees Celsius <i>(Centigrade)</i>
BARO-VNAV <sup>†</sup>	<i>(to be pronounced “BAA-RO-VEE- NAV”)</i> Barometric vertical navigation	CA	Course to an altitude
		CAA	Civil aviation authority <i>or</i> civil aviation administration
BASE <sup>†</sup>	Cloud base	CAT	Category
BCFG	Fog patches	CAT	Clear air turbulence
		CAVOK <sup>†</sup>	<i>(to be pronounced “KAV-OH-KAY”)</i> Visibility, cloud and present weather better than prescribed values or conditions
		CB‡	<i>(to be pronounced “CEE BEE”)</i> Cumulonimbus
		CC	Cirrocumulus
		CCA	<i>(or CCB, CCC . . . etc., in sequence)</i> Corrected meteorological message <i>(message type designator)</i>

BCN	Beacon ( <i>aeronautical ground light</i> )	CCO	Continuous climb operations
BCST	Broadcast	CD	Candela
BDRY	Boundary	CDN	Coordination ( <i>message type designator</i> )
BECMG	Becoming	CDO	Continuous descent operations
BFR	Before	CDR	Conditional route
BKN	Broken	CF	Change frequency to . . .
BL . . .	Blowing ( <i>followed by DU = dust, SA = sand or SN = snow</i> )	CF	Course to a fix
BLDG	Building	CFM*	Confirm or I confirm ( <i>to be used in AFS as a procedure signal</i> )
BLO	Below clouds	CGL	Circling guidance light(s)
BLW	Below	CH	Channel
BOMB	Bombing	CH#	This is a channel-continuity-check of transmission to permit comparison of your record of channel-sequence numbers of messages received on the channel ( <i>to be used in AFS as a procedure signal</i> )
BR	Mist		
BRF	Short ( <i>used to indicate the type of approach desired or required</i> )		
BRG	Bearing		
BRKG	Braking		
BS	Commercial broadcasting station		

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# Signal for use in the teletypewriter service only.

CHEM	Chemical	CRM	Collision risk model
CHG	Modification ( <i>message type designator</i> )	CRP	Compulsory reporting point
CI	Cirrus	CRZ	Cruise
CIDIN <sup>†</sup>	Common ICAO data interchange network	CS	Call sign
CIV	Civil	CS	Cirrostratus
CK	Check	CTA	Control area
CL	Centre line	CTAM	Climb to and maintain
CLA	Clear type of ice formation	CTC	Contact
CLBR	Calibration	CTL	Control
CLD	Cloud	CTN	Caution
CLG	Calling	CTR	Control zone
CLIMB-OUT	Climb-out area	CU	Cumulus
CLR	Clear(s) <i>or</i> cleared to . . . <i>or</i> clearance	CUF	Cumuliform
CLRD	Runway(s) cleared ( <i>used in METAR/SPECI</i> )	CUST	Customs
CLSD	Close <i>or</i> closed <i>or</i> closing	CVR	Cockpit voice recorder
CM	Centimetre	CW	Continuous wave
CMB	Climb to <i>or</i> climbing to	CWY	Clearway
CMPL	Completion <i>or</i> completed <i>or</i> complete	<b>D</b>	
CNL	Cancel <i>or</i> cancelled	D	Downward ( <i>tendency in RVR during</i>
CNL	Flight plan cancellation ( <i>message type designator</i> )		<i>previous 10 minutes</i> )
CNS	Communications, navigation and surveillance	D . . .	Danger area ( <i>followed by identification</i> )
COM	Communications	DA	Decision altitude
CONC	Concrete		( <i>to be pronounced “DEE-ATIS”</i> )
COND	Condition	D-ATIS <sup>†</sup>	Data link automatic terminal information service

CONS	Continuous	DCD	Double channel duplex
CONST	Construction <i>or</i> constructed	DCKG	Docking
CONT	Continue(s) <i>or</i> continued	DCP	Datum crossing point
COOR	Coordinate <i>or</i> coordination	DCPC	Direct controller-pilot communications
COORD	Coordinates	DCS	Double channel simplex
COP	Change-over point	DCT	Direct ( <i>in relation to flight plan clearances and type of approach</i> )
COR	Correct <i>or</i> correction <i>or</i> corrected  <i>(used to indicate corrected meteorological message; message  type designator)</i>	DE*	From ( <i>used to precede the call sign of  the calling station</i> ) ( <i>to be used in  AFS as a procedure signal</i> )
COT	At the coast	DEC	December
COV	Cover <i>or</i> covered <i>or</i> covering	DEG	Degrees
CPDLC‡	Controller-pilot data link  communications	DEP	Depart <i>or</i> departure  Departure ( <i>message type designator</i> )
CPL	Current flight plan ( <i>message type  designator</i> )	DEPO	Deposition
CRC	Cyclic redundancy check	DER	Departure end of the runway

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# Signal for use in the teletypewriter service only.

## Abbreviations — Decode

DES	Descend to <i>or</i> descending to	<b>E</b>	
DEST	Destination		
DETRESFA <sup>+</sup>	Distress phase	E	East <i>or</i> eastern longitude
DEV	Deviation <i>or</i> deviating	EAT	Expected approach time
DF	Direction finding	EB	Eastbound
DFDR	Digital flight data recorder	EDA	Elevation differential area
			Extended diversion time operations
DFTI	Distance from touchdown indicator	EDTO	
DH	Decision height	EEE#	Error ( <i>to be used in AFS as a procedure signal</i> )
DIF	Diffuse	EET	Estimated elapsed time
DIST	Distance	EFC	Expect further clearance
DIV	Divert <i>or</i> diverting	EFIS <sup>+</sup>	( <i>to be pronounced “EE-FIS”</i> )
DLA	Delay <i>or</i> delayed		Electronic flight instrument system
DLA	Delay ( <i>message type designator</i> )	EGNOS <sup>+</sup>	( <i>to be pronounced “EGG-NOS”</i> )
DLIC	Data link initiation capability		European geostationary navigation overlay service
DLY	Daily		Extremely high frequency [30 000 to 300 000 MHz]
DME‡	Distance measuring equipment	EHF	
DNG	Danger <i>or</i> dangerous		Emergency location beacon — aircraft
DOF	Date of flight	ELBA <sup>+</sup>	
		ELEV	Elevation
DOM	Domestic	ELR	Extra long range
DP	Dew point temperature	ELT	Emergency locator transmitter
DPT	Depth	EM	Emission
DR	Dead reckoning	EMBD	Embedded in a layer ( <i>to indicate cumulonimbus embedded in layers of other clouds</i> )
DR . . .	Low drifting ( <i>followed by DU = dust, SA = sand or SN = snow</i> )	EMERG	Emergency
DRG	During	END	Stop-end ( <i>related to RVR</i> )
DS	Duststorm		
DSB	Double sideband		
DTAM	Descend to and maintain		

DTG	Date-time group	ENE	East-north-east
DTHR	Displaced runway threshold	ENG	Engine
DTRT	Deteriorate <i>or</i> deteriorating	ENR	En route
DTW	Dual tandem wheels	ENRC . . .	Enroute chart ( <i>followed by name/title</i> )
DU	Dust	EOBT	Estimated off-block time
DUC	Dense upper cloud	EQPT	Equipment
DUPE#	This is a duplicate message ( <i>to be used</i>  <i>in AFS as a procedure signal</i> )	ESE	East-south-east
DUR	Duration	EST	Estimate <i>or</i> estimated <i>or</i> estimation  ( <i>message type designator</i> )
D-VOLMET	Data link VOLMET	ETA*‡	Estimated time of arrival <i>or</i> estimating  arrival
DVOR	Doppler VOR	ETD‡	Estimated time of departure <i>or</i> estimating departure
DW	Dual wheels	ETO	Estimated time over significant point
DZ	Drizzle	EUR RODEX	European regional OPMET data  exchange
		EV	Every
		EVS	Enhanced vision system

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# Signal for use in the teletypewriter service only.

EXC	Except	FM	From
EXER	Exercises <i>or</i> exercising <i>or</i> to exercise	FM . . .	From ( <i>followed by time at which weather change is forecast to begin</i> )
EXP	Expect <i>or</i> expected <i>or</i> expecting		
EXTD	Extend <i>or</i> extending <i>or</i> extended		
<b>F</b>		FMC	Flight management computer
		FMS‡	Flight management system
		FMU	Flow management unit
		FNA	Final approach
F	Fixed	FPAP	Flight path alignment point
FA	Course from a fix to an altitude	FPL	Flight plan
FAC	Facilities	FPM	Feet per minute
FAF	Final approach fix	FPR	Flight plan route
FAL	Facilitation of international air transport	FR	Fuel remaining
FAP	Final approach point	FREQ	Frequency
FAS	Final approach segment	FRI	Friday
FATO	Final approach and take-off area	FRNG	Firing
FAX	Facsimile transmission	FRONT†	Front ( <i>relating to weather</i> )
FBL	Light ( <i>used to indicate the intensity of weather phenomena, interference or static reports, e.g. FBL RA = light rain</i> )	FROST†	Frost ( <i>used in aerodrome warnings</i> )
FC	Funnel cloud ( <i>tornado or waterspout</i> )	FRQ	Frequent
FCST	Forecast	FSL	Full stop landing
FCT	Friction coefficient	FSS	Flight service station
FDPS	Flight data processing system	FST	First
FEB	February	FT	Feet ( <i>dimensional unit</i> )
FEW	Few	FTE	Flight technical error
FG	Fog	FTP	Fictitious threshold point
FIC	Flight information centre	FTT	Flight technical tolerance
FIR‡	Flight information region	FU	Smoke
		FZ	Freezing
		FZDZ	Freezing drizzle
		FZFG	Freezing fog
		FZRA	Freezing rain

FIS	Flight information service		
FISA	Automated flight information service		
FL	Flight level	<b>G</b>	
FLD	Field		
FLG	Flashing	G	Green
FLR	Flares	G . . .	Variations from the mean wind speed
FLT	Flight		(gusts) <i>(followed by figures in METAR/SPECI and TAF)</i>
FLTCK	Flight check		
FLUC	Fluctuating or fluctuation or fluctuated	GA	General aviation
FLW	Follow(s) or following	GA	Go ahead, resume sending <i>(to be used in AFS as a procedure signal)</i>
FLY	Fly or flying	G/A	Ground-to-air
FM	Course from a fix to manual termination <i>(used in navigation database coding)</i>	G/A/G GAGAN <sup>†</sup>	Ground-to-air and air-to-ground GPS and geostationary earth orbit augmented navigation

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# Signal for use in the teletypewriter service only.

## Abbreviations — Decode

GAIN	Airspeed or headwind gain	<b>H</b>	
GAMET	Area forecast for low-level flights		High pressure area <i>or</i> the centre of high
GARP	GBAS azimuth reference point	H	pressure
GBAS†	<i>(to be pronounced “GEE-BAS”)</i> Ground-based augmentation system	H . . .	Significant wave height <i>(followed by figures in METAR/SPECI)</i>
GCA‡	Ground controlled approach system <i>or</i> ground controlled approach	H24	Continuous day and night service
GEN	General	HA	Holding/racetrack to an altitude
GEO	Geographic <i>or</i> true	HAPI	Helicopter approach path indicator
GES	Ground earth station	HBN	Hazard beacon
GLD	Glider	HCH	Heliport crossing height
GLONASS†	<i>(to be pronounced “GLO-NAS”)</i> Global orbiting navigation satellite system	HDF	High frequency direction-finding station
GLS‡	GBAS landing system	HDG	Heading
GMC . . .	Ground movement chart <i>(followed by name/title)</i>	HEL	Helicopter
GND	Ground	HF	Holding/racetrack to a fix
GNDCK	Ground check	HF‡	High frequency [3 000 to 30 000 kHz]
GNSS‡	Global navigation satellite system	HGT	Height <i>or</i> height above
GOV	Government	HJ	Sunrise to sunset
GP	Glide path	HLDG	Holding
GPA	Glide path angle	HLP	Heliport
GPIP	Glide path intercept point	HLS	Helicopter landing site
GPS‡	Global positioning system	HM	Holding/racetrack to a manual termination
GPU	Ground power unit	HN	Sunset to sunrise
		HO	Service available to meet operational requirements
		HOL	Holiday
		HOSP	Hospital aircraft

GPWS‡	Ground proximity warning system	HPA	Hectopascal
GR	Hail	HR	Hours
GRAS†	<i>(to be pronounced “GRASS”)</i> Ground-based regional augmentation system	HRP	Heliport reference point
GRASS	Grass landing area	HS	Service available during hours of scheduled operations
GRIB	Processed meteorological data in the form of grid point values expressed in binary form  <i>(in meteorological code)</i>	HUD	Head-up display
GRVL	Gravel	HUM	Humanitarian
GS	Ground speed	HURCN	Hurricane
GS	Small hail and/or snow pellets	HVDF	High and very high frequency direction-finding stations <i>(at the same location)</i>
GUND	Geoid undulation	HVY	Heavy
		HVY	Heavy <i>(used to indicate the intensity of weather phenomena, e.g. HVY RA = heavy rain)</i>
		HX	No specific working hours
		HYR	Higher
		HZ	Haze
		HZ	Hertz <i>(cycle per second)</i>

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# Signal for use in the teletypewriter service only.

<b>I</b>		ISA	International standard atmosphere
		ISB	Independent sideband
IAC . . .	Instrument approach chart ( <i>followed by name/title</i> )	ISOL	Isolated
IAF	Initial approach fix		
IAO	In and out of clouds	<b>J</b>	
IAP	Instrument approach procedure	JAN	January
IAR	Intersection of air routes	JTST	Jet stream
IAS	Indicated airspeed	JUL	July
IBN	Identification beacon	JUN	June
ICAO	International Civil Aviation Organization		
ICE	Icing		
ID	Identifier <i>or</i> identify	<b>K</b>	
IDENT <sup>†</sup>	Identification		
IF	Intermediate approach fix	KG	Kilograms
IFF	Identification friend/foe	KHZ	Kilohertz
IFR <sup>‡</sup>	Instrument flight rules	KIAS	Knots indicated airspeed
IGA	International general aviation	KM	Kilometres
ILS <sup>‡</sup>	Instrument landing system	KMH	Kilometres per hour
IM	Inner marker	KPA	Kilopascal
IMC <sup>‡</sup>	Instrument meteorological conditions	KT	Knots
IMG	Immigration	KW	Kilowatts
IMI*	Interrogation sign (question mark) ( <i>to be used in AFS as a procedure signal</i> )		
IMPR	Improve <i>or</i> improving	<b>L</b>	
IMT	Immediate <i>or</i> immediately	. . . L	Left ( <i>preceded by runway designation number to identify a parallel runway</i> )
INA	Initial approach		
INBD	Inbound	L	Litre
INC	In cloud	L	Locator
INCERFA <sup>†</sup>	Uncertainty phase		
INCORP	Incorporated		

INFO†	Information	L	Low pressure area <i>or</i> the center of low pressure
INOP	Inoperative		
INP	If not possible	LAM	Logical acknowledgement ( <i>message type designator</i> )
INPR	In progress		
INS	Inertial navigation system	LAN	Inland
INSTL	Install <i>or</i> installed <i>or</i> installation	LAT	Latitude
INSTR	Instrument	LCA	Local <i>or</i> locally <i>or</i> location <i>or</i> located
INT	Intersection	LDA	Landing distance available
INTL	International	LDAH	Landing distance available, helicopter
INTRG	Interrogator	LDG	Landing
INTRP	Interrupt <i>or</i> interruption <i>or</i> interrupted	LDI	Landing direction indicator
INTSF	Intensify <i>or</i> intensifying	LEN	Length
INTST	Intensity	LF	Low frequency [30 to 300 kHz]
IR	Ice on runway	LGT	Light <i>or</i> lighting
IRS	Inertial reference system	LGTD	Lighted

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# Signal for use in the teletypewriter service only.

## Abbreviations — Decode

LIH	Light intensity high	MAP	Aeronautical maps and charts
LIL	Light intensity low	MAPT	Missed approach point
LIM	Light intensity medium	MAR	At sea
LINE	Line ( <i>used in SIGMET</i> )	MAR	March
LM	Locator, middle	MATF	Missed approach turning fix
LMT	Local mean time	MATZ	Military aerodrome traffic zone
LNAV†	( <i>to be pronounced “EL-NAV”</i> ) Lateral navigation	MAX	Maximum
LNG	Long ( <i>used to indicate the type of approach desired or required</i> )	MAY	May
LO	Locator, outer	MBST	Microburst
LOC	Localizer	MCA	Minimum crossing altitude
LONG	Longitude	MCTR	Military control zone
LORAN†	LORAN ( <i>long range air navigation system</i> )	MCW	Modulated continuous wave
LOSS	Airspeed or headwind loss	MDA	Minimum descent altitude
LPV	Localizer performance with vertical guidance	MDF	Medium frequency direction-finding station
LR	Last message received by me was . . . ( <i>to be used in AFS as a procedure signal</i> )	MDH	Minimum descent height
LRG	Long range	MEA	Minimum en-route altitude
LS	Last message sent by me was . . . or Last message was . . . ( <i>to be used in AFS as a procedure signal</i> )	MEDEVAC	Medical evacuation flight
LTA	Lower control area	MEHT	Minimum eye height over threshold ( <i>for visual approach slope indicator systems</i> )
LTD	Limited	MET†	Meteorological or meteorology
LTP	Landing threshold point	METAR†	Aerodrome routine meteorological report ( <i>in meteorological code</i> )
LV	Light and variable ( <i>relating to wind</i> )	MET	
		REPORT	Local routine meteorological report ( <i>in abbreviated plain language</i> )
		MF	Medium frequency [300 to 3 000 kHz]
		MHA	Minimum holding altitude

LVE	Leave <i>or</i> leaving	MHDF	Medium and high frequency direction-finding stations ( <i>at the same location</i> )
LVL	Level		
LVP	Low visibility procedures	MHVDF	Medium, high and very high frequency direction-finding stations ( <i>at the same location</i> )
LYR	Layer <i>or</i> layered		
<b>M</b>		MHZ	Megahertz
		MID	Mid-point ( <i>related to RVR</i> )
		MIFG	Shallow fog
. . . M	Metres ( <i>preceded by figures</i> )	MIL	Military
M . . .	Mach number ( <i>followed by figures</i> )	MIN*	Minutes
M . . .	Minimum value of runway visual range ( <i>followed by figures in METAR/SPECI</i> )	MIS	Missing . . . ( <i>transmission identification</i> ) ( <i>to be used in AFS as a procedure signal</i> )
MAA	Maximum authorized altitude	MKR	Marker radio beacon
MAG	Magnetic	MLS‡	Microwave landing system
MAHF	Missed approach holding fix	MM	Middle marker
MAINT	Maintenance	MNM	Minimum

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MNPS	Minimum navigation performance specifications	<b>N</b>	
MNT	Monitor <i>or</i> monitoring <i>or</i> monitored	N	No distinct tendency ( <i>in RVR during previous 10 minutes</i> )
MNTN	Maintain		
MOA	Military operating area	N	North <i>or</i> northern latitude
MOC	Minimum obstacle clearance ( <i>required</i> )	NADP	Noise abatement departure procedure
MOCA	Minimum obstacle clearance altitude	NASC†	National AIS system centre
MOD	Moderate ( <i>used to indicate the intensity of weather phenomena, interference or static reports, e.g. MODRA = moderate rain</i> )	NAT	North Atlantic
MON	Above mountains	NAV	Navigation
MON	Monday	NAVAID	Navigation aid
MOPST	Minimum operational performance standards	NB	Northbound
MOV	Move <i>or</i> moving <i>or</i> movement	NBFR	Not before
MPS	Metres per second	NC	No change
MRA	Minimum reception altitude	NCD	No cloud detected ( <i>used in automated METAR/SPECI</i> )
MRG	Medium range	NDB‡	Non-directional radio beacon
MRP	ATS/MET reporting point	NDV	No directional variations available ( <i>used in automated METAR/SPECI</i> )
MS	Minus	NE	North-east
MSA	Minimum sector altitude	NEB	North-eastbound
MSAS†	( <i>to be pronounced “EM-SAS”</i> ) Multi-functional transport satellite (MTSAT) satellite-based augmentation system	NEG	No <i>or</i> negative <i>or</i> permission not granted <i>or that is not correct</i>
MSAW	Minimum safe altitude warning	NGT	Night
MSG	Message	NIL*†	None <i>or</i> I have nothing to send to you
MSL	Mean sea level	NM	Nautical miles
MSR#	Message . . . ( <i>transmission identification</i> )	NML	Normal
		NN	No name, unnamed
		NNE	North-north-east
		NNW	North-north-west

	has been misrouted ( <i>to be used in AFS as a procedure signal</i> )	NO	No (negative) ( <i>to be used in AFS as a procedure signal</i> )
MSSR	Monopulse secondary surveillance radar	NOF	International NOTAM office
MT	Mountain	NONSTD	Non-standard
MTOM	Maximum take-off mass	NOSIG†	No significant change ( <i>used in trend-type landing forecasts</i> )
MTU	Metric units		
MTW	Mountain waves	NOTAM†	Notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations
MVDF	Medium and very high frequency direction- finding stations ( <i>at the same location</i> )		
MWO	Meteorological watch office	NOTAMC	Cancelling NOTAM
MX	Mixed type of ice formation ( <i>white and clear</i> )	NOTAMN	New NOTAM

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# Signal for use in the teletypewriter service only.

## Abbreviations — Decode

NOTAMR	Replacing NOTAM	OPST	Operations
NOV	November	O/R	On request
NOZ‡	Normal operating zone	ORD	Order
NPA	Non-precision approach	OSV	Ocean station vessel
NR	Number	OTP	On top
NRH	No reply heard	OTS	Organized track system
NS	Nimbostratus	OUBD	Outbound
NSC	Nil significant cloud	OVC	Overcast
NSE	Navigation system error		
NSW	Nil significant weather		
NTL	National	<b>P</b>	
NTZ‡	No transgression zone		
NW	North-west	P . . .	Maximum value of wind speed or runway
NWB	North-westbound		visual range ( <i>followed by figures in METAR/SPECI and TAF</i> )
NXT	Next		
<b>O</b>			
OAC	Oceanic area control centre	P . . .	Prohibited area ( <i>followed by identification</i> )
OAS	Obstacle assessment surface	PA	Precision approach
OBS	Observe <i>or</i> observed <i>or</i> observation	PALS	Precision approach lighting system ( <i>specify category</i> )
OBSC	Obscure <i>or</i> obscured <i>or</i> obscuring	PANS	Procedures for air navigation services
		PAPI†	Precision approach path indicator
OBST	Obstacle	PAR‡	Precision approach radar
OCA	Obstacle clearance altitude	PARL	Parallel
OCA	Oceanic control area		Precision approach terrain chart ( <i>followed by name/title</i> )
OCC	Occulting ( <i>light</i> )	PATC . . .	
OCH	Obstacle clearance height		
		PAX	Passenger(s)
		PBC	Performance-based communication
		PBN	Performance-based navigation

OCNL	Occasional <i>or</i> occasionally	PBS	Performance-based surveillance
OCS	Obstacle clearance surface	PCD	Proceed <i>or</i> proceeding
OCT	October	PCL	Pilot-controlled lighting
OFZ	Obstacle free zone	PCN	Pavement classification number
OGN	Originate ( <i>to be used in AFS as a procedure signal</i> )	PCT	Per cent
OHD	Overhead	PDC‡	Pre-departure clearance
OIS	Obstacle identification surface	PDG	Procedure design gradient
OK*	We agree <i>or</i> It is correct ( <i>to be used in AFS as a procedure signal</i> )	PER	Performance
OLDI†	On-line data interchange	PERM	Permanent
OM	Outer marker	PIB	Pre-flight information bulletin
OPA	Opaque, white type of ice formation	PJE	Parachute jumping exercise
OPC	Control indicated is operational control	PL	Ice pellets
OPMET†	Operational meteorological ( <i>information</i> )	PLA	Practice low approach
OPN	Open <i>or</i> opening <i>or</i> opened	PLVL	Present level
OPR	Operator <i>or</i> operate <i>or</i> operative <i>or</i> operating <i>or</i> operational	PN	Prior notice required
		PNR	Point of no return
		PO	Dust/sand whirls ( <i>dust devils</i> )
		POB	Persons on board

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# Signal for use in the teletypewriter service only.

POSS	Possible	QTA	Shall I cancel telegram number . . . ? <i>or</i> Cancel telegram number . . . <i>(to be used in AFS as a Q Code)</i>
PPI	Plan position indicator	QTE	True bearing
PPR	Prior permission required	QTF	Will you give me the position of my station according to the bearings taken by the D/F stations which you control? <i>or</i> The position of your station according to the bearings taken by the D/F stations that I control was . . . latitude . . . longitude ( <i>or</i> other indication of position), class . . . at . . . hours <i>(to be used in radiotelegraphy as a Q Code)</i>
PPSN	Present position	QUAD	Quadrant
PRFG	Aerodrome partially covered by fog	QUJ	Will you indicate the TRUE track to reach you? <i>or</i> The TRUE track to reach me is . . . degrees at . . . hours <i>(to be used in radiotelegraphy as a Q Code)</i>
PRI	Primary	<b>R</b>	
PRKG	Parking	. . . R	Right <i>(preceded by runway designation number to identify a parallel runway)</i>
PROB†	Probability	R	Rate of turn
PROC	Procedure		
PROP	Propeller		
PROV	Provisional		
PRP	Point-in-space reference point		
PS	Plus		
PSG	Passing		
PSN	Position		
PSP	Pierced steel plank		
PSR‡	Primary surveillance radar		
PSYS	Pressure system(s)		
PTN	Procedure turn		
PTS	Polar track structure		
PWR	Power		
<b>Q</b>			
QDL	Do you intend to ask me for a series of		

	bearings? <i>or</i> I intend to ask you for a series of bearings <i>(to be used in radiotelegraphy as a Q Code)</i>	R	Red
		R . . .	Radial from VOR <i>(followed by three figures)</i>
QDM‡	Magnetic heading <i>(zero wind)</i>	R . . .	Restricted area <i>(followed by identification)</i>
QDR	Magnetic bearing	R . . .	Runway <i>(followed by figures in METAR/SPECI)</i>
QFE‡	Atmospheric pressure at aerodrome elevation <i>(or at runway threshold)</i>	R*	Received <i>(acknowledgement of receipt)</i> <i>(to be used in AFS as a procedure signal)</i>
QFU	Magnetic orientation of runway	RA	Rain
QGE	What is my distance to your station? <i>or</i> Your distance to my station is <i>(distance figures and units)</i> <i>(to be used in radiotelegraphy as a Q Code)</i>	RA	Resolution advisory
		RAC	Rules of the air and air traffic services
		RAG	Ragged
QJH	Shall I run my test tape/a test sentence? <i>or</i> Run your test tape/a test sentence <i>(to be used in AFS as a Q Code)</i>	RAG	Runway arresting gear
		RAI	Runway alignment indicator
QNH‡	Altimeter sub-scale setting to obtain elevation when on the ground	RAIM†	Receiver autonomous integrity monitoring
		RASC†	Regional AIS system centre
QSP	Will you relay to . . . free of charge? <i>or</i> I will relay to . . . free of charge <i>(to be used in AFS as a Q Code)</i>	RASS	Remote altimeter setting source
		RB	Rescue boat
		RCA	Reach cruising altitude
		RCC	Rescue coordination centre

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# Signal for use in the teletypewriter service only.

## Abbreviations — Decode

RCF	Radiocommunication failure ( <i>message type designator</i> )	RPLC	Replace <i>or</i> replaced
RCH	Reach <i>or</i> reaching	RPS	Radar position symbol
RCL	Runway centre line	RPT*	Repeat <i>or</i> I repeat ( <i>to be used in AFS as a procedure signal</i> )
RCLL	Runway centre line light(s)	RQ*	Request ( <i>to be used in AFS as a procedure signal</i> )
RCLR	Recleared	RQMNTS	Requirements
RCP‡	Required communication performance	RQP	Request flight plan ( <i>message type designator</i> )
RDH	Reference datum height	RQS	Request supplementary flight plan ( <i>message type designator</i> )
RDL	Radial	RR	Report reaching
RDO	Radio	RRA	( <i>or RRB, RRC . . . etc., in sequence</i> ) Delayed meteorological message ( <i>message type designator</i> )
RDOACT	Radioactive	RSC	Rescue sub-centre
RE	Recent ( <i>used to qualify weather phenomena, e.g. RERA = recent rain</i> )	RSCD	Runway surface condition
REC	Receive <i>or</i> receiver	RSP	Responder beacon
REDL	Runway edge light(s)	RSP‡	Required surveillance performance
REF	Reference to . . . <i>or</i> refer to . . .	RSR	En-route surveillance radar
REG	Registration	RSS	Root sum square
RENL	Runway end light(s)	RTD	Delayed ( <i>used to indicate delayed meteorological message; message type designator</i> )
REP	Report <i>or</i> reporting <i>or</i> reporting point	RTE	Route
REQ	Request <i>or</i> requested	RTF	Radiotelephone
ERTE	Re-route	RTG	Radiotelegraph
RESA	Runway end safety area	RTHL	Runway threshold light(s)
RF	Constant radius arc to a fix	RTN	Return <i>or</i> returned <i>or</i> returning
RFFS	Rescue and firefighting services		
RG	Range ( <i>lights</i> )		
RHC	Right-hand circuit		
RIF	Reclearance in flight		
RIME†	Rime ( <i>used in aerodrome warnings</i> )		
RL	Report leaving		

RLA	Relay to	RTODAH	Rejected take-off distance available, helicopter
RLCE	Request level change en route	RTS	Return to service
RLLS	Runway lead-in lighting system	RTT	Radioteletypewriter
RLNA	Requested level not available	RTZL	Runway touchdown zone light(s)
RMK	Remark	RUT	Standard regional route transmitting frequencies
RNAV <sup>†</sup>	<i>(to be pronounced "AR-NAV")</i> Area navigation	RV	Rescue vessel
RNG	Radio range	RVA	Radar vectoring area
RNP <sup>‡</sup>	Required navigation performance	RVR <sup>‡</sup>	Runway visual range
ROBEX <sup>†</sup>	Regional OPMET bulletin exchange <i>(scheme)</i>	RVSM <sup>‡</sup>	Reduced vertical separation minimum [300 m (1 000 ft) between FL 290 and FL 410]
ROC	Rate of climb	RWY	Runway
ROD	Rate of descent		
RON	Receiving only		
RPDS	Reference path data selector		
RPI <sup>‡</sup>	Radar position indicator		
RPL	Repetitive flight plan		

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# Signal for use in the teletypewriter service only.

<b>S</b>		SHF	Super high frequency [3 000 to 30 000 MHz]
S	South <i>or</i> southern latitude	SI	International system of units
S . . .	State of the sea ( <i>followed by figures in METAR/SPECI</i> )	SID <sup>+</sup>	Standard instrument departure
SA	Sand	SIF	Selective identification feature
SALS	Simple approach lighting system	SIG	Significant
SAN	Sanitary	SIGMET <sup>+</sup>	Information concerning en-route weather and other phenomena in the atmosphere that may affect the safety of aircraft operations
SAR	Search and rescue	SIMUL	Simultaneous <i>or</i> simultaneously
SARPS	Standards and Recommended Practices [ICAO]	SIWL	Single isolated wheel load
SAT	Saturday	SKED	Schedule <i>or</i> scheduled
SATCOM <sup>+</sup>	Satellite communication ( <i>used only when referring generally to both voice and data satellite communication or only data satellite communication</i> )	SLP	Speed limiting point
SATVOICE <sup>+</sup>	Satellite voice communication	SLW	Slow
SB	Southbound	SMC	Surface movement control
SBAS <sup>+</sup>	( <i>to be pronounced "ESS-BAS"</i> ) Satellite-based augmentation system	SMR	Surface movement radar
SC	Stratocumulus	SN	Snow Aerodrome closed due to snow ( <i>used in METAR/SPECI</i> )
SCT	Scattered	SNOCLO	
SD	Standard deviation	SNOWTAM <sup>+</sup>	Special series NOTAM notifying the presence or removal of hazardous conditions due to snow, ice, slush or standing water associated with snow, slush and ice on the movement area, by means of a specific format
SDBY	Stand by	SOC	Start of climb
SDF	Step down fix		
SE	South-east		
SEA	Sea ( <i>used in connection with sea-surface</i> )		

	<i>temperature and state of the sea)</i>	SPECI†	Aerodrome special meteorological report <i>(in meteorological code)</i>
SEB	South-eastbound		
SEC	Seconds	SPECIAL†	Local special meteorological report <i>(in abbreviated plain language)</i>
SECN	Section		
SECT	Sector	SPI	Special position indicator
			Supplementary flight plan ( <i>message type</i> <i>designator</i> )
SELCAL†	Selective calling system	SPL	
SEP	September		
SER	Service <i>or</i> servicing <i>or</i> served	SPOC	SAR point of contact
SEV	Severe ( <i>used to qualify icing and turbulence reports</i> )	SPOT†	Spot wind
		SQ	Squall
SFC	Surface	SQL	Squall line
SG	Snow grains	SR	Sunrise
SGL	Signal	SRA	Surveillance radar approach
			Surveillance radar element of precision approach radar system
SH . . .	Shower ( <i>followed by RA = rain, SN = snow, PL = ice pellets, GR = hail, GS = small hail and/or snow pellets or combinations thereof, e.g. SHRASN = showers of rain and snow</i> )	SRE	
		SRG	Short range
		SRR	Search and rescue region
		SRY	Secondary
		SS	Sandstorm

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# Signal for use in the teletypewriter service only.

## Abbreviations — Decode

SS	Sunset	TCAS RA <sup>†</sup>	<i>(to be pronounced “TEE-CAS-AR-AY”)</i>
SSB	Single sideband		Traffic alert and collision avoidance
SSE	South-south-east		system resolution advisory
SSR‡	Secondary surveillance radar	TCH	Threshold crossing height
SST	Supersonic transport	TCU	Towering cumulus
SSW	South-south-west	TDO	Tornado
ST	Stratus	TDZ	Touchdown zone
STA	Straight-in approach	TECR	Technical reason
STAR <sup>†</sup>	Standard instrument arrival	TEL	Telephone
STD	Standard	TEMPO <sup>†</sup>	Temporary <i>or</i> temporarily
STF	Stratiform	TF	Track to fix
STN	Station	TFC	Traffic
STNR	Stationary	TGL	Touch-and-go landing
STOL	Short take-off and landing	TGS	Taxiing guidance system
STS	Status	THR	Threshold
STWL	Stopway light(s)	THRU	Through
SUBJ	Subject to	THU	Thursday
SUN	Sunday		Traffic information broadcast by aircraft
SUP	Supplement <i>(AIP Supplement)</i>	TIBA <sup>†</sup>	
SUPPS	Regional supplementary procedures	TIL <sup>†</sup>	Until
SVC	Service <i>(message type only)</i>	TIP. . .	Until past <i>(followed by place)</i>
SVCBL	Serviceable	TKOF	Take-off
SW	South-west		Till <i>(followed by time by which weather change is forecast to end)</i>
SWB	South-westbound	TL . . .	
SWY	Stopway		
<b>T</b>		TLOF	Touchdown and lift-off area
		TMA‡	Terminal control area
		TN . . .	Minimum temperature <i>(followed by figures in TAF)</i>
		TNA	Turn altitude
		TNH	Turn height

T	Temperature	TO . . .	To <i>(followed by place)</i>
. . . T	True <i>(preceded by a bearing to indicate reference to True North)</i>	TOC	Top of climb
TA	Traffic advisory	TODA	Take-off distance available
TA	Transition altitude	TODAH	Take-off distance available, helicopter
TAA	Terminal arrival altitude	TOP†	Cloud top
TACAN†	UHF tactical air navigation aid	TORA	Take-off run available
TAF†	Aerodrome forecast <i>(in meteorological code)</i>	TOX	Toxic
TA/H	Turn at an altitude/height	TP	Turning point
TAIL†	Tail wind	TR	Track
TAR	Terminal area surveillance radar	TRA	Temporary reserved airspace
TAS	True airspeed	TRANS	Transmits <i>or</i> transmitter
TAX	Taxiing <i>or</i> taxi	TREND†	Trend forecast
TC	Tropical cyclone	TRG	Training
TCAC	Tropical cyclone advisory centre	TRL	Transition level
		TROP	Tropopause

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# Signal for use in the teletypewriter service only.

TS	Thunderstorm ( <i>in aerodrome reports and forecasts, TS used alone means thunder heard but no precipitation at the aerodrome</i> )	UIC	Upper information centre
TS . . .	Thunderstorm ( <i>followed by RA = rain, SN = snow, PL = ice pellets, GR = hail, GS = small hail and/or snow pellets or combinations thereof, e.g. TSRASN = thunderstorm with rain and snow</i> )	UIR‡	Upper flight information region
TSUNAMI†	Tsunami ( <i>used in aerodrome warnings</i> )	ULM	Ultra light motorized aircraft
TT	Teletypewriter	ULR	Ultra long range
TUE	Tuesday	UNA	Unable
TURB	Turbulence	UNAP	Unable to approve
T-VASIS†	( <i>to be pronounced “TEE-VASIS”</i> ) T visual approach slope indicator system	UNL	Unlimited
TVOR	Terminal VOR	UNREL	Unreliable
TWR	Aerodrome control tower <i>or</i> aerodrome control	UP	Unidentified precipitation ( <i>used in automated METAR/SPECI</i> )
TWY	Taxiway	U/S	Unserviceable
TX . . .	Maximum temperature ( <i>followed by figures in TAF</i> )	UTA	Upper control area
TXL	Taxilane	UTC‡	Coordinated Universal Time
TXT*	Text ( <i>when the abbreviation is used to request a repetition, the question mark (IMI) precedes the abbreviation, e.g. IMI TXT</i> ) ( <i>to be used in AFS as a procedure signal</i> )		
TYP	Type of aircraft		
		<b>V</b>	
		. . . V . . .	Variations from the mean wind direction ( <i>preceded and followed by figures in METAR/SPECI, e.g. 350V070</i> )
		VA	Heading to an altitude
		VA	Volcanic ash
		VAAC	Volcanic ash advisory centre
		VAC . . .	Visual approach chart ( <i>followed by name/title</i> )
		VAL	In valleys
		VAN	Runway control van
		VAR	Magnetic variation
		VAR	Visual-aural radio range

TYPH	Typhoon	VASIS	Visual approach slope indicator systems
		VC . . .	Vicinity of the aerodrome <i>(followed by</i> <i>FG = fog, FC = funnel cloud,</i> <i>SH = shower, PO = dust/sand whirls,</i> <i>BLDU = blowing dust, BLSA =</i> <i>blowing sand, BLSN = blowing snow,</i> <i>DS = duststorm, SS = sandstorm,</i> <i>TS = thunderstorm or VA = volcanic ash, e.g. VCFG = vicinity fog)</i>
<b>U</b>			
U	Upward <i>(tendency in RVR during previous 10 minutes)</i>		
UA	Unmanned aircraft		
UAB	Until advised by . . .		
UAC	Upper area control centre	VCY	Vicinity
UAR	Upper air route	VDF	Very high frequency direction-finding station
UAS	Unmanned aircraft system		
UDF	Ultra high frequency direction-finding station	VER	Vertical
UFN	Until further notice	VFR‡	Visual flight rules
UHDT	Unable higher due traffic	VHF‡	Very high frequency [30 to 300 MHz]
UHF‡	Ultra high frequency [300 to 3 000 MHz]	VI	Heading to an intercept
		VIP‡	Very important person

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# Signal for use in the teletypewriter service only.

## Abbreviations — Decode

VIS	Visibility	WIE	With immediate effect <i>or</i> effective immediately
VLF	Very low frequency [3 to 30 kHz]	WILCO†	Will comply
VLR	Very long range	WIND	Wind
VM	Heading to a manual termination	WIP	Work in progress
VMC‡	Visual meteorological conditions	WKN	Weaken <i>or</i> weakening
VNAV†	<i>(to be pronounced “VEE-NAV”)</i> Vertical navigation	WNW	West-north-west
VOL . . .	Volume <i>(followed by I, II . . .)</i>	WO	Without
VOLMET†	Meteorological information for aircraft in flight	WPT	Way-point
VOR‡	VHF omnidirectional radio range	WRNG	Warning
VORTAC†	VOR and TACAN combination	WS	Wind shear
VOT	VOR airborne equipment test facility	WSPD	Wind speed
VPA	Vertical path angle	WSW	West-south-west
VPT	Visual manoeuvre with prescribed track	WT	Weight
VRB	Variable	WTSPT	Waterspout
VSA	By visual reference to the ground	WWW	Worldwide web
VSP	Vertical speed	WX	Weather
VTF	Vector to final	WXR	Weather radar
VTOL	Vertical take-off and landing		
VV . . .	Vertical visibility <i>(followed by figures in METAR/SPECI and TAF)</i>	<b>X</b>	
		X	Cross
<b>W</b>		XBAR	Crossbar <i>(of approach lighting system)</i>
W	West <i>or</i> western longitude	XNG	Crossing
W	White	XS	Atmospherics
W . . .	Sea-surface temperature <i>(followed by figures in METAR/SPECI)</i>	<b>Y</b>	
		Y	Yellow

WAAS†	Wide area augmentation system		
WAC. . .	World Aeronautical Chart — ICAO 1:1 000 000 (followed by name/title)	YCZ	Yellow caution zone (runway lighting)
WAFB	World area forecast centre	YES*	Yes (affirmative) (to be used in AFS as a procedure signal)
WB	Westbound	YR	Your
WBAR	Wing bar lights		
WDI	Wind direction indicator		
WDSPR	Widespread	<b>Z</b>	
WED	Wednesday		
WEF	With effect from or effective from	Z	Coordinated Universal Time (in meteorological messages)
WGS-84	World Geodetic System — 1984		
WI	Within		
WID	Width or wide		

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# Signal for use in the teletypewriter service only.

## ABBREVIATIONS

### ENCODE

A		Aerodrome closed due to snow ( <i>used in METAR/SPECI</i> )	SNOCLO
Abbreviated precision approach path indicator ( <i>to be pronounced "AY-PAPI"</i> )	APAPI†	Aerodrome control tower or aerodrome control	TWR
Abbreviated T visual approach slope indicator system ( <i>to be pronounced "AY-TEE-VASIS"</i> )	AT-VASIS†	Aerodrome flight information service	AFIS
Abeam	ABM	Aerodrome forecast ( <i>in meteorological code</i> )	TAF†
About	ABT	Aerodrome obstacle chart ( <i>followed by type and name/title</i> )	AOC . . .
Above	ABV	Aerodrome office ( <i>specify service</i> )	ADO
Above aerodrome level	AAL	Aerodrome partially covered by fog	PRFG
Above ground level	AGL	Aerodrome reference point	ARP
Above mean sea level	AMSL	Aerodrome routine meteorological report	
Above mountains	MON	( <i>in meteorological code</i> )	METAR†
Accelerate-stop distance available	ASDA	Aerodrome special meteorological report	
Accept or accepted	ACPT	( <i>in meteorological code</i> )	SPECI†
Acceptance ( <i>message type designator</i> )	ACP	Aerodromes, air routes and ground aids	AGA
Acknowledge	ACK	Aerodrome traffic zone	ATZ
Active or activated or activity	ACT	Aeronautical chart — 1:500 000	
Actual time of arrival	ATA‡	( <i>followed by name/title</i> )	ANC . . .
Actual time of departure	ATD‡	Aeronautical fixed service	AFS
Addition or additional	ADDN	Aeronautical fixed telecommunication network	AFTN‡

Address ( <i>when this abbreviation is used</i>		Aeronautical information circular	AIC
<i>to request a repetition, the question</i>		Aeronautical information management	AIM
<i>mark (IMI) precedes the</i>		Aeronautical information publication	AIP
<i>abbreviation, e.g. IMI ADS) (to be used in AFS as a procedure signal)</i>	ADS*	Aeronautical information regulation and control	AIRAC
Adjacent	ADJ	Aeronautical information services	AIS
Advance boundary information	ABI	Aeronautical maps and charts	MAP
Advise	ADZ	Aeronautical mobile satellite service	AMSS
Advise at what time able	AWTA	Aeronautical mobile service	AMS
Advisory area	ADA	Aeronautical navigation chart — small	
Advisory route	ADR	<i>scale (followed by name/title and scale)</i>	ANCS . . .
Advisory service	ADVS	Aeronautical telecommunication network	ATN
Aerodrome	AD	<i>After (to be followed by time or place)</i>	AFT . . .
Aerodrome beacon	ABN	After passing	APSG
Aerodrome chart	ADC	Again	AGN

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# *Signal for use in the teletypewriter service only.*

Airborne collision avoidance system ( <i>to be pronounced "AY-CAS"</i> )	ACAS†	Altostratus	AS
Aircraft	ACFT	Amber	A
Aircraft accident, notification of	ACCID	Amend or amended ( <i>used to indicate amended meteorological message;</i>	
Aircraft autonomous integrity monitoring	AAIM	<i>message type designator)</i>	AMD
Aircraft classification number	ACN	Amended meteorological message	AAA ( <i>or AAB,</i>
Aircraft communication addressing and reporting system ( <i>to be pronounced "AY-CARS"</i> )	ACARS†	( <i>message type designator)</i>	AAC . . . etc., in sequence)
Aircraft earth station	AES	Amendment ( <i>AIP Amendment</i> )	AMDT
Aircraft operator	AO	Answer	ANS
Aircraft parking/docking chart ( <i>followed by name/title</i> )	APDC . . .	Approach	APCH
Air defence identification zone ( <i>to be pronounced "AY-DIZ"</i> )	ADIZ†	Approach control office or approach control or approach control service	APP
Airport	AP	Approach lighting system	ALS
Air-report	AIREP†	Approach procedure with vertical guidance	APV
Air-report ( <i>message type designator</i> )	ARP	Approximate or approximately	APRX
Airspeed or headwind gain	GAIN	April	APR
Airspeed or headwind loss	LOSS	Apron	APN
Air-to-air	A/A	Area chart	ARC
Air-to-ground	A/G	Area control centre or area control	ACC‡
Air to air refuelling	AAR	Area forecast for low-level flights	GAMET
Air traffic control ( <i>in general</i> )	ATC‡	Area minimum altitude	AMA
Air traffic control surveillance minimum altitude chart ( <i>followed by name/title</i> )	ATCSMAC . . .	Area navigation ( <i>to be pronounced "AR-NAV"</i> )	RNAV†

Air traffic flow management	ATFM	Arrange	ARNG
Air traffic management	ATM	Arresting ( <i>specify (part of) aircraft</i>	
Air traffic services	ATS	<i>arresting equipment)</i>	ARST
Air traffic services interfacility data		Arrival ( <i>message type designator)</i>	ARR
communications	AIDC	Arrive or arrival	ARR
Air traffic services reporting office	ARO	Ascend to or ascending to	ASC
Airway	AWY	Asphalt	ASPH
Alert phase	ALERFA <sup>†</sup>	Assigned altitude deviation	AAD
Alerting ( <i>message type designator)</i>	ALR	As soon as possible	ASAP
		At ( <i>followed by time at which</i>	
Alerting service	ALRS	<i>weather</i>	
Alighting area	ALA	<i>change is forecast to occur)</i>	AT . . .
All up weight	AUW	At ( <i>followed by time or place)</i>	ATP . . .
Alternate or alternating ( <i>light</i>			
<i>alternates</i>		Atmospheric pressure at aerodrome	
		elevation ( <i>or at runway</i>	
<i>in colour)</i>	ALTN	<i>threshold)</i>	QFE‡
Alternate ( <i>aerodrome)</i>	ALTN	Atmospherics	XS
Altimeter check location	ACL	At sea	MAR
Altimeter sub-scale setting to obtain		ATS/MET reporting point	MRP
elevation when on the ground	QNH‡	Attention	ATTN
Altimetry system error	ASE	At the coast	COT
Altitude	ALT	August	AUG

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# Signal for use in the teletypewriter service only.

## Abbreviations — Encode

Authorized or authorization	AUTH	Broken	BKN
Automated flight information service	FISA	Building	BLDG
Automated weather observation system	AWOS		
Automatic	AUTO		
Automatic dependent surveillance — broadcast	ADS-B‡	<b>C</b>	
Automatic dependent surveillance — contract	ADS-C‡	Calibration	CLBR
Automatic dependent surveillance unit	ADSU	Call sign	CS
Automatic direction-finding equipment	ADF‡	Calling	CLG
Automatic error correction	ARQ	Cancel or cancelled	CNL
Automatic terminal information service (to be pronounced “AY-TIS”)	ATIS†	Cancelling NOTAM	NOTAMC
Auxiliary	AUX	Candela	CD
Auxiliary power unit	APU	Category	CAT
Available or availability	AVBL	Caution	CTN
Average	AVG	Celsius ( <i>Centigrade</i> ), degrees	C
Aviation gasoline	AVGAS†	Centimetre	CM
Azimuth	AZM	Centre ( <i>preceded by runway designation</i> <i>number to identify a parallel runway</i> )	... C
		Centre line	CL
		Change frequency to . . .	CF
		Change-over point	COP
		Channel	CH
<b>B</b>		Check	CK
Barometric vertical navigation ( <i>to be pronounced “BAA-RO-VEE-NAV”</i> )	BARO-VNAV†	Chemical	CHEM
		Circling guidance light(s)	CGL
		Cirrocumulus	CC

Beacon ( <i>aeronautical ground light</i> )	BCN	Cirrostratus	CS
Bearing	BRG	Cirrus	CI
Becoming	BECMG	Civil	CIV
Before	BFR	Civil aviation authority <i>or</i> civil aviation	
Below	BLW	administration	CAA
Below clouds	BLO	Clear air turbulence	CAT
Between	BTN	Clear(s) <i>or</i> cleared to . . . <i>or</i> clearance	CLR
Between layers	BTL	Clear type of ice formation	CLA
Binary universal form for the representation of meteorological data	BUFR	Clearway	CWY
Blowing ( <i>followed by DU = dust, SA = sand or SN = snow</i> )	BL . . .	Climb-out area	CLIMB-OUT
Blue	B	Climb to <i>or</i> climbing to	CMB
Bombing	BOMB	Climb to and maintain	CTAM
Boundary	BDRY	Close <i>or</i> closed <i>or</i> closing	CLSD
Braking	BRKG	Cloud	CLD
Braking action	BA	Cloud base	BASE <sup>†</sup>
Broadcast	BCST	Cloud top	TOP <sup>†</sup>
Broadcasting station, commercial	BS	Cockpit voice recorder	CVR
		Collision risk model	CRM
		Completion <i>or</i> completed <i>or</i> complete	CMPL

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# Signal for use in the teletypewriter service only.

Commercial broadcasting station	BS	Crossing	XNG
Common ICAO data interchange network	CIDIN <sup>†</sup>	Cruise	CRZ
Communications	COM	Cumuliform	CUF
Communications, navigation and surveillance	CNS	Cumulonimbus ( <i>to be pronounced "CEE BEE"</i> )	CB <sup>‡</sup>
Compulsory reporting point	CRP	Cumulus	CU
Concrete	CONC	Current flight plan ( <i>message type designator</i> )	CPL
Condition	COND	Customs	CUST
Conditional route	CDR	Cyclic redundancy check	CRC
Confirm <i>or</i> I confirm ( <i>to be used in AFS as a procedure signal</i> )	CFM <sup>*</sup>		
Constant radius arc to a fix	RF	<b>D</b>	
Construction <i>or</i> constructed	CONST	Daily	DLY
Contact	CTC	Danger <i>or</i> dangerous	DNG
Continue(s) <i>or</i> continued	CONT	Danger area ( <i>followed by identification</i> )	D . . .
Continuous	CONS	Data link automatic terminal information	
Continuous climb operations	CCO	service ( <i>to be pronounced "DEE-ATIS"</i> )	D-ATIS <sup>†</sup>
Continuous day and night service	H24	Data link initiation capability	DLIC
Continuous descent operations	CDO	Data link VOLMET	D-VOLMET
Continuous wave	CW	Date of flight	DOF
Control	CTL	Date-time group	DTG
Control area	CTA	Datum crossing point	DCP
Control indicated is operational control	OPC	Dead reckoning	DR
Controller-pilot data link communications	CPDLC <sup>‡</sup>	December	DEC
Control zone	CTR		
Coordinate <i>or</i> coordination	COOR		

Coordinated Universal Time	UTC‡	Decision altitude	DA
Coordinated Universal Time (in meteorological messages)	Z	Decision height	DH
Coordinates	COORD	Degrees	DEG
Coordination (message type designator)	CDN	Degrees Celsius (Centigrade)	C
Correct or correction or corrected (used to indicate corrected meteorological message; message type designator)	COR	Delay (message type designator)	DLA
Corrected meteorological message (message type designator)	CCA (or CCB, CCC . . . etc., in sequence)	Delay or delayed	DLA
Course from a fix to an altitude	FA	Delayed (used to indicate delayed meteorological message; message type designator)	RTD
Course from a fix to manual termination (used in navigation database coding)	FM	Delayed meteorological message (message type designator)	RRA (or RRB, RRC . . . etc., in sequence)
Course to a fix	CF	Dense upper cloud	DUC
Course to an altitude	CA	Depart or departure	DEP
Cover or covered or covering	COV	Departure (message type designator)	DEP
Cross	X	Departure end of the runway	DER
Crossbar (of approach lighting system)	XBAR	Deposition	DEPO
		Depth	DPT
		Descend to or descending to	DES

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## Abbreviations — Encode

Descend to and maintain	DTAM	Effective immediately <i>or</i> with immediate	
Destination	DEST	effect	WIE
Deteriorate <i>or</i> deteriorating	DTRT	Electronic flight instrument system ( <i>to be</i>	
Deviation <i>or</i> deviating	DEV	<i>pronounced “EE-FIS”</i> )	EFIS <sup>†</sup>
Dew point temperature	DP	Elevation	ELEV
Diffuse	DIF	Elevation differential area	EDA
Digital flight data recorder	DFDR	Embedded in a layer ( <i>to indicate</i>	
Direct ( <i>in relation to flight plan clearances and type of approach</i> )	DCT	<i>cumulonimbus embedded in layers of other clouds</i> )	EMBD
Direct controller-pilot communications	DCPC	Emergency	EMERG
Direction finding	DF	Emergency location beacon — aircraft	ELBA <sup>†</sup>
Displaced runway threshold	DTHR	Emergency locator transmitter	ELT
Distance	DIST	Emission	EM
Distance from touchdown indicator	DFTI	Engine	ENG
Distance measuring equipment	DME‡	Enhanced vision system	EVS
Distress phase	DETRESFA <sup>†</sup>	En route	ENR
Divert <i>or</i> diverting	DIV	Enroute chart ( <i>followed by name/title</i> )	ENRC . . .
Docking	DCKG	En-route surveillance radar	RSR
Domestic	DOM	Equipment	EQPT
Doppler VOR	DVOR	Error ( <i>to be used in AFS as a procedure</i>	
Double channel duplex	DCD	<i>signal</i> )	EEE#
Double channel simplex	DCS	Estimate <i>or</i> estimated <i>or</i> estimation	EST
Double sideband	DSB	( <i>message type designator</i> )	
Downward ( <i>tendency in RVR during previous 10 minutes</i> )	D	Estimated elapsed time	EET
Do you intend to ask me for a series of		Estimated off-block time	EOBT
		Estimated time of arrival <i>or</i> estimating	

bearings? or I intend to ask you for a		arrival	ETA*‡
series of bearings ( <i>to be used in radiotelegraphy as a Q Code</i> )	QDL	Estimated time of departure or estimating	
Drizzle	DZ	departure	ETD‡
Dual tandem wheels	DTW	Estimated time over significant point	ETO
Dual wheels	DW	European geostationary navigation overlay service ( <i>to be pronounced "EGG-NOS"</i> )	EGNOS†
Duration	DUR	European regional OPMET data	
During	DRG	exchange	EUR RODEX
Dust	DU	Every	EV
Dust/sand whirls ( <i>dust devils</i> )	PO	Except	EXC
Duststorm	DS	Exercises or exercising or to exercise	EXER
		Expect or expected or expecting	EXP
<b>E</b>		Expect further clearance	EFC
		Expected approach time	EAT
East or eastern longitude	E	Extend or extending or extended	EXTD
Eastbound	EB	Extended diversion time operations	EDTO
East-north-east	ENE	Extra long range	ELR
East-south-east	ESE	Extremely high frequency [30 000 to 300 000 MHz]	EHF
Effective from or with effect from	WEF		

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# Signal for use in the teletypewriter service only.

<b>F</b>			
Facilitation of international air transport	FAL	Freezing	FZ
Facilities	FAC	Freezing drizzle	FZDZ
Facsimile transmission	FAX	Freezing fog	FZFG
February	FEB	Freezing rain	FZRA
Feet ( <i>dimensional unit</i> )	FT	Frequency	FREQ
Feet per minute	FPM	Frequent	FRQ
Few	FEW	Friction coefficient	FCT
Fictitious threshold point	FTP	Friday	FRI
Field	FLD	From	FM
Final approach	FNA	From ( <i>followed by time at which weather change is forecast to begin</i> )	FM . . .
Final approach and take-off area	FATO	From ( <i>used to precede the call sign of the calling station</i> ) ( <i>to be used in AFS as a procedure signal</i> )	DE*
Final approach fix	FAF	Front ( <i>relating to weather</i> )	FRONT†
Final approach point	FAP	Frost ( <i>used in aerodrome warnings</i> )	FROST†
Final approach segment	FAS	Fuel remaining	FR
Firing	FRNG	Full stop landing	FSL
First	FST	Funnel cloud ( <i>tornado or waterspout</i> )	FC
Fixed	F		
Flares	FLR		
Flashing	FLG		
Flight	FLT	<b>G</b>	
Flight check	FLTCK		
Flight data processing system	FDPS	GBAS azimuth reference point	GARP
Flight information centre	FIC	GBAS landing system	GLS‡
Flight information region	FIR‡	General	GEN
Flight information service	FIS	General aviation	GA
Flight level	FL	Geographic or true	GEO
Flight management computer	FMC	Geoid undulation	GUND

Flight management system	FMS‡	Glide path	GP
Flight path alignment point	FPAP	Glide path angle	GPA
Flight plan	FPL	Glide path intercept point	GPIP
Flight plan cancellation ( <i>message type designator</i> )	CNL	Glider	GLD
Flight plan filed in the air	AFIL	Global navigation satellite system	GNSS‡
Flight plan route	FPR	Global orbiting navigation satellite system ( <i>to be pronounced “GLO-NAS”</i> )	GLONASS†
Flight service station	FSS	Global positioning system	GPS‡
Flight technical error	FTE	Go ahead, resume sending ( <i>to be used in AFS as a procedure signal</i> )	GA
Flight technical tolerance	FTT	Government	GOV
Flow management unit	FMU	GPS and geostationary earth orbit augmented navigation	GAGAN†
Fluctuating or fluctuation or fluctuated	FLUC	Grass landing area	GRASS
Fly or flying	FLY	Gravel	GRVL
Fog	FG	Green	G
Fog patches	BCFG		
Follow(s) or following	FLW		
Forecast	FCST		

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# Signal for use in the teletypewriter service only.

## Abbreviations — Encode

Ground	GND	High pressure area <i>or</i> the centre of high	
Ground-based augmentation system ( <i>to be pronounced "GEE-BAS"</i> )	GBAS†	pressure	H
Ground-based regional augmentation system ( <i>to be pronounced "GRASS"</i> )	GRAS†	Higher	HYR
Ground check	GNDCK	Holding	HLDG
Ground controlled approach system <i>or</i> ground controlled approach	GCA‡	Holding/racetrack to a fix	HF
Ground earth station	GES	Holding/racetrack to a manual termination	HM
Ground movement chart ( <i>followed by name/title</i> )	GMC . . .	Holding/racetrack to an altitude	HA
Ground power unit	GPU	Holiday	HOL
Ground proximity warning system	GPWS‡	Hospital aircraft	HOSP
Ground speed	GS	Hours	HR
Ground-to-air	G/A	Humanitarian	HUM
Ground-to-air and air-to-ground	G/A/G	Hurricane	HURCN
<b>H</b>		<b>I</b>	
Hail	GR	I have nothing to send to you <i>or</i> none	NIL*†
Hazard beacon	HBN	Ice on runway	IR
Haze	HZ	Ice pellets	PL
Heading	HDG	Icing	ICE
Heading to a manual termination	VM	Identification	IDENT†
Heading to an altitude	VA	Identification beacon	IBN
Heading to an intercept	VI	Identification friend/foe	IFF
Head-up display	HUD	Identifier <i>or</i> identify	ID
Heavy	HVY	If not possible	INP
		Immediate <i>or</i> immediately	IMT
		Immigration	IMG
		Improve <i>or</i> improving	IMPR

Heavy ( <i>used to indicate the intensity of weather phenomena, e.g. heavy rain = HVY RA</i> )	HVY	In and out of clouds	IAO
Hectopascal	HPA	In cloud	INC
Height or height above	HGT	Inbound	INBD
Helicopter	HEL	Incorporated	INCORP
Helicopter approach path indicator	HAPI	Independent sideband	ISB
Helicopter landing site	HLS	Indicated airspeed	IAS
Heliport	HLP	Inertial navigation system	INS
Heliport crossing height	HCH	Inertial reference system	IRS
Heliport reference point	HRP	Information	INFO†
Hertz ( <i>cycle per second</i> )	HZ	Information concerning en-route weather and other phenomena in the atmosphere that may affect the safety of aircraft operations	SIGMET†
High and very high frequency direction-finding stations ( <i>at the same location</i> )	HVDF	Information concerning en-route weather phenomena which may affect the safety of low-level aircraft operations	AIRMET†
High frequency [3 000 to 30 000 kHz]	HF‡	Initial approach	INA
High frequency direction-finding station	HDF		

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# Signal for use in the teletypewriter service only.

Initial approach fix	IAF	Kilometres per hour	KMH
Inland	LAN	Kilopascal	KPA
Inner marker	IM	Kilowatts	KW
Inoperative	INOP	Knots	KT
In progress	INPR	Knots indicated airspeed	KIAS
Install <i>or</i> installed <i>or</i> installation	INSTL		
Instrument	INSTR		
Instrument approach chart ( <i>followed by</i> <i>name/title</i> )	IAC . . .	<b>L</b>	
Instrument approach procedure	IAP	Landing	LDG
Instrument flight rules	IFR‡	Landing direction indicator	LDI
Instrument landing system	ILS‡	Landing distance available	LDA
Instrument meteorological conditions	IMC‡	Landing distance available, helicopter	LDAH
Intensify <i>or</i> intensifying	INTSF	Landing threshold point	LTP
Intensity	INTST	Last message received by me was . . . ( <i>to be used in AFS as a procedure</i> <i>signal</i> )	LR
Intermediate approach fix	IF	Last message sent by me was . . . <i>or</i> Last message was . . . ( <i>to be used in</i> <i>AFS as a procedure signal</i> )	LS
International	INTL	Lateral navigation ( <i>to be pronounced</i> <i>“EL-NAV”</i> )	LNAV†
International Civil Aviation Organization	ICAO	Latitude	LAT
International general aviation	IGA	Layer <i>or</i> layered	LYR
International NOTAM office	NOF	Leave <i>or</i> leaving	LVE
International standard atmosphere	ISA	Left ( <i>preceded by runway designation</i> <i>number to identify a parallel</i> <i>runway</i> )	. . . L
International system of units	SI	Length	LEN
Interrogation sign (question mark) ( <i>to be used in AFS as a procedure</i> <i>signal</i> )	IMI*		
Interrogator	INTRG		
Interrupt <i>or</i> interruption <i>or</i> interrupted	INTRP		
Intersection	INT		

Intersection of air routes	IAR	Level	LVL
In valleys	VAL	Light ( <i>used to indicate the intensity of weather phenomena, interference or static reports, e.g. light rain = FBL RA</i> )	FBL
Isolated	ISOL		
<b>J</b>		Light or lighting	LGT
		Light and variable ( <i>relating to wind</i> )	LV
January	JAN	Light intensity high	LIH
Jet stream	JTST	Light intensity low	LIL
July	JUL	Light intensity medium	LIM
June	JUN	Lighted	LGTD
		Limited	LTD
		Line ( <i>used in SIGMET</i> )	LINE
<b>K</b>		Litre	L
		Local or locally or location or located	LCA
Kilograms	KG	Local mean time	LMT
Kilohertz	KHZ	Local routine meteorological report	
Kilometres	KM	( <i>in abbreviated plain language</i> )	MET REPORT

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# Signal for use in the teletypewriter service only.

## Abbreviations — Encode

		Lower control area	LTA
Local special meteorological report <i>(in abbreviated plain language)</i>	SPECIAL†		
Localizer	LOC	<b>M</b>	
Localizer performance with vertical guidance	LPV	Mach number <i>(followed by figures)</i>	M . . .
Locator	L	Magnetic	MAG
Locator, middle	LM	Magnetic bearing	QDR
Locator, outer	LO	Magnetic heading <i>(zero wind)</i>	QDM‡
Logical acknowledgement <i>(message type designator)</i>	LAM	Magnetic orientation of runway	QFU
Long <i>(used to indicate the type of approach desired or required)</i>	LNG	Magnetic variation	VAR
Longitude	LONG	Maintain	MNTN
Long range	LRG	Maintenance	MAINT
LORAN <i>(long range air navigation system)</i>	LORAN†	March	MAR
Low drifting <i>(followed by DU = dust, SA = sand or SN = snow)</i>	DR . . .	Marker radio beacon	MKR
Low frequency [30 to 300 kHz]	LF	Maximum	MAX
Low pressure area <i>or</i> the centre of low pressure	L	Maximum authorized altitude	MAA
Low visibility procedures	LVP	Maximum take-off mass	MTOM
		Maximum temperature <i>(followed by figures in TAF)</i>	TX . . .
		Maximum value of wind speed <i>or</i> runway visual range <i>(followed by figures in METAR/SPECI and TAF)</i>	P . . .
		May	MAY

Mean sea level	MSL
Medical evacuation flight	MEDEVAC
Medium and high frequency direction- finding stations ( <i>at the same location</i> )	MHDF
Medium and very high frequency direction-finding stations ( <i>at the same location</i> )	MVDF
Medium frequency [300 to 3 000 kHz] MF Medium frequency direction-finding station	MDF
Medium, high and very high frequency direction-finding stations ( <i>at the same location</i> )	MHVDF
Medium range	MRG
Megahertz	MHZ
Message	MSG
Message . . . ( <i>transmission identification</i> ) has been misrouted ( <i>to be used in AFS as a procedure signal</i> )	MSR#
Meteorological or meteorology	MET†
Meteorological information for aircraft in flight	VOLMET†
Meteorological watch office	MWO
Metres ( <i>preceded by figures</i> )	. . . M

Metres per second	MPS	Minimum crossing altitude	MCA
Metric units	MTU	Minimum descent altitude	MDA
Microburst	MBST	Minimum descent height	MDH
Microwave landing system	MLS‡	Minimum en-route altitude	MEA
Middle marker	MM	Minimum eye height over threshold ( <i>for</i>	
Mid-point ( <i>related to RVR</i> )	MID	<i>visual approach slope indicator</i>	
Military	MIL	<i>systems</i> )	MEHT
Military aerodrome traffic zone	MATZ	Minimum holding altitude	MHA
Military control zone	MCTR	Minimum navigation performance	
Military operating area	MOA	specifications	MNPS
Minimum	MNM	Minimum obstacle clearance ( <i>required</i> )	
		MOC	

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# Signal for use in the teletypewriter service only.



		No reply heard	NRH
Navigation	NAV	No significant change ( <i>used in trend-type</i>	
Navigation aid	NAVAID	<i>landing forecasts)</i>	NOSIG†
Navigation system error	NSE	No specific working hours	HX
New NOTAM	NOTAMN	No transgression zone	NTZ‡
Next	NXT	Noise abatement departure procedure	NADP
Night	NGT	Non-directional radio beacon	NDB‡
Nil significant cloud	NSC	Non-precision approach	NPA
Nil significant weather	NSW	Non-standard	NONSTD
Nimbostratus	NS	None <i>or</i> I have nothing to send to you	NIL*†
No <i>or</i> negative <i>or</i> permission not granted		Normal	NML
<i>or</i> that is not correct	NEG	Normal operating zone	NOZ‡
No change	NC	North <i>or</i> northern latitude	N
No cloud detected ( <i>used in automated</i>		North Atlantic	NAT
<i>METAR/SPECI)</i>	NCD	Northbound	NB
No directional variations available ( <i>used</i>		North-east	NE
<i>in automated METAR/SPECI)</i>	NDV	North-eastbound	NEB
No distinct tendency ( <i>in RVR during</i>		North-north-east	NNE
<i>previous 10 minutes)</i>	N	North-north-west	NNW
No name, unnamed	NN	North-west	NW
No (negative) ( <i>to be used in AFS as a</i>		North-westbound	NWB
<i>procedure signal)</i>	NO	Not before	NB

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# Signal for use in the teletypewriter service only.

## Abbreviations — Encode

Notice distributed by means of telecommunication containing information concerning the establishment, condition or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations	NOTAM†	Overcast	OVC
November	NOV	Overhead	OHD
Number	NR	<b>P</b>	
<b>O</b>		Parachute jumping exercise	PJE
Obscure <i>or</i> obscured <i>or</i> obscuring	OBSC	Parallel	PARL
Observe <i>or</i> observed <i>or</i> observation	OBS	Parking	PRKG
Obstacle	OBST	Passenger(s)	PAX
Obstacle assessment surface	OAS	Passing	PSG
Obstacle clearance altitude	OCA	Pavement classification number	PCN
Obstacle clearance height	OCH	Per cent	PCT
Obstacle clearance surface	OCS	Performance	PER
Obstacle free zone	OFZ	Performance-based communication	PBC
Obstacle identification surface	OIS	Performance-based navigation	PBN
Occasional <i>or</i> occasionally	OCNL	Performance-based surveillance	PBS
Occulting ( <i>light</i> )	OCC	Permanent	PERM
Ocean station vessel	OSV	Persons on board	POB
Oceanic area control centre	OAC	Pierced steel plank	PSP
Oceanic control area	OCA	Pilot-controlled lighting	PCL
October	OCT	Plan position indicator	PPI
		Plus	PS
		Point-in-space reference point	PRP
		Point of no return	PNR
		Polar track structure	PTS
		Position	PSN
		Possible	POSS
		Power	PWR

On-line data interchange	OLDI†	Practice low approach	PLA
On request	O/R	Precision approach	PA
On top	OTP	Precision approach lighting system	
Opaque, white type of ice formation	OPA	<i>(specify category)</i>	PALS
Open <i>or</i> opening <i>or</i> opened	OPN	Precision approach path indicator	PAPI†
Operations	OPS†	Precision approach radar	PAR‡
Operator <i>or</i> operate <i>or</i> operative		Precision approach terrain chart	
<i>or</i> operating <i>or</i> operational	OPR	<i>(followed by name/title)</i>	PATC . . .
Operational control is the control		Pre-departure clearance	PDC‡
indicated	OPC	Pre-flight information bulletin	PIB
Operational meteorological		Present level	PLVL
<i>(information)</i>	OPMET†	Present position	PPSN
Order	ORD	Pressure system(s)	PSYS
Organized track system	OTS	Primary	PRI
Originate <i>(to be used in AFS as a</i>		Primary surveillance radar	PSR‡
<i>procedure signal)</i>	OGN	Prior notice required	PN
Outbound	OUBD	Prior permission required	PPR
Outer marker	OM		

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# Signal for use in the teletypewriter service only.

Probability	PROB†	Received ( <i>acknowledgement of receipt</i> )	
Procedure	PROC	( <i>to be used in AFS as a procedure</i>	
Procedure design gradient	PDG	<i>signal</i> )	R*
Procedure turn	PTN	Receiver autonomous integrity	
Procedures for air navigation services	PANS	monitoring	RAIM†
Proceed <i>or</i> proceeding	PCD	Receiving only	RON
Processed meteorological data in the		Recent ( <i>used to qualify weather</i>	
form of grid point values		<i>phenomena, e.g. recent rain =</i>	
expressed in		<i>RERA</i> )	RE
binary form ( <i>in meteorological</i>			
<i>code</i> )	GRIB	Reclearance in flight	RIF
Prohibited area ( <i>followed by</i>		Recleared	RCLR
<i>identification</i> )	P . . .	Red	R
		Reduced vertical separation minimum	
Propeller	PROP	[300 m (1 000 ft) between FL 290	
Provisional	PROV	and FL 410]	RVSM‡
		Reference datum height	RDH
		Reference path data selector	RPDS
<b>Q</b>		Reference to . . . <i>or</i> refer to . . .	REF
		Regional AIS system centre	RASC†
Quadrant	QUAD	Regional OPMET bulletin exchange	
		( <i>scheme</i> )	ROBEX†
		Regional supplementary procedures	SUPPS
<b>R</b>		Registration	REG
		Rejected take-off distance available,	
Radar position indicator	RPI‡	helicopter	RTODAH
Radar position symbol	RPS	Relay to	RLA
Radar vectoring area	RVA	Remark	RMK
Radial	RDL	Remote altimeter setting source	RASS
Radial from VOR ( <i>followed by three</i>	R . . .	Repeat <i>or</i> I repeat ( <i>to be used in AFS</i>	
<i>figures</i> )		<i>as a</i>	
		<i>procedure signal</i> )	RPT*

Radio	RDO	Repetitive flight plan	RPL
Radio range	RNG	Replace <i>or</i> replaced	RPLC
Radioactive	RDOACT	Replacing NOTAM	NOTAMR
Radiocommunication failure ( <i>message</i> <i>type designator</i> )	RCF	Report <i>or</i> reporting <i>or</i> reporting point	REP
Radiotelegraph	RTG	Report leaving	RL
Radiotelephone	RTF	Report reaching	RR
Radioteletypewriter	RTT	Request <i>or</i> requested	REQ
Ragged	RAG	Request ( <i>to be used in AFS as a procedure signal</i> )	RQ*
Rain	RA	Request flight plan ( <i>message type designator</i> )	RQP
Range ( <i>lights</i> )	RG	Request level change en route	RLCE
Rate of climb	ROC	Request supplementary flight plan	
Rate of descent	ROD	( <i>message type designator</i> )	RQS
Rate of turn	R	Requested level not available	RLNA
Reach <i>or</i> reaching	RCH	Required communication performance	RCP‡
Reach cruising altitude	RCA	Required navigation performance	RNP‡
Receive <i>or</i> receiver	REC		

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# Signal for use in the teletypewriter service only.

## Abbreviations — Encode

Required surveillance performance	RSP‡	SAR point of contact	SPOC
Requirements	RQMNTS	Satellite-based augmentation system ( <i>to</i>	
Re-route	RE RTE	<i>be pronounced “ESS-BAS”</i> )	SBAS†
Rescue and fire fighting services	RFFS	Satellite communication ( <i>used only</i> <i>when</i>	SATCOM†
Rescue boat	RB	<i>referring generally to both voice</i> <i>and</i>	
Rescue coordination centre	RCC	<i>data satellite communication or</i> <i>only</i>	
Rescue sub-centre	RSC	<i>data satellite communication</i> )	
Rescue vessel	RV	Satellite voice communication	SATVOICE†
Resolution advisory	RA	Saturday	SAT
Responder beacon	RSP	Scattered	SCT
Restricted area ( <i>followed by</i>		Schedule <i>or</i> scheduled	SKED
<i>identification</i> )	R . . .	Sea ( <i>used in connection with sea-</i> <i>surface</i>	
Return <i>or</i> returned <i>or</i> returning	RTN	<i>temperature and state of sea</i> )	SEA
Return to service	RTS	Sea-surface temperature ( <i>followed by</i>	
Right ( <i>preceded by runway</i> <i>designation</i>		<i>figures in METAR/SPECI</i> )	W . . .
<i>number to identify a parallel</i> <i>runway</i> )	. . . R	Search and rescue	SAR
Right-hand circuit	RHC	Search and rescue region	SRR
Rime ( <i>used in aerodrome warnings</i> )	RIME†	Secondary	SRY
Root sum square	RSS	Secondary surveillance radar	SSR‡
Route	RTE	Seconds	SEC
Rules of the air and air traffic services	RAC	Section	SECN
Runway	RWY	Sector	SECT
Runway ( <i>followed by figures in</i> <i>METAR/SPECI</i> )	R . . .	Selective calling system	SELCAL†
Runway alignment indicator	RAI	Selective identification feature	SIF
Runway arresting gear	RAG	September	SEP
		Service <i>or</i> servicing <i>or</i> served	SER

Runway centre line	RCL	Service available during hours of	
Runway centre line light(s)	RCLL	scheduled operation	HS
Runway(s) cleared ( <i>used in METAR/SPECI</i> )	CLRD	Service available to meet operational requirements	HO
Runway control van	VAN	Service ( <i>message type only</i> )	SVC
Runway edge light(s)	REDL	Serviceable	SVCBL
Runway end light(s)	RENL	Severe ( <i>used to qualify icing and turbulence reports</i> )	SEV
Runway end safety area	RESA	Shall I cancel telegram number . . . ? <i>or</i>	
Runway lead-in lighting system	RLLS	Cancel telegram number . . . ( <i>to be used in AFS as a Q Code</i> )	QTA
Runway surface condition	RSCD	Shall I run my test tape/a test sentence?	
Runway threshold light(s)	RTHL	<i>or</i> Run your test tape/a test sentence	
Runway touchdown zone light(s)	RTZL	( <i>to be used in AFS as a Q Code</i> )	QJH
Runway visual range	RVR‡	Shallow fog	MIFG
<b>S</b>		Short ( <i>used to indicate the type of approach desired or required</i> )	BRF
Sand	SA	Short range	SRG
Sandstorm	SS	Short take-off and landing	STOL
Sanitary	SAN		

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Shower ( <i>followed by RA = rain, SN = snow, PL = ice pellets, GR = hail, GS = small hail and/or snow pellets or combinations thereof, e.g. showers of rain and snow = SHRASN</i> )	SH . . .	Standard	STD
Signal	SGL	Standard deviation	SD
Significant	SIG	Standard instrument arrival	STAR†
Significant wave height ( <i>followed by figures in METAR/SPECI</i> )	H . . .	Standard instrument departure	SID†
Simple approach lighting system	SALS	Standard regional route transmitting frequencies	RUT
Simultaneous or simultaneously	SIMUL	Standards and Recommended Practices [ICAO]	SARPS
Single isolated wheel load	SIWL	Start of climb	SOC
Single sideband	SSB	State of the sea ( <i>followed by figures in METAR/SPECI</i> )	S . . .
Slow	SLW	Station	STN
Small hail and/or snow pellets	GS	Stationary	STNR
Smoke	FU	Status	STS
Snow	SN	Step down fix	SDF
Snow grains	SG	Stop-end ( <i>related to RVR</i> )	END
South or southern latitude	S	Stopway	SWY
Southbound	SB	Stopway light(s)	STWL
South-east	SE	Straight-in approach	STA
South-eastbound	SEB	Stratiform	STF
South-south-east	SSE	Stratocumulus	SC
South-south-west	SSW	Stratus	ST
South-west	SW	Subject to	SUBJ
South-westbound	SWB	Sunday	SUN
Special air-report ( <i>message type designator</i> )	ARS	Sunrise	SR
Special position indicator	SPI	Sunrise to sunset	HJ
		Sunset	SS
		Sunset to sunrise	HN
		Super high frequency [3 000 to	

Special series NOTAM notifying by means of a specific format change in activity of a volcano, a volcanic eruption and/or volcanic ash cloud that is of significance to aircraft operations	ASHTAM	30 000 MHz]	SHF
Special series NOTAM notifying the presence or removal of hazardous conditions due to snow, ice, slush or standing water associated with snow, slush and ice on the movement area, by means of a specific format	SNOWTAM†	Supersonic transport	SST
Speed limiting point	SLP	Supplement ( <i>AIP Supplement</i> )	SUP
Spot wind	SPOT‡	Supplementary flight plan ( <i>message type designator</i> )	SPL
Squall	SQ	Surface	SFC
Squall line	SQL	Surface movement control	SMC
Stand by	SDBY	Surface movement radar	SMR
		Surveillance radar approach	SRA
		Surveillance radar element of precision approach radar system	SRE
		<b>T</b>	
		Tail wind	TAIL†
		Take-off	TKOF

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# Signal for use in the teletypewriter service only.

## Abbreviations — Encode

Take-off distance available	TODA	To ( <i>followed by place</i> )	TO . . .
Take-off distance available, helicopter	TODAH	Top of climb	TOC
Take-off run available	TORA	Tornado	TDO
Taxiing <i>or</i> taxi	TAX	Touch-and-go landing	TGL
Taxiing guidance system	TGS	Touchdown and lift-off area	TLOF
Taxilane	TXL	Touchdown zone	TDZ
Taxiway	TWY	Towering cumulus	TCU
Technical reason	TECR	Toxic	TOX
Telephone	TEL	Track	TR
Teletypewriter	TT	Track to fix	TF
Temperature	T	Traffic	TFC
Temporary <i>or</i> temporarily	TEMPO <sup>†</sup>	Traffic advisory	TA
Temporary reserved airspace	TRA	Traffic alert and collision avoidance system resolution advisory ( <i>to be pronounced “TEE-CAS-AR-AY”</i> )	TCAS RA <sup>†</sup>
Terminal area surveillance radar	TAR	Traffic information broadcast by aircraft	TIBA <sup>†</sup>
Terminal arrival altitude	TAA	Training	TRG
Terminal control area	TMA <sup>‡</sup>	Transition altitude	TA
Terminal VOR	TVOR	Transition level	TRL
Text ( <i>when the abbreviation is used to request a repetition, the question mark (IMI) precedes the abbreviation, e.g. IMI TXT) (to be used in AFS as a procedure signal)</i>	TXT*	Transmits <i>or</i> transmitter	TRANS
This is a channel-continuity-check of transmission to permit comparison of your record of channel-sequence numbers of messages received on the channel ( <i>to be used in AFS as a</i>		Trend forecast	TREND <sup>†</sup>
		Tropical cyclone	TC
		Tropical cyclone advisory centre	TCAC
		Tropopause	TROP
		True ( <i>preceded by a bearing to indicate reference to True North</i> )	. . . T
		True airspeed	TAS

<i>procedure signal)</i>	CH#	True bearing	QTE
This is a duplicate message ( <i>to be used in</i>		Tsunami ( <i>used in aerodrome warnings</i> )	TSUNAMI†
<i>AFS as a procedure signal)</i>	DUPE#	Tuesday	TUE
Threshold	THR	Turbulence	TURB
Threshold crossing height	TCH	Turn altitude	TNA
Through	THRU	Turn at an altitude/height	TA/H
Thunderstorm ( <i>in aerodrome reports and</i>		Turn height	TNH
<i>forecasts, TS used alone means</i>		Turning point	TP
<i>thunder heard but no precipitation at</i>		T visual approach slope indicator system	
<i>the aerodrome)</i>	TS	<i>(to be pronounced “TEE-VASIS”)</i>	T-VASIS†
Thunderstorm ( <i>followed by RA = rain, SN = snow, PL = ice pellets, GR = hail, GS = small hail and/or snow pellets or combinations thereof, e.g. thunderstorm with rain and snow = TSRASN)</i>	TS . . .	Type of aircraft	TYP
Thursday	THU	Typhoon	TYPH
Till ( <i>followed by time by which weather</i>		<b>U</b>	
<i>change is forecast to end)</i>	TL . . .	UHF tactical air navigation aid	TACAN†
		Ultra high frequency [300 to 3 000 MHz]	UHF‡

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# Signal for use in the teletypewriter service only.

Ultra high frequency direction-finding station	UDF	Very high frequency [30 to 300 MHz]	VHF‡
Ultra light motorized aircraft	ULM	Very high frequency direction-finding station	VDF
Ultra long range	ULR	Very important person	VIP‡
Unable	UNA	Very long range	VLR
Unable higher due traffic	UHDT	Very low frequency [3 to 30 kHz]	VLF
Unable to approve	UNAP	VHF omnidirectional radio range	VOR‡
Uncertainty phase	INCERFA†	Vicinity	VCY
Unidentified precipitation ( <i>used in automated METAR/SPECI</i> )	UP	Vicinity of the aerodrome ( <i>followed by</i> <i>FG = fog, FC = funnel cloud,</i> <i>SH = shower, PO = dust/sand whirls,</i> <i>BLDU = blowing dust, BLSA = blowing sand, BLSN = blowing snow,</i> <i>DS = duststorm, SS = sandstorm,</i> <i>TS = thunderstorm or VA = volcanic ash, e.g. vicinity fog = VCFG)</i>	VC . . .
Unlimited	UNL	Visibility	VIS
Unmanned aircraft	UA	Visibility, cloud and present weather better than prescribed values or conditions ( <i>to be pronounced "KAV-OH-KAY"</i> )	CAVOK†
Unmanned aircraft system	UAS	Visual approach chart ( <i>followed by name/title</i> )	VAC . . .
Unreliable	UNREL	Visual approach slope indicator systems	VASIS
Unserviceable	U/S	Visual-aural radio range	VAR
Until	TIL†	Visual flight rules	VFR‡
Until advised by . . .	UAB . . .	Visual manoeuvre with prescribed track	VPT
Until further notice	UFN	Visual meteorological conditions	VMC‡
Until past ( <i>followed by place</i> )	TIP . . .		
Upper air route	UAR		
Upper area control centre	UAC		
Upper control area	UTA		
Upper flight information region	UIR‡		
Upper information centre	UIC		
Upward ( <i>tendency in RVR during previous 10 minutes</i> )	U		
<b>V</b>			

		Visual reference to the ground, by	VSA
		Volcanic ash	VA
Variable	VRB	Volcanic ash advisory centre	VAAC
Variations from the mean wind direction		Volume ( <i>followed by I, II . . .</i> )	VOL . . .
<i>(preceded and followed by figures in</i>		VOR airborne equipment test facility	VOT
<i>in</i>		VOR and TACAN combination	VORTAC <sup>†</sup>
<i>METAR/SPECI, e.g. 350V070)</i>	. . . V . . .		
Variations from the mean wind speed			
<i>(gusts) (followed by figures in</i>		<b>W</b>	
<i>METAR/SPECI and TAF)</i>	G . . .	Warning	WRNG
Vector to final	VTF	Waterspout	WTSPT
Vertical	VER	Way-point	WPT
Vertical navigation ( <i>to be pronounced</i>		We agree or It is correct ( <i>to be used</i>	
<i>“VEE-NAV”</i> )	VNAV <sup>†</sup>	<i>in</i>	
Vertical path angle	VPA	<i>AFS as a procedure signal)</i>	OK*
Vertical speed	VSP	Weaken or weakening	WKN
Vertical take-off and landing	VTOL	Weather	WX
Vertical visibility ( <i>followed by figures</i>		Weather radar	WXR
<i>in</i>			
<i>METAR/SPECI and TAF)</i>	VV . . .		

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# Signal for use in the teletypewriter service only.

Abbreviations — Encode

Wednesday	WED	Will you relay to . . . free of charge? or I	
Weight	WT	will relay to . . . free of charge ( <i>to be</i>	
West or western longitude	W	<i>used in AFS as a Q Code)</i>	QSP
Westbound	WB	Wind	WIND
West-north-west	WNW	Wind direction indicator	WDI
West-south-west	WSW	Wind shear	WS
What is my distance to your station? or		Wind speed	WSPD
Your distance to my station is		Wing bar lights	WBAR
( <i>distance figures and units</i> ) ( <i>to be</i>		With effect from <i>or</i> effective from	WEF
<i>used in radiotelegraphy as a Q</i>		With immediate effect <i>or</i> effective	WIE
<i>Code)</i>	QGE	immediately	
White	W	Within	WI
White type of ice formation, opaque	OPA	Without	WO
Wide area augmentation system	WAAS <sup>†</sup>	Work in progress	WIP
Widespread	WDSPR	World Aeronautical Chart — ICAO	
Width <i>or</i> wide	WID	1:1 000 000 ( <i>followed by</i>	
Will comply	WILCO <sup>†</sup>	<i>name/title</i> )	WAC . . .
Will you give me the position of my		World area forecast centre	WAFC
station according to the bearings		World Geodetic System — 1984	WGS-84
taken by the D/F stations which		Worldwide web	WWW
you			
control? <i>or</i> The position of your			
station according to the bearings			
taken by the D/F stations that I			
control was . . . latitude . . .			
longitude			
( <i>or other indication of position</i> ),			
class . . . at . . . hours ( <i>to be used in</i>			
<i>radiotelegraphy as a Q Code)</i>	QTF	Yellow	Y
		Yellow caution zone ( <i>runway lighting</i> )	YCZ

Will you indicate the TRUE track to reach you? or The TRUE track to reach me is . . . degrees at . . . hours (to be used in radiotelegraphy as a Q Code)	QJJ	Yes or affirm or affirmative or that is correct Yes (affirmative) (to be used in AFS as a procedure signal) Your	AFM YES* YR
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# Signal for use in the teletypewriter service only

**ABBREVIATIONS FOR IDENTIFYING**

**ABBREVIATIONS FOR IDENTIFYING  
AERONAUTICAL FIXED SERVICE (AFS) MESSAGES**

**Abbreviations for use as the first word of the text of a message**

**ENCODE**

Aircraft Accident Notification Messages		Meteorological Messages	
Notification of an aircraft accident	ACCID	Data designators for meteorological bulletins are given in the <i>Manual of Aeronautical Meteorological Practice</i> (Doc 8896)	
Air Traffic Services Messages		Other messages	
Acceptance	ACP	Notice distributed by means of telecom-	NOTAM
Alerting	ALR	munication containing information	
Arrival	ARR	concerning the establishment,	
Coordination	CDN	condition or change in any	
Current flight plan	CPL	aeronautical facility, service,	
Delay	DLA	procedure or hazard, the timely	
Departure	DEP	knowledge of which is essential to	
Estimate	EST	personnel concerned with flight	
Flight plan cancellation	CNL	operations	
Logical acknowledgement	LAM	Special series NOTAM notifying the	SNOWTAM
Modification	CHG	presence or removal of hazardous	
Radiocommunication failure	RCF	conditions due to snow, ice, slush or	
Request flight plan	RQP	standing water associated with	
Request supplementary flight plan	RQS	snow,	
Supplementary flight plan	SPL	slush and ice on the movement area,	

by means of a specific format  
Service *(to be used by AFS stations  
only)*

SVC

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**ABBREVIATIONS AND TERMS TO BE TRANSMITTED AS SPOKEN**

## ABBREVIATIONS AND TERMS TO BE TRANSMITTED AS SPOKEN

## WORDS WHEN USED IN RADIOTELEPHONY

## DECODE

ACARS	<i>(to be pronounced "AY-CARS")</i> Aircraft communication addressing and reporting system	FRONT	Front <i>(relating to weather)</i>
ACAS	<i>(to be pronounced "AY-CAS")</i> Airborne collision avoidance system	FROST	Frost <i>(used in aerodrome warnings)</i>
ADIZ	<i>(to be pronounced "AY-DIZ")</i> Air defence identification zone	GAGAN	GPS and geostationary earth orbit augmented navigation <i>(to be pronounced "GEE-BAS")</i>
AIREP	Air-report	GBAS	Ground-based augmentation system <i>(to be pronounced "GLO-NAS")</i>
AIRMET	Information concerning en-route weather phenomena which may affect the safety of low-level aircraft operations	GLONASS	Global orbiting navigation satellite system
ALERFA	Alert phase	GRAS	<i>(to be pronounced "GRASS")</i> Ground-based regional augmentation system
APAPI	<i>(to be pronounced "AY-PAPI")</i> Abbreviated precision approach path indicator	IDENT	Identification
ATIS	<i>(to be pronounced "AY-TIS")</i> Automatic terminal information service	INCERFA	Uncertainty phase
AT-VASIS	<i>(to be pronounced "AY-TEE-VASIS")</i> Abbreviated T visual approach slope indicator system	INFO	Information
AVGAS	Aviation gasoline	LNAV	<i>(to be pronounced "EL-NAV")</i> Lateral navigation
BARO-VNAV	<i>(to be pronounced "BAA-RO-VEE-</i>	LORAN	LORAN <i>(long range air navigation system)</i>
		MET	Meteorological or meteorology Aerodrome routine meteorological report
		METAR	

	NAV”) Barometric vertical navigation		<i>(in meteorological code)</i>
BASE	Cloud base	MOPS	Minimum operational performance standards
CAVOK	<i>(to be pronounced “KAV-OH-KAY”)</i> Visibility, cloud and present weather better than prescribed values or conditions	MSAS	<i>(to be pronounced “EM-SAS”)</i> Multi-functional transport satellite (MTSAT) satellite-based augmentation system
CIDIN	Common ICAO data interchange network	NASC	National AIS system centre
D-ATIS	<i>(to be pronounced “DEE-ATIS”)</i> Data link automatic terminal information service	NIL	None or I have nothing to send you
DETRESFA	Distress phase	NOSIG	No significant change <i>(used in trend-type landing forecasts)</i>
EFIS	<i>(to be pronounced “EE-FIS”)</i> Electronic flight instrument system	NOTAM	Notice distributed by means of telecommunication containing information concerning the establishment, conditions or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations
EGNOS	<i>(to be pronounced “EGG-NOS”)</i> European geostationary navigation overlay service		
ELBA	Emergency location beacon — aircraft		

OLDI	On-line data interchange	SPECI	Aerodrome special meteorological report
OPMET	Operational meteorological <i>(information)</i>		<i>(in meteorological code)</i>
OPS	Operations	SPECIAL	Local special meteorological report <i>(in abbreviated plain language)</i>
PAPI	Precision approach path indicator	SPOT	Spot wind
PROB	Probability	STAR	Standard instrument arrival
RAIM	Receiver autonomous integrity  monitoring	TACAN	UHF tactical air navigation aid
RASC	Regional AIS system centre	TAF	Aerodrome forecast <i>(in meteorological code)</i>
RIME	Rime <i>(used in aerodrome warnings)</i>	TAIL	Tail wind
RNAV	<i>(to be pronounced “AR-NAV”)</i> Area  navigation	TCAS RA	<i>(to be pronounced “TEE-CAS-AR-AY”)</i>  Traffic alert and collision avoidance system resolution advisory
ROBEX	Regional OPMET bulletin exchange <i>(scheme)</i>	TEMPO	Temporary or temporarily
SATCOM	Satellite communication <i>(used only when referring generally to both voice and data satellite communication or only data satellite communication)</i>	TIBA	Traffic information broadcast by aircraft
SATVOICE	Satellite voice communication	TIL	Until
SBAS	<i>(to be pronounced “ESS-BAS”)</i>  Satellite-based augmentation system	TOP	Cloud top
SELCAL	Selective calling system	TREND	Trend forecast
SID	Standard instrument departure	TSUNAMI	Tsunami <i>(used in aerodrome warnings)</i>
SIGMET	Information concerning en-route weather  and other phenomena in the	T-VASIS	<i>(to be pronounced “TEE-VASIS”)</i>  T visual approach slope indicator system
		VNAV	<i>(to be pronounced “VEE-NAV”)</i> Vertical navigation
		VOLMET	Meteorological information for aircraft in

	atmosphere that may affect the safety of aircraft operations		flight
		VORTAC	VOR and TACAN combination
SNOWTAM	Special series NOTAM notifying the presence or removal of hazardous conditions due to snow, ice, slush or standing water associated with snow, slush and ice on the movement area, by means of a specific format	WAAS	Wide area augmentation system
		WILCO	Will comply

**ABBREVIATIONS AND TERMS TO BE TRANSMITTED AS SPOKEN  
WORDS WHEN USED IN RADIOTELEPHONY**

**ENCODE**

Abbreviated precision approach path	APAPI	European geostationary navigation overlay service ( <i>to be pronounced</i> “EGG-NOS”)	EGNOS
indicator ( <i>to be pronounced</i> “AY-PAPI”)		Front ( <i>relating to weather</i> )	FRONT
Abbreviated T visual approach slope indicator system ( <i>to be pronounced</i> “AY-TEE-VASIS”)	AT-VASIS	Frost ( <i>used in aerodrome warnings</i> )	FROST
Aerodrome forecast ( <i>in meteorological code</i> )	TAF	Global orbiting navigation satellite system ( <i>to be pronounced</i> “GLO-NAS”)	GLONASS
Aerodrome routine meteorological report ( <i>in meteorological code</i> )	METAR	GPS and geostationary earth orbit augmented navigation	GAGAN
Aerodrome special meteorological report ( <i>in meteorological code</i> )	SPECI	Ground-based augmentation system ( <i>to be pronounced</i> “GEE-BAS”)	GBAS
Airborne collision avoidance system ( <i>to be pronounced</i> “AY-CAS”)	ACAS	Ground-based regional augmentation system ( <i>to be pronounced</i> “GRASS”)	GRAS
Aircraft communication addressing and reporting system ( <i>to be pronounced</i> “AY-CARS”)	ACARS	Identification	IDENT
Air defence identification zone ( <i>to be pronounced</i> “AY-DIZ”)	ADIZ	Information	INFO
Air-report	AIREP	Information concerning en-route	SIGMET

Alert phase	ALERFA	weather and other phenomena in the	
Area navigation ( <i>to be pronounced "AR-NAV"</i> )	RNAV	atmosphere that may affect the safety of aircraft operations	
Automatic terminal information service ( <i>to be pronounced "AY-TIS"</i> )	ATIS	Information concerning en-route weather phenomena which may affect the safety of low-level aircraft operations	AIRMET
Aviation gasoline	AVGAS		
Barometric vertical navigation ( <i>to be pronounced "BAA-RO-VEE-NAV"</i> )	BARO-VNAV	Lateral navigation ( <i>to be pronounced "EL-NAV"</i> )	LNAV
Cloud base	BASE	Local special meteorological report ( <i>in abbreviated plain language</i> )	SPECIAL
Cloud top	TOP		
Common ICAO data interchange network	CIDIN	LORAN ( <i>long range air navigation system</i> )	LORAN
Data link automatic terminal information service ( <i>to be pronounced "DEE-ATIS"</i> )	D-ATIS	Meteorological or meteorology information for aircraft in flight	MET VOLMET
Distress phase	DETRESFA	Minimum operational performance standards	MOPS
Electronic flight instrument system ( <i>to be pronounced "EE-FIS"</i> )	EFIS	Multi-functional transport satellite (MTSAT) satellite-based	MSAS
Emergency location beacon — aircraft	ELBA	augmentation system ( <i>to be pronounced "EM-SAS"</i> )	

		<i>when referring generally to both voice and data satellite communication or only data satellite communication)</i>	
National AIS system centre	NASC		
None or I have nothing to send you	NIL		
No significant change ( <i>used in trend-type landing forecasts</i> )	NOSIG	Satellite voice communication	SATVOICE
Notice distributed by means of telecom-	NOTAM	Selective calling system	SELCAL
munication containing information concerning the establishment, conditions or change in any aeronautical facility, service, procedure or hazard, the timely knowledge of which is essential to personnel concerned with flight operations		Special series NOTAM notifying the presence or removal of hazardous conditions due to snow, ice, slush or standing water associated with snow, slush and ice on the movement area, by means of a specific format	SNOWTAM
On-line data interchange	OLDI	Spot wind	SPOT
Operational meteorological ( <i>information</i> )	OPMET	Standard instrument arrival	STAR
Operations	OPS	Standard instrument departure	SID
Precision approach path indicator	PAPI	Tail wind	TAIL
Probability	PROB	Temporary or temporarily	TEMPO
Receiver autonomous integrity monitoring	RAIM	Traffic alert and collision avoidance system resolution advisory ( <i>to be pronounced "TEE-CAS-AR-AY"</i> )	TCAS RA
Regional AIS system centre	RASC	Traffic information broadcast by aircraft	TIBA
Regional OPMET bulletin exchange ( <i>scheme</i> )	ROBEX	Trend forecast	TREND
Rime ( <i>used in aerodrome warnings</i> )	RIME	Tsunami ( <i>used in aerodrome warnings</i> )	TSUNAMI
Satellite-based augmentation system ( <i>to be pronounced "ESS-BAS"</i> )	SBAS	T visual approach slope indicator system ( <i>to be pronounced "TEE-VASIS"</i> )	T-VASIS
Satellite communication ( <i>used only</i> )	SATCOM		

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UHF tactical air navigation aid	TACAN
Uncertainty phase	INCERFA
Until	TIL
Vertical navigation ( <i>to be pronounced</i> “VEE-NAV”)	VNAV
Visibility, cloud and present weather better than prescribed values or conditions ( <i>to be pronounced</i> “KAV-OH-KAY”)	CAVOK
VOR and TACAN combination	VORTAC
Wide area augmentation system	WAAS
Will comply	WILCO

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**ABBREVIATIONS AND TERMS TO BE TRANSMITTED USING THE INDIVIDUAL LETTERS IN NON-PHONETIC FORM  
WHEN USED IN RADIOTELEPHONY**

**ABBREVIATIONS AND TERMS TO BE TRANSMITTED USING THE INDIVIDUAL LETTERS IN NON-PHONETIC FORM WHEN USED IN RADIOTELEPHONY**

**DECODE**

ACC	Area control centre <i>or</i> area control	MLS	Microwave landing system
ADF	Automatic direction-finding equipment		
ADS-B	Automatic dependent surveillance — broadcast	NDB	Non-directional radio beacon
ADS-C	Automatic dependent surveillance — contract	NOZ	Normal operating zone
AFTN	Aeronautical fixed telecommunication network	NTZ	No transgression zone
ATA	Actual time of arrival	PAR	Precision approach radar
ATC	Air traffic control ( <i>in general</i> )	PDC	Pre-departure clearance
ATD	Actual time of departure	PSR	Primary surveillance radar
		QDM	Magnetic heading ( <i>zero wind</i> )
CB	( <i>to be pronounced “CEE BEE”</i> ) Cumulonimbus	QFE	Atmospheric pressure at aerodrome elevation ( <i>or at runway threshold</i> )
CPDLC	Controller-pilot data link communications	QNH	Altimeter sub-scale setting to obtain elevation when on the ground
DME	Distance measuring equipment	RCP	Required communication performance
ETA	Estimated time of arrival <i>or</i> estimating arrival	RNP	Required navigation performance
ETD	Estimated time of departure <i>or</i> estimating departure	RPI	Radar position indicator
		RSP	Required surveillance performance
		RVR	Runway visual range
		RVSM	Reduced vertical separation minimum

			[300 m (1 000 ft) between FL 290 and FL 410]
FIR	Flight information region		
FMS	Flight management system		
		SSR	Secondary surveillance radar
GCA	Ground controlled approach system <i>or</i> ground controlled approach	TMA	Terminal control area
GLS	GBAS landing system		Ultra high frequency [300 to 3 000 MHz]
GNSS	Global navigation satellite system	UHF	
GPS	Global positioning system	UIR	Upper flight information region
GPWS	Ground proximity warning system	UTC	Coordinated universal time
HF	High frequency [3 000 to 30 000 kHz]	VFR	Visual flight rules
		VHF	Very high frequency [30 to 300 MHz]
IFR	Instrument flight rules	VIP	Very important person
ILS	Instrument landing system	VMC	Visual meteorological conditions
IMC	Instrument meteorological conditions	VOR	VHF omnidirectional radio range

**ABBREVIATIONS AND TERMS TO BE TRANSMITTED USING THE INDIVIDUAL LETTERS IN NON-PHONETIC FORM WHEN USED IN RADIOTELEPHONY**

**ENCODE**

Actual time of arrival	ATA	High frequency [3 000 to 30 000 kHz]	HF
Actual time of departure	ATD		
Aeronautical fixed telecommunication network	AFTN	Instrument flight rules	IFR
Air traffic control ( <i>in general</i> )	ATC	Instrument landing system	ILS
Altimeter sub-scale setting to obtain elevation when on the ground	QNH	Instrument meteorological conditions	IMC
Area control centre <i>or</i> area control	ACC	Magnetic heading ( <i>zero wind</i> )	QDM
Atmospheric pressure at aerodrome elevation ( <i>or at runway threshold</i> )	QFE	Microwave landing system	MLS
Automatic dependent surveillance — broadcast	ADS-B	No transgression zone	NTZ
Automatic dependent surveillance — contract	ADS-C	Non-directional radio beacon	NDB
Automatic direction-finding equipment	ADF	Normal operating zone	NOZ
Controller-pilot data link communications	CPDLC	Precision approach radar	PAR
Coordinated universal time	UTC	Pre-departure clearance	PDC
Cumulonimbus ( <i>to be pronounced "CEE BEE"</i> )	CB	Primary surveillance radar	PSR
Distance measuring equipment	DME	Radar position indicator	RPI
Estimated time of arrival <i>or</i> estimating		Reduced vertical separation minimum [300 m (1 000 ft) between FL 290 and FL 410]	RVSM
		Required communication performance	RCP
		Required navigation performance	RNP

	ETA	Required surveillance performance	RSP
arrival		Runway visual range	RVR
Estimated time of departure <i>or</i> estimating	ETD		
departure		Secondary surveillance radar	SSR
Flight information region	FIR	Terminal control area	TMA
Flight management system	FMS	Ultra high frequency [300 to 3 000 MHz]	UHF
GBAS landing system	GLS	Upper flight information region	UIR
Global navigation satellite system	GNSS		
Global positioning system	GPS	Very high frequency [30 to 300 MHz]	VHF
Ground controlled approach system <i>or</i> ground controlled approach	GCA	Very important person	VIP
Ground proximity warning system	GPWS	VHF omnidirectional radio range	VOR
		Visual flight rules	VFR
		Visual meteorological conditions	VMC