
Chapter 1—Preliminary

1.01 Name

- (1) This instrument is the *Part 121 (Australian Air Transport Operations—Larger Aeroplanes) Manual of Standards 2020*.
- (2) This instrument may also be cited as:
 - (a) the Part 121 Manual of Standards; or
 - (b) the Part 121 MOS.

1.03 Authority

This instrument is made under the *Civil Aviation Safety Regulations 1998*.

Note: CASA may issue a Manual of Standards for Part 121 (Australian air transport operations—larger aeroplanes): see regulation 121.015 of CASR.

1.04 Definitions

Note: A number of expressions used in this instrument are defined in the Dictionary at the end of the *Civil Aviation Safety Regulations 1998*, or in section 3 of the *Civil Aviation Act 1988*. Some definitions in the Dictionary have been included in section 1.04, or another provision of this instrument, for ease of reference.

- (1) In this instrument:

ACAS means airborne collision avoidance system.

accelerate stop distance available means the length of the take-off run available plus the length of the stopway.

actual landing distance: see subsection 9.13(1).

additional fuel means the supplementary amount of fuel required to allow an aeroplane that suffers engine failure or loss of pressurisation at the most critical point along a route, whichever results in the greater subsequent fuel consumption, to:

- (a) proceed to an alternate aerodrome; and
- (b) fly for 15 minutes at a holding speed at 1 500 ft above the aerodrome elevation in ISA conditions; and
- (c) make an approach and landing.

adequate aerodrome: see Part 1 of the CASR Dictionary.

ADF means automatic direction finder.

aerodrome forecast means:

- (a) for an aerodrome in Australian territory—an authorised weather forecast for the aerodrome issued by the Bureau of Meteorology, that is labelled as a “TAF”; and

-
- (b) for an aerodrome outside Australian territory—an authorised weather forecast for the aerodrome that meets the requirements of standard 6.2 of Annex 3, *Meteorological Service for International Air Navigation*, to the Chicago Convention, in relation to an aerodrome.

Note: TAF is an acronym for terminal area forecast.

airborne collision avoidance system: see Part 1 of the CASR Dictionary.

airframe/engine combination means a combination of an aeroplane model and an engine model, identified on an aeroplane's type certification data sheet for the purposes of extended diversion time operations.

alternate aerodrome has the same meaning as in Annex 2 to the Chicago Convention.

Note: At the commencement of this instrument, Chapter 1 of Annex 2 to the Chicago Convention included the following definition:

“Alternate aerodrome. An aerodrome to which an aircraft may proceed when it becomes either impossible or inadvisable to proceed to or to land at an 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.”

approved ACAS: see subsection 11.21(1).

area navigation has the meaning given by subsection 1.07(6) of the Part 91 MOS.

automatic ELT has the meaning given by section 11.50.

BECMG, in relation to a weather forecast, has the same meaning as in ICAO Document 8896.

Note: At the commencement of this instrument, ICAO Document 8896 included the following:

“BECMG (abbreviation for “*becoming*”) – this change indicator describes changes where the conditions are expected to reach or pass specified values at a regular or irregular rate.”

BKN, in relation to amounts of cloud, has the same meaning as in ICAO Document 8896.

Note: At the commencement of this instrument, ICAO Document 8896 refers to BKN as 5-7 oktas of cloud.

cabin training device means a device that simulates an aeroplane or part of an aeroplane.

CAR means the *Civil Aviation Regulations 1988*.

CASR means the *Civil Aviation Safety Regulations 1998*.

Civil Aviation Order 100.7 means *Civil Aviation Order 100.7 Instrument 2015*, as in force from time to time.

clearway:

- (a) for an aerodrome in Australian territory—has the meaning given in the Part 139 (Aerodromes) Manual of Standards 2019; or
- (b) for an aerodrome in a foreign country—means the clearway for a runway at the aerodrome, declared in accordance with the relevant requirements of the national aviation authority of the country.

cloud ceiling: see the CASR Dictionary.

Note: The CASR Dictionary defines **cloud ceiling** as having “the same meaning as **ceiling** in Annex 2 to the Chicago Convention”. At the commencement of this instrument, Chapter 1 of the Annex included the following definition:

“**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.”

combination recorder: see the CASR Dictionary.

commuter type aeroplane means:

- (a) an SFAR 41 aeroplane; or
- (b) an aeroplane that is type certificated in the commuter category.

configuration maintenance and procedures standards document, or **CMP document** means a document, provided by the manufacturer of an aeroplane and as existing from time to time, that:

- (a) specifies the minimum requirements for the aeroplane’s configuration, including any special inspections, flight crew procedures, hardware life limits, MMEL constraints and maintenance practices necessary to establish the suitability of the airframe/engine combination for extended diversion time operations; and
- (b) is approved by the certification authority for the aeroplane.

contingency fuel: see section 7.03.

critical point means a point en route during a flight of an aeroplane, determined by the operator or the pilot in command for the flight before the flight commences, at which the aeroplane can:

- (a) if it arrives at the point with adequate fuel to complete the flight to the planned destination aerodrome while maintaining the fuel required by subsection 7.05(3)—continue to that aerodrome; or

-
- (b) otherwise—divert to an en-route alternate aerodrome while maintaining the fuel required by subsection 7.05(3).

CVR: see section 11.28.

DA means decision altitude.

destination alternate aerodrome means an alternate aerodrome that is a destination alternate (within the meaning of Annex 2 to the Chicago Convention).

destination alternate fuel: see section 7.02.

DH means decision height.

diversion time, in relation to an aeroplane and an EDTO, means the time it would take for the aeroplane to fly from a point on a route, occurring beyond the threshold distance for the aeroplane, to an adequate aerodrome for the aeroplane.

Note: The term **adequate aerodrome** is defined in the CASR Dictionary as follows:

“**adequate aerodrome**, in relation to a flight of an aeroplane, means an aerodrome that complies with the following:

- (a) an authorised weather forecast for the aerodrome must be available for the aeroplane’s estimated time of use of the aerodrome;
- (b) the aerodrome’s services and facilities must be operational for at least the estimated time of use;
- (c) the landing distance available for the aeroplane must be at least the landing distance required under these Regulations for the aeroplane’s landing at the aerodrome;
- (d) for an IFR flight—at least one authorised instrument approach procedure that is suitable for use by the aeroplane must be operational for at least the estimated time of use.”

(E)TSO, followed by an identifying letter and number, is a shorthand reference to both the TSO and the ETSO, each of which has the same identifying letter and number.

EDTO, or **extended diversion time operation**, means an operation in which an aeroplane is flown further from an adequate aerodrome for the aeroplane than the threshold distance for the aeroplane.

EDTO approval means an approval, mentioned in paragraph 121.035(1)(b) of CASR, to conduct extended diversion time operations using a particular aeroplane and airframe/engine combination.

Note: An approval mentioned in paragraph 121.035(1)(b) of CASR is granted under regulation 121.010 of CASR.

EDTO en-route alternate aerodrome means an adequate aerodrome that is selected as an EDTO en-route alternate aerodrome under section 4.19 for use in the event of a diversion during an EDTO.

EDTO entry point means the first point on a route at which an aeroplane exceeds the threshold distance from an adequate aerodrome.

EDTO significant system means:

- (a) an aeroplane's propulsion system; or
- (b) any other aeroplane system:
 - (i) whose failure or degradation could adversely affect the safety of an EDTO flight conducted by the aeroplane; or
 - (ii) the functioning of which is important to continued safe flight and landing during a diversion.

ELT means emergency locator transmitter.

emergency exit trainer means a standalone device comprising an emergency exit and any other feature that is necessary to enable the device to be used to assess a crew member's competence to operate the exit.

empty weight has the meaning given by subsection 2 of Civil Aviation Order 100.7.

en-route alternate aerodrome means an alternate aerodrome that is an en-route alternate (within the meaning of Annex 2 to the Chicago Convention).

estimated time of use: see section 4.05.

ETSO (short for European Technical Standard Order): see the CASR Dictionary.

FAA means the Federal Aviation Administration of the United States of America.

FDR: see section 11.28.

FEW, in relation to amounts of cloud, has the same meaning as in ICAO Document 8896.

Note: At the commencement of this instrument, ICAO Document 8896 refers to FEW as 1-2 oktas of cloud.

final reserve fuel means the amount of fuel:

- (a) that is required to fly an aeroplane mentioned in column 1 of an item in the following table, calculated as follows:
 - (i) for the period mentioned in column 2 of the item;
 - (ii) at 1 500 ft above aerodrome elevation in ISA conditions;
 - (iii) at holding speed;
 - (iv) at the aeroplane's estimated weight on arrival at the destination alternate aerodrome, or the planned destination aerodrome if no destination alternate aerodrome is required for the flight; and
- (b) which is usable fuel that is remaining on completion of the final landing at the aerodrome.

Final reserve fuel requirements		
Item	Column 1	Column 2
	Aeroplane	Final reserve fuel flight time
1	A turbine-engine aeroplane	30 minutes
2	A piston-engine aeroplane	45 minutes

FL is short for *flight level* (see the CASR Dictionary).

flight manual: see the CASR Dictionary.

flight recorder: see section 11.28.

GAF, or **graphical area forecast**, means an authorised weather forecast that:

- (a) is issued by the Bureau of Meteorology; and
- (b) is a forecast of the weather conditions within a specific geographical area published in the AIP.

Note: At the commencement of this instrument the AIP document containing these geographical areas was the *Planning Chart Australia*.

GAMET area forecast has the same meaning as in Annex 3, *Meteorological Service for International Air Navigation*, to the Chicago Convention.

Note: At the commencement of this instrument, Chapter 1 of Annex 3 included the following definition:

“**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.”

GBAS means ground-based augmentation system.

GBAS landing system, or **GLS**, has the same meaning as in ICAO Document 8168, Volume 1.

Note: At the commencement of this instrument, ICAO Document 8168 defined **GBAS landing system** to be:

“a system for approach and landing operations utilizing GNSS, augmented by a ground-based augmentation system (GBAS), as the primary navigational reference”.

GNSS means the global navigation satellite system.

GPWS means ground proximity warning system.

gross flight path means the flight path that an aeroplane will follow when flown in a particular configuration, in accordance with specified procedures in relevant conditions, and that is established, from the aeroplane’s performance data, as representing the average fleet performance of the aeroplane type.

holding fuel means the amount of fuel required by an aeroplane to fly for the period of time anticipated for holding (taking into account the operating

conditions), calculated at the holding fuel consumption rate established for the aeroplane for the anticipated meteorological conditions or ISA.

ICAO Document 8168 means ICAO Document 8168 (*Procedures for Air Navigation Services – Aircraft Operations Volume 1 Flight Procedures*) approved and published by decision of the Council of the International Civil Aviation Organization, as in force from time to time.

ICAO Document 8896 means ICAO Document 8896 (*Manual of Aeronautical Meteorological Practice*) approved and published by decision of the Council of the International Civil Aviation Organization, as in force from time to time.

ICAO landing forecast means an authorised weather forecast that meets the requirements of standard 6.3 of Annex 3 to the Chicago Convention.

Note: The term **authorised weather forecast** is defined in the CASR Dictionary.

ILS means instrument landing system.

in-flight shutdown means an engine of an aeroplane:

- (a) ceasing to function normally in flight for any reason; and
- (b) shutting down, whether the shutting down is:
 - (i) self-induced; or
 - (ii) initiated by a crew member; or
 - (iii) caused by some other external influence.

inoperative: see the CASR Dictionary.

ISA means International Standard Atmosphere.

isolated destination aerodrome: see section 4.03.

landing distance available means:

- (a) for landing an aeroplane at a certified aerodrome—the distance declared by the aerodrome operator as available and suitable for the ground run of the aeroplane when it lands at the aerodrome; and
- (b) for landing an aeroplane at an aerodrome other than a certified aerodrome—the distance established by the aeroplane operator as available and suitable for the ground run of the aeroplane when it lands at the aerodrome.

LNAV means lateral navigation.

LP means localiser performance.

LPV means localiser performance with vertical navigation.

maximum diversion time means the maximum time approved by CASA for an operator to conduct an EDTO using a particular aeroplane and airframe/engine combination.

maximum zero fuel weight, of an aeroplane, means the maximum weight for the aeroplane, not including disposable fuel or oil, that is set out in:

- (a) the type certificate data sheet for the aeroplane; or
- (b) the aeroplane's flight manual.

MDA means minimum descent altitude.

MDH means minimum descent height.

MLS means microwave landing system.

navigation specification has the meaning given by subsection 1.07(6) of the Part 91 MOS.

net flight path means the gross flight path reduced in elevation or extended in length by margins stated in subparagraphs 9.04(7)(e)(i) to (iii).

Note: The margins are to allow for factors such as deterioration in aeroplane performance and variations in pilot techniques in relating aeroplane performance to obstacle clearance.

NM means nautical miles.

non-precision approach procedure, or **NPA**, means an instrument approach procedure designed for 2D instrument approach operations.

operative, for anything, means the thing is not inoperative.

Note: The term **inoperative** is defined in the CASR Dictionary.

OVC, in relation to cloud, has the same meaning as in ICAO Document 8896.

Note: At the commencement of this instrument, ICAO Document 8896 refers to OVC as 8 oktas of cloud.

PBN, or **performance-based navigation**, has the meaning given by subsection 1.07(6) of the Part 91 MOS.

point of in-flight replanning means a point en route during a flight of an aeroplane, determined by the operator for the flight before the flight commences, at which the aeroplane can:

- (a) if it arrives at the point with adequate fuel to complete the flight to the planned destination aerodrome while maintaining the fuel required by subsection 7.05(2)—continue to that aerodrome; or
- (b) otherwise—divert to an en-route alternate aerodrome while maintaining the fuel required by subsection 7.05(3).

precision approach procedure means an instrument approach procedure based on an ILS, an MLS, a GLS or an SBAS CAT 1, and which is designed for 3D instrument approach operations.

presumed temperature, at an aerodrome, in relation to an aeroplane take-off, means the most limiting of the following:

- (a) the ambient temperature;
- (b) the temperature assumed to be the ambient temperature determined using the procedures, contained in an aeroplane operator's exposition, for

estimating the ambient temperature at take-off for the purpose of determining take-off performance.

quick donning mask: see section 11.39.

relevant weather conditions: see section 4.04.

removable equipment has the meaning given by subsection 2 of Civil Aviation Order 100.7.

resolution advisory, or **RA** (for an ACAS), has the meaning given by subsection 11.21(1).

RNAV specification has the meaning given by subsection 1.07(6) of the Part 91 MOS.

RNP APCH-LNAV means the conduct of an RNP APCH using LNAV minima.

RNP APCH-LNAV/VNAV means the conduct of an RNP APCH. **RNP APCH-LP** means the conduct of an RNP APCH using LP minima.

RNP APCH-LPV means the conduct of an RNP APCH using LPV minima.

RNP specification has the meaning given by subsection 1.07(6) of the Part 91 MOS.

runway has the meaning given by the *Part 139 (Aerodromes) Manual of Standards 2019*.

SBAS means satellite-based augmentation system.

SBAS CAT 1, in relation to an instrument approach procedure, means SBAS Category 1.

SCT, in relation to amounts of cloud, has the same meaning as in ICAO Document 8896.

Note: At the commencement of this instrument, ICAO Document 8896 refers to SCT as 3-4 oktas of cloud.

SFAR 41 means Special Federal Aviation Regulation 41 of the United States of America, as in force on 12 September 1983.

Note: At the commencement of this instrument, a copy of SFAR 41, as in force on 12 September 1983, was available at:
https://rgl.faa.gov/Regulatory_and_Guidance_Library/rgFAR.nsf/0/51D22E0C18BE4BA586256E450069078D?OpenDocument.

SFAR 41 aeroplane means an aeroplane that:

- (a) is certificated as a normal category aircraft; and
- (b) is an aeroplane in relation to which an applicant under part 4(c) of SFAR 41 would be entitled to a type certificate amendment or a supplemental type certificate that shows compliance with Annex 8 to the Chicago Convention in relation to the aeroplane, if SFAR 41 were still in force; and

-
- (c) is operated in accordance with flight manual instructions that specify performance standards that are at least equivalent to the standards set out in Annex 8 to the Chicago Convention.

stopway:

- (a) for an aerodrome in Australian territory, means a defined rectangular area on the ground at the end of the take-off run available, prepared as a suitable area:
 - (i) in which an aircraft can be stopped in the case of an abandoned take-off; and
 - (ii) that meets the requirements in relation to a stopway in the Part 139 (Aerodromes) Manual of Standards 2019, as in force from time to time; or
- (b) for an aerodrome in a foreign country, means a defined area on the ground at the end of the take-off run available, prepared as a suitable area:
 - (i) in which an aircraft can be stopped in the case of an abandoned take-off; and
 - (ii) that meets the relevant requirements (however described), as in force from time to time, of the national aviation authority in relation to a stopway.

survival ELT has the meaning given by section 11.51.

TAF3 means an aerodrome forecast:

- (a) issued by the Bureau of Meteorology for an aerodrome within Australian territory; and
- (b) that contains the text “TAF3” in the remarks section of the forecast.

take-off alternate aerodrome means an alternate aerodrome that is a take-off alternate (within the meaning of Annex 2 to the Chicago Convention).

take-off distance available means the total of:

- (a) the length of the take-off run available at an aerodrome; and
- (b) if a clearway is provided at the aerodrome—the length of the clearway.

take-off distance required, for an aeroplane, means the take-off distance for the aeroplane calculated in accordance with the relevant requirements in the flight manual instructions for the aeroplane.

take-off run available, for take-off at an aerodrome, means:

- (a) if the aerodrome is a certified aerodrome—the distance declared by the aerodrome operator in the AIP as available and suitable for the ground run of an aeroplane taking off; and
- (b) if the aerodrome is not a certified aerodrome—the distance established by the operator of an aeroplane as available and suitable for the ground run of an aeroplane taking off.

take-off run required, for an aeroplane, means the take-off run for the aeroplane calculated in accordance with the relevant requirements stated in the aeroplane’s flight manual.

TAWS means terrain awareness and warning system.

taxi fuel means the amount of fuel expected to be used by an aeroplane before take-off, taking into account:

- (a) local conditions at the departure aerodrome; and
- (b) auxiliary power unit consumption, if applicable.

threshold distance, in relation to an aeroplane, means the distance mentioned in subparagraph 121.030(1)(b)(ii) of CASR for the aeroplane.

Note: The table in regulation 121.030 (1) of CASR sets out the threshold distance for an aeroplane described in an item in column 1 of the table, being a distance from an adequate aerodrome for the aeroplane measured by the time required for the aeroplane to achieve that distance if flying at the speed mentioned in the item for the aeroplane.

time-limited system means any EDTO significant system:

- (a) on whose availability the duration of a flight of an aeroplane depends; and
- (b) whose capacity has a time limit.

traffic advisory, or **TA** (for an ACAS): see subsection 11.21(1).

trip fuel means the amount of fuel required to enable an aeroplane to fly from any point along the route until landing at an aerodrome, including (as applicable):

- (a) fuel for take-off and climb from the departure aerodrome to initial cruising level or altitude, taking into account the expected departure routing; and
- (b) fuel for cruise from top of climb to top of descent, including any step climb or descent; and
- (c) fuel from top of descent to the point where the approach is initiated, taking into account the expected arrival procedure; and
- (d) fuel for executing an approach and landing.

TSO (short for Technical Standard Order of the FAA): see the CASR Dictionary.

unforeseen factors means factors that could have an influence on an aeroplane's fuel consumption to the planned destination aerodrome, including:

- (a) the aeroplane's deviation from the expected fuel consumption data for an aeroplane of that type; and
- (b) extended delays and deviations from planned routings or cruising levels.

VNAV means vertical navigation.

VOR means VHF omnidirectional radio range.

V_I means the take-off decision speed.

V_I (wet) means a reduced V_I, not below V_{MCG}, established for use on a wet or contaminated runway.

V₂ means the take-off safety speed which is the target speed to be attained at the 35 ft height following an engine failure after V_I.

Note: The 35 ft height is also known as reference zero, which is also the point at which the take-off distance ends.

V_{EF} means the take-off engine failure speed established by the certification basis for the aeroplane.

V_{MCG} has the meaning given by regulation 25.149 of the FARs, as in force from time to time.

- (2) See section 11.65 for the definitions in this instrument of words and phrases appearing in Division 13 of Chapter 11 (Transponders and surveillance equipment).
- (3) In this instrument, a reference to a class of airspace means the volumes of airspace of that class, as determined by CASA in or under the *Determination of Airspace and Controlled Aerodromes Etc. (Designated Airspace Handbook) Instrument*, as in force from time to time.

Note: The *Determination of Airspace and Controlled Aerodromes Etc. (Designated Airspace Handbook) Instrument* is a legislative instrument that is revised and reissued by CASA approximately every 6 months. Airspace details from the Determination in force at any particular time are also published by Airservices Australia in the Designated Airspace Handbook available free online at www.airservicesaustralia.com.

- (4) In this instrument, a reference to an Annex to the Chicago Convention is a reference to that Annex as in force from time to time.

1.05 References to AS/NZS standards, TSOs, ETSOs etc.

In this instrument, unless the contrary intention appears:

- (a) a reference to a particular AS/NZS standard is a reference to the particular joint Australian and New Zealand Standard, as in force or existing from time to time; and
- (b) a reference to a particular TSO is a reference to that TSO or a later version of that TSO; and
- (c) a reference to a particular ETSO is a reference to that ETSO or a later version of that ETSO.

Note 1: An example for paragraph (a) is the joint Australian and New Zealand Standard AS/NZS 1754:2004, *Child restraint systems for use in motor vehicles*.

Note 2: The first version of a TSO may have been issued with or without the notation “(0)” at the end (for example, citations of TSO-C129 and TSO-129(0) would refer to the same document. Thus, for first version TSOs, either form is an acceptable citation for the other.

Note 3: Later versions of a TSO are identified by an alphabetical letter (for example, a later version of TSO-C129 or TSO-C129(0) is TSO-C129a). Unless the contrary intention appears in a provision, a reference in this instrument to TSO-C129 or TSO-C129(0) means that version or a later version (in this case, TSO-C129a).

1.06 References in type design and certification documents—EDTO

A reference, in any of the following documents, to “ETOPS”:

- (a) a flight manual;
- (b) a type certificate data sheet or a supplement to the sheet;

(c) a CMP document;
is, for the purposes of this instrument, taken to be a reference to “extended diversion time operations” or “EDTO”.