

# IREX Exam Extract

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PART 91 MOS

PART 135 MOS

CASR PART 61

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**Extracts From  
CASR PART 91 MOS**



**Australian Government**  
**Civil Aviation Safety Authority**

**Part 91 (General Operating and Flight Rules) Manual of Standards 2020**

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## CHAPTER 2 PRESCRIPTIONS FOR CERTAIN DEFINITIONS IN THE CASR DICTIONARY

*Note* Relevant definitions to which these provisions refer were inserted in the CASR Dictionary by the *Civil Aviation Safety Amendment (Operations Definitions) Regulations 2019* (as amended).

### Division 2.1 Definition of *special VFR*

#### 2.01 Special VFR

- (1) This section is for paragraph (a) of the definition of *special VFR* in the CASR Dictionary.
- (2) For the definition of *special VFR*, the VFR in subsection (3) are prescribed.
- (3) To operate under the special VFR, the pilot in command must:
  - (a) be authorised by ATC; and
  - (b) operate by day; and
  - (c) conduct the flight clear of cloud; and (d) maintain flight visibility of at least:
    - (i) for an aeroplane — 1 600 m; and
    - (ii) for a rotorcraft — 800 m; and
  - (e) for a rotorcraft — ensure that the rotorcraft is operated at a speed that allows the pilot in command to see obstructions or other traffic in sufficient time to avoid a collision.

### Division 2.2 Definition of *specified aircraft performance category*

#### 2.02 Specified aircraft performance category

- (1) This section is for the definition of *specified aircraft performance category* in the CASR Dictionary.

*Note* Paragraph 91.320 (1) (a) requires an aircraft to “operate in the specified aircraft performance category” unless an approval under regulation 91.045 is held. The specific requirements for an IFR aircraft that determine whether the aircraft is being operated within the *specified aircraft performance category* are contained in section 14.09.
- (1A) In relation to an aircraft’s *specified aircraft performance category*, the aircraft performance categories, in order of lowest to highest, are H, A, B, C, D and E.
- (2) For an aeroplane with an IAS mentioned in an item of column 1 of Table 2.02 (2), the aircraft performance category is that mentioned in the same item of column 2.
- (3) The *specified aircraft performance category* for an aeroplane is the aircraft performance category determined under subsection (2).
- (4) The *specified aircraft performance category* for a helicopter is:
  - (a) aircraft performance category H; or
  - (b) during the conduct of an IAP that does not have category H minima — aircraft performance category A.
- (5) The *specified aircraft performance category* for a powered-lift aircraft is the aircraft performance category stated in the AFM.

**Table 2.02 (2) — Aircraft performance categories**

	<b>Column 1</b>	<b>Column 2</b>
<b>Item</b>	<b>Indicated airspeed (IAS) V<sub>AT</sub> (kts)</b>	<b>Aircraft performance category</b>
1	Not more than 90	A
2	91-120	B
3	121-140	C
4	141-165	D
5	166-210	E

**Division 2.3 Definition of *standard visual signal***

**2.03 Purpose**

For the definition of *standard visual signal* in the CASR Dictionary, this Division prescribes:

- (a) light, hand and ground signals; and
- (b) the requirements and circumstances for their display.

**2.04 Light or projectile signals to aircraft on an aerodrome or in flight**

- (1) Light (which includes projectile) signals to aircraft mentioned in an item of Table 2.04 (1), are prescribed standard visual signals.
- (2) For subsection (1), a light or projectile signal mentioned in an item of column 2 of the Table:
  - (a) for an aircraft in flight — has the meaning mentioned for it in column 3 of the item; and
  - (b) for an aircraft on the ground at an aerodrome — has the meaning mentioned for it in column 4 of the item.

**Table 2.04 (1) — Light signals to aircraft on an aerodrome or in flight**



	<b>Column 1</b>	<b>Column 2</b>	<b>Column 3</b>
<b>Item</b>	<b>Light or projectile signal</b>	<b>Meaning — in flight</b>	<b>Meaning — on the ground at an aerodrome</b>
1	Steady green	Authorised to land if pilot satisfied no collision risk exists	Authorised to take-off if pilot satisfied no collision risk exists
2	Steady red	Give way to other aircraft and continue circling	Stop
3	Green flashes	Return for landing	Authorised to taxi if pilot satisfied no collision risk exists


4	Red flashes	Aerodrome unsafe — do not land	Taxi clear of landing area in use
5	White flashes	No significance	Return to starting point on aerodrome
6	A series of projectiles discharged from the ground at intervals of 10 seconds, each showing, on bursting, red and green lights or stars	The aircraft is flying in, or about to enter, a restricted, prohibited or danger area, and the pilot in command of the aircraft must take such remedial action as may be necessary	No significance

## 2.05 Ground signals for aircraft at aerodromes

- (1) The ground signals for aircraft at aerodromes depicted in an item of Table 2.05 (1), are prescribed standard visual signals.
- (2) For subsection (1), a ground signal depicted in an item of column 1 of the Table:
  - (a) when in the form mentioned in column 2 of the item; and
  - (b) when displayed at location mentioned in column 3 of the item;
has the meaning mentioned for it in column 4 of the item.

**Table 2.05 (1) — Ground signals for aircraft at aerodromes**

	Column 1	Column 2	Column 3	Column 4
Item	Ground signal	Description	Where ground signal is displayed at an aerodrome (display location)	Meaning of ground signal
1		Horizontal white dumb-bell	Adjacent to an aerodrome wind direction indicator.	<ol style="list-style-type: none"> <li>1. Use only hard surface movement areas.</li> <li>2. Where there are sealed and gravel manoeuvring areas, use only the sealed surfaces.</li> <li>3. Where there are constructed gravel and natural surface manoeuvring areas, use only the gravel surfaces.</li> </ol> <p><i>Note</i> See also AIP-ERSA FAC for any local information relating to this particular ground signal.</p>
2		White cross	1. Adjacent to an aerodrome wind direction indicator.	1. The aerodrome is completely inoperative.
			2. On the manoeuvring area.	2. For an area signalled with a cross or crosses with the limit delineated by those ground signals — this area is unfit for use by aircraft.

3		White double cross	Adjacent to wind direction indicator.	Gliding operations are in progress.
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## 2.06 Hand signals for marshalling aircraft at aerodromes

The hand signals mentioned in the following documents are prescribed standard visual signals:

- (a) 5. *Marshalling Signals, 5.1 From a signalman to an aircraft*, as contained in Appendix 1 of ICAO Annex 2, Rules of the Air (excluding 5.1.1); and
- (b) 6. *Standard Emergency Hand Signals*, as contained in Appendix 1 of ICAO Annex 2, Rules of the Air.

*Note* For ICAO documents — see section 1.04.

## Division 2.4 Definition of *VMC criteria*

### 2.07 VMC criteria

- (1) This section is for paragraph (a) of the definition of *VMC criteria* in the CASR Dictionary.
- (2) *VMC criteria* means meteorological conditions expressed in terms of the flight visibility and distance from cloud (horizontal and vertical) prescribed in this section.
- (3) For Table 2.07 (3), for a type of aircraft mentioned in an item of column 1, in a Class of airspace mentioned in the same item of column 2, at a height mentioned in the same item of column 3, the VMC criteria are those mentioned in the same item in columns 4 and 5 respectively, and are subject to the operational requirements mentioned in the same item in column 6.

**Table 2.07 (3) — VMC criteria**

	Column 1	Column 2	Column 3	Column 4	Column 5	Column 6
Item	Type of aircraft	Class of airspace	Height	Flight visibility	Distance from cloud	Operational requirements
1	Aircraft	A, B, C, E or G	At or above 10 000 ft AMSL	8 000 m	1 500 m horizontal 1 000 ft vertical	
2	Aircraft	A, B, C, E or G	Below 10 000 ft AMSL	5 000 m	1 500 m horizontal 1 000 ft vertical	
2A	Aircraft	C	Below 10 000 ft AMSL	5 000 m	Clear of cloud	Operations must comply with conditions stated in subsection 2.07 (3A)
2B	Aircraft	Any class	Below 10 000 ft AMSL	5 000 m or less, but not less than 3 000 m. In all cases, only with a relevant CASA approval		Operations must comply with conditions stated in subsections 2.07 (3B) and (3C)

3	Aircraft	D	All heights	5 000 m	600 m horizontal 1 000 ft vertical above cloud 500 ft vertical below cloud	
4	Aircraft	G	At or below whichever is the higher of: (a) 3 000 ft AMSL; (b) 1 000 ft AGL	5 000 m	Clear of cloud	Aircraft must be operated in sight of ground or water
5	Rotorcraft	G	Below 700 ft over land. Below 700 ft over water <i>with</i> track guidance	800 m	Clear of cloud	Operations must comply with conditions stated in subsection
	<b>Column 1</b>	<b>Column 2</b>	<b>Column 3</b>	<b>Column 4</b>	<b>Column 5</b>	<b>Column 6</b>
<b>Item</b>	<b>Type of aircraft</b>	<b>Class of airspace</b>	<b>Height</b>	<b>Flight visibility</b>	<b>Distance from cloud</b>	<b>Operational requirements</b>
			from a navigation system			2.07 (4)
6	Rotorcraft	G	Below 700 ft over water <i>without</i> track guidance from a navigation system	5 000 m	600 m horizontal and 500 ft vertical	Operations must comply with conditions stated in subsection 2.07 (4)

*Note 1* Subject to ATC clearance, operation under the special VFR may be available within a control zone.

*Note 2* Refer to regulation 91.285 for restrictions on VFR flight in Class A airspace.

(3A) For item 2A in Table 2.07 (3), the conditions are that the flight must be an NVIS operation.

(3B) For item 2B in Table 2.07 (3), the conditions are that the flight must be:

- (a) an NVIS operation; and
- (b) conducted under Part 138 MOS by an aerial work operator; and
- (c) conducted by at least 2 NVIS crew members authorised (however described) to conduct an NVIS operation by:
  - (i) for an Australian aircraft — Part 61 of CASR; or
  - (ii) for a foreign-registered aircraft — the NAA of the State of registry of the aircraft; and
- (d) for a flight with visibility of 5 000 m — one for which the operator holds a CASA approval under regulation 91.045; and
- (e) for a flight with visibility of less than 5 000 m but not less than 3 000 m — one for which the operator holds a CASA approval under subsection (3C).

- (3C) For paragraph (3B) (e), CASA may approve a minimum in-flight visibility requirement of less than 5 000 m but not less 3 000 m for an NVIS operation in VMC for a particular class of airspace but only if:
  - (a) the operation is not NVIS firebombing, NVIS fire mapping, or NVIS incendiary dropping; and
  - (b) the operator's application includes a detailed risk assessment; and
  - (c) given the risks, approval (including subject to conditions if required) would not have an adverse effect on aviation safety.
- (4) For items 5 and 6 of Table 2.07 (3), the conditions are that the flight must be conducted:
  - (a) by day; and
  - (b) at a speed that allows the pilot in command to see obstructions or other traffic in sufficient time to avoid a collision; and
  - (c) if not more than 10 NM from an aerodrome with an IAP — in a way that ensures the flight maintains a separation of at least 500 ft vertically from any aircraft that is:
    - (i) less than 10 NM from the aerodrome; and
    - (ii) conducting an IFR operation.
- (4A) Subsection (1) does not apply to the pilot in command of a rotorcraft in an operation:
  - (a) to which Division 5 of Chapter 9 of the Part 138 MOS applies; and
  - (b) which is conducted using NVIS in accordance with Chapter 12 of the Part 138 MOS.

## Division 2.5 Definitions of specified cruising levels

### 2.08 Specified cruising levels

- (1) This Division is for the definition of the following expressions in the CASR Dictionary:
  - (a) *specified IFR cruising level* for a track; and (b) *specified VFR cruising level* for a track.
- (2) Sections 2.09 and 2.10 prescribe the *specified IFR cruising level* for an IFR flight on a track. (3) Sections 2.09 and 2.10 prescribe the *specified VFR cruising level* for a VFR flight on a track.

### 2.09 Specified cruising levels — at or north of 80° south

- (1) Specified cruising levels are those levels set out in Table 2.09 (1), including the effect of any applicable footnote.
- (2) Specified IFR cruising levels for operations at or north of 80° south are as set out in Table 2.09 (1), so that:
  - (a) for an aircraft track from 000° clockwise to 179°— a specified IFR cruising level is an altitude or a FL mentioned in column 1; and
  - (b) for an aircraft track from 180° clockwise to 359°— a specified IFR cruising level is an altitude or a FL mentioned in column 3.
- (3) Specified VFR cruising levels for operations at or north of 80° south are as set out in Table 2.09 (1), so that:
  - (a) for an aircraft track from 000° clockwise to 179°— a specified VFR cruising level is an altitude or a FL mentioned in column 2; and
  - (b) for an aircraft track from 180° clockwise to 359°— a specified VFR cruising level is an altitude or a FL mentioned in column 4.
- (4) For subsection (2) and (3) cruising levels must be selected by reference to the following:



- (a) when operating at or north of 60° south — aircraft magnetic track; (b) when operating south of 60° south — aircraft grid track.

**Table 2.09 (1) — Specified cruising levels for operations at or north of 80° south**

<b>Track 000° clockwise to 179°</b>		<b>Track 180° clockwise to 359°</b>	
<b>IFR Column 1</b>	<b>VFR Column 2</b>	<b>IFR Column 3</b>	<b>VFR Column 4</b>
—	1 500 ft	2 000 ft	2 500 ft
3 000 ft	3 500 ft	4 000 ft	4 500 ft
5 000 ft	5 500 ft	6 000 ft	6 500 ft
<b>Track 000° clockwise to 179°</b>		<b>Track 180° clockwise to 359°</b>	
<b>IFR Column 1</b>	<b>VFR Column 2</b>	<b>IFR Column 3</b>	<b>VFR Column 4</b>
7 000 ft	7 500 ft	8 000 ft	8 500 ft
9 000 ft	9 500 ft	10 000 ft	—
FL110 <sup>1</sup>	FL115 <sup>2</sup>	FL120 <sup>3</sup>	FL125 <sup>4</sup>
FL130	FL135	FL140	FL145
FL150	FL155	FL160	FL165
FL170	FL175	FL180	FL185
FL190	FL195	FL200	FL205
FL210	FL215	FL220	FL225
FL230	FL235	FL240	FL245
FL250		FL260	
FL270		FL280	
FL290		FL300	
FL310		FL320	
FL330		FL340	
FL350		FL360	
FL370		FL380	
FL390		FL400	
FL410		FL430	
FL450		FL470	
FL490		FL510	

FL530		FL550	
FL570		FL590	
1. FL110 is not useable when the local QNH is less than 1013 hPa. 2. FL115 is not useable when the local QNH is less than 997 hPa. 3. FL120 is not useable when the local QNH is less than 980 hPa. 4. FL125 is not useable when the local QNH is less than 963 hPa. <i>Note</i> Refer to section 11.02 for the rules relating to use of certain flight levels when QNH is less than 1013 hPa.			

## 2.10 Specified cruising levels — south of 80° south

- (1) Specified VFR cruising levels are those levels set out in Table 2.10 (1), including the effect of any footnotes.
- (2) Specified IFR cruising levels for operations south of 80° south are as set out in Table 2.10 (1), so that:
  - (a) for an aircraft track from 000° clockwise to 179° — a specified IFR cruising level is an altitude or a FL mentioned in column 1; and
  - (b) for an aircraft track from 180° clockwise to 359° — a specified IFR cruising level is an altitude or a FL mentioned in column 3.
- (3) Specified VFR cruising levels for operations south of 80° south are as set out in Table 2.10 (1), so that:
  - (a) for an aircraft track from 000° clockwise to 179° — a specified VFR cruising level is an altitude or a FL mentioned in column 2; and
  - (b) for an aircraft track from 180° clockwise to 359° — a specified VFR cruising level is an altitude or a FL mentioned in column 4.

**Table 2.10 (1) — Specified cruising levels for operations south of 80° south**

Track 000° clockwise to 179°		Track 180° clockwise to 359°	
IFR Column 1	VFR Column 2	IFR Column 3	VFR Column 4
—	1 500 ft	2 000 ft	2 500 ft
3 000 ft	3 500 ft	4 000 ft	4 500 ft
5 000 ft	5 500 ft	6 000 ft	6 500 ft
7 000 ft	7 500 ft	8 000 ft	8 500 ft
9 000 ft	9 500 ft	10 000 ft	—
FL110 <sup>1</sup>	FL115 <sup>2</sup>	FL120 <sup>3</sup>	FL125 <sup>4</sup>
FL130	FL135	FL140	FL145
FL150	FL155	FL160	FL165
FL170	FL175	FL180	FL185
FL190	FL195	FL200	FL205
FL210	FL215	FL220	FL225
FL230	FL235	FL240	FL245
FL250	FL255	FL260	FL265
FL270	FL275	FL280	FL285

FL290	FL300	FL310	FL320
FL330	FL340	FL350	FL360
FL370	FL380	FL390	FL400
FL410	FL420	FL430	FL440
FL450	FL460	FL470	FL480
<b>Track 000° clockwise to 179°</b>		<b>Track 180° clockwise to 359°</b>	
<b>IFR Column 1</b>	<b>VFR Column 2</b>	<b>IFR Column 3</b>	<b>VFR Column 4</b>
FL490	FL500	FL510	FL520
FL530	FL540	FL550	FL560
FL570	FL580	FL590	FL600
<ol style="list-style-type: none"> <li>1. FL110 is not useable when the local QNH is less than 1013 hPa.</li> <li>2. FL115 is not useable when the local QNH is less than 997 hPa.</li> <li>3. FL120 is not useable when the local QNH is less than 980 hPa.</li> <li>4. FL125 is not useable when the local QNH is less than 963 hPa.</li> </ol> <p><i>Note</i> Refer to section 11.02 for the rules relating to use of certain flight levels when QNH is less than 1013 hPa.</p>			

## CHAPTER 7 FLIGHT PREPARATION (WEATHER ASSESSMENTS)

### REQUIREMENTS

#### 7.01 Purpose

For subregulation 91.230 (1), this Chapter prescribes requirements relating to flight preparation and weather assessments (the *flight preparation (weather assessments) requirements*).

#### 7.02 Forecasts for flight planning

- (1) Subject to subsection (1A), before commencing a flight, the pilot in command must study:
  - (a) authorised weather forecasts and authorised weather reports for:
    - (i) the route to be flown; and
    - (ii) the departure aerodrome, the planned destination aerodrome and any planned alternate aerodrome; and

*Note* See also subsection 8.04 (3).
  - (b) any other reasonably available weather information that is relevant to the intended operation.
    - (1A) If the information mentioned in paragraph (1) (a) is studied more than 1 hour before commencing the flight, the pilot in command must obtain, and review, an update to that information before the flight begins.
- (2) For subparagraph (1) (a) (i), the authorised weather forecasts are as follows:
  - (a) 1 of the following:
    - (i) for an operation at or below 10 000 ft AMSL — a GAF or a GAMET area forecast;
    - (ii) for an operation above 10 000 ft AMSL — a SIGWX forecast;
    - (iii) for any operation — a flight forecast; (b) a wind and temperature forecast.
- (3) An authorised weather forecast used to satisfy the requirement under subparagraph (1) (a) (i) must cover the whole period of the flight for which it is to be used.
- (4) For subparagraph (1) (a) (ii), for an IFR flight to a planned destination aerodrome with an IAP that a pilot is able to conduct, the authorised weather forecasts for the planned destination aerodrome and any planned alternate aerodromes must be an aerodrome forecast or an ICAO landing forecast.
- (5) For subparagraph (1) (a) (ii), for an IFR flight to a planned destination aerodrome without an IAP, or with 1 or more IAPs none of which a pilot is able to conduct, the authorised weather forecasts must be the following:
  - (a) for the planned destination aerodrome — an aerodrome forecast, an ICAO landing forecast, or a GAF or a GAMET area forecast;
  - (b) for any planned alternate aerodrome — an aerodrome forecast or an ICAO landing forecast.
- (5A) However, subsections (4) and (5) do not apply if the IFR flight is a Part 121 operation.
- (6) An authorised weather forecast used to satisfy the requirement under subparagraph (1) (a) (ii) must be valid for at least 30 minutes before, and 60 minutes after, the planned ETA.

### **7.03 Flights unable to obtain an authorised weather forecast before departure**

- (1) Despite subsection 7.02 (1), an aircraft may commence a flight if:
  - (a) an authorised weather forecast or an authorised weather report for the flight is not available; and
  - (b) the pilot in command reasonably considers that the weather conditions at the departure aerodrome will permit the aircraft to return and land safely at the departure aerodrome within 1 hour after take-off.
- (2) The pilot in command of a flight mentioned in subsection (1) (other than a flight that is a Part 121 operation) must return to the departure aerodrome if:
  - (a) the authorised weather forecast required for the planned destination aerodrome is not obtained within 30 minutes after take-off; and
  - (b) the pilot in command has not nominated a destination alternate aerodrome if required to do so by subsection 8.04 (3).
- (3) The pilot in command of a flight that is a Part 121 operation must return to the departure aerodrome if the authorised weather forecasts required to satisfy the requirements under regulation 121.170 of CASR (Flight preparation (Part 121 alternate aerodromes) requirements) are not obtained within 30 minutes after take-off.

## CHAPTER 8 FLIGHT PREPARATION (ALTERNATE AERODROMES)

### REQUIREMENTS

#### Division 8.1 Purpose and definitions

##### 8.01 Purpose

For subregulation 91.235 (1), this Chapter prescribes requirements relating to flight preparation and alternate aerodromes (the *flight preparation (alternate aerodrome) requirements*).

##### 8.02 Definition of *relevant weather conditions*

- (1) Subject to subsection (2), in this Chapter: *relevant weather conditions* means the following weather conditions:
- (a) for cloud — more than SCT below the alternate minima;  
*Note* For alternate minima see section 8.08. (b)  
for visibility — either:
    - (i) less than the alternate minima; or
    - (ii) equal to or more than the alternate minima but with a forecast of at least a 30% probability of fog, mist, dust or any other phenomenon restricting visibility below the alternate minima;
  - (c) for wind — a headwind, crosswind or downwind component more than the maximum for the aircraft;
  - (d) a thunderstorm or associated severe turbulence, or a forecast of at least a 30% probability of such an event.
- (2) If flight planning for a flight is based on 1 of the following:
- (a) a TAF3, where the ETA of the flight is within the first 3 hours of the TAF3 validity period (but not if that ETA falls outside the end time (if any) specified for the TAF3 service); (b) an ICAO landing forecast;
- then the definition in subsection (1) may be read as if there were no mention of probabilities in subparagraph (1) (b) (ii) and paragraph (1) (d).

##### 8.03 Definition of *relevant IAP*

- (1) In this Chapter:
- relevant IAP* for an aerodrome outside Australian territory is the IAP that the pilot in command of an aircraft determines has the second lowest minimum altitude of the IAPs that the aircraft is able to conduct at the aerodrome (*conductible IAPs*).
- (2) For subsection (1), in determining which conductible IAP has the second lowest minimum altitude, the pilot in command must comply with the following constraints:
- (a) the conductible IAPs that may be considered in determining the IAP with the lowest, and hence the second lowest, minimum altitudes must not both require use of the same radio navigation aid;  
*Note* *Radio navigation aid* is a defined term in the CASR Dictionary. An example of this mandatory constraint is an aerodrome that has the following IAPs to a specific runway (from lowest to highest minimum altitude): an ILS with CAT I and CAT II minima that both require the use of a non-associated DME; a VOR that uses the same DME as the ILS; a GNSS with LNAV minima; and an NDB. The CAT II minima cannot be used and, therefore, cannot be the lowest

minimum altitude and VOR could not be considered to have the second lowest minimum altitude as it shares a required radio navigation aid with the ILS (namely, the same DME).

- (b) CAT II and CAT III minimum altitudes must not be used in determining altitudes for the relevant IAP.

## **Division 8.2 Destination alternate aerodromes**

### **8.04 Destination alternate aerodromes — weather**

- (1) Subject to subsection (2), the pilot in command of an aircraft must nominate a destination alternate aerodrome if the ETA at the planned destination aerodrome is during the period that:
  - (a) begins 30 minutes before the forecast commencement of relevant weather conditions at the planned destination aerodrome; and
  - (b) ends 30 minutes after the forecast ending of relevant weather conditions.

*Note* For relevant weather conditions, see section 8.02.
- (2) If:
  - (a) flight planning is based on a TAF3; and
  - (b) the ETA at the planned destination aerodrome:
    - (i) is within the first 3 hours of the TAF3 validity; and
    - (ii) does not fall outside the end time (if any) specified for the TAF3 service;then the pilot in command of an aircraft must nominate a destination alternate aerodrome if the ETA is during the period that:
    - (c) begins at the forecast commencement of relevant weather conditions at the planned destination aerodrome; and
    - (d) ends at the forecast ending of the relevant weather conditions.
- (3) If the forecast for the planned destination aerodrome required by subparagraph 7.02 (1) (a) (ii) is not available then the pilot in command of an aircraft must nominate a destination alternate aerodrome.
- (4) Subsections (1) and (2) do not apply if the pilot in command is operating an aircraft under the VFR by day within 50 NM of the departure aerodrome.
- (5) Subsections (1) and (2) do not apply if:
  - (a) relevant weather conditions exist; and
  - (b) the pilot in command ensures that sufficient fuel is carried to permit the aircraft to hold at the planned destination aerodrome until the end of the period mentioned in subsection (1) or (2), as the case requires.
- (6) Subsections (1) and (2) do not apply if:
  - (a) relevant weather conditions are forecast to occur on an intermittent or temporary basis; and
  - (b) the pilot in command ensures that sufficient fuel is carried to permit the aircraft to hold for:
    - (i) 30 minutes — when the forecast is based on a change indicator of INTER;
    - or (ii) 60 minutes — when the forecast is based on a change indicator of TEMPO.

- (7) For subsection (6), if a forecast contains multiple change indicators of INTER or TEMPO, the fuel for holding that is required under paragraph (6) (b) must be that for the most limiting requirement.
- (8) For subsections (1) and (2), if a forecast includes the change indicator BECMG:
  - (a) where the weather conditions within the BECMG element of the forecast represent a deterioration in any of the weather elements within the preceding element of the forecast — the change indication is to be applied from the start of the forecast BECMG period; and
  - (b) where the weather conditions within the BECMG element of the forecast represent an improvement in all of the weather elements within the preceding elements of the forecast — the change indication is to be applied from the end of the forecast BECMG period.

### **8.05 Destination alternate aerodromes — navigation**

- (1) The pilot in command of an aircraft must nominate a destination alternate aerodrome if a flight is an IFR flight by night to a planned destination aerodrome that is:
  - (a) not served by an IAP; or
  - (b) is served by 1 or more IAPs none of which the pilot in command is able to conduct.
- (2) For a VFR flight by night, the pilot in command must nominate a destination alternate aerodrome that is within 1 hour's flight time of the planned destination aerodrome:
  - (a) unless:
    - (i) the planned destination aerodrome is served by a ground-based radio navigation aid; and
    - (ii) the aircraft is fitted with the appropriate radio navigation system capable of using the aid; and
    - (iii) the pilot in command is competent in using the aid; or (b) unless:
      - (i) the aircraft is fitted with an approved GNSS; and
      - (ii) the pilot in command is competent in using the GNSS.
- (3) If aircraft navigation is to be conducted using a GNSS receiver certified only to (E)TSO C-129, navigation to a destination alternate aerodrome must be planned using a navigation system other than GNSS.

### **8.06 Destination alternate aerodromes — aerodrome lighting**

- (1) If a flight is planned to land at night at an aerodrome that only has portable runway lighting, the pilot in command of an aircraft must nominate a destination alternate aerodrome unless reliable arrangements have been made for a qualified and responsible person to:
  - (a) attend the aerodrome during the period beginning at least 30 minutes before the ETA, and ending on completion of the aircraft's landing and taxiing (the *landing period*); and
  - (b) display the portable lighting.



- (2) If a flight is planned to land at night at an aerodrome with electric runway lighting, but without standby power, the pilot in command must nominate a destination alternate aerodrome unless:
  - (a) portable runway lights are available; and
  - (b) reliable arrangements have been made for a qualified and responsible person to:
    - (i) attend the aerodrome during the landing period; and
    - (ii) display the portable lighting in the event of a failure of the electric runway lighting.
- (3) If a flight is planned to land at night at an aerodrome with PAL, the pilot in command must nominate a destination alternate aerodrome unless reliable arrangements have been made for a qualified and responsible person to:
  - (a) attend the aerodrome during the landing period; and
  - (b) manually switch on the runway lighting in the event of a failure of the PAL.
- (4) The pilot in command of an aircraft fitted with a single VHF radiocommunication system may only nominate an aerodrome with PAL as a destination alternate aerodrome if:
  - (a) reliable arrangements have been made for a qualified and responsible person to be in attendance to manually switch on the aerodrome lighting; and (b) the aircraft has:
    - (i) a HF radiocommunication system; and
    - (ii) 30 minutes of holding fuel.

*Note* There is no requirement for a responsible person to be in attendance on the ground. The requirement for holding fuel will allow ground staff to be alerted in the event of a failure of the aircraft's VHF radiocommunication system.

- (5) Subsections (1) to (4) do not apply if the pilot in command ensures that sufficient fuel is carried to permit the aircraft to hold until first-light plus 10 minutes.
- (6) A destination alternate aerodrome nominated in accordance with subsection (2) or (3) is not required to have standby power or portable runway lighting.
- (7) In this section:
 

***qualified***, for a responsible person, means a person who is instructed in, and is competent to display, the standard runway lighting with portable lights.

### **8.07 Destination alternate aerodromes — restrictions**

The pilot in command of an aircraft may nominate an aerodrome as a destination alternate aerodrome only if the aerodrome is:

- (a) suitable as a planned destination aerodrome for the flight; and
- (b) not itself an aerodrome for which the aircraft would require a destination alternate aerodrome; and (c) not a helideck.

### **8.08 Alternate minima — Australian aerodromes**

(1) For Table 8.08 (1), for a type of aircraft mentioned in an item of column 1, conducting the type of operation mentioned in the same item of column 2, the alternate minima for an aerodrome in Australian territory are those mentioned in the same item of column 3 (for altitude) and column 4 (for visibility), subject to any conditions mentioned in the same item of column 5.

**Table 8.08 (1) Alternate minima at Australian aerodromes**

	Column 1	Column 2	Column 3	Column 4	Column 5
Item	Type of aircraft	Type of operation	Altitude	Visibility	Conditions
1	Aeroplane or rotorcraft	IFR to aerodrome with an IAP the pilot is able to conduct	The alternate minima published on the instrument approach chart	The alternate minima published on the instrument approach chart	
2	Aeroplane or rotorcraft	(a) Day IFR to an aerodrome not served by an IAP; or (b) Day IFR to an aerodrome served by 1 or more IAPs none of which the pilot is able to conduct	LSALT for the final route segment plus 500 ft	8 km	<i>Note</i> See subsection 8.05 (1) for night IFR requirements
3	Aeroplane	Day VFR and night VFR	1 500 ft	8 km	
4	Rotorcraft	Day VFR	1 000 ft	3 km	Only for aerodromes in Class G airspace
		Day VFR and night VFR	1 500 ft	8 km	Only for aerodromes in airspace other than Class G airspace
		Night VFR	1 500 ft	8 km	

(2) Subject to subsection (3), special alternate minima are only available for operations by aircraft with the following:

- (a) at least 2 localiser and glideslope receiving systems;
- (b) at least 2 VOR receiving systems;
- (c) at least 1 of the following combinations of distance measuring systems: (i) 2 DME systems;
- (ii) 2 GNSS;

- (iii) 1 DME system and 1 GNSS.
- (3) Special alternate minima must not be used in any of the following circumstances: (a)  
when an aerodrome control service is not provided;

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- (b) when an authorised weather forecast or authorised weather report is not available for the aerodrome;
- (c) when ground equipment associated with the approach aid has been continuously unserviceable for more than 7 days and continues to be unserviceable.

*Note* In the circumstance mentioned in paragraph (c), the non-availability of special alternate minima will be published in NOTAM.

## CHAPTER 9 FLIGHT NOTIFICATIONS

### 9.01 Purpose

For subregulation 91.240 (1), this Chapter prescribes requirements relating to flight notifications (*flight notification requirements*).

*Note* Different requirements in this Chapter apply either before a flight, during a flight, or after a flight.

### 9.02 Flight notification requirements

- (1) If a flight is 1 of the following:
  - (a) an IFR flight;
  - (b) a VFR flight in Class C or Class D airspace; then the pilot in command must submit a flight plan in accordance with procedures published in the authorised aeronautical information.
- (2) If a VFR flight is 1 of the following:
  - (a) a flight conducting an air transport operation;
  - (b) a flight over water that is conducted beyond a distance from land greater than that which would allow the aircraft to reach land with an engine inoperative;
  - (c) a flight in a designated remote area;
  - (d) a flight at night proceeding beyond 120 NM from the aerodrome of departure; then the pilot in command must ensure that, in accordance with procedures published in authorised aeronautical information, 1 of the following has occurred:
    - (e) the submission of a flight plan;
    - (f) the nomination of a SARTIME for arrival;
    - (g) the leaving of a flight note with a responsible person.
- (3) If a VFR flight is a community service flight, the pilot in command must submit a flight plan or nominate a SARTIME for arrival in accordance with procedures published in authorised aeronautical information.

*Note* See section 9.05 for *responsible person*.

*Note* The fact that a flight is not one mentioned in subsection (1), (2) or (3), does not prevent the pilot in command from submitting a flight plan, nominating a SARTIME, or leaving a flight note with a responsible person. However, if a flight plan is submitted, a SARTIME is nominated or a flight note is left with a responsible person, sections 9.03, 9.04 and 9.05 apply.

### 9.03 Changes to flight plans and SARTIME nominations

- (1) The pilot in command of an aircraft for a flight where a flight plan has been submitted must ensure that ATS is notified of changes in any of the following:
  - (a) the aircraft callsign or registration;
  - (b) the flight rules under which the flight will be operating;
  - (c) serviceability of the equipment that, as stated in the flight plan, is carried on board;
  - (d) the planned departure time (but only if changed by more than 30 minutes);
  - (e) the route, landing points and destination alternate aerodromes;
  - (f) the cruising level;

- (g) the cruising speed;
- (h) the number of POB (except for a flight that is an Australian air transportoperation).

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- (2) The pilot in command of an aircraft for a flight where a SARTIME has been nominated must ensure that ATS is notified of changes in any of the following: (a) the aircraft callsign or registration;
- (b) the planned departure time (but only if changed by more than 30 minutes);
  - (c) the route, landing points and destination alternate aerodromes; (d) the SARTIME.

#### **9.04 Cancelling SARTIME**

The pilot in command of an aircraft for a flight where a SARTIME has been nominated must ensure that the SARTIME is cancelled not later than the time nominated.

#### **9.05 Responsible persons for receipt of a flight note**

- (1) In this Chapter, a responsible person for the receipt of a flight note must meet the requirements mentioned in subsection (2).
- (2) For subsection (1), the responsible person must:
- (a) be over the age of 18 years; and
  - (b) have access to at least 2 operative and appropriate means of communicating with a search and rescue service; and
- Note* For example, 2 telephones or a telephone and a radio transmitter etc. (c) satisfy the pilot in command that the person:
- (i) knows how to contact JRCC Australia; and
  - (ii) will immediately do so in the event that the pilot in command's flight is overdue.

## **CHAPTER 10 MATTERS TO BE CHECKED BEFORE TAKE-OFF**

### **10.01 Purpose**

For subregulation 91.245 (1), this Chapter prescribes the checks to be carried out before take-off.

### **10.02 Matters to be checked before take-off**

The prescribed checks are the following:

- (a) a check to confirm that each aerodrome, air route and airway facility that the pilot plans to use for the flight will be available for use; (b) a check of the following:
  - (i) all Head Office and FIR NOTAMs applicable to the en route phase of the flight;
  - (ii) all location-specific NOTAMs for relevant aerodromes;
- (c) a check to confirm the availability of GNSS integrity if required by section 11.03 or 14.06;
- (d) a check to confirm that:
  - (i) all equipment required to be fitted to, or carried on, the aircraft by or under the civil aviation legislation is available and functioning properly; and
  - (ii) emergency and survival equipment carried on the aircraft is readily accessible;
- (e) a check to confirm that each crew member is fit to perform the crew member's duties;
- (f) a check to confirm that:
  - (i) the aircraft's hatches, access ports, panels and fuel tank caps are secured; and
  - (ii) the control locks, covers and ground safety devices and restraints have been removed;
- (g) if the aircraft is an Australian aircraft — a check to confirm that there is either:
  - (i) a certificate of release to service for the most recent maintenance carried out on the aircraft; or
  - (ii) a maintenance release for the aircraft;
- (h) a check to confirm that the aircraft's flight controls have been tested and are functioning correctly;
- (i) for each system fitted to the aircraft for measuring and displaying pressure altitude, a check of the system's accuracy in accordance with the procedures mentioned in this Chapter;
- (j) if an amount of supplemental oxygen or protective breathing equipment is required by or under the civil aviation legislation to be carried on the aircraft for a flight crew member for the flight — checks to ensure the following (as the case requires):
  - (i) that the required amount of supplemental oxygen is available;
  - (ii) that the protective breathing equipment is operative;
  - (iii) that the oxygen mask is connected to the supply terminal;
  - (iv) that each communication system associated with the oxygen mask is operative;

- (v) if the oxygen mask is adjustable — that the mask fits the flight crew member correctly.

### 10.03 Checking systems for measuring and displaying pressure altitude — general

- (1) For paragraph 10.02 (i), this section sets out the requirements for checking aircraft systems for measuring and displaying pressure altitude (*pressure altitude systems*).
- (2) If:
  - (a) an aircraft is at a known elevation (the *site elevation*); and
  - (b) an accurate QNH is available;

then, before take-off, the pilot in command of the aircraft must check the accuracy of each of the aircraft's pressure altitude systems in accordance with this section.

*Note* For accurate QNH and site elevation — see section 10.06.

### 10.04 Checking pressure altitude systems — IFR flight

- (1) The pilot in command of an IFR flight must consider any pressure altitude system with an error in excess of  $\pm 75$  ft to be inoperative for the flight.
- (2) If 2 pressure altitude systems are required for the category of operation, then:
  - (a) at least 1 system (the *first system*) must read the site elevation to within 60 ft; and
  - (b) if the other system (the *second system*) has an error between 60 ft and 75 ft — the pilot in command may conduct a flight to the first point of landing where the accuracy of the second system can be rechecked; and
  - (c) if, on rechecking, the second system shows an error in excess of 60 ft — the pilot in command must consider the second system to be inoperative for further IFR flight.
- (3) If 1 pressure altitude system is required for the category of operation, but 2 are fitted, then:
  - (a) the pilot in command is permitted to conduct a flight if at least 1 system (the *first system*) reads the site elevation to within 60 ft; and
  - (b) if the other system (the *second system*) has an error in excess of 75 ft — the pilot in command must consider the second system to be inoperative for further IFR flight.
- (4) If 1 pressure altitude system is required for the category of operation, and 1 is fitted, then:
  - (a) if the system has an error between 60 ft and 75 ft — the pilot in command is permitted to conduct a flight to the first point of landing where the accuracy of the system can be rechecked; and
  - (b) if, on rechecking, the system shows an error in excess of 60 ft — the pilot in command must consider the system to be inoperative for further IFR flight.

### 10.05 Checking pressure altitude systems — VFR flight

- (1) A pressure altitude system with an accurate QNH is operative for a VFR flight only if the system reads site elevation to within:
  - (a) 100 ft; or



- (b) at test sites above 3 300 ft — 110 ft.
- (2) If an aircraft that is fitted with 2 pressure altitude systems continues to conduct a flight under the VFR with 1 of the systems erroneously reading more than 100 ft (or 110 ft  
  
10 Matters to be Checked before Take-off  
  
as the case may be), the pilot in command must consider the erroneous system to be inoperative for further VFR flight.
- (3) For an aeroplane operation conducted under the VFR involving flight above FL 200, the pressure altitude system used must be checked against the accuracy requirements for such system usage under the IFR.

### **10.06 Accurate QNH and site elevation**

- (1) In this Chapter, a QNH is to be considered accurate only if it is provided by 1 of the following:
  - (a) AAIS;
  - (b) ATC;
  - (c) ATIS;
  - (d) AWIS;
  - (e) CA/GRS; (f) WATIR.
- (2) QNH contained in an authorised weather forecast must not be used for checking the accuracy of a pressure altitude system.
- (3) Site elevation must be derived from aerodrome survey data that is:
  - (a) authorised in writing (as the case requires):
    - (i) by CASA; or
    - (ii) by an NAA; or
  - (b) supplied in writing by the relevant aerodrome operator.



## CHAPTER 11 AIR TRAFFIC SERVICES — PRESCRIBED REQUIREMENTS

### Division 11.1 Use of a class of airspace

#### 11.01 Purpose and definition

- (1) For subregulation 91.255 (1), this Division prescribes requirements in relation to the use by an aircraft of a class of airspace or a portion of a class of airspace.
- (2) In this Division: *oceanic airspace* means:
  - (a) for any airspace within an Australian FIR — the airspace within the lateral boundaries of an oceanic control area described in the AIP; or (b) for any airspace not within an Australian FIR — the airspace:
    - (i) described by the relevant NAA as an oceanic control area; or
    - (ii) if subparagraph (i) does not apply — within an area, predominantly over an ocean or sea, where aircraft are unlikely to maintain VHF radiocommunications with an air traffic service.

*Note* The effect of subsection (2) is that the vertical limits of an oceanic control area have no relevance to the definition of *oceanic airspace* within an Australian FIR. At the commencement of this instrument, the AIP document describing the geographic boundaries of oceanic control areas is the Designated Airspace Handbook.

#### 11.02 Transition altitude, transition layer and transition level

- (1) This section applies to a flight using any class of airspace, whether controlled or uncontrolled, that is within an Australian FIR.
- (2) The transition altitude is 10 000 ft.
- (3) The transition level is as set out in Table 11.02 (3), so that for an area QNH mentioned in an item of column 1, the transition level is that mentioned in the same item of column 2.

**Table 11.02 (3) — Transition level**

	<b>Column 1</b>	<b>Column 2</b>
<b>Item</b>	<b>Area QNH</b>	<b>Transition level</b>
1	Equal to, or greater than, 1 013.2 hPa	FL 110
2	At least 997 hPa but less than 1 013.2 hPa	FL 115
3	At least 980 hPa but less than 997 hPa	FL 120
4	At least 963 hPa but less than 980 hPa	FL 125
5	Less than 963 hPa	FL 130

*Note* The intention is to retain a minimum buffer of 1 000 ft above the transition altitude.

- (4) The pilot in command must not cruise within the transition layer.
- (5) For an operation at or below the transition altitude, the pilot in command must use the following altimeter setting:

(a) the current local QNH (either an accurate QNH as defined in section 10.06 or a forecast QNH) of a station along the route within 100 NM of the aircraft; or (b) if the current local QNH is not known — the current area forecast QNH.

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- (6) For an operation above the transition altitude, the pilot in command must use an altimeter setting of 1 013.2 hPa.
- (7) On climb, the pilot in command must change between QNH and 1 013.2 hPa after passing 10 000 ft and before levelling off.
- (8) On descent, the pilot in command must change between 1 013.2 hPa and the QNH before entering the transition layer.

### **11.04 Loss of GNSS integrity**

- (1) This section applies to a flight in any class of airspace, whether controlled or uncontrolled:
  - (a) that is within an Australian FIR; and (b) for which the flight is:
    - (i) required to maintain regular contact with an ATS; or (ii) being provided with a separation service by an ATS.

*Note* Regulation 91.630 requires certain flights to make regular reports or broadcasts to an ATS. Regulation 91.635 requires certain flights to continuously monitor the primary communications medium used by ATC in controlled airspace.

- (2) The pilot in command of an aircraft must advise ATS if any of the following occurs:
  - (a) during an en route phase of flight — there is RAIM loss or loss of GNSS integrity for more than 5 minutes;
  - (b) during a terminal phase of flight — there is RAIM loss or loss of GNSS integrity;
  - (c) when ATS requests the provision of GNSS-derived information — RAIM or GNSS integrity is not available;
  - (d) when ATS grants a clearance or imposes a requirement based on GNSS-derived information — RAIM or GNSS integrity is not available;
  - (e) the GNSS receiver is in dead-reckoning mode, or experiences loss of its navigation function, for more than 1 minute.
- (3) If a pilot has notified ATS of a RAIM loss or loss of GNSS integrity in accordance with subsection (2), the pilot must notify ATS when RAIM or GNSS integrity is restored.

### 11.05 Use and supply of distance information

- (1) This section applies to a flight using any class of airspace, whether controlled or uncontrolled, that is within an Australian FIR.
- (2) When supplying distance information requested by the ATS, the pilot in command must be satisfied that ATS is aware of the source and the point of reference of the distance measurement.

*Note* Here are examples of source and the point of reference: 115 GNSS ML VOR, 80 GNSS CTM NDB, 267 GNSS BEEZA 86 DME BN.

- (3) When supplying GNSS-derived distance information, the pilot in command must ensure that the information is obtained:
  - (a) from an approved GNSS; and
  - (b) by reference to data from a valid database.

### 11.06 ACAS resolution advisory

In any class of airspace, whether controlled or uncontrolled, in the event of an ACAS resolution advisory (an **RA**), the pilot in command of an aircraft must:

- (a) respond immediately by following the RA as indicated, unless doing so would jeopardize the safety of the aircraft; and
- (b) follow the RA even if there is a conflict between the RA and an ATC instruction to manoeuvre; and
- (c) limit the alterations of the flight path to the minimum extent necessary to comply with the RA; and
- (d) promptly return to the last assigned level when the conflict is resolved; and (e) notify ATC when returning to the last assigned level.

*Note* When this section is complied with, an RA satisfies the requirements of subregulation 91.257 (2) that is, it is a defence to the offence of failing to comply with an ATC clearance or instruction.

### 11.07 RVSM airspace

- (1) This section applies to a pilot in command of an aircraft conducting a flight in a class of airspace that is RVSM airspace.



- (2) The pilot in command must conduct the flight in accordance with procedures published in the authorised aeronautical information.
- (3) When changing levels in RVSM airspace in an Australian FIR, the pilot in command must ensure that the aircraft does not overshoot or undershoot its cleared FL by more than 150 ft.
- (4) If the cleared FL cannot be maintained, the pilot in command must: (a) inform ATC as soon as possible of the circumstances; and (b) either:
  - (i) obtain a revised ATC clearance (a *revised clearance*) before initiating any deviation from the cleared route or FL (the *deviation*); or
  - (ii) if a revised clearance cannot be obtained before the deviation, obtain a revised clearance as soon as possible after the deviation.
- (5) If it is not possible to obtain a revised clearance for an operation within RVSM airspace in an oceanic control area in an Australian FIR, the pilot in command may initiate a temporary lateral offset procedure with the intention of returning to the cleared route as soon as possible.

#### 11.09 Performance-based communication and surveillance requirements

- (1) This section applies to a flight of an aircraft within any class of airspace, whether it is controlled or uncontrolled, that involves:
  - (a) the conduct of datalink operations using FANS 1/A; and
  - (b) the declaration of RCP or RSP capabilities for the aircraft on the flight plan for the flight.

- (1A) In this section:

*automatic dependent surveillance – contract*, or *ADS-C*, means a contract between ATC and an aircraft's system:

- (a) for the reporting of aircraft position and other data via a datalink; and (b) which specifies:

- (i) under what conditions ADS-C reports are to be initiated; and (ii)

what data is to be contained in the reports.

*communication services provider*, or *CSP*, means any public or private entity which, under a contract or agreement, provides communication services for general air traffic which may include services provided by a satellite service provider (*SSP*) or services provided by the CSP in its own capacity as an SSP.

*controller-pilot datalink communications*, or *CPDLC*, is the means of communication between ATC and a pilot, using datalink for ATC communications.

*datalink operations* means aircraft operations using FANS 1/A avionics.

*FANS 1/A*, which is taken to include *FANS 1/A+*, is a direct datalink communication between the pilot of an aircraft and ATC via FANS 1/A avionics and FANS 1/A ground end systems, based on EUROCAE ED-100A/RTCA DO-258A, or a later version, as in force from time to time.

**performance-based communication**, or **PBC**, means communication based on performance specifications applied to the provision of air traffic services.

**performance-based communications and surveillance**, or **PBCS**, means the application of required communication performance (**RCP**) and required surveillance performance (**RSP**) specifications to ensure appropriate performance levels for relevant air traffic management operations.

**performance-based surveillance**, or **PBS**, means surveillance based on performance specifications applied to the provision of air traffic services.

**RCP 240** is the value for the communication expiry time (namely, 240 seconds) after which the initiator of the communication is required to revert to an alternative procedure.

*Note* In the context of RCP, the initiator is normally an air traffic controller.

**RCP allocation** is a portion of an RCP parameter, and is a time value assigned to a specific component of the communication system used for transferring messages between aircraft and ATC.

**RCP parameters** are performance characteristics that:

- (a) provide the basis for developing an RCP specification; and
- (b) include RCP transaction time, RCP continuity, RCP availability and RCP integrity.

**RCP pilot operational response time**, or **RCP PORT**, is an RCP allocation that specifies the maximum time for a flight crew member to recognise and respond to an ATC instruction.

**required communication performance**, or **RCP specification**, means the requirements needed to support PBC, being requirements for the following:

- (a) ATC and associated ground equipment;
- (b) the communication service provider;
- (c) aircraft equipment;
- (d) flight crew members.

**required surveillance performance (RSP) specification** means the requirements needed to support PBS, being requirements for the following:

- (a) ATC and associated ground equipment;
- (b) the communication service provider;
- (c) aircraft equipment.

**RSP 180** is the value for the surveillance data delivery time (namely, 180 seconds) at which the surveillance data delivery is considered overdue.

*Note* RSP 180 means that 99.9% of surveillance data must be delivered in less than 180 seconds.

**RSP allocation** is a portion of an RSP parameter and is a time value assigned to a specific component of the communication system used for transferring surveillance reports from aircraft to ATC.

**RSP parameters** are performance characteristics that:

- (a) provide the basis for developing an RSP specification; and
- (b) include RSP data delivery time, RSP continuity, RSP availability and RSP integrity.

**satellite service provider**, or **SSP**, means an entity, or group of entities, that provides the portion of the communication system that involves the operation of 1 or more satellites.



*Flight plan declaration of capability*

- (2) Before declaring RCP 240 or RSP 180 capabilities on a flight plan, the pilot in command of the aircraft must:
- (a) check with the operator of the aircraft whether the operator has received advice from Airservices Australia that the relevant aircraft has consistently not met the operational criteria of RCP 240 and RSP 180 specifications; and
  - (b) if such advice has been received — be reasonably satisfied that the operator of the aircraft has ensured that the aircraft consistently meets the operational criteria of the specifications.

*Note* Airservices Australia monitors datalink communications in Australian-administered airspace and advises when operational criteria of RCP 240 and RSP 180 specifications are consistently not met.

- (3) A declaration must not be made on a flight plan, submitted to ATS for a flight, that the aircraft has RCP capability or RSP capability unless:

- (a) the declaration relates solely to RCP 240 or RSP 180 capabilities; and
- (b) the requirements of subsections (4) to (7) are complied with at the time of the declaration.

*Note* It is ultimately a matter for the relevant aviation authority to be satisfied that an aircraft operator's declaration is, in actual fact, valid for the relevant aircraft at the time of any declaration, audit or inspection. A false declaration would constitute an offence under regulation 11.255 of the *Civil Aviation Safety Regulations 1998* and could result in other legal consequences under the *Civil Aviation Act 1988*.

*Equipment*

- (4) The aircraft must:
- (a) be equipped with avionics supporting ADS-C and CPDLC applications over FANS 1/A (the **equipment**); and
  - (b) the equipment must be operative for the flight.

*Aircraft documentation*

- (5) Subject to subsection (6), 1 of the following documents:
- (a) the AFM;
  - (b) an original equipment manufacturer service letter;
  - (c) any other document from the entity responsible for the design approval of the aircraft datalink communications equipment;
- must include a statement of compliance (an **SOC**) indicating that:
- (d) the aircraft system is approved for datalink communications using FANS 1/A avionics; and
  - (e) the aircraft datalink system meets the aircraft-allocated requirements of the RCP 240 and RSP 180 specifications.
- (6) If a document mentioned in paragraph (5) (a), (b) or (c) does not include an SOC, the following may act as a temporary substitute pending the formal issue of the SOC, provided there has been no indication of non-compliance given by the State of Design — a copy of the aircraft operator's written and dated request to the appropriate design authority for an SOC which indicates the matters mentioned in paragraphs (5) (d) and (e).

*Note* Allocation requirements for RCP 240 and RSP 180 specifications are as defined in ICAO Doc 9869, *Performance-based Communications and Surveillance (PBCS) Manual*.

*Communication service provider agreement*

- (7) Subject to subsection (8), the pilot in command must be reasonably satisfied that an agreement, or a relevant request under subsection (8), is in place between the aircraft operator and the CSP that includes the following terms and conditions: (a) that there is adequate subnetwork coverage in the route flown;
- (b) that there is to be notification of coverage and performance failures;
  - (c) that there is to be recording of datalink messages for 30 days;
  - (d) that datalink messages mentioned in paragraph (c) will be available on written request by:
    - (i) CASA; or
    - (ii) the national aviation authority responsible for the regulation of flight plans to whom the declaration of an RCP or RSP capability on the flight plan is made;
  - (e) that datalink messages will not be manipulated or altered;
  - (f) that network-allocated requirements for the RCP 240 and RSP 180 specification are met according to the definitions contained in ICAO Doc 9869, *Performance-based Communications and Surveillance (PBCS) Manual*.
- (8) If the agreement between the operator of the aircraft and the CSP does not include the terms and conditions mentioned in subsection (7), the following may act as a temporary substitute pending the formal issue, as soon as practicable, of an agreement that does include the terms and conditions (a **revised agreement**) — a copy of the relevant operator’s written and dated request to the appropriate CSP for a revised agreement (the **relevant request**).

### 11.10 Australian domestic airspace — inoperative radio requirements

- (1) This section applies to a flight within any class of airspace, whether controlled or uncontrolled, that is within an Australian FIR and is not specified in the AIP as an oceanic control area.
- Note* At the commencement of this instrument, the AIP document specifying the geographic boundaries of oceanic control areas is the Designated Airspace Handbook.
- (2) If the radiocommunication system becomes inoperative during a flight, the pilot in command must do the following:
- (a) if operating under the VFR in Class G or Class E airspace:
    - (i) select code 7600 on the aircraft transponder (if fitted); and
    - (ii) remain outside controlled airspace; and
    - (iii) assume the radiocommunication system is broadcasting and broadcast position and intentions on the frequency appropriate to the area of operation; and
    - (iv) as soon as practicable, descend below 5 000 ft to continue flight under the VFR;
  - (b) if operating under the VFR in Class A, B, C or D airspace or in a restricted area, or if operating under the IFR in any class of airspace whether controlled or uncontrolled:
    - (i) select code 7600 on the aircraft transponder (if fitted); and
    - (ii) assume the radiocommunication system is functioning and broadcast position and intentions on the frequency prescribed in the authorised aeronautical information; and

- (iii) if the aircraft is in VMC and certain of maintaining VMC — remain in VMC and land at the most suitable aerodrome; and
- (iv) if the aircraft is in IMC or is uncertain of maintaining VMC:
  - (A) maintain the last assigned altitude or level (or LSALT if higher) for 3 minutes; and
  - (B) maintain the last assigned vector for 2 minutes, or fly one more holding pattern; and
  - (C) after complying with sub-subparagraphs (A) and (B) — proceed in accordance with the latest ATC route clearance acknowledged; and
  - (D) commence descent in accordance with latest ATC route clearance acknowledged; and
  - (E) conduct the most suitable IAP.

### 11.10A Mandatory broadcast area requirements

- (1) This section applies to the pilot in command of a flight in a mandatory broadcast area (an **MBA**) mentioned in subsection (2).
- (2) A volume of Class G airspace within the Australian FIR is an MBA if it is so specified in the AIP, as in force from time to time.

*Note 1* At the commencement of this instrument, the AIP specifies which broadcast areas are mandatory broadcast areas and also the lateral and vertical boundaries of each MBA.

*Note 2* This section contains MBA requirements **other than those** for the specific radio broadcasts or reports required to be made in relation to an MBA, or the radio carriage or fitment requirements for flight within an MBA. Radio broadcast and report requirements for an MBA are contained in section 21.09. Radio carriage or fitment requirements for an MBA are contained in section 26.18.

- (3) For an MBA mentioned in an item of column 1 of Table 11.10A (3), the pilot in command must comply with the requirements mentioned in column 2 of the same item.

**Table 11.10A (3) — Mandatory Broadcast area requirements**

	<b>Column 1</b>	<b>Column 2</b>
<b>Item</b>	<b>Mandatory Broadcast Area</b>	<b>Requirements</b>
1	Ayers Rock MBA	Nil
2	Ballina/Byron Gateway MBA	When an SFIS is active for this MBA, operations in the MBA, or immediately before entering the MBA, must be conducted in accordance with the AIP.
3	Port Hedland MBA	Nil

## Division 11.2 Use of controlled aerodromes, control areas and control zones

### 11.11 Purpose

For subregulation 91.255 (1), this Division prescribes requirements in relation to the use by an aircraft of a controlled aerodrome, a control area or a control zone.

*Note* Regulation 91.405 also places certain requirements on the pilot in command in relation to operations conducted at controlled aerodromes.

### 11.12 Readback of ATC clearances and instructions

- (1) This section applies to the pilot in command of an aircraft in relation to the use by the aircraft of a controlled aerodrome, a control area or a control zone.
- (2) The pilot in command must:
  - (a) read back to an air traffic controller the safety-related parts of any ATC clearance or instruction which the controller has transmitted by voice (a ***relevant ATC clearance or instruction***); or
  - (b) ensure that another flight crew member (if any) does the reading back.
- (3) Without affecting subsection (2), the following parts of a relevant ATC clearance or instruction must always be read back to the air traffic controller:
  - (a) ATC route clearances, including any amendments;  
*Note* ATC route clearances include departure, en route, arrival and approach clearances.
  - (b) en route holding instructions;
  - (c) route and runway-holding positions specified in a taxi clearance;
  - (d) clearances, conditional clearances and instructions to taxi on, enter, line up on, wait on, land on, take off from, hold short of, cross, or backtrack on, any runway; and
  - (e) the assigned runway or HLS, altimeter settings, Mode A transponder codes, data link logon addresses, altitude instructions, heading and speed instructions; (f) radio frequency instructions.

### 11.13 Controlled aerodromes

- (1) Aircraft operations at a controlled aerodrome must be conducted in accordance with the authorised aeronautical information.
- (2) Subject to subsection (3), the pilot in command of an aircraft operating at a controlled aerodrome must obtain ATC clearance to do any of the following:
  - (a) taxi on any part of the manoeuvring area;
  - (b) enter, cross, or backtrack on, a runway;
  - (c) take-off; (d) land.
- (3) Subsection (2) does not apply when an ATC service is not in operation for the aerodrome.
- (4) Subject to subsection (5), the pilot in command of an aircraft taxiing on the manoeuvring area of a controlled aerodrome:
  - (a) must stop and hold at all illuminated stop bars; and
  - (b) may only proceed beyond the stop bars when the stop bar lights are switched off.
- (5) Despite subsection (4), the pilot in command of the aircraft may proceed beyond a lighted stop bar if ATC:
  - (a) advises the pilot that stop bar contingency measures are in effect for the stop bar; and
  - (b) identifies the relevant lighted stop bar to the pilot by reference to the specific holding position; and
  - (c) instructs the pilot to cross the lighted stop bar.

### 11.14 Controlled aerodromes — other requirements

RESERVED

*Note* This section has been reserved to preserve the MOS structure for any future provisions that would be appropriate following consultation.

### **11.15 Control zones and control areas — entry into Class A, B, C, D or E airspace**

- (1) Subject to subsections (2) and (3), a pilot in command of an aircraft must not enter a control zone or a control area that is Class A, B, C, D or E airspace without ATC clearance.
- (2) Despite subsection (1), a VFR flight does not require clearance to enter Class E airspace.
- (3) Subsection (1) does not apply when an ATC service is not in operation for the control zone or the control area.

### **11.16 Control zones and control areas — operating within**

- (1) Aircraft operations in a control zone or a control area must be conducted in accordance with the authorised aeronautical information.
- (2) The pilot in command of an aircraft operating in a control zone or a control area must take positive action to regain track as soon as a deviation from the cleared track is recognised.
- (3) The pilot in command must notify ATC if any deviation from track exceeds any of the following tolerances:
  - (a) for PBN operations — 1 x the RNP value for the route or route segment being flown;
  - (b) for LOC-based operations — full-scale deflection of the course deviation indicator;
  - (c) for VOR-based operations — half-scale deflection of the course deviation indicator;
  - (d) for NDB-based operations — + or -5° from the specified bearing;
  - (e) for DME-based operations — + or -2 NM from the required arc;

(f) for operations based on visual navigation — 1 NM from the cleared track.

### **11.17 Control areas – IFR flights – VFR climb/descent and VFR-on-top**

- (1) The pilot in command of an IFR flight must obtain clearance for a VFR climb or VFR descent in a control area.
- (1A) A pilot in command of an IFR flight may only request a clearance for a VFR climb or VFR descent in a control area that is Class D or Class E airspace.
- (2) During the VFR climb or VFR descent, the pilot in command must:
  - (a) be in VMC at all times; and
  - (b) comply with IFR reporting and communication requirements; and  
*Note* See Division 21.2.
  - (c) maintain separation from other aircraft; and (d) visually maintain obstacle clearance.
- (3) The pilot in command of an IFR flight must obtain clearance for VFR-on-top operations.
- (3A) A pilot in command of an IFR flight may only request a clearance for a VFR-on-top operation in a control area that is Class E airspace.
- (4) During the VFR-on-top operation, the pilot in command must:
  - (a) be in VMC at all times; and
  - (b) comply with IFR reporting and communication requirements; and  
*Note* See Division 21.2.
  - (c) maintain separation from other aircraft; and  
*Note* Pilots are advised that maintaining separation from other aircraft includes wake turbulence separation.
  - (d) operate on specified VFR cruising levels.
- (5) The pilot in command of an IFR flight must obtain ATC clearance to cancel the VFR climb or VFR descent, or the VFR-on-top operation.

- (e) maintain the last assigned speed and level for a period of 60 minutes following the aircraft's failure to report its position over a compulsory reporting point (including ADS-C flights), and thereafter adjust speed and altitude in accordance with the filed flight plan;
- (f) upon exiting the oceanic control area, conform, as far as practicable, to the relevant State procedures and regulations.

## **Division 11.3 Prohibited, restricted and danger areas**

### **11.19 Purpose**

For subregulation 91.255 (1), this Division prescribes requirements in relation to the use by an aircraft of a prohibited area, a restricted area or a danger area.

### **11.20 Prohibited areas**

*Note* For prohibited areas, see CASA's OAR 6-monthly *Designation of Prohibited, Restricted and Danger Areas – Declaration and Determination (Permanent PRDs) Instruments* and the relevant Designated Airspace Handbooks, as each exists, or is in force, from time to time. Entry or flight in a prohibited area is an offence under regulations 6, 15 and 16 of the *Airspace Regulations 2007* and regulation 91.260 of Part 91 of CASR.

### **11.21 Restricted areas**

*Note* For restricted areas, see CASA's OAR 6-monthly *Designation of Prohibited, Restricted and Danger Areas – Declaration and Determination (Permanent PRDs) Instruments* and the relevant Designated Airspace Handbooks, as each exists, or is in force, from time to time. Unauthorised entry or flight in an active restricted area is an offence under regulations 6, 15 and 16 of the *Airspace Regulations 2007* and regulation 91.260 of Part 91 of CASR.

### **11.22 Danger areas**

The pilot in command of an aircraft may fly within or across a danger area provided that:

- (a) before the flight, the pilot in command is demonstrably aware of the specific activity which causes the area to be a danger area; and
- (b) before and during the flight, the pilot in command takes appropriate precautions against any safety risks that could arise from the flight.

*Note* For danger areas, see CASA's OAR 6-monthly *Designation of Prohibited, Restricted and Danger Areas – Declaration and Determination (Permanent PRDs) Instruments* and the relevant Designated Airspace Handbooks, as each exists, or is in force, from time to time. It is an offence under subregulation 91.255 (2) to not comply with the section 11.22 requirements for a danger area.

## **CHAPTER 12 MINIMUM HEIGHT RULES**

### **12.01 Minimum height rules — populous areas and public gatherings**

- (1) For paragraph 91.265 (4) (a), for flight over a populous area or a public gathering, this section prescribes take-off and landing circumstances for the purposes of paragraphs 91.265 (2) (b) and (3) (b).

*Note* For an aeroplane and a rotorcraft, paragraphs 91.265 (2) (b) and (3) (b), respectively, permit flight over a populous area or a public gathering below 1 000 ft above the highest feature or obstacle within a horizontal radius of 600 m or 300 m, respectively, of the point on the ground or water immediately below the aircraft.

- (2) For subsection (1), the circumstances are when the following requirements are complied with:

- (a) for take-off — when, from the point of lift-off, the pilot in command is conducting a climb to the planned cruising level in accordance with normal procedures for the aircraft type;
- (b) for landing — when the pilot in command is conducting a continuous descent from the cruising level or circuit height to the landing threshold using rates of descent and flight manoeuvres which are normal for the aircraft type.

### **12.02 Minimum height rules — other areas**

- (1) For paragraph 91.267 (3) (a), for flight over an area other than a populous area or a public gathering, this section prescribes take-off and landing circumstances for the purposes of paragraph 91.267 (2) (b).
- (2) For subsection (1), the circumstances are when the following requirements are complied with:
  - (a) for take-off — when, from the point of lift-off, the pilot in command is conducting a climb to the planned cruising level in accordance with normal procedures for the aircraft type;
  - (b) for landing — when the pilot in command is conducting a circling manoeuvre as part of an authorised IAP using rates of descent and flight manoeuvres which are normal for the aircraft type;
  - (c) for landing — when the pilot in command is conducting a continuous descent from the cruising level or circuit height to the landing threshold using rates of descent and flight manoeuvres which are normal for the aircraft type.

### **12.03 Minimum heights — VFR flight at night**

For paragraph 91.277 (2) (e), this section prescribes an additional method for calculating the lowest altitude for a route or route segment as the minimum height for a VFR flight at night.

#### **RESERVED**

*Note* No requirements are currently prescribed. This section has been reserved to preserve the MOS structure for any future provisions that would be appropriate following consultation.



## CHAPTER 13 VFR FLIGHTS

### 13.01 Purpose

For subregulation 91.273 (1), this Chapter prescribes requirements relating to the operation of an aircraft for a VFR flight.

### 13.02 VFR flight navigation requirements

- (1) When navigating by visual reference to the ground or water, the pilot in command must, at intervals of not more than 30 minutes, positively fix the aircraft's position by visual reference to features marked on topographical charts.
- (2) For subsection (1), when navigating by visual reference over the sea, visual reference features may include rocks, reefs and fixed human-made objects that are:
  - (a) marked on topographical charts appropriate for the flight; and (b) readily identifiable from the air.
- (3) When not navigating by visual reference to the ground or water, the pilot in command must comply with the requirements in Chapter 14, as if the flight were an IFR flight.
- (4) The pilot in command of an aircraft may:
  - (a) operate in an airspace or on a route designated as requiring use of a particular navigation specification; or
  - (b) conduct a terminal instrument flight procedure designated as requiring use of a particular navigation specification;but only if the aircraft is approved for operation, under the particular navigation specification, by at least 1 of the following:
  - (c) the AFM;
  - (d) a document approved under Part 21 of CASR as part of, or based on, an airworthiness assessment;
  - (e) for a foreign-registered aircraft — a document approved in writing by the NAA of the State of registration or State of the operator of the aircraft.
- (5) If the pilot in command is engaged in any of the following:
  - (a) operating in an airspace or on a route that requires the use of GNSS;
  - (b) conducting a terminal instrument flight procedure that requires the use of GNSS;
  - (c) conducting a terminal instrument flight procedure using GNSS as a substitute or alternative for a ground-based navigation aid within the meaning of subsection 14.05 (1);then the operation must be conducted using an approved GNSS.

## CHAPTER 14 IFR FLIGHTS

### 14.01 Purpose and definition

- (1) For subregulation 91.287 (1), this Chapter prescribes requirements relating to the operation of an aircraft for an IFR flight.
- (2) In this Chapter, an aircraft is approved for operation under a particular navigation specification if it is approved for the specification by at least 1 of the following:
  - (a) the AFM;
  - (b) a document approved under Part 21 of CASR as part of, or based on, an airworthiness assessment;
  - (c) for a foreign-registered aircraft — a document approved in writing by the NAA of the State of registration or State of the operator of the aircraft.

### 14.02 IFR flight navigation requirements

- (1) The pilot in command must navigate the aircraft by:
  - (a) use of an area navigation system that meets the performance requirements of the intended airspace or route; or
  - (b) use of a ground-based navigation aid, but only if:
    - (i) the route is one where, after making allowance for possible tracking errors of  $\pm 9^\circ$  from the last positive fix, the aircraft will come within the rated coverage of a ground-based navigation aid which can be used to fix the position of the aircraft; and
    - (ii) the maximum time interval between positive fixes is not more than 2 hours; or
  - (c) visual reference to the ground or water, but only:
    - (i) when unable to operate in accordance with paragraph (a) or (b); and
    - (ii) by day; and
    - (iii) if weather conditions permit flight in VMC; and
    - (iv) if the VFR position-fixing requirements mentioned in subsections 13.02 (1) and (2) are complied with.
- (2) The pilot in command of an aircraft may:
  - (a) operate in an airspace or on a route designated as requiring use of a particular navigation specification; or
  - (b) conduct a terminal instrument flight procedure designated as requiring use of a particular navigation specification;  
only if the aircraft is approved for operation under the particular navigation specification.
- (3) If the pilot in command is:
  - (a) operating in an airspace or on a route that requires the use of GNSS; or

- (b) conducting a terminal instrument flight procedure that requires the use of GNSS; then the operation must be conducted using an approved GNSS.
- (4) If the navigation system being used becomes inaccurate, unreliable or inoperative, the pilot in command must do the following:
    - (a) monitor the aircraft's track by reference to the other navigation aids with which the aircraft is equipped;
    - (b) carry out appropriate procedures designed to maintain aviation safety in the event of loss of navigation equipment;
    - (c) notify ATS.
  - (5) The pilot in command of an aircraft must ensure that data entered into an area navigation system has:
    - (a) for a multi-crew operation — been crosschecked for accuracy by at least 2 flight crew members; or
    - (b) for a single-pilot operation — been checked for accuracy by the pilot in command.
  - (6) The pilot in command of an aircraft must ensure that position and tracking information is checked:
    - (a) at, or before, each waypoint specified as a reporting point for the flight and published in the authorised aeronautical information or designated by ATS; and
    - (b) as far as practicable, at, or before, each en route waypoint published in the authorised aeronautical information; and
    - (c) at regular intervals (as far as practicable) during navigation via waypoints not published in the authorised aeronautical information.
  - (7) The pilot in command of an aircraft must ensure that, for a terminal instrument flight procedure in which GNSS will be used as the sole means of navigation:
    - (a) the intended procedure is loaded from the navigation database by name; and
    - (b) waypoints are not added to, or deleted from, the procedure as so loaded; and
    - (c) the navigation system will fly the procedure as published in authorised aeronautical information.

*Note* During the conduct of an IAP that is based on a ground-based navigation aid but where GNSS will be used for navigation, pilots should be aware that not all aircraft are capable of conducting reversal or holding procedures, or of navigating DME arcs. The pilot in command should confirm the aircraft navigation system is capable of conducting such operations.

### 14.03 Instrument approaches — QNH sources

- (1) Before passing the IAF, the pilot in command must set 1 of the following:
  - (a) the actual aerodrome QNH from 1 of the following (an *approved source*):
    - (i) AAIS;
    - (ii) ATC;
    - (iii) ATIS;
    - (iv) AWIS;
    - (v) CA/GRS;
    - (vi) WATIR;
  - (b) the forecast aerodrome QNH; (c) the forecast area QNH.
- (2) The pilot in command must not use an actual aerodrome QNH for an instrument approach more than 15 minutes after receiving it.

- (3) If the forecast area QNH is used, the pilot in command must increase the minima for the instrument approach by 50 ft.

**14.04 GNSS arrivals, and DME or GNSS arrivals**

- (1) During a GNSS arrival, or a DME or GNSS arrival, the pilot in command must:
  - (a) use the destination VOR or NDB to provide the primary track guidance; and
  - (b) if there is a significant disparity between the track guidance provided by the destination VOR or NDB and the GNSS track indication — discontinue the arrival procedure.
- (2) For the purposes of paragraph (1) (b), a significant disparity is: (a) for an NDB — a divergence of more than 6.9°; and (b) for a VOR — a divergence of more than 5.2°.

**14.05 Use of GNSS as substitute or alternative to ground-based navigation aids**

- (1) For this section, a ground-based navigation aid is 1 of the following:
  - (a) VOR;
  - (b) DME;
  - (c) NDB; (d) Outer Marker;
  - (e) Middle Marker.
- (2) GNSS may be used as a substitute or alternative to a ground-based navigation aid for the procedure or phase of flight mentioned in an item of column 1 of Table 14.05 (2) only if the aircraft is approved for operation under the particular navigation specification shown in the corresponding item in column 2 of the Table.

**Table 14.05 (2) — Use of GNSS instead of a ground-based navigation aid**

	<b>Column 1</b>	<b>Column 2</b>
<b>Item</b>	<b>Procedure or phase of flight</b>	<b>Navigation specification</b>
1	En route phase	RNP 2
2	SID or STAR	RNP 1
3	Initial, intermediate or missed approach segment	RNP 1
4	Final approach segment	RNP APCH

- (3) Before using GNSS as a substitute for or alternative to a ground-based navigation aid during an en route phase of flight, the pilot in command must ensure that:
  - (a) when a waypoint of the route of the flight that is the ground-based navigation aid is entered into the GNSS — the waypoint is loaded from the navigation database by name; and
  - (b) latitude and longitude coordinates for the ground-based navigation aid are not manually entered into the GNSS.
- (4) GNSS must not be used as a substitute or alternative to a ground-based navigation aid that has been decommissioned.

#### 14.06 Availability of GNSS integrity for instrument approaches

- (1) Before the departure of a flight that is planned to conduct an IAP that requires the use of GNSS at the planned destination aerodrome or at the destination alternate aerodrome, the pilot in command must obtain a prediction for GNSS integrity availability.
- (2) For subsection (1), if a continuous loss of GNSS integrity for more than 5 minutes is predicted for any part of the IAP, the pilot in command must revise the flight plan.  
*Note* Some examples of flight plan revisions include delaying the departure time, planning a different route or providing for an alternate.
- (3) The pilot in command of a flight that is navigating with SBAS-capable receivers must regularly check for the availability of GNSS integrity indication in areas where the SBAS is not available.
- (4) The pilot in command of an aircraft whose approved GNSS can achieve LNAV accuracy of less than 0.3 NM using requisite GNSS satellites may disregard subsections (1) and (2).

*Note* **Requisite GNSS satellites** is defined in section 1.07.

#### 14.07 Navigation database requirements

- (1) In this section:  
**current**, for a navigation database, means that the database is up-to-date in accordance with the AIRAC cycle.  
**valid**, for a navigation database, means that the database must be provided by an approved provider.
- (2) The data in the navigation database must be:
  - (a) valid; and
  - (b) subject to subsection (7) — current; and
  - (c) in a form that cannot be changed by the operator or a flight crew member.
- (3) Updating of the navigation database must be carried out in accordance with the instructions issued by the manufacturer of the navigation system.
- (4) The aircraft operator must ensure that any person updating the navigation database is appropriately qualified and competent to properly perform that task.
- (5) The operator of an aircraft must:
  - (a) regularly check the navigation database for integrity; and (b) if any discrepancy in the data is discovered:
    - (i) report the discrepancy as soon as practicable to the approved provider; and (ii) deal with the discrepancy before further operational use by:
      - (A) resolving it through the reissue of the database; or
      - (B) prohibiting use of the route; or
      - (C) ensuring that each flight crew member has instructions on how to preserve the safety of the operation despite the discrepancy.
- Note* The *Transport Safety Investigation Regulations 2003* have the effect that any discrepancy in the navigation database must be reported if it is likely to cause a hazardous condition from loss of separation between the aircraft and terrain or obstacles, or between the aircraft and other aircraft.
- (6) If the navigation database changes to the next AIRAC cycle during a flight, the pilot in command must complete the flight using the unchanged database unless to do so will, or is likely to, jeopardise the safety of the flight.
- (7) Despite paragraph (2) (b), and without affecting subsections (5) and (6), a navigation database:

- (a) that is not current at the start of a flight; or
  - (b) that ceases to be current during a flight; may be used for navigation only if:
  - (c) data used for navigation of a flight is verified before use by reference to authorised aeronautical information; and
  - (d) the database is not used for updating of a navigation system.
- (8) Despite anything else in this section, an aircraft operated without an MEL must not operate under PBN for more than 72 hours after the navigation database has ceased to be current.

*Note* An aircraft that is operated with an MEL must operate in accordance with the instructions in the MEL.

#### 14.08 PRM instrument approach operations

The pilot in command of an aircraft must not carry out a PRM approach unless all of the pilots required by the AFM for the conduct of such an approach have received training from an appropriate source that ensures familiarisation with the following:

- (a) the guidance on PRM approaches provided in the AIP;
- (b) the PRM user instructions for the aerodrome of intended operation;
- (c) the relevant instrument approach charts for the aerodrome of intended operation;
- (d) relevant training material available on the websites of Airservices Australia and CASA.

#### 14.09 Instrument approach operational requirements

*Note* This section effectively prescribes the requirements for the operation of an aircraft in a specified aircraft performance category at an aerodrome: see regulation 91.320 and section 2.02.

- (1) When conducting an authorised IAP in IMC, the pilot in command of an aircraft must ensure that the aircraft is operated within the range of, or at not more than the maximum, IAS provided for in subsection (2).
- (2) For any of the following:
  - (a) the specified aircraft performance category for the aircraft that is mentioned in an item of column 1 of Table 14.09 (2);
  - (b) a higher specified aircraft performance category than the specified aircraft performance category for the aircraft;
  - (c) subject to subsection (3), a lower specified aircraft performance category than the specified aircraft performance category for the aircraft;

the aircraft must be operated within the range of speeds, and at not more than the maximum speed (as the case requires), specified in columns 2, 3, 4 and 5 of the same item.
- (3) For paragraph (2) (c), the aircraft must not be operated at a lower specified aircraft performance category unless the operator of the aircraft:
  - (a) holds an approval under regulation 91.045 for regulation 91.320 to operate in the lower specified aircraft performance category; and (b) has complied with subregulation 91.320 (3).

*Note 1* For example, an aircraft whose specified aircraft performance category is B, may conform to the requirements of aircraft performance category C. But an aircraft whose specified aircraft

performance category is C must not attempt to conform to the requirements of aircraft performance category B without CASA approval and operator compliance with subregulation 91.320 (3).

*Note 2* Subregulation 91.320 (3) requires an operator holding the relevant approval to give details of the approval, and the conditions (if any) imposed by CASA on the approval, to the flight crew of an aircraft conducting a flight that uses the approval.

**Table 14.09 (2) — IAP segment speeds**

		<b>Indicated airspeed (IAS)</b>			
	<b>Column 1</b>	<b>Column 2</b>	<b>Column 3</b>	<b>Column 4</b>	<b>Column 5</b>
<b>Item</b>	<b>Specified aircraft performance category</b>	<b>Range of speeds for initial and intermediate approach (kts)</b>	<b>Range of speeds for final approach (kts)</b>	<b>Max. speed for visual manoeuvring (circling) (kts)</b>	<b>Max. speed for missed approach (kts)</b>
1	H	70-120	60-90	None specified	90
2	A	90-150	70-100	100	110
3	B	120-180	85-130	135	150
4	C	160-240	115-160	180	240
5	D	185-250	130-185	205	265
6	E	185-250	155-230	240	275

## CHAPTER 15 IFR TAKE-OFF AND LANDING MINIMA

### 15.01 Purpose

For subregulation 91.307 (1), this Chapter prescribes:

- (a) requirements relating to take-off minima for an aerodrome (the *take-off minima requirements*); and
- (b) requirements relating to landing minima for an aerodrome (the *landing minima requirements*).

### 15.02 Definitions for this Chapter

In this Chapter:

*qualifying multi-engine aeroplane* means an IFR multi-engine aeroplane, whether powered by piston or turboprop engines, that is:

- (a) operated by:
  - (i) at least 2 pilots; or
  - (ii) if fitted with operative autofeather — 1 pilot; and
- (b) in the event of an engine failure — capable of maintaining terrain clearance until reaching the minimum height for IFR flight.

*qualifying multi-engine rotorcraft* means an IFR rotorcraft that:

- (a) has a Category A performance supplement; and
- (b) is operated to the Category A weights, limitations and procedures contained in the supplement; and
- (c) in the event of an engine failure — is capable of maintaining terrain clearance until reaching the minimum height for IFR flight.

### 15.03 Take-off minima requirements

A pilot in command must not commence a take-off if, at the time of take-off:

- (a) the meteorological conditions are less than the take-off minima for the aircraft; or
- (b) the meteorological conditions that would exist if it were necessary to return to land at the departure aerodrome because of engine failure, are not:
  - (i) at or above the landing minima for any IAP that the pilot in command is able to conduct at the aerodrome; or
  - (ii) such as to allow a visual approach for the return to land.

### 15.04 Take-off minima for low-visibility operations

The take-off minima for a low-visibility operation at an aerodrome are the take-off minima stated in an approval granted for paragraph 91.315 (1) (b).

### 15.05 Take-off minima for qualifying multi-engine aeroplanes

- (1) The take-off minima mentioned in this section apply to a take-off that:
  - (a) is not a low-visibility take-off; and
  - (b) is conducted using a qualifying multi-engine aeroplane.
- (2) The take-off minima are:
  - (a) visibility of:



- (i) 800 m, or
- (ii) 550 m, but only if:
  - (A) the runway has illuminated edge lighting at spacing intervals not exceeding 60 m; and
  - (B) the runway has centreline lighting or centreline markings; and
  - (C) all lighting mentioned in sub-subparagraphs (A) and (B) is supported by a secondary power supply with a switchover capability of 1 second or less; and
  - (D) if the aerodrome is a non-controlled aerodrome or a controlled aerodrome where ATC is not in operation — the take-off is conducted by day and the aerodrome is one at which the carriage of radio is mandatory.

### **15.06 Take-off minima for other aeroplanes**

- (1) The take-off minima mentioned in this section apply to a take-off that:
  - (a) is not a low-visibility take-off; and
  - (b) is not conducted using a qualifying multi-engine aeroplane.
- (2) The take-off minima are: (a) a cloud ceiling of 300 ft; and (b) visibility of 2 000 m.

### **15.07 Take-off minima for qualifying multi-engine rotorcraft**

- (1) The take-off minima mentioned in this section apply to a take-off that:
  - (a) is not a low-visibility operation; and
  - (b) is conducted using a qualifying multi-engine rotorcraft.
- (2) The take-off minima are:
  - (a) a cloud ceiling not lower than the height at which the greater of the following can be achieved:
    - (i)  $V_y$ ;
    - (ii)  $V_{\min}$  IMC; and
  - (b) visibility of either:
    - (i) 800 m; or
    - (ii) 550 m, but only if:
      - (A) the relevant runway or FATO has illuminated edge lighting at spacing intervals not exceeding 60 m and centreline lighting; and
      - (B) all lighting mentioned in sub-subparagraph (A) is supported by a secondary power supply with a switchover capability of 1 second or less; and
      - (C) if the aerodrome is a non-controlled aerodrome or a controlled aerodrome where ATC is not in operation — the take-off is conducted by day and the aerodrome is one at which the carriage of radio is mandatory.

### **15.08 Take-off minima for other rotorcraft**

- (1) The take-off minima mentioned in this section apply to a take-off that:
  - (a) is not a low-visibility take-off; and
  - (b) is not conducted using a qualifying multi-engine rotorcraft.
- (2) The take-off minima are:

- (a) a cloud ceiling of 500 ft; and
- (b) visibility of 800 m.

### **15.09 Landing minima requirements**

- (1) Subject to complying with the requirements of section 15.11, a pilot in command of an aircraft must not land at an aerodrome if the meteorological conditions are below the landing minima for the aircraft that are:
  - (a) for a low-visibility operation — specified in an approval granted for paragraph 91.315 (1) (b); or
  - (b) for a landing that is not a low-visibility operation — specified in section 15.10.
- (2) For the determination of landing minima for paragraph (1) (b), the pilot in command of an aircraft must obtain the landing minima from an instrument approach chart in accordance with:
  - (a) the specified aircraft performance category; and (b) the aircraft LNAV and VNAV capabilities.

### **15.10 Landing minima**

- (1) For an RNP APCH-LNAV/VNAV, an RNP APCH-LPV, or a precision approach procedure — the minimum altitude must not be below whichever of the following is the highest:
  - (a) the DA or DH specified on the instrument approach chart for the IAP being conducted;
  - (b) relevant minima specified in the AFM;
  - (c) relevant minima specified in the operator's exposition or operations manual.
- (2) For an RNP APCH-LNAV/VNAV, an RNP APCH-LPV, or a precision approach procedure — the minimum visibility must not be below whichever of the following is the highest:
  - (a) the RVR or visibility specified on the instrument approach chart for the IAP being conducted;
  - (b) relevant minima specified in the AFM;
  - (c) relevant minima specified in the operator's exposition or operations manual; (d) 800 m, but only if:
    - (i) the TDZ RVR report is not available; or
    - (ii) the approach lighting system normally available beyond 420 m from the runway threshold is inoperative; (e) 1 200 m, but only if:
      - (i) the approach cannot be flown to at least the landing minima using a flight director, a HUD or an autopilot; or
      - (ii) the aircraft is not equipped with an operative failure warning system for the primary attitude and heading reference systems; or
      - (iii) high intensity runway edge lighting is not in operation; or
      - (iv) the approach lighting system normally available beyond 210 m from the runway threshold is inoperative;
  - (f) 1 500 m — but only if the approach lighting system normally available for the runway is inoperative;

- (g) 1.5 times either the RVR or the visibility specified on the instrument approach chart for the IAP being conducted — but only if:
- (i) a lighting failure has occurred on a runway at a controlled aerodrome; and
  - (ii) doubled spacing of runway edge lights results.

*Note* At a controlled aerodrome, in the event of failure of 1 electrical circuit on a runway equipped with interleaved circuitry lighting, pilots will be notified of a doubled spacing of runway edge lights, that is, from 60 m spacing to 120 m spacing.

- (3) Subject to subsection (5), for an RNP APCH-LNAV, an RNP APCH-LP or another NPA — the minimum altitude must not be below whichever of the following is the highest:
- (a) the MDA or MDH specified on the instrument approach chart for IAP being conducted;
  - (b) the relevant minima specified in the AFM;
  - (c) relevant minima specified in the operator's exposition or operations manual.
- (4) Subject to subsection (6), for an RNP APCH-LNAV, an RNP APCH-LP or another NPA — the minimum visibility must not be below whichever of the following is the highest:
- (a) the visibility specified on the instrument approach chart for IAP being conducted;
  - (b) relevant minima specified in the AFM;
  - (c) relevant minima specified in the operator's exposition or operations manual;
  - (d) if the approach lighting system normally available for the runway is inoperative — the visibility specified on the instrument approach chart, plus a value equivalent to the published length of the approach lighting system.
- (5) Despite subsection (3), if the aircraft is conducting a circling manoeuvre — the minimum altitude must not be below whichever of the following is the highest:
- (a) the circling minimum altitude specified on the instrument approach chart for the IAP being conducted;
  - (b) the relevant minima specified in the AFM;
  - (c) the relevant minima specified in the operator's exposition or operations manual.
- (6) Despite subsection (4), if the aircraft is conducting a circling manoeuvre — the minimum visibility must not be below whichever of the following is the highest:
- (a) the circling minimum visibility specified on the instrument approach chart for the IAP being conducted;
  - (b) the relevant minima specified in the AFM;
  - (c) the relevant minima specified in the operator's exposition or operations manual.
- (7) For an aerodrome without an authorised IAP, the minimum altitude must not be below the altitude at which the flight can comply with the requirements relating to visual approach approaches published in the authorised aeronautical information for the purposes of subparagraph 91.305 (3) (b) (i).
- (8) For an aerodrome without an authorised IAP, the minimum visibility must not be below the flight visibility specified for the type of aircraft, the class of airspace and the height in Table 2.07 (3).

*Note* Table 2.07 (3) specifies the VMC criteria. The effect of this paragraph is that flight visibility must not be below the highest flight visibility relevant to the aircraft, if it were required to maintain VMC, during the flight to the aerodrome.

## 15.11 Missed approach

- (1) During an IAP, the pilot in command of an aircraft must immediately execute the missed approach procedure for the IAP in any of the following circumstances:
    - (a) during the final segment of the IAP — if the aircraft is flown outside the navigational tolerance for the navigation aid being used;
    - (b) when using GNSS as a substitute or alternative to a ground-based navigation aid — if there is a sustained deviation from the centreline of the IAP other than during a transient manoeuvre;
    - (c) when below the MSA — if the navigational aid in use for the IAP becomes unreliable or inoperative;  
*Note 1* Examples of when a navigational aid for an approach becomes unreliable or inoperative include a RAIM warning for a GNSS approach, a red flag for a VOR approach, or a loss of the ident for an NDB approach.  
*Note 2* If, after the pilot in command has commenced the missed approach procedure, a RAIM warning ceases or there is no longer loss of data integrity, the pilot may execute the missed approach using GNSS-derived information.
  - (d) if the requirements in subsection (2) are not met for the IAP being flown, and the aircraft:
    - (i) for an RNP APCH-LNAV/VNAV, an RNP APCH-LPV, or a precision approach procedure:
      - (A) has arrived at the minimum altitude; or
      - (B) has passed the minimum altitude but has not touched down; or
    - (ii) for an RNP APCH-LNAV, an RNP APCH-LP or other NPA:
      - (A) has arrived at the missed approach point; or
      - (B) is being operated below minimum altitude;
  - (e) if the aircraft is conducting a circling manoeuvre and:
    - (i) the flight visibility reduces below the minimum visibility; or
    - (ii) an identifiable part of the aerodrome is not distinctly visible to the pilot in command (apart from loss of visibility due to normal aircraft manoeuvring during the approach).
- (2) For paragraph (1) (d), the requirements are as follows:
    - (a) the aircraft must be continuously in a position from which a descent to a landing on the intended runway or, for a rotorcraft, flight to a landing or hover on or over the intended FATO, may be made:
      - (i) at a normal rate of descent; and
      - (ii) using normal manoeuvres; and
      - (iii) that allows touchdown to occur within the TDZ of the runway or TLOF of intended landing;
    - (b) for other than low-visibility operations;
      - (i) the flight visibility must be not less than the landing minima; and
      - (ii) at least 1 of the following visual references for the intended runway or FATO must be distinctly visible and identifiable to the pilot in command:
        - (A) elements of the approach lighting system;
        - (B) the threshold;

- (C) the threshold markings;
- (D) the threshold lights;
- (E) the runway identification lights;
- (F) the FATO itself;
- (G) the visual approach slope indicator;
- (H) the TDZ or TDZ markings;
- (I) the TDZ lights;
- (J) the FATO or runway lights;

*Note* There are certain NPAs that have a minimum flight visibility of 5 km, and where the geographical point of attaining the minimum altitude is more than 5 km from the visual references mentioned above. In these instances, noting that the minimum flight visibility is 5 km, if the requirements to conduct a visual approach procedure are met, effectively, the flight transitions from one conducting an IAP, to one conducting a visual approach at the minima.

- (c) for a low-visibility operation, the following visual references for the intended runway must be continuously visible and identifiable to the pilot in command:
  - (i) for a CAT III approach using an FO landing system where use of a DH is prescribed — at least 1 centreline light;
  - (ii) for a CAT III approach utilising an FP landing system — at least 3 consecutive longitudinally-aligned lights;
  - (iii) for a CAT III approach utilising an FO hybrid landing system — at least 3 consecutive longitudinally-aligned lights;(iv) for any other low-visibility operation:
    - (A) at least 3 consecutive longitudinally-aligned lights; and
    - (B) unless the approach is conducted using a HUD — a lateral element of lighting in the form of an approach lighting crossbar, a landing threshold light, or a barrette of TDZ lights.
- (3) For paragraph (2) (c), ***consecutive longitudinally-aligned lights*** means any of the following:
  - (a) centreline lights of the approach lighting system;
  - (b) the TDZ lights;
  - (c) runway centreline lighting;
  - (d) runway edge lights;
  - (e) a combination of the lights mentioned in paragraphs (a) to (d).

## CHAPTER 16 APPROACH BAN FOR IFR FLIGHTS

### 16.01 Purpose

- (1) For subregulation 91.310 (1), this Chapter prescribes circumstances in which an aircraft flown under the IFR must not make an approach to land at an aerodrome.
- (2) This Chapter applies to an aircraft conducting an IAP at an aerodrome:
  - (a) that has an air traffic control service in operation; and
  - (b) for which RVR reports are available for IAPs to the relevant runway.

### 16.02 Approach ban — other than low-visibility operations

- (1) This section applies to an operation that is not a low-visibility operation.
- (2) The pilot in command must not descend below 1 000 ft above the aerodrome elevation where the TDZ RVR is reported by ATC as continually less than the landing minima for the IAP.
- (3) Despite subsection (2), if, after passing 1 000 ft above the aerodrome elevation, the TDZ RVR is reported by ATC as falling below the landing minima, the approach may be continued.

### 16.03 Approach ban — low-visibility operations

- (1) This section applies to an operation that is a low-visibility operation.
- (2) The pilot in command must not descend below 1 000 ft above the aerodrome elevation where a controlling zone RVR is reported by ATC as continually less than the RVR zone requirements.

*Note Controlling zone RVR* is defined in section 1.07. An RVR zone is controlling if a report is received from that zone, whether or not it is a required report.
- (3) Subject to subsection (2), if, after passing 1 000 ft above the aerodrome elevation, a controlling zone RVR is reported by ATC as falling below the RVR zone requirements, the IAP may be continued.
- (4) For subsections (2) and (3), the RVR zone requirements are as follows:
  - (a) a TDZ RVR report is always required, unless:
    - (i) the IAP is a CAT III instrument approach operation conducted with the use of an FO landing system and an FO or FP rollout system; and
    - (ii) the MID and END RVR zones are providing valid reports;
  - (b) other than for an SA CAT I instrument approach operation, a MID RVR report is required if the END RVR zone is not providing valid reports;
  - (c) other than for an SA CAT I instrument approach operation, an END RVR report is required if the MID RVR is not providing valid reports.

*Note* MID or END RVR reports are not required for SA CAT I instrument approach operations.
  - (d) for the TDZ RVR report — the RVR value shown on the instrument approach chart;
  - (e) for MID RVR zone report:
    - (i) for a CAT III instrument approach operation conducted without the use of a rollout system — 175 m; and
    - (ii) for a CAT III instrument approach operation conducted with the use of an FO rollout system — 75 m; and

- (iii) for other IAPs — 125 m;
- (f) for the END RVR report — 75 m.

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## CHAPTER 19 FUEL REQUIREMENTS

### 19.01 Purpose

For subregulation 91.455 (1), this Chapter prescribes requirements relating to fuel for aircraft.

### 19.02 Definitions of *final reserve fuel* and *contingency fuel*

The final reserve fuel and contingency fuel that must be carried on board an aircraft for a flight must conform to the requirements set out in Table 19.02 (2) so that, for an aircraft mentioned in an item of column 1 of the Table, in the kind of flight mentioned for the aircraft in column 2, the final reserve fuel flight time, and the contingency fuel amount, must be as mentioned in columns 3 and 4 respectively for the item.

**Table 19.02 (2) — Final reserve fuel and contingency fuel requirements**

	Column 1	Column 2	Column 3	Column 4
Item	Aircraft (by aircraft category)	Kind of flight (by flight rules)	Final reserve fuel flight time	Contingency fuel amount
1	Aeroplane with MTOW ≤ 5 700 kg (piston engine or turboprop)	VFR	30 minutes	N/A
2	Aeroplane with MTOW ≤ 5 700 kg (piston engine or turboprop)	Night VFR	45 minutes	N/A
3	Aeroplane with MTOW ≤ 5 700 kg (piston engine or turboprop)	IFR	45 minutes	N/A
4	Turbojet engine aeroplane, or aeroplane with MTOW > 5 700 kg (turboprop engine)	IFR or VFR	30 minutes	5% of trip fuel
5	Aeroplane with MTOW > 5 700 kg (piston engine)	IFR or VFR	45 minutes	5% of trip fuel
6	Rotorcraft	VFR	20 minutes	N/A
7	Rotorcraft	IFR	30 minutes	N/A

*Note* Table 19.02 (2) describes the required final reserve fuel and contingency fuel by aircraft type and flight rules.

### 19.03 General requirements

*Fuel consumption data*

- (1) When determining the amount of usable fuel required under this Chapter for a flight of an aircraft, the pilot in command must use 1 of the following fuel consumption data sources:
  - (a) the most recent aircraft specific fuel consumption data derived from the fuel consumption monitoring system used by the operator of the aircraft (if available);
  - (b) the aircraft manufacturer's data for the aircraft.

*Note* The aircraft manufacturer's data includes electronic flight planning data. The manufacturer's data may be in the AFM, cruise performance manuals or other publications.

*Operational requirements etc.*
- (2) In determining the amount of usable fuel required under this Chapter, the pilot in command must take into account the effect of the following matters:
  - (a) the operating conditions for the proposed flight, including the following:
    - (i) the actual weight (if known or available), or the anticipated weight, of the aircraft;
    - (ii) relevant NOTAMs;
    - (iii) relevant authorised weather forecasts and authorised weather reports;
    - (iv) relevant air traffic service procedures, restrictions and anticipated delays;
    - (v) the effects of deferred maintenance items and configuration deviations;
  - (b) the potential for deviations from the planned flight because of unforeseen factors.

#### **19.04 Amount of fuel that must be carried for a flight**

- (1) The pilot in command of an aircraft must ensure that, when a flight of the aircraft commences, the aircraft is carrying on board at least the following amounts of usable fuel:
  - (a) taxi fuel;
  - (b) trip fuel;
  - (c) destination alternate fuel (if required);
  - (d) holding fuel (if required);
  - (e) contingency fuel (if applicable);
  - (f) final reserve fuel;
  - (g) additional fuel (if applicable).
- (2) The pilot in command must ensure that, at any point of in-flight replanning, the aircraft is carrying on board at least the following amounts of usable fuel:
  - (a) trip fuel from that point;
  - (b) destination alternate fuel (if required);
  - (c) holding fuel (if required);
  - (d) contingency fuel (if applicable);
  - (e) final reserve fuel;
  - (f) additional fuel (if applicable).
- (3) The pilot in command must ensure that the aircraft is carrying on board at least the following amounts of usable fuel, required at any time to safely continue the flight:
  - (a) trip fuel from that time;
  - (b) destination alternate fuel (if required);
  - (c) holding fuel (if required);
  - (d) final reserve fuel;



- (e) additional fuel (if applicable).
- (4) If, after commencement of the flight, fuel is used for a purpose other than that originally intended during pre-flight planning, the pilot in command must reanalyse the planned use of fuel for the remainder of the flight, and adjust the parameters of the

flight in so far as is necessary to remain in compliance with the requirements of this Chapter.

- (5) Subsection (6) applies if an aircraft for a flight:
  - (a) is unable to land at the planned destination aerodrome; and
  - (b) diverts to the planned destination alternate aerodrome that was required for the flight.
- (6) Despite subsection (3), the pilot in command must ensure that the aircraft is carrying at least the following amounts of usable fuel:
  - (a) destination alternate fuel from the time of commencing the diversion;
  - (b) holding fuel (if required);
  - (c) final reserve fuel.

#### **19.05 Procedures for determining fuel before flight and fuel monitoring during a flight**

- (1) The pilot in command of an aircraft for a flight must ensure that the amount of usable fuel on board the aircraft is determined before the flight commences.
- (2) The pilot in command must ensure that the amount of fuel is checked at regular intervals throughout the flight, and that the usable fuel remaining is evaluated to:
  - (a) compare planned fuel consumption with actual fuel consumption; and
  - (b) determine the amount of usable fuel remaining; and
  - (c) determine whether the remaining usable fuel is sufficient to satisfy:
    - (i) if a point of in-flight replanning has been specified by the pilot in command for the flight and the flight has not proceeded past the point — the requirements of subsection 19.04 (2); and
    - (ii) otherwise — the requirements of subsection 19.04 (3); and
  - (d) determine the amount of usable fuel expected to be remaining when the aircraft lands at the destination aerodrome.

#### **19.06 Procedures if fuel reaches specified amounts**

- (1) If, at any time during a flight, the amount of usable fuel remaining in the aircraft on landing at the destination aerodrome will be, or is likely to be, less than the fuel required under subsection 19.04 (3), then the pilot in command must:
  - (a) take into account the likely air traffic and operational conditions on arrival at:
    - (i) the destination aerodrome; and
    - (ii) if a destination alternate aerodrome is required for the flight — the destination alternate aerodrome; and
    - (iii) any en route alternate aerodrome; and
  - (b) proceed to an aerodrome mentioned in paragraph (a) that enables the pilot in command to continue to meet the requirements in section 19.04.

- (2) The pilot in command must request from ATS the duration of any likely delay in landing if unforeseen factors could result in the aircraft landing at the destination aerodrome with less than the following amounts of fuel remaining:
  - (a) the final reserve fuel;
  - (b) the destination alternate fuel (if required).
- (3) The pilot in command must declare to ATS a “minimum fuel” state if:
  - (a) the pilot in command is committed to land the aircraft at an aerodrome in accordance with this section; and
  - (b) the pilot in command determines that, if there is any change to the existing ATC clearance issued to the aircraft in relation to that aerodrome, the aircraft will land with less than the final reserve fuel remaining.

*Note 1* The declaration of “minimum fuel” informs ATS that all planned aerodrome options have been reduced to a specific aerodrome of intended landing, and any change to the existing clearance may result in landing with less than final reserve fuel. This is not an emergency situation, but an indication that an emergency situation is possible should any additional delay occur.

*Note 2* A pilot in command should not expect any form of priority handling because of a “minimum fuel” declaration. ATS will, however, advise the flight crew member of any additional expected delays, and coordinate when transferring control of the aircraft to ensure other ATS units are aware of the aircraft’s fuel state.

- (4) If, at any time during a flight, the amount of usable fuel remaining in the aircraft on landing at the nearest aerodrome where a safe landing can be made, will be, or is likely to be, less than the final reserve fuel, then the pilot in command must declare a situation of “emergency fuel” by broadcasting “MAYDAY, MAYDAY, MAYDAY FUEL”.

*Note* The emergency fuel declaration is a distress message.

## 19.07 Operational variations — procedures and requirements

- (1) This section applies only to the following operators (a *relevant operator*):
  - (a) a Part 141 operator or a Part 142 operator;
  - (b) an aerial application operator; (c) an aerial work operator.

*Note* These operators are defined in section 1.07, Definitions.
- (2) Despite sections 19.03 and 19.04, a relevant operator may use an operational variation, specified in the operator’s operations manual or exposition (as applicable) for the purpose of this section, that relates to the calculation of any of the following, if the requirements in subsections (5) and (7) are met:
  - (a) taxi fuel;
  - (b) trip fuel;
  - (c) contingency fuel (if any);
  - (d) destination alternate fuel; (e) additional fuel.
- (3) The operations manual or exposition (as applicable) of a relevant operator must not include an operational variation relating to the calculation of holding fuel.
- (4) The operations manual of an aerial application operator or an aerial work operator may include an operational variation relating to the calculation of final reserve fuel for an aerial application operation or an aerial work operation, as the case requires, provided that only flight crew members are carried for the operation.
- (5) At least 28 days before using an operational variation, a relevant operator must submit to CASA:
  - (a) evidence of at least 1 of the following, that demonstrates how the operational variation will maintain or improve aviation safety:

(i) documented in-service experience;

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(ii) the results of a specific safety risk assessment conducted by the relevant operator that meets the requirements of subsection (6); and

(b) a copy of the relevant operator's procedures proposed for inclusion in the operations manual or exposition (as applicable), in relation to using the operational variation.

*Note* Under regulations 137.080, 137.085, 137.090, 138.068, 141.100 and 142.155 of CASR (as applicable), CASA may direct the relevant operator to remove or revise the operational variation, if CASA were to find there was insufficient evidence that it would maintain or improve aviation safety.

(6) For subparagraph (5) (a) (ii), a specific safety risk assessment must include at least the following:

(a) flight fuel calculations;

(b) the capabilities of the relevant operator, including:

(i) a data-driven method that includes a fuel consumption monitoring program; and

(ii) the use of sophisticated techniques for determining the suitability of alternate aerodromes; and

(iii) specific risk mitigating measures.

(7) For the purposes of subsection (2), the relevant operator's operations manual or exposition (as applicable) must include procedures in relation to the use of the operational variation.

## CHAPTER 21 RADIO FREQUENCY, BROADCAST AND REPORTING REQUIREMENTS

### Division 21.1 Use of certain frequencies — radio qualifications required

#### 21.01 Purpose

For subparagraph 91.625 (1) (a) (iv), the following kinds of radio frequencies are prescribed:

- (a) the CTAF for a non-controlled aerodrome; (b) the frequency for an MBA.

### Division 21.2 Use of radio — broadcasts and reports

#### 21.02 Purpose

For paragraph 91.630 (1) (b), this Division prescribes broadcasts and reports relating to a flight that the pilot in command of an aircraft fitted with or carrying a radio must ensure are made during the flight.

*Note* Regulation 91.675 (Pilot in command to report hazards to air navigation) also requires the pilot in command to make certain reports to different persons (ATS or aerodrome operators) including, for example, meteorological conditions that are hazardous to flight or defects in airways facilities or at aerodromes.

#### 21.03 Prescribed broadcasts and reports — general

The broadcasts and reports required under this Division must be made on the relevant published radio frequency, unless the air traffic service agrees to the use of a different frequency for special flight circumstances.

*Note* For example, descent from controlled to uncontrolled airspace, formation flights, SAR operations, and police and security operations. The pilot in command may initiate a request for the air traffic service to agree to a changed radio frequency for special flight circumstances.

#### 21.04 Non-controlled aerodromes — prescribed broadcasts

- (1) The pilot in command of an aircraft must ensure that broadcasts on the CTAF are made for a non-controlled aerodrome in accordance with Table 21.04 (1) if:

- (a) the aircraft is operating at, or in the vicinity of, a non-controlled aerodrome (including a certified or military aerodrome when non-controlled); and
- (b) the aircraft is equipped with an operative VHF radio; and (c) the pilot is qualified to use the radio.

*Note 1* For the definition of *in the vicinity of a non-controlled aerodrome* — see section 1.07.

*Note 2* For a pilot qualified to use the radio — see regulation 91.625.

*Note 3* For an aircraft that must be equipped with an operative VHF radio — see Chapter 26.

*Note 4* Additional requirements apply for a non-controlled aerodrome in a mandatory broadcast area — see section 21.09.

- (2) For Table 21.04 (1), for an item in the Table, the pilot in command in the situation mentioned for an item in column 1 must ensure the broadcast mentioned for the item in column 2 is made.



**Table 21.04 (1) – Non-controlled aerodromes – broadcasts**

	<b>Column 1</b>	<b>Column 2</b>
<b>Item</b>	<b>Situation</b>	<b>Broadcast</b>
1	When the pilot in command considers it reasonably necessary to broadcast to avoid the risk of a collision with another aircraft	Broadcast

**21.05 Controlled aerodromes and controlled airspace — prescribed reports**

- (1) The pilot in command of 1 of the following:
  - (a) an aircraft on the ground at a controlled aerodrome;
  - (b) an aircraft in Class A, B, C or D airspace;(c) an IFR aircraft in Class E airspace; must:
  - (d) subject to subsection (1A), ensure that reports to the ATC service are made in accordance with Table 21.05 (1); and
  - (e) ensure that reports and broadcasts are made in accordance with the other applicable provisions of this Chapter.
- (1A) Despite paragraph (1) (d), for item 10 of Table 21.05 (1), to ensure that separation with any aircraft operating near the base of controlled airspace is not compromised, the required report is to be made to the air traffic service for the Class G airspace volume that the aircraft will descend into after leaving controlled airspace.
- (2) For Table 21.05 (1), for an item in the Table, the pilot in command in the situation mentioned for the item in column 1 must ensure that the report mentioned for the item in column 2 is made.

**Table 21.05 (1) – An aircraft at a controlled aerodrome, or in Class A, B, C or D airspace, or an IFR aircraft in Class E airspace – reports**

	<b>Column 1</b>	<b>Column 2</b>
<b>Item</b>	<b>Situation</b>	<b>Report</b>
1	Ready to Taxi	Report the situation
2	Airborne (only at locations where an ATS surveillance service is provided)	Report the situation
3	Departure (only when item 2 does not apply)	Report the situation
4	Position report when required by the ATC service or the route reporting requirements in the authorised aeronautical information	Report the situation
5	Previously reported position estimate is more than 2 minutes in error	Corrected position estimate

6	Sustained variation of more than 10 kts or Mach 0.02 from any previously notified speed or any standard descent profile agreed between the aircraft operator and ATS	Report the situation
7	Aircraft performance degraded below: (a) the level required for the airspace in which it is	Report the situation

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	Column 1	Column 2
Item	Situation	Report
	operating; or (b) the capability of the aircraft reported in the aircraft's flight notification	
8	Leaving a level or reaching an assigned level	Report the situation
9	Unable to comply with ATC clearances or instructions	Report the situation
10	Before leaving controlled airspace on descent	Report the situation
11	Arrival	If cancelling SARWATCH — report cancellation

*Note* Item 7 pertains to degradation of aircraft performance as a result of failure or degradation of navigation, communications, altimetry (including RVSM airspace capability), flight control or other systems.

### 21.06 IFR aircraft in Class G airspace — prescribed reports

- (1) The pilot in command of an IFR aircraft in Class G airspace must ensure that:
  - (a) reports are made to the air traffic service for the airspace in accordance with Table 21.06 (1); and
  - (b) reports and broadcasts are made in accordance with the other applicable provisions of this Chapter.
- (2) Despite subsection (1), if the pilot in command of an IFR aircraft in Class G airspace is unable to make contact with the air traffic service in relation to the report required by item 1 or item 2 of Table 21.06 (1), the aircraft may taxi and take-off but only if:
  - (a) broadcasts are made in place of the required reports; and
  - (b) contact with the air traffic service is established as soon as possible after take-off; and
  - (c) the following conditions are complied with:
    - (i) where the operator of the flight is an AOC holder, aerial work certificate holder or Part 141 certificate holder — the pilot is assured of radio contact with the operator, or with a representative of the operator who has immediate access to a serviceable telephone, until contact is made with the air traffic service;
    - (ii) except for Part 121 operations conducted using aircraft with a MOPSC greater than 19 seats — a SARTIME for departure, that is a

maximum of 30 minutes after commencing to taxi, has been established with the air traffic service.

- (3) For Table 21.06 (1), for an item of the Table, the pilot in command in the situation mentioned for the item of column 1 must ensure that the report mentioned for the item in column 2 is made.

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**Table 21.06 (1) – IFR aircraft in Class G airspace – reports**

	<b>Column 1</b>	<b>Column 2</b>
<b>Item</b>	<b>Situation</b>	<b>Report</b>
1	Taxiing	Report the situation
2	Departure	Report the situation
3	Reaching cruising level	Report the situation
4	Position report when required by the ATC service or by the route reporting requirements of the authorised aeronautical information	Report the situation
5	Previously reported position estimate is more than 2 minutes in error	Report the situation
6	Before changing level	Report the situation
7	Before changing frequency	Report the situation
8	Requiring clearance into controlled airspace	Report the situation
9	Before changing to CTAF and not monitoring ATS frequency on second COM system	Report the situation
10	After landing	If cancelling SARWATCH at this time — report the cancellation

**21.07 VFR aircraft in Class E or G airspace — prescribed reports**

- (1) The pilot in command of a VFR aircraft in Class E or G airspace must ensure that:
- (a) a report is made to the air traffic service for the airspace in accordance with Table 21.07 (1); and



- (b) reports and broadcasts are made in accordance with the other applicable provisions of this Chapter.
- (2) For Table 21.07 (1), for an item of the Table, the pilot in command in the situation mentioned for the item in column 1 must ensure that the report mentioned for the item in column 2 is made.

**Table 21.07 (1) — VFR aircraft in Classes E and G airspace**

	<b>Column 1</b>	<b>Column 2</b>
<b>Item</b>	<b>Situation</b>	<b>Report</b>
1	Requiring clearance into controlled airspace	Report the situation
2	Before, and on completion of, over-water stage	Report in accordance with SAR reporting schedules if arranged before the over-water stage

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## 21.08 Flights in RVSM airspace — prescribed reports

The pilot in command of an aircraft conducting a flight in RVSM airspace within an Australian FIR must ensure that a report is made of all FL deviations of 300 ft or more from the aircraft's assigned level:

- (a) regardless of the cause of the deviation; and
- (b) in accordance with procedures published in the authorised aeronautical information.

## 21.09 Flights in a mandatory broadcast area — prescribed broadcasts and reports

- (1) The pilot in command of an aircraft intending to operate in an MBA must:
    - (a) make broadcasts and reports in accordance with:
      - (i) if an SFIS is not active for the MBA — Table 21.09 (1); and
      - (ii) if an SFIS is active for the MBA — the requirements specified in the AIP, as in force from time to time for the SFIS; and
    - (b) ensure that, when making a broadcast or a report required by paragraph (a), the broadcast or report contains the following information, in the following order:
      - (i) the name of the relevant aerodrome followed by the word TRAFFIC;
      - (ii) the aircraft type and callsign;
      - (iii) for an MBA where an SFIS is not active immediately before entering the MBA:
        - (A) the aircraft's present altitude (where appropriate); and
        - (B) the situation-based information required by Table 21.09 (1);
      - (iv) for an MBA where an SFIS is active immediately before to entering the MBA — the information required by the AIP for the SFIS;
      - (v) the name of the relevant aerodrome; and
    - (c) ensure that reports and broadcasts are made in accordance with the other applicable provisions of this Chapter.
- Note* Certain other operational requirements for MBA are contained in section 11.10A. The requirement to have a radio in an MBA is contained in section 26.18.
- (2) For Table 21.09 (1), for an item of the Table, the pilot in command in the situation mentioned in column 1 of an item must ensure that the broadcast mentioned in column 2 of the same item is made.

**Table 21.09 (1) – Broadcasts – in relation to a MBA**

	<b>Column 1</b>	<b>Column 2</b>
<b>Item</b>	<b>Situation</b>	<b>Broadcast</b>
1	Before or immediately after entering an MBA	Broadcast the pilot's intended use of the MBA
2	Joining a circuit	Broadcast the situation, and indicate the leg on which the aircraft will join
3	Conducting a straight-in approach	No later than 3 NM from the runway threshold — broadcast the situation

4	Passing the final approach fix of	Broadcast the situation
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	Column 1	Column 2
Item	Situation	Broadcast
	an instrument approach procedure	
5	Commencing a missed approach	Broadcast the situation
6	After landing and clear of the active runway(s)	Broadcast the situation
7	Starting to taxi	Broadcast the situation, and the following information: (a) that the flight is to be conducted under the IFR, if that is the case; (b) for any flight, either: (i) the planned destination aerodrome for the flight; or (ii) the direction in which the pilot intends to fly from the aerodrome; or (iii) the nature of operation (e.g. circuits); (c) the runway proposed to be used for take-off.
8	Immediately before entering the runway to be used for take-off	Broadcast the following: (a) a statement that the aircraft is entering the runway; (b) the runway identifier.

## CHAPTER 26 EQUIPMENT

### Division 26.1 General

#### 26.01 Purpose

- (1) For subregulation 91.810 (1), this Chapter prescribes requirements relating to:
  - (a) the fitment and non-fitment of equipment to an aircraft; and
  - (b) the carrying of equipment on an aircraft; and
  - (c) equipment that is fitted to, or carried on, an aircraft.

*Note* Requirements in relation to equipment may also be in relation to inoperative equipment.
- (2) For subregulation 91.810 (1), unless the contrary intention appears in or for a particular provision, the pilot in command of an aircraft is subject to each of the requirements set out in the provisions of this Chapter.
- (3) In this Chapter, unless the contrary intention appears in or for a particular provision:

- (a) a reference to a pilot seeing or viewing anything from a pilot's seat is taken to mean that the thing is seen or viewed from the pilot's normal sitting position in the seat; and
- (b) any mention of feet (or ft) in the context of an altitude is taken to mean feet above mean sea level (AMSL), unless otherwise stated.

## **Division 26.2 Approvals, visibility and inoperative equipment**

### **26.02 Approval of aircraft equipment**

- (1) In this section:

*relevant aircraft* means any of the following:

- (a) a light sport aircraft for which a special certificate of airworthiness has been issued and is in force under regulation 21.186 of CASR;
  - (b) a light sport aircraft for which an experimental certificate has been issued and is in force under paragraph 21.191 (j) or (k) of CASR;
  - (c) any other aircraft for which an experimental certificate has been issued and is in force under paragraph 21.191 (g) or (h) of CASR.
- (2) Before an Australian aircraft begins a flight, any equipment that is required to be fitted to, or carried on, the aircraft under this Chapter (other than equipment required under Division 26.16) must be compliant with the requirements of, or approved under, Part 21 of CASR.

*Note* Division 26.16 contains requirements for mandatory or optional carriage of surveillance equipment, most of which requires TSO or ETSO authorisation. However, the Division also contains a conditional alleviation. For the relevant equipment, a requirement for Part 21 approval would inappropriately negate this conditional alleviation.

- (3) Subsection (2) does not apply to the following:
- (a) an item of equipment used to display the time;
  - (b) an independent portable light, for example, a flashlight or torch;
  - (c) a headset;
  - (d) a sea anchor and other equipment for mooring;
  - (e) survival equipment, including signalling equipment.
- (4) Subsection (2) does not apply to a relevant aircraft in respect of any required radiocommunication system if the aircraft is fitted with a radiocommunication system

which provides the pilot with the same radiocommunication capability as would be provided if the radiocommunication system had complied with subsection (2).

- (6) Before a foreign-registered aircraft begins a flight in Australian airspace, the equipment required by this Chapter to be fitted to, or carried on, the aircraft must have been approved by the NAA of the aircraft's State of registry.
- (7) If equipment is carried on an aircraft although not required by this Chapter to be fitted or carried, then:
  - (a) the equipment need not be compliant with the requirements of, or approved under, Part 21 of CASR; and
  - (b) for a foreign-registered aircraft — the equipment need not have been approved by the NAA of the aircraft's State of registry; and
  - (c) any information, or data, provided by the equipment must not be used by any flight crew member for a flight to comply with any requirement of the civil aviation legislation in relation to communications or navigation; and
  - (d) the equipment, whether functional or otherwise, must not at any time affect the airworthiness of the aircraft.

*Note* For other requirements in relation to surveillance equipment that is not required to be fitted or carried, see section 26.69.

### **26.03 Visibility and accessibility of pilot-operated equipment**

- (1) This section applies in relation to equipment that is required under this Chapter to be fitted to, or carried on, an aircraft for a flight.
- (2) Any equipment that is for a pilot's manual or visual use in, or from, the cockpit must be visible to, and usable by, the pilot from the pilot's seat in the aircraft.
- (3) Emergency equipment that is required under this Chapter to be fitted to, or carried on, an aircraft for a flight must be easily accessible for immediate use in the event of an emergency.

### **26.04 Serviceability of equipment**

Any equipment required by this Chapter to be fitted to, or carried on, an aircraft for a flight must be operative unless:

- (a) another section of this Chapter provides otherwise; or

*Note* A minimum equipment list (a *MEL*), approved under regulation 91.935, can only permit equipment required to be fitted to, or carried on, an aircraft by this Chapter, to be unserviceable within the limits of the requirements contained in this Chapter. For example, section 26.26 contains an allowable time period of 72 hours related to flights with inoperative altitude alerting equipment. An MEL would not be approved if it contained a maximum time period for altitude alerting equipment to be inoperative that was greater than the time period specified by either a master minimum equipment list (MMEL) or the legislation. (b) the equipment:

- (i) is inoperative because of a defect that has been approved as a permissible unserviceability for the aircraft for the flight; and
- (ii) is fitted or carried in accordance with the permissible unserviceability.

## **Division 26.3 Flight instruments — aeroplanes**

### **26.05 Application**

This Division applies to an aeroplane, subject to Division 26.5.

## 26.06 Aeroplane VFR flight by day

- (1) Subject to subsection (2), an aeroplane for a VFR flight by day must be fitted with equipment for measuring and displaying the following flight information:
- (a) indicated airspeed;
  - (b) pressure altitude;
  - (c) magnetic heading;
  - (d) time;
  - (e) Mach number — but only for an aeroplane with operating limitations expressed in terms of Mach number;
  - (f) turn and slip — but only for an aeroplane conducting an aerial work operation;
  - (g) outside air temperature — but only for an aeroplane conducting an aerial work operation from an aerodrome at which ambient air temperature is not available from ground-based instruments.
- (2) For subsection (1), the equipment for measuring and displaying the flight information mentioned in column 1 of an item in Table 26.06 (2) must meet the requirements mentioned in column 2 of the item.

**Table 26.06 (2) – Requirements for equipment – aeroplane VFR flight by day**

	<b>Column 1</b>	<b>Column 2</b>
<b>Item</b>	<b>Flight information</b>	<b>Requirements</b>
1	Pressure altitude	The equipment must: <ul style="list-style-type: none"> <li>(a) have an adjustable datum scale calibrated in millibars or hPa; and</li> <li>(b) be calibrated in ft, except that, if a flight is conducted in a foreign country which measures FLs or altitudes in metres, the equipment must be calibrated in metres, or fitted with a conversion placard or device.</li> </ul>
2	Magnetic heading	The equipment must be: <ul style="list-style-type: none"> <li>(a) a direct reading magnetic compass; or (b) both: <ul style="list-style-type: none"> <li>(i) a remote indicating compass; and</li> <li>(ii) a standby direct reading magnetic compass.</li> </ul> </li> </ul>
3	Time	<ol style="list-style-type: none"> <li>1. The equipment must display accurate time in hours, minutes and seconds.</li> <li>2. The equipment must be: <ul style="list-style-type: none"> <li>(a) fitted to the aircraft; or</li> <li>(b) worn by, or immediately accessible to, the pilot for the duration of the flight.</li> </ul> </li> </ol>

## 26.07 Aeroplane VFR flight by night

- (1) An aeroplane for a VFR flight by night must be fitted with: (a) an approved GNSS; or (b) an ADF or VOR.

*Note 1* See subsection 1.07 (6) for definitions.

*Note 2* For aircraft entering oceanic airspace with RNP 2, 4 or 10 navigation specification capability, see subsections 11.03 (1B) and (1C) in relation to long range navigation systems (LRNS) operability requirements.

- (2) For subsection (1), if an approved GNSS unit is provided with the automatic barometric aiding options specified in any of the following (the *relevant options*):

- (a) (E)TSO-C129a;
- (b) (E)TSO-C145a;
- (c) (E)TSO-C146a;
- (d) (E)TSO-C196a;

then the relevant options must be connected.

- (3) Subject to subsection (4), an aeroplane for a VFR flight by night must be fitted with equipment for measuring and displaying the following flight information for the aeroplane:

- (a) indicated airspeed;
- (b) pressure altitude;
- (c) magnetic heading;
- (d) time;
- (e) Mach number — but only for an aeroplane with operating limitations expressed in terms of Mach number;
- (f) turn and slip;
- (g) attitude;
- (h) vertical speed;
- (i) stabilised heading;
- (j) outside air temperature;
- (k) whether the supply of power to gyroscopic instruments (if any) is adequate.

- (4) For subsection (3), the equipment for measuring and displaying the flight information mentioned in column 1 of an item in Table 26.07 (4) must meet the requirements mentioned in column 2 of the item.

**Table 26.07 (4) – Requirements for equipment – aeroplane VFR flight by night**

	Column 1	Column 2
Item	Flight information	Requirements



1	Indicated airspeed	The equipment must be capable of being connected to: (a) an alternate source of static pressure that: (i) is selectable by a pilot; and (ii) includes a selector that can open or block the aeroplane's static source and alternative static source at the same time; or (b) a balanced pair of flush static ports.
2	Pressure altitude	1. The equipment must: (a) have an adjustable datum scale calibrated in millibars or hPa; and
	<b>Column 1</b>	<b>Column 2</b>
<b>Item</b>	<b>Flight information</b>	<b>Requirements</b>
		(b) be calibrated in feet, except that, if a flight is conducted in a foreign country which measures FLs or altitudes in metres, the equipment must be: (i) calibrated in metres; or (ii) fitted with a conversion placard or device. 2. The equipment must be capable of being connected to: (a) an alternate source of static pressure that is selectable by a pilot; or (b) a balanced pair of flush static ports.
3	Magnetic heading	The equipment must be: (a) a direct reading magnetic compass; or (b) both: (i) a remote indicating compass; and (ii) 1a standby direct reading magnetic compass.
4	Time	1. The equipment must display accurate time in hours, minutes and seconds. 2. The equipment must be: (a) fitted to the aircraft; or (b) worn by, or immediately accessible to, the pilot for the duration of the flight.
5	Turn and slip	The equipment must display turn and slip information, except when a second independent source of attitude information is available in which case only the display of slip information is required.
6	Vertical speed	The equipment must be capable of being connected to: (a) an alternate source of static pressure that is selectable by a pilot; or (b) a balanced pair of flush static ports.

7	Stabilised heading	<i>Note</i> A gyromagnetic type of remote indicating compass meets this requirement if it has a primary power supply and an alternate power supply.
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## 26.08 Aeroplane IFR flight

- (1) An aeroplane for an IFR flight must be fitted with the following navigation equipment:
  - (a) for an aeroplane that is manufactured on or after 6 February 2014 — at least 1 approved GNSS but not one authorised in accordance with (E)TSO-C129;
 

*Note* For **approved GNSS**, see subsection 1.07 (6).
  - (b) for an aeroplane that was manufactured before 6 February 2014:
    - (i) if the GNSS equipment is installed on or after 6 February 2014 — at least 1 approved GNSS, but not one authorised in accordance with (E)TSO-C129;
    - (ii) if the GNSS equipment was installed before 6 February 2014 — at least:
      - (A) 1 approved GNSS, but not one authorised in accordance with (E)TSO-C129; or
      - (B) 1 approved GNSS that is authorised in accordance with (E)TSO-C129, and an ADF or VOR.

*Note* For aircraft entering oceanic airspace with RNP 2, 4 or 10 navigation specification capability, see subsections 11.03 (1B) and (1C) in relation to long range navigation systems (LRNS) operability requirements.

- (2) If, in accordance with subsection (1), an approved GNSS unit is provided with the automatic barometric aiding options specified in any of the following (the **relevant options**):
  - (a) (E)TSO-C129a;
  - (b) (E)TSO-C145a;
  - (c) (E)TSO-C146a;
  - (d) (E)TSO-C196a;
 then the relevant options must be connected.
- (3) Subject to subsection (4), an aeroplane for an IFR flight must be fitted with equipment for measuring and displaying the following flight information:
  - (a) indicated airspeed;
  - (b) pressure altitude;
  - (c) magnetic heading;
  - (d) time;
  - (e) Mach number — but only for an aeroplane with operating limitations expressed in terms of Mach number;
  - (f) turn and slip;
  - (g) attitude;
  - (h) vertical speed;
  - (i) stabilised heading;
  - (j) outside air temperature;
  - (k) whether the supply of power to gyroscopic instruments (if any) is adequate.

- (4) For subsection (3), the equipment for measuring and displaying the flight information mentioned in column 1 of an item in Table 26.08 (4) must meet the requirements mentioned in column 2 of the item.

**Table 26.08 (4) – Requirements for equipment – aeroplane IFR flight**

	<b>Column 1</b>	<b>Column 2</b>
<b>Item</b>	<b>Flight information</b>	<b>Requirements</b>
1	Indicated airspeed	1. The equipment must be capable of being connected to: <ul style="list-style-type: none"> <li>(a) an alternate source of static pressure that is selectable by a pilot; or</li> <li>(b) a balanced pair of flush static ports.</li> </ul> 2. Subject to clause 3, the equipment for indicated airspeed must include a means of preventing malfunction due to condensation or

	<b>Column 1</b>	<b>Column 2</b>
<b>Item</b>	<b>Flight information</b>	<b>Requirements</b>
		icing. 3. If more than 1 unit of indicated airspeed equipment is fitted, at least 1 of the units must include a means of preventing malfunction due to condensation or icing.
2	Pressure altitude	1. The equipment must: <ul style="list-style-type: none"> <li>(a) have an adjustable datum scale calibrated in millibars or hPa; and</li> <li>(b) be calibrated in ft, except that, if a flight is conducted in a foreign country which measures FLs or altitudes in metres, the equipment must be calibrated in metres or fitted with a conversion placard or device.</li> </ul> 2. The equipment must be capable of being connected to: <ul style="list-style-type: none"> <li>(a) an alternate source of static pressure that is selectable by a pilot; or</li> <li>(b) a balanced pair of flush static ports.</li> </ul>
3	Magnetic heading	The equipment must be: <ul style="list-style-type: none"> <li>(a) a direct reading magnetic compass; or (b)</li> </ul> both: <ul style="list-style-type: none"> <li>(i) a remote indicating compass; and</li> <li>(ii) a standby direct reading magnetic compass.</li> </ul>

4	Time	<ol style="list-style-type: none"> <li>1. The equipment must display accurate time in hours, minutes and seconds.</li> <li>2. The equipment must be: <ol style="list-style-type: none"> <li>(a) fitted to the aircraft; or</li> <li>(b) worn by, or immediately accessible to, the pilot for the duration of the flight.</li> </ol> </li> </ol>
5	Turn and slip	<ol style="list-style-type: none"> <li>1. The equipment must display turn and slip information, except where a second independent source of attitude information is available, in which case only the display of slip information is required.</li> <li>2. The equipment must have an alternate power supply in addition to its primary power supply unless: <ol style="list-style-type: none"> <li>(a) the equipment has a source of power independent of the power operating other gyroscopic instruments; or</li> <li>(b) a second independent source of attitude information is available.</li> </ol> </li> </ol>
6	Attitude	<p>The equipment must have an alternate power supply in addition to its primary power supply:</p> <ol style="list-style-type: none"> <li>(a) unless the equipment has a source of power independent of the source of turn and slip information; or</li> </ol>

	<b>Column 1</b>	<b>Column 2</b>
<b>Item</b>	<b>Flight information</b>	<b>Requirements</b>
		(b) a second independent source of attitude information is available.
7	Vertical speed	The equipment must be capable of being connected to: (a) an alternate source of static pressure that is selectable by a pilot; or (b) a balanced pair of flush static ports.
8	Stabilised heading	The equipment must have an alternate power supply in addition to its primary power supply unless: (a) the equipment has a source of power independent of the power operating the source of turn and slip information; or (b) a second independent source of attitude information is available. <i>Note</i> A gyromagnetic type of remote indicating compass meets this requirement if it has a primary power supply and an alternate power supply.

## Division 26.6 Operational equipment

### 26.18 Radiocommunication systems

- (1) Subject to subsection (2), an aircraft for a flight, in any class of airspace, whether controlled or uncontrolled, must be fitted with radiocommunication systems capable of:
  - (a) collectively communicating on all frequencies necessary to meet the reporting, broadcast and listening watch requirements under regulations 91.630, 91.635, 91.640 and 91.675, from any point on the route of the flight, including in the event of any diversions; and
  - (b) 2-way voice communications; and
  - (c) communicating on the aeronautical emergency frequency 121.5 MHz.

*Note 1* Certain light sport aircraft and experimental aircraft do not have to comply with the requirement for this equipment to be approved under Part 21 of CASR: see subsection 26.02 (5).

*Note 2* Regulation 91.400 places certain requirements on aircraft without an operative radio at certain non-controlled aerodromes.

- (2) Subject to subsections (3) and (4), an aircraft for a flight under the VFR by day in Class G airspace at or below 5 000 ft AMSL (a **relevant aircraft**) is not required to comply with subsection (1).
- (3) Subsection (2) does not apply if a relevant aircraft is operating in accordance with the VMC criteria at item 4, 5 or 6 of Table 2.07 (3).
- (4) Subsection (2) does not apply if a relevant aircraft is operating within, or intending to enter, an MBA.

*Note* Certain operational requirements for MBA are contained in section 11.10A. Radio broadcast requirements for MBA are contained in section 21.09.

### 26.19 When aircraft may begin a flight with inoperative radiocommunications

An aircraft for which a radiocommunication system is required may begin a flight with inoperative radiocommunication system if:

- (a) the flight begins from a departure aerodrome with no facility for the radiocommunication system to be repaired or replaced; and
- (b) the flight is to the nearest facility at which the radiocommunication system can be repaired or replaced; and
- (c) for the portions of the flight conducted in controlled airspace:
  - (i) ATS is informed, before the flight begins, of the inoperative radiocommunication system; and
  - (ii) clearance is obtained from ATS for the flight; and
- (d) for the portions of the flight conducted in Class G airspace above 5 000 ft AMSL, or conducted in an MBA:
  - (i) the flight is conducted during the day in VMC; and
  - (ii) the flight is conducted in-company with another aircraft (the **other aircraft**); and
  - (iii) the other aircraft is carrying an operative radio; and
  - (iv) the pilot in command of the other aircraft ensures that all the broadcasts and reports required by regulation 91.630 are made for both aircraft; and

- (v) the pilot in command of the other aircraft is:
  - (A) if the aircraft is an Australian aircraft — authorised under Part 61 of CASR to operate the radio; or
  - (B) if the aircraft is a foreign registered aircraft — authorised to operate the radio under the law of the aircraft's State of registry.

*Note 1* For continuation of a flight with an inoperative radiocommunication system, see sections 11.10 and 11.18.

*Note 2* Regulation 91.400 places certain requirements on aircraft without an operative radio at certain non-controlled aerodromes.

## 26.22 Anti-collision lights

- (1) Subject to subsection (2), an aircraft operating by day or night must be fitted with the number of anti-collision lights required by the aircraft type design.
- (2) The anti-collision light equipment fitted to an aircraft must comprise:
  - (a) at least 1 red beacon light; or
  - (b) at least 2 white strobe lights; or
  - (c) a combination of at least all of the lights mentioned in paragraphs (a) and (b).
- (3) For anti-collision light equipment comprising 1 or more red beacon lights only, the lights must be displayed as follows:
  - (a) for a turbine-engine aircraft — from immediately before the engines are started until the time the engines are shut down at the end of the flight;
  - (b) for any other aircraft — from whichever of the following is the earlier, until the time the engines are shut down at the end of the flight: (i) as required by the aircraft's flight manual instructions; or (ii) from immediately after the engines are started.
- (4) For anti-collision light equipment comprising white strobe lights only, the lights must be displayed as follows:
  - (a) for a turbine-engine aircraft — from immediately before the engines are started until the time the engines are shut down at the end of the flight;
  - (b) for any other aircraft — from whichever of the following is the earlier, until the time the engines are shut down at the end of the flight: (i) as required by the aircraft's flight manual instructions; or (ii) from immediately after the engines are started.
- (5) For anti-collision light equipment comprising a combination of red beacon lights and white strobe lights, the lights must be displayed as follows:
  - (a) for the red beacon lights — in accordance with the requirements in subsection (3);
  - (b) for the white strobe lights — in accordance with the following:
    - (i) if the aircraft, on its way to the runway from which it will take off, or on its way from the runway on which it has landed, crosses any other runway that is in use for take-offs or landings (an **active runway**) — while the aircraft is crossing the active runway;
    - (ii) from the time the aircraft first enters the runway from which the aircraft will take off until the time the aircraft leaves the runway on which it has landed.
- (6) Subsections (3), (4) and (5) do not apply if the pilot in command reasonably believes that, in the circumstances, reflection or glare from the anti-collision light system may cause a hazard to an aircraft.

## 26.23 Landing lights

An aircraft operating by night must be fitted with at least 1 landing light.





### **26.24 Navigation lights**

- (1) An aircraft operating by night must be fitted with navigation lights.
- (2) When required to be fitted, navigation lights must be displayed during a flight, and when operating on the movement area of an aerodrome.

## **Division 26.8 Alerting and warning system requirements**

### **26.25 Altitude alerting system and assigned altitude indicator — IFR flights**

- (1) For an IFR flight, the following aircraft must be fitted with altitude alerting equipment in accordance with subsection (2):
  - (a) a piston-engine aircraft operating in controlled airspace above FL 150;
  - (b) an unpressurised turbine-engine aircraft operating in controlled airspace above FL 150;
  - (c) a pressurised turbine-engine aircraft operating in any controlled airspace.
- (2) For subsection (1), the altitude alerting equipment must:
  - (a) include an assigned altitude indicator; and
  - (b) alert the flight crew members if the aircraft approaches a preselected altitude; and
  - (c) alert the flight crew members, including by an aural warning, if the aircraft deviates from a preselected altitude.
- (3) If an aircraft, other than an aircraft to which subsection (1) applies, is operating under the IFR in controlled airspace, the aircraft must be fitted with altitude alerting equipment that at least includes an assigned altitude indicator.

### **26.26 Aircraft flown with inoperative altitude alerting equipment — IFR flights**

Despite section 26.25, altitude alerting equipment may be inoperative at the beginning of a flight only if the flight:

- (a) begins within 72 hours of the time the equipment was found to be inoperative; and
- (b) is from an aerodrome at which there is no facility for the equipment to be repaired or replaced.

## Division 26.12 Emergency locator transmitters

### 26.48 Carriage of ELTs

- (1) When an aircraft begins a flight, it must comply with the following requirements:
  - (a) for a flight other than one mentioned in paragraph (b) — the flight must:
    - (i) be fitted with an automatic ELT; or
    - (ii) carry at least 1 survival ELT;
  - (b) for a flight where more than 1 life raft is carried to comply with the requirements of section 26.60 — the flight must:
    - (i) be fitted with an automatic ELT and carry a survival ELT; or (ii) carry at least 2 survival ELTs.
- (2) Despite paragraph (1) (a), but without affecting paragraph (1) (b), when a single-engine aircraft is flown further over water than the distance from which, with the engine inoperative, the aircraft could reach an area of land that is suitable for a forced landing — the aircraft must carry a survival ELT.
- (3) Without affecting paragraph (1) (b) (but subject to subsection (4)), paragraph (1) (a) does not apply to:
  - (a) a single-seat aircraft; or
  - (b) an aircraft in a flight for a purpose related to any of the following:
    - (i) the aircraft's manufacture;
    - (ii) the preparation or delivery of the aircraft following its purchase or transfer of operator;
    - (iii) the positioning of an Australian aircraft from a location outside Australia to any place at which any ELTs required to be fitted to the aircraft by this Division will be registered with AMSA; or
  - (c) an aircraft flown no more than 50 NM from its place of departure.
- (4) For paragraph (1) (b), an automatic ELT or a survival ELT that is fitted or carried need not meet the requirements of paragraph 26.49 (b) or (c) (as applicable), if the flight is for a purpose related to any of the following: (a) the aircraft's manufacture; or
  - (b) the preparation or delivery of the aircraft following its purchase or transfer of operator; or
  - (c) the positioning of an Australian aircraft from a location outside Australia to any place at which any ELTs required to be fitted to the aircraft by this Division will be registered with AMSA.

## Division 26.15 Remote areas

### 26.63 Definitions

In this Division:

**Central Australia remote area** has the meaning given by section 26.65.

**remote area** means 1 of the following: (a) Central Australia remote area; (b) Snowy Mountains remote area; (c) Tasmania remote area.

**Snowy Mountains remote area** has the meaning given by section 26.65.

**Tasmania remote area** has the meaning given by section 26.65.

*Note* The actual definitions are located in section 26.65, adjacent to supporting maps.

## 26.64 Remote area survival equipment

- (1) This section applies to the flight of an aircraft over a remote area.
- (2) When the aircraft begins the flight, it must carry survival equipment for sustaining life, as appropriate for the remote area to be overflown.

## 26.65 Meaning of remote area

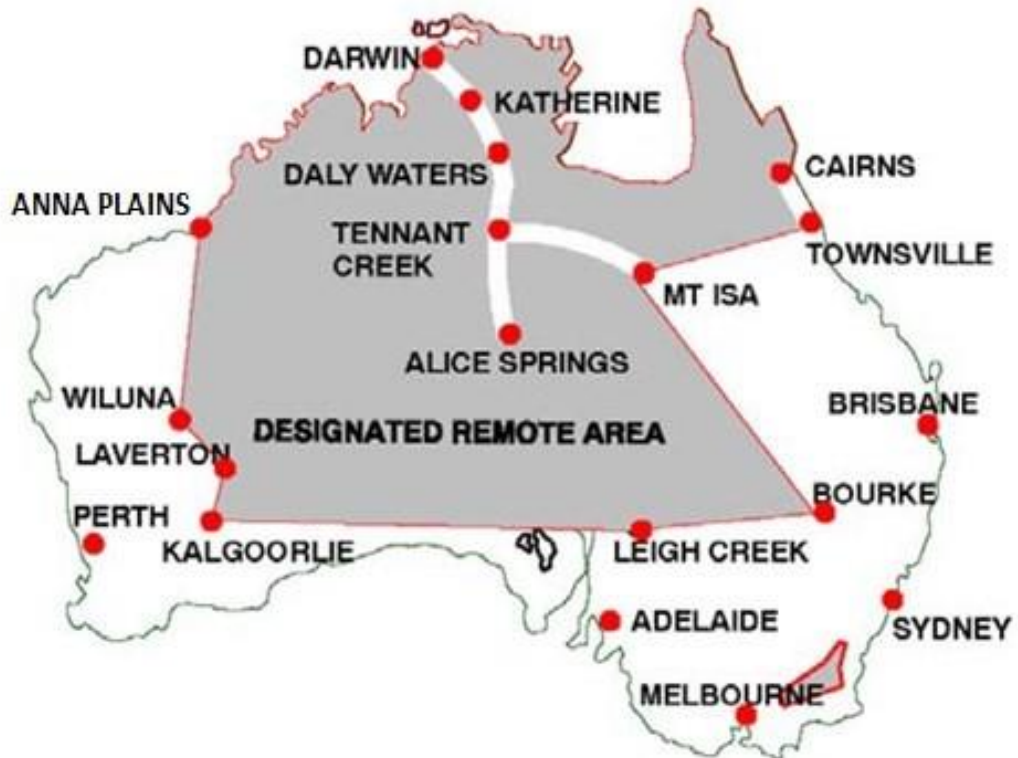
- (1) **Central Australia remote area** means the area of Australia, illustrated by the shading in Figure 26.65-1 Central Australia remote area, that:
  - (a) is enclosed within the boundary of the following lines: a line from Kalgoorlie to Leigh Creek, to Bourke, to Mt Isa, to Townsville, to Cairns, then following the coast north to Cape Horn, then along the coastline of the Gulf of Carpentaria and on to Darwin, then following the coastline to Anna Plains, then to Wiluna, to Laverton, and back to Kalgoorlie; and
  - (b) includes Australian-administered islands adjacent to the remote area between Cairns and Talgarno; and
  - (c) excludes the area within a 50 NM radius of Darwin; and
  - (d) excludes the flight corridors within sight of, and not more than 5 NM from the following:
    - (i) the Stuart highway between Alice Springs and Darwin;
    - (ii) the Barkly highway between Tenant Creek and Mt Isa;
    - (iii) the Bruce Highway between Townsville and Cairns.

**Snowy Mountains remote area** means the area of Australia, illustrated by the shading in Figure 26.65-2 Snowy Mountains remote area, that is enclosed within the boundary of the following lines: a line from Mt Franklin to Tharwa, to Berridale, to Delegate, to Mt Baw, to Jamieson, to Khancoban, and back to Mt Franklin.

**Tasmania remote area** means the area of Australia, illustrated by the shading in Figure 26.65-3 TAS remote area, that is enclosed within the boundary of the following lines: a line from West Point to Black Bluff, to 15 NM beyond Cape Bruny, then back to West Point at a distance of 15 NM off the coastline (disregarding bays and inlets).

(2) For subsection (1):

- (a) subject to paragraph (b), a line, other than a coastline, is taken to be a straight line; and
- (b) a line to or from a named town is taken to come no closer than 5 NM from the town centre on the side of the town adjacent to the remote area.



**Figure 26.65-1 Central Australia Remote Area**

Authorised Version F2021C01308 registered 22/12/2021

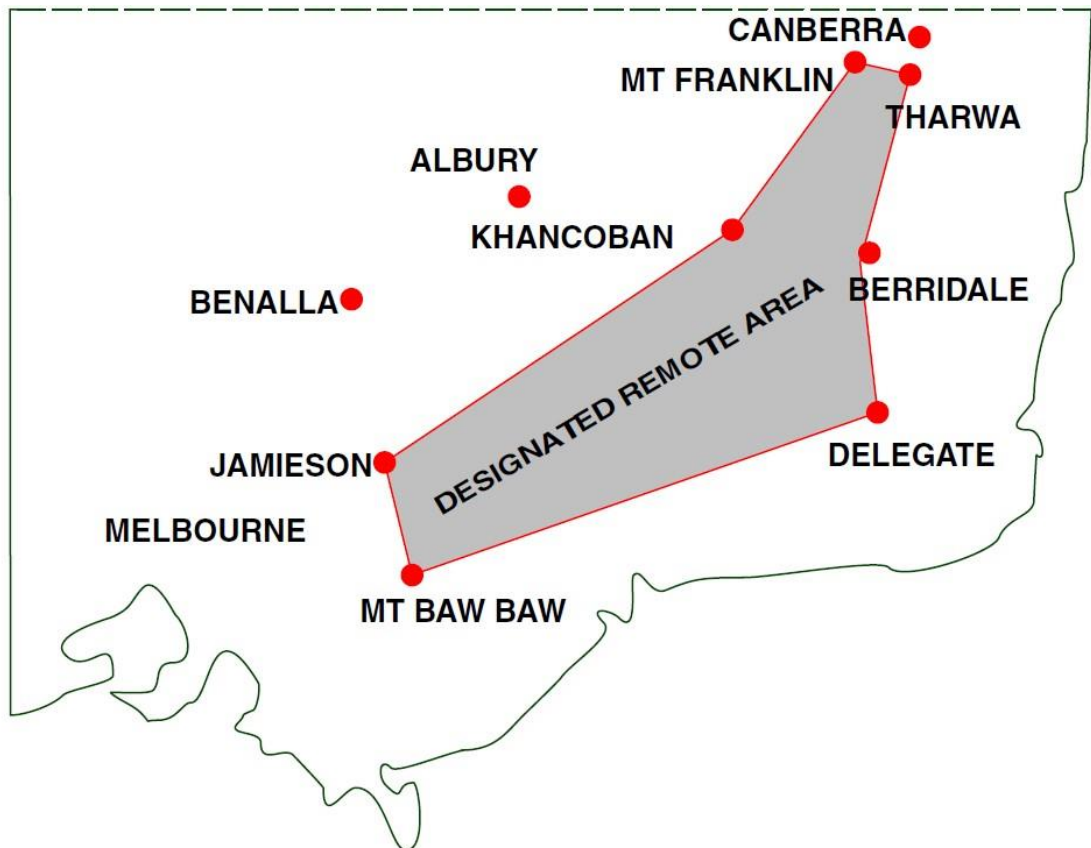


Figure 26.65-2 Snowy Mountains remote area

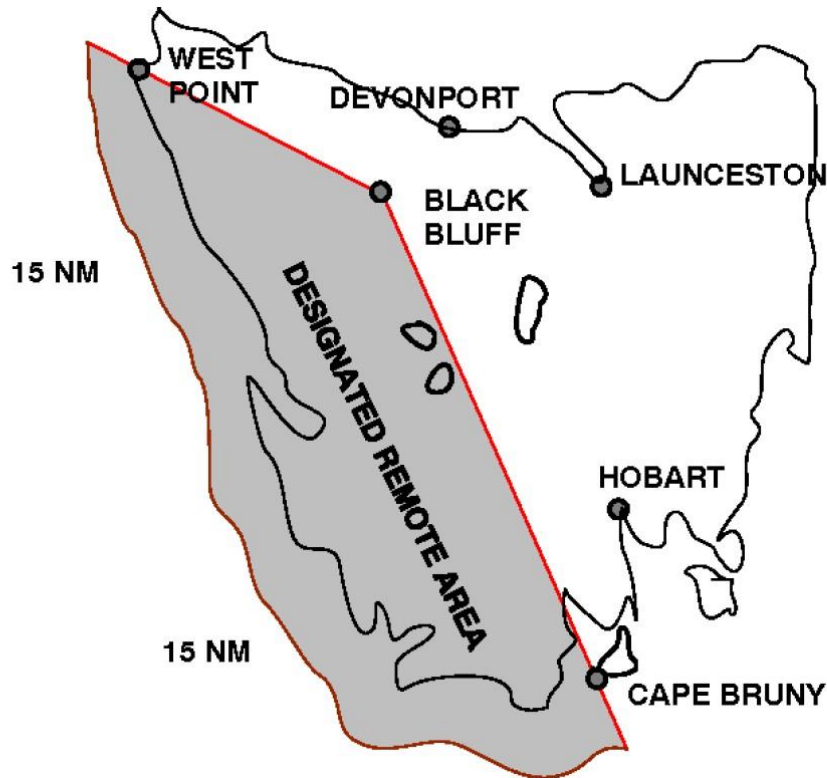


Figure 26.65-3 Tasmania remote area

Authorised Version F2021C01308 registered 22/12/2021

## Division 26.16 Surveillance equipment

### 26.66 Exceptions to (E)TSO or NAA requirements

- (1) In this section:  
*relevant aircraft* means any of the following:
  - (a) a light sport aircraft for which a special certificate of airworthiness has been issued and is in force under regulation 21.186 of CASR;
  - (b) a light sport aircraft for which an experimental certificate has been issued and is in force under paragraph 21.191 (j) or (k) of CASR;
  - (c) any other aircraft for which an experimental certificate has been issued and is in force under paragraph 21.191 (g) or (h) of CASR.
- (2) A requirement in this Division that an item of equipment, or element of an item of equipment, be authorised in accordance with a particular TSO or ETSO, does not apply to a relevant aircraft in respect of any surveillance equipment if:
  - (a) the configuration of the surveillance equipment that is fitted or carried provides the pilot, other aircraft and ATS with the same surveillance capability as would be provided if the equipment complied with the particular TSO or ETSO; and

- (b) the pilot or the operator has a statement of conformance (however described) from the equipment manufacturer stating the particular standard or standards of the TSO or ETSO with which the equipment conforms.
- (3) The requirement in subsection 26.75 (4) that an approved integrated TABS device (the *equipment*) be authorised by the relevant NAA of the equipment manufacturer does not apply to a relevant aircraft if:
  - (a) the configuration of the equipment that is fitted or carried provides the pilot, other aircraft and ATS with the same surveillance capability as would be provided if the equipment had been expressly authorised by the relevant NAA; and
  - (b) the pilot or the operator has a statement of conformance (however described) from the equipment manufacturer stating the equipment meets the requirements of this Division for the equipment.

## 26.67 Definitions

In this Division:

**14 CFR 91.225** means regulation 91.225 of the United States Title 14 Code of Federal Regulations (CFR) titled *Automatic Dependent Surveillance-Broadcast (ADS-B) Out equipment and use*.

**ADS-B** means automatic dependent surveillance – broadcast.

**ADS-B test flight** means a flight to prove ADS-B transmitting equipment that is newly installed on the aircraft undertaking the flight.

**ADS-B OUT** means the functional capability of an aircraft or vehicle to periodically broadcast its state vector (position and velocity) and other information derived from on-board systems in a format suitable for ADS-B IN capable receivers.

**aircraft address** means a unique combination of 24 bits available for assignment to an aircraft for the purpose of air-ground communications, navigation and surveillance.

**alternate ADS-B OUT equipment configuration**: see paragraph (b) of the definition of **approved ADS-B OUT equipment configuration**.

**approved ADS-B OUT equipment configuration** means an equipment configuration capable of ADS-B OUT operation on the ground and in flight, and that is 1 of the following:

- (a) an approved Mode S transponder with ADS-B capability connected to an approved GNSS position source;
- (b) an alternate ADS-B OUT equipment configuration meeting the requirements mentioned in section 26.72;
- (c) another system approved under Part 21 of CASR as having a level of performance equivalent to a system mentioned in paragraph (a) or (b).

**approved EC device configuration** means an equipment configuration meeting the requirements mentioned in section 26.72C. **approved GNSS position source** means a GNSS position source that is: (a) authorised by the FAA or EASA in accordance with 1 of the following: (i) (E)TSO-C145a;

(ii) (E)TSO-C146a;

(iii) (E)TSO-C196a; or

- (b) an alternate GNSS position source meeting the requirements mentioned in section 26.71; or



- (c) another system approved under Part 21 of CASR as having a level of performance equivalent to performance in accordance with paragraph (a) or (b).

***approved integrated TABS configuration*** means an equipment configuration meeting the requirements mentioned in section 26.72B.

***approved Mode A/C transponder*** means a Mode A transponder or a Mode C transponder that is authorised:

- (a) by CASA or the NAA of a recognised country in accordance with TSO-C74c or ETSO-C74d; or
- (b) by CASA in accordance with ATSO-1C74c.

***approved Mode S transponder*** means a Mode S transponder that is:

- (a) authorised by CASA or the NAA of a recognised country in accordance with TSO-C112 or ETSO-2C112a; or
- (b) another system approved under Part 21 of CASR as having a level of performance equivalent to a system mentioned in paragraph (a).

***approved Mode S transponder with ADS-B capability*** means an approved Mode S transponder that is:

- (a) authorised by CASA or the NAA of a recognised country in accordance with (E)TSO-C166; or
- (b) another system approved under Part 21 of CASR as having a level of performance equivalent to a system mentioned in paragraph (a).

***approved Mode S transponder with Class B TABS position source device configuration*** means an equipment configuration meeting the requirements mentioned in section 26.72A.

***approved transponder*** means an approved Mode A/C transponder or an approved Mode S transponder.

***assigned aircraft address*** means an aircraft address that is assigned to an aircraft by:

- (a) for an aircraft registered on the Australian Civil Aircraft Register — CASA; or

(c) for an aircraft that is a foreign-registered aircraft — the relevant NAA.

**Class A TABS** means TABS functionality relating to transponder function, altitude source function, and ADS-B OUT function, in accordance with (E)TSO-C199.

**Class B TABS** means TABS functionality relating to position source function, in accordance with (E)TSO-C199.

**Class B TABS position source device** means a device with a Class B TABS functionality.

**DAPs** means Mode S EHS downlink aircraft parameters.

**EASA AMC 20-24** means Annex II to ED Decision 2008/004/R titled *Certification Considerations for the Enhanced ATS in Non-Radar Areas using ADS-B Surveillance (ADS-B-NRA) Application via 1090 MHz Extended Squitter*, dated 2 May 2008, of EASA.

**EASA CS-ACNS** means Annex I to ED Decision 2013/031/R titled *Certification Specifications and Acceptable Means of Compliance for Airborne Communications, Navigation and Surveillance CS-ACNS*, dated 17 December 2013, of EASA, or any later version.

**GPS** means Global Positioning System.

**HPL** means the horizontal protection level of the GNSS position of an aircraft as an output of the GNSS receiver or system.

**integrated TABS device** means a device with integrated Class A TABS and Class B TABS functionality.

**Mode A** is a transponder function that transmits a 4-digit octal identification code for an aircraft's identity when interrogated by an SSR.

**Mode A code** is the 4-digit octal identification code transmitted by a Mode A transponder function.

**Mode C** is a transponder function that transmits a 4-digit octal identification code for an aircraft's pressure altitude when interrogated by an SSR.

**Mode S** is a transponder function that uses a unique aircraft address to selectively call individual aircraft and support advanced surveillance using Mode S EHS, Mode S ELS, or Mode S ES capabilities.

**Mode S EHS** means Mode S enhanced surveillance, which is a data transmission capability of a Mode S transponder.

**Mode S ELS** means Mode S elementary surveillance, which is a data transmission capability of a Mode S transponder.

**Mode S ES** means Mode S extended squitter, which is a data transmission capability of a Mode S transponder used to transmit ADS-B OUT information.

**NACp** means Navigation Accuracy Category – Position as specified in paragraph 2.2.3.2.7.1.3.8 of RTCA/DO-260B.

**NIC** means Navigation Integrity Category as specified in paragraph 2.2.8.1.16 of RTCA/DO-260B.

**NUCp** means Navigation Uncertainty Category – Position as specified in paragraph 2.2.8.1.5 of RTCA/DO-260.

**RTCA/DO-229D** means document RTCA/DO-229D titled *Minimum Operational*

*Performance Standards for Global Positioning System/Wide Area Augmentation System Airborne Equipment*, dated 13 December 2006, of the RTCA Inc. of Washington D.C. USA (**RTCA Inc.**).

**RTCA/DO-260** means RTCA Inc. document RTCA/DO-260 titled *Minimum Operational Performance Standards for 1090 MHz Automatic Dependent Surveillance – Broadcast (ADS-B)*, dated 13 September 2000.

**RTCA/DO-260B** means RTCA Inc. document RTCA/DO-260B titled *Minimum Operational Performance Standards for 1090 MHz Extended Squitter Automatic Dependent Surveillance – Broadcast (ADS-B) and Traffic Information Services – Broadcast (TIS-B)*, dated 2 December 2009, unless a later version as in force from time to time is expressly referred to.

**SA** means Selective Availability, and is a function of the GPS that has the effect of degrading the accuracy of the computed GPS position of a GNSS equipped aircraft.

**SDA** means System Design Assurance as specified in section 2.2.3.2.7.2.4.6 of RTCA/DO-260B.

**SIL** means Source Integrity Level as specified in paragraph 2.2.3.2.7.1.3.10 of RTCA/DO-260B.

**SSR**, or *secondary surveillance radar*, means a surveillance radar system which uses transmitters/receivers (interrogators) and transponders.

**surveillance equipment** means equipment that broadcasts data as a means to identify an aircraft, determine its three-dimensional position or obtain other information (such as, but not limited to, velocity and selected altitude or flight level).

**surveillance radar** means radar equipment used to determine the position of an aircraft in range and azimuth.

**TABS** means traffic awareness beacon system. **transponder** means an aircraft's SSR transponder.

## 26.68 Required surveillance equipment

- (1) An aircraft for a flight for which surveillance equipment is required under this section must be fitted with surveillance equipment that meets the requirements relevant to the intended operation and class of airspace.

*Note* See section 26.66 regarding certain aircraft that can be fitted with, or carry, surveillance equipment that is not in accordance with a TSO or ETSO provided certain conditions are met.

- (1A) An aircraft operating at Brisbane, Sydney, Melbourne or Perth aerodrome must be fitted with, or carry, at least 1 approved Mode S transponder with ADS-B capability.

*Note* An approved Mode S transponder with ADS-B capability is not required to transmit ADS-B OUT for a VFR flight.

- (2) For subsection (1), an aircraft in an operation mentioned in column 1 of an item in Table 26.68 (2), in the class of airspace mentioned in column 2 of the item, must be fitted with surveillance equipment meeting the requirements mentioned in column 3 of the item.

**Table 26.68 (2) – Surveillance equipment – requirements**

	Column 1	Column 2	Column 3
Item	Operation	Class of airspace	Requirements

1	IFR	Any (Classes A, B, C, D, E and G)	At least 1 approved ADS-B OUT equipment configuration.
2	VFR	Any — from FL290 and above	At least 1 approved ADS-B OUT equipment configuration.

	Column 1	Column 2	Column 3
Item	Operation	Class of airspace	Requirements
3	VFR	Class A, B or C (below FL290)	<p>At least 1:</p> <ul style="list-style-type: none"> <li>(a) approved ADS-B OUT configuration; or</li> <li>(b) approved Mode S transponder with Class B TABS position source device configuration; or</li> <li>(c) approved transponder being: <ul style="list-style-type: none"> <li>(i) for an aircraft, manufactured on or after 6 February 2014, or modified by having its transponder installation replaced on or after 6 February 2014 — an approved Mode S transponder with ADS-B capability; or</li> <li>(ii) for any other aircraft — approved transponder.</li> </ul> </li> </ul> <p><i>Note</i> An approved Mode S transponder with ADS-B capability is not required to transmit ADS-B OUT for a VFR flight.</p>

4	VFR	Class E (not above FL290) Class G — from 10 000 ft to not above FL290	At least 1: (a) approved ADS-B OUT configuration; or (b) approved equipment configuration of a Mode S transponder with Class B TABS position source device; or (c) approved transponder being: (i) for an aircraft, manufactured on or after 6 February 2014, or modified by having its transponder installation replaced on or after 6 February 2014 — a Mode S transponder with ADS-B capability; or (ii) for any other aircraft — an approved
	<b>Column 1</b>	<b>Column 2</b>	<b>Column 3</b>
<b>Item</b>	<b>Operation</b>	<b>Class of airspace</b>	<b>Requirements</b>
			transponder; or (d) an approved integrated TABS device. <i>Note</i> An approved Mode S transponder with ADS-B capability is not required to transmit ADS-B OUT for a VFR flight.

- (3) Item 4 in Table 26.68 (2) does not apply to an aircraft if the aircraft does not have:
- (a) an engine; or
  - (b) sufficient engine-driven electrical power generation capacity to power the surveillance equipment.

### 26.68A Requirements for other surveillance equipment for VFR aircraft

- (1) An aircraft may be fitted with, or carry, surveillance equipment in addition to the surveillance equipment required by section 26.68, but only if the requirements of this section are met.
- (2) An aircraft may be fitted with, or carry, surveillance equipment in circumstances where surveillance equipment is not required by section 26.68, but only if the requirements of this section are met.
- (3) For subsections (1) and (2), an aircraft in an operation mentioned in column 1 of Table 26.68A (3), in the class of airspace mentioned in column 2 of the item, may be fitted with, or carry, surveillance equipment that meets the requirements mentioned in column 3 of the item.

**Table 26.68A (3) – Optional surveillance equipment – requirements**

<b>Item</b>	<b>Operation</b>	<b>Class of airspace</b>	<b>Capability and Requirements</b>
	<b>Column 1</b>	<b>Column 2</b>	<b>Column 3</b>
1	VFR	Classes A, B, C or E — below FL290 Class G — from 10 000 ft but not above FL290	An approved EC device configuration. <i>Note</i> An EC device may be operated concurrently with a Mode A/C, or a Mode S transponder (other than one that is transmitting ADS-B — see section 26.72C.
2	VFR	Class G — below 10 000 ft	Any of the following: (a) approved ADS-B OUT configuration; (b) approved equipment configuration of a Mode S transponder with Class B TABS position source device; (c) approved transponder being: (i) for an aircraft
<b>Item</b>	<b>Operation</b>	<b>Class of airspace</b>	<b>Capability and Requirements</b>
	<b>Column 1</b>	<b>Column 2</b>	<b>Column 3</b>

			<p>manufactured on or after 6 February 2014, or modified by having its transponder installation replaced on or after 6 February 2014 — a Mode S transponder with ADS-B capability; or</p> <p>(ii) for any other aircraft — an approved transponder;</p> <p>(d) an approved integrated TABS device;</p> <p>(e) an approved EC device configuration.</p> <p><i>Note</i> An approved Mode S transponder with ADS-B capability is not required to transmit ADS-B OUT for a VFR flight.</p> <p><i>Note</i> An EC device may be operated concurrently with a Mode A/C, or a Mode S transponder (other than one that is transmitting ADS-B).</p>
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### 26.69 Operation of surveillance equipment — general requirements

- (1) The requirements of this section are subject to section 26.73.
- (2) Surveillance equipment required to be fitted to, or carried on, an aircraft by section 26.68 must be continuously operated during the circumstances mentioned in section 26.68.
 

*Note* Continuous operation for a transponder means that the equipment must be operated in a mode that enables an SSR response to be transmitted and, where an altitude reporting capability is available, that this capability is also activated.

(2A) Surveillance equipment (other than approved transponders) fitted to, or carried on, an aircraft under section 26.68A must be continuously operated during the circumstances mentioned in that section for the specific kind of equipment.
- (3) Subsections (2) and (2A) do not apply if ATC has issued an instruction that the surveillance equipment is not to be operated.
- (4) Unless otherwise required by ATC, an aircraft that is flying in formation with, or is in-company with, 1 or more other aircraft, is not required to operate surveillance equipment if serviceable surveillance equipment is operated by any of the other aircraft at all times while the aircraft are flying in formation or are in-company.
- (5) If an aircraft is fitted with more than 1 approved transponder, only 1 transponder is to be operated at any time.
- (6) If an approved transponder is fitted to an aircraft for a flight, the Mode A code must be set:
  - (a) to the transponder code assigned by ATS for the flight; or
  - (b) if no transponder code is so assigned — to the relevant standard code in Table 26.69 (7).

- (7) For paragraph (6) (b), for a situation mentioned in column 1 of an item in Table 26.69 (7), the Mode A code is the number mentioned in column 2 for the item.
- (7A) Subject to subsection (7B), if an emergency situation described in an item of column 1 of Table 26.69 (7A) occurs during a flight, a pilot of the aircraft for the flight must set the Mode A code mentioned in column 2 for the item.
- (7B) Despite subsection (7A), a pilot of an aircraft for a flight does not have to set a Mode A code mentioned in column 2 of Table 26.69 (7A) if the pilot reasonably believes that maintaining an existing Mode A code would result in a safer outcome.
- (8) Pressure altitude information reported by an approved transponder or approved ADS-B OUT equipment configuration must be determined by:
- (a) a barometric encoder of a type that is authorised in accordance with (E)TSO-C88a; or
  - (b) another system approved under Part 21 of CASR as having a level of performance equivalent to a system mentioned in paragraph (a).

**Table 26.69 (7) – Transponders – Mode A standard codes**

	<b>Column 1</b>	<b>Column 2</b>
<b>Item</b>	<b>Situation</b>	<b>Mode A Code</b>
1	(a) Flights in Class A, B, C or D airspace; (b) IFR flights in Class E airspace.	3000
2	IFR flights in Class G airspace.	2000
3	VFR flights in Class E or Class G airspace.	1200
4	Flights in Class G over water at a distance greater than 15 NM from shore.	4000
5	Flights engaged in coastal surveillance.	7615
6	Ground testing by aircraft maintenance staff.	2100

**Table 26.69 (7A) – Transponders – Mode A emergency codes**

	<b>Column 1</b>	<b>Column 2</b>
<b>Item</b>	<b>Situation</b>	<b>Mode A Code</b>
1	Unlawful interference.	7500
2	Loss of radiocommunication.	7600
3	In-flight emergency (unless otherwise instructed by ATC).	7700

**26.70 Mode S transponders, ADS-B OUT and electronic conspicuity equipment — specific requirements**

- (1) An approved Mode S transponder fitted to an aircraft for a flight must have the following items entered into the equipment:



- (a) the assigned aircraft address;
  - (b) as far as practicable for the equipment — 1 of the following forms of aircraft flight identification:
    - (i) if a flight notification is filed with ATS for the flight — the aircraft identification mentioned on the flight notification;
    - (ii) if no flight notification is filed with ATS for the flight — the aircraft registration mark.
- (2) An approved ADS-B OUT equipment configuration, approved integrated TABS configuration or approved EC device configuration, fitted to, or carried on, an aircraft for a flight, must have the following items entered into the equipment:
- (a) the assigned aircraft address;
  - (b) 1 of the following forms of aircraft flight identification:
    - (i) if a flight plan is filed with ATS for the flight — the aircraft identification mentioned on the flight plan;
    - (ii) if no flight plan is filed with ATS for the flight — the aircraft registration mark.
- (3) An approved Mode S transponder must transmit each of the following when interrogated on the manoeuvring area of an aerodrome or in flight:
- (a) the assigned aircraft address;
  - (b) the Mode A code;
  - (c) the Mode C code;
  - (d) subject to subsection (4) — the aircraft flight identification.
- (4) Transmission of the aircraft flight identification by an approved Mode S transponder is optional for an aircraft that was first issued with a certificate of airworthiness before 9 February 2012 (an *older aircraft*). However, an older aircraft that is equipped to do so may transmit its aircraft flight identification.
- (5) If an approved Mode S transponder transmits any Mode S EHS DAPs, the transmitted DAPs must comply with the standards set out in paragraph 3.1.2.10.5.2.3 and Table 3-10 of *Volume IV, Surveillance and Collision Avoidance Systems*, of ICAO Annex 10.
- Note 1* Paragraph 3.1.2.10.5.2.3 includes paragraphs 3.1.2.10.5.2.3.1 and 3.1.2.10.5.2.3.2 and 3.1.2.10.5.2.3.3.
- Note 2* Australian Mode S SSR supports EHS DAPs. Transmission of Mode S EHS DAPs that are not in accordance with the ICAO standards may provide misleading information to ATS. Operators need to ensure that EHS DAPs are being transmitted.
- (6) If an approved Mode S transponder is fitted to an aircraft first issued with a certificate of airworthiness on or after 9 February 2012: (a) that has a certificated MTOW above 5 700 kg; or
- (b) that is capable of normal operation at a maximum cruising true airspeed above 250 kts;
- then the transponder's receiving and transmitting antennae must:
- (c) be located in the upper and lower fuselage; and

- (d) operate in diversity, as specified in paragraphs 3.1.2.10.4 to 3.1.2.10.4.5 (inclusive) of *Volume IV, Surveillance and Collision Avoidance Systems*, of ICAO Annex 10.

*Note* Paragraph 3.1.2.10.4.2.1 is recommendatory only.

- (7) Subject to subsection (8), an aircraft fitted with, or carrying, ADS-B OUT equipment that is not an approved ADS-B OUT equipment configuration, approved EC device configuration, approved integrated TABS configuration or approved Mode S transponder with Class B TABS position source device configuration, must not fly in Australian territory, unless the equipment is:

- (a) deactivated; or
- (b) set to transmit only a value of zero for the NUCp, NACp, NIC or SIL.

*Note* It is considered equivalent to deactivation if NUCp, NACp, NIC or SIL is set to continually transmit only a value of zero.

- (8) Subsection (7) does not apply to an aircraft if it is undertaking an ADS-B test flight in VMC in airspace below FL 290.

### **26.71 Alternate GNSS position source for ADS-B OUT — requirements**

- (1) For an aircraft first issued with a certificate of airworthiness on or after 8 December 2016, an alternate GNSS position source is acceptable if the source:
  - (a) is certified by the NAA of a recognised country for use in IFR flight; and
  - (b) has included in its specification and operation the following:
    - (i) GNSS FDE, computed in accordance with the definition at paragraph 1.7.3 of *RTCA/DO-229D*;
    - (ii) the output function HPL, computed in accordance with the definition at paragraph 1.7.2 of *RTCA/DO-229D*;
    - (iii) functionality that, for the purpose of HPL computation, accounts for the absence of the SA of the GPS in accordance with paragraph 1.8.1.1 of *RTCA/DO-229D*.
- (2) For an aircraft first issued with a certificate of airworthiness before 8 December 2016, an alternate GNSS position source is acceptable if it meets the requirements of subsection (1), other than subparagraph (1) (b) (iii) which is optional.

### **26.72 Alternate ADS-B OUT equipment configuration — requirements**

An alternate ADS-B OUT equipment configuration must meet the following requirements:

- (a) it has been approved or accepted by:
  - (i) the NAA of a recognised country as meeting the standards of EASA AMC 20-24 or EASA CS-ACNS; or
  - (ii) the FAA as meeting the standards of 14 CFR 91.225 for 1090 Megahertz (MHz) Extended Squitter ADS-B; and
- (b) the AFM or flight manual supplement attests to the certification; and
- (c) the GNSS system meets the relevant performance requirements mentioned in section 26.71.

### **26.72A Approved Mode S transponder with Class B TABS position source device equipment configuration — requirements**

- (1) A Mode S transponder must be of a type that is:
  - (a) authorised in accordance with (E)TSO-C166B; or
  - (b) approved under Part 21 of CASR as having a level of performance equivalent to that of a type compliant with paragraph (a).
- (2) When required to be operated, the Mode S transponder must transmit NAC<sub>p</sub>, NIC, SIL and SDA values in accordance with the authorised capability of the GNSS position source.
- (3) The geographical position transmitted by the Mode S transponder must be determined by:
  - (a) a Class B TABS position source device that is authorised in accordance with (E)TSO-C199; or
  - (b) another source approved under Part 21 of CASR as having a level of performance equivalent to that of a device compliant with paragraph (a).
- (4) If a Mode S transponder with Class B TABS position source device transmits a SIL value of less than 2, the aircraft must not enter any controlled airspace in which the aircraft must be fitted with, or carry, equipment that is of an approved ADS-B OUT equipment configuration.

### **26.72B Approved integrated TABS device — requirements**

- (1) An approved integrated TABS device (the *device*) must only be operated in transmitting mode if the flight is conducted:
  - (a) under the VFR; and
  - (b) below FL290; and
  - (c) in Class D, E or G airspace.
- (2) The device must meet the technical specifications in (E)TSO-C199 that are for a device with integrated Class A TABS and Class B TABS functionality.
- (3) The device must transmit a SIL value of 1.
- (4) The device must be authorised by the relevant NAA of the equipment manufacturer as meeting the standards mentioned in subsections (2) and (3).

*Note* Section 26.66 provides for an exception to the relevant NAA authorisation requirement for certain kinds of light sport, experimental and other aircraft.

### **26.72C Approved EC device — requirements**

- (1) An approved EC device (an *EC device*) must only be operated in transmitting mode if the flight is conducted: (a) under the VFR; and (b) below FL290.
- (2) The EC device must not be operated in transmitting mode concurrently with a Mode S transponder that is also transmitting ADS-B.

*Note* An EC device may be operated concurrently with a Mode A/C, or a Mode S transponder (other than one that is transmitting ADS-B) but it is not a substitute for mandatory carriage of a transponder in relevant airspace.
- (3) The EC device must meet the technical specifications in UK CAP 1391, except in relation to the matters mentioned in subsections (4), (5) and (6).
- (4) The EC device must use a Class B TABS position source that complies with the performance standards specified in (E)TSO-C199.

- (5) The EC device must:
  - (a) be capable of transmitting a SIL value of 1, in accordance with the standards in UK CAP 1391 for an EC device that uses a Class B TABS position source; and
  - (b) transmit that SIL value of 1.
- (6) The EC device must:
  - (a) meet the requirements described in paragraph 2.2.3.2.7.2.4.6 of RTCA/DO-260B for transmitting an SDA of 1; and (b) transmit an SDA value of 1.
- (7) The EC device must use a barometric encoder for altitude information.
- (8) The EC device must be mounted in accordance with the manufacturer's instructions.
- (9) The EC device, when mounted in accordance with the manufacturer's instructions, must not:
  - (a) interfere with aircraft controls; or
  - (b) otherwise affect the safe operation of the aircraft.
- (10) The following administrative standards for the EC device must be complied with:
  - (a) an EC device must have a statement of compliance (however described) from the EC device manufacturer certifying that the device meets the following requirements (*a declaration of capability and conformance or declaration*):
    - (i) if the declaration was made before 2 December 2021 — clauses 1 to 5 of Part B of Appendix XIV of Civil Aviation Order 20.18 as in force immediately before 2 December 2021;
    - (ii) otherwise — subsections (3) to (7);
  - (b) the pilot in command of an aircraft that uses the EC device must carry the declaration, or a copy of it, on board the aircraft;
  - (c) an EC device model must not be operated in a transmit mode anywhere in Australia unless it is listed on the CASA website as an EC device model for which the manufacturer has made a valid declaration;
  - (d) the manufacturer of an EC device model may apply in writing to CASA:
    - (i) for a statement that CASA considers that the manufacturer has made a valid declaration of capability and conformance to subsections (3) to (7); and
    - (ii) for inclusion of the EC device model on the CASA website;
  - (e) CASA may remove an EC device model from the CASA website if:
    - (i) the manufacturer requests its removal in writing; or
    - (ii) if CASA is satisfied that removal is required in the interests of aviation safety.

### **26.73 Aircraft flown with inoperative surveillance equipment**

Surveillance equipment required by section 26.68 may be inoperative at the beginning of a flight if:

- (a) the flight begins from an aerodrome at which there is no facility for the surveillance equipment to be repaired or replaced; and
- (b) the flight ends not more than 72 hours after the time the surveillance equipment was found to be inoperative; and

- (c) before the flight commences, the pilot in command informs ATS about the unserviceability.

*Note* See also section 26.04 for additional requirements related to flight with inoperative equipment. For a flight with inoperative surveillance equipment, within controlled airspace or at a controlled aerodrome, Division 11.2 has requirements related to ATC clearances. Whether a clearance is issued, or when a clearance may be issued, could be affected by the flight's inoperative equipment.

Chapter 26



# **Extracts From Part 135 MOS**



# **Part 135 (Australian Air Transport Operations—Smaller Aeroplanes) Manual of Standards 2020**

made under the *Civil Aviation Safety Regulations 1998*.

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# Chapter 1 — Preliminary

## 1.01 Name

- (1) This instrument is the *Part 135 (Australian Air Transport Operations—Smaller Aeroplanes) Manual of Standards 2020*.
- (2) This instrument may be cited as the *Part 135 Manual of Standards*.
- (3) Unless the contrary intention appears, references in this instrument to “this manual of standards”, “this MOS” or “this instrument” are references to the *Part 135 Manual of Standards*.

## 1.03 Authority

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

Note: Regulation 135.025 of CASR includes a general power for CASA to issue a Manual of Standards for the purposes of Part 135 of CASR (Australian air transport operations—smaller aeroplanes).

## 1.04 Definitions and abbreviations

Note: Some expressions used in this instrument are defined in section 1.03 of the *Civil Aviation Act 1988*, the Dictionary of the *Civil Aviation Safety Regulations 1998* or subregulation 2(1) of the *Civil Aviation Regulations 1988*.

In this instrument:

*AGL* means above ground level.

*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.” *APU* means auxiliary power unit.

*ATS* means Air Traffic Services.

Note: The term *Air Traffic Services* is defined in the Dictionary.

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*automatic ELT*: see section 11.49.

*destination alternate aerodrome* means an alternate aerodrome that is a

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destination alternate (within the meaning of Annex 2 to the Chicago Convention). *ELT*: see section 11.48.

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

***(E)TSO*** means ETSO or TSO.

***GNSS*** means global navigation satellite system.

***headset*** includes a flying helmet that incorporates a headset.

***ISA*** means International Standard Atmosphere.

***landing performance requirements***, for an aeroplane, means the landing performance requirements for the aeroplane stated in its flight manual.

***LSALT*** means lowest safe altitude.

***MTOW*** means maximum take-off weight.

***NAA*** means national aviation authority.

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

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

***passenger list***, for a flight, means a passenger list for the flight, or other document, containing the information stated in subregulation 135.090(2) of CASR.

***survival ELT***: see section 11.50.

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

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## **Chapter 4 — Operational flight plans**

### **4.01 Pre-flight content of operational flight plan**

- (1) This section prescribes the information for paragraph 135.145(2)(b) of CASR.

#### *General information requirements*

- (2) The operational flight plan must include the following information:

- 
- (a) the aeroplane's registration mark;
  - (b) the flight number of the flight, if any;

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- (c) the date of the flight;
- (d) the name, or identification, of the departure aerodrome, and planned destination aerodrome, for the flight;
- (e) whether the flight is planned, whether in whole or part, to be a VFR flight at night, an IFR flight or both;
- (f) the amount of fuel required to be carried on board the aeroplane for the flight under regulation 135.215 of CASR, and the actual amount of fuel carried on board the aeroplane for the flight; (g) for the planned flight route for the flight:
  - (i) the route and route segments of the flight, including waypoints, distances and tracks; and
  - (ii) for a VFR flight at night or IFR flight — the published LSALT, or LSALT (whichever is applicable), for each route segment of the flight; and
  - (iii) the planned cruising speed, and flying times between waypoints, for the flight; and
  - (iv) the planned altitudes or flight levels during the flight.

*Information about alternate aerodromes*

- (3) If a destination alternate aerodrome is required for the flight, the operational flight plan must include details of the destination alternate aerodrome, and the routes, or route segments, required for the flight to the destination alternate aerodrome, unless:
  - (a) there is a last-minute change:
    - (i) to the destination alternate aerodrome required for the flight; or
    - (ii) requiring a destination alternate aerodrome to be planned for the flight; and
  - (b) it is not reasonably practicable in the circumstances to update the flight plan to include either or both matters; and
  - (c) in the case where the information identifying the destination alternate aerodrome is not included — there are procedures in the aeroplane operator's exposition to ensure the pilot in command is notified of the details of the destination alternate aerodrome before the aeroplane takes-off for the flight.

Note: Regulation 135.180 of CASR requires the inclusion of details of a take-off alternate aerodrome in the operational flight plan in certain circumstances.

## **Chapter 5 — Alternate aerodrome requirements**

### **5.01 Operations to remote islands**

(1) In this section:

*remote island* means:

- (a) Christmas Island; or
- (b) the Cocos (Keeling) Islands; or (c) Lord Howe Island; or (d) Norfolk Island.

- (2) This section prescribes circumstances and requirements for subregulation 135.185(1) of CASR.
- (3) This section applies to an aeroplane that:
  - (a) has more than 1 engine; and
  - (b) is conducting a passenger transport operation or medical transport operation, which involves flying to a remote island.
- (4) The requirements are the following:
  - (a) before the flight commences, the pilot in command of the aeroplane must nominate a destination alternate aerodrome for the flight;
  - (b) the nominated destination alternate aerodrome, for the flight, must not be located on a remote island.
- (5) However, the requirement stated in paragraph (4)(b) does not apply if the aeroplane's operator holds an approval, under regulation 135.020 of CASR, for the nominated destination alternate aerodrome, for the flight, to be located on a remote island.

# Chapter 7 — Fuel requirements

## 7.01 Purpose of Chapter 7

This Chapter prescribes requirements for subregulation 135.215(1) of CASR.

## 7.02 Definitions for Chapter 7

In this Chapter:

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

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

**contingency fuel**, for an aeroplane and flight, means the amount of fuel required to compensate for unforeseen factors, which must not be less than the greater of the following amounts:

- (a) if:
  - (i) the aeroplane is a piston-engine aeroplane — 10% of the trip fuel amount for the flight; or
  - (ii) the aeroplane is a turbine-engine aeroplane — 5% of the trip fuel amount for the flight;
- (b) an amount of fuel required to fly, in ISA conditions, for 5 minutes at the holding speed, for the aeroplane, at 1 500 ft above the planned destination aerodrome.

**destination alternate fuel** means the amount of fuel required to enable an aeroplane to do the following in a sequence:

- (a) perform a missed approach at the destination aerodrome;
- (b) climb to the expected cruising altitude;
- (c) fly the expected routing to the destination alternate aerodrome;
- (d) descend to the point where the expected approach is initiated;
- (e) conduct the approach;
- (f) land at the destination alternate aerodrome.

**established**, for the definition of **holding fuel** in this section, means any of the following:

- (a) established by the aeroplane's manufacturer, and published in the aeroplane's flight manual;
- (b) established by the use of a fuel consumption monitoring system;
- (c) established by the aeroplane's operator and published in the operator's exposition, along with:
  - (i) the relevant data and methodology used; or
  - (ii) references to another accessible location of the data and methodology used.

**final reserve fuel** means the calculated 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 kind of flight mentioned in column 2 of the item—for the period of the flight mentioned in column 3 of the item; and
  - (ii) at 1 500 ft above aerodrome elevation in ISA conditions; and
  - (iii) at holding speed; and
  - (iv) at the aeroplane's estimated weight on arrival at the destination alternate aerodrome, or planned destination aerodrome if no destination alternate aerodrome is required for the flight; and
- (b) that is usable fuel remaining on completion of the final landing at the aerodrome.

**Table—Final reserve fuel requirements**

Item	Column 1	Column 2	Column 3
	Aeroplane	Kind of flight	Final reserve fuel flight time
1	A piston-engine aeroplane	IFR flight or VFR flight	45 minutes
2	A turbine-engine aeroplane	IFR flight or VFR flight	30 minutes

**holding fuel** means the amount of fuel required by an aeroplane to fly for the period 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 conditions.

Note: See the definition of *established* in this section.

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

- (a) if the flight arrives at the point with adequate fuel to complete the flight to the planned destination aerodrome while maintaining the fuel required by subsection 7.04(2) —continue to that aerodrome; or
- (b) otherwise — divert to an en route alternate aerodrome while maintaining the fuel required by subsection 7.04(3).

**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) APU consumption, if applicable.

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

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

**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.

### 7.03 General requirements

#### *Fuel consumption data*

- (1) When determining the quantity of usable fuel required under this Chapter for a flight of an aeroplane, the operator, and pilot in command, must each use the following fuel consumption data sources:
  - (a) the most recent aeroplane specific fuel consumption data derived from a fuel consumption monitoring system used by the operator, if available;
  - (b) the aeroplane's manufacturer's data for the aeroplane.

Note: The aeroplane manufacturer's data includes electronic flight planning data. The manufacturer's data may be in the flight manual, cruise performance manuals or other publications.

#### *Operational conditions etc*

- (2) In determining the quantity of usable fuel required under this Chapter, the operator, and pilot in command, must each consider the effect of the following matters:
  - (a) the operating conditions for the proposed flight, including the following:
    - (i) the actual (if known or available), or anticipated, weight of the aeroplane;
    - (ii) relevant NOTAMs;
    - (iii) relevant meteorological reports and forecasts;
    - (iv) relevant ATS procedures, restrictions and anticipated delays;
    - (v) the effects of deferred maintenance items and configuration deviations;
  - (b) the potential for deviations from the planned flight because of unforeseen factors.

## 7.04 Amounts of fuel to be carried on board for a flight

- (1) The operator, and pilot in command, of an aeroplane must each ensure that, when a flight of the aeroplane commences, the aeroplane is carrying on board at least the total of the following amounts of usable fuel:
  - (a) taxi fuel;
  - (b) trip fuel;
  - (c) destination alternate fuel, if required;
  - (d) holding fuel, if required;
  - (e) contingency fuel;
  - (f) final reserve fuel;
  - (g) additional fuel, if applicable.
- (2) The operator, and pilot in command, must each ensure, at any point of in-flight replanning, the aeroplane is carrying on board at least the following amounts of usable fuel:
  - (a) trip fuel from that point;
  - (b) destination alternate fuel, if required;
  - (c) holding fuel, if required;
  - (d) contingency fuel;
  - (e) final reserve fuel;
  - (f) additional fuel, if applicable.
- (3) The operator, and pilot in command, must each ensure the aeroplane is carrying on board at least the following amounts of usable fuel, required at any time to continue the flight safely:
  - (a) trip fuel from that time;
  - (b) destination alternate fuel, if required;
  - (c) holding fuel, if required;
  - (d) final reserve fuel;
  - (e) additional fuel if applicable.
- (4) If, after the commencement of the flight, fuel is used for a purpose other than that originally intended during pre-flight planning, the pilot in command must re-analyse the planned use of fuel for the remainder of the flight, and adjust the parameters of the flight if that is necessary to continue to meet the requirements of this Chapter.
- (5) Subsection (6) applies if an aeroplane:
  - (a) has been unable to land at the planned destination aerodrome; and
  - (b) is diverting to the planned destination alternate aerodrome.
- (6) Despite subsection (3), the operator, and pilot in command, must each ensure the aeroplane is carrying at least the following amounts of usable fuel:
  - (a) destination alternate fuel from that time;
  - (b) holding fuel, if required;
  - (c) final reserve fuel.

## 7.05 Requirements for determining fuel before, and monitoring fuel during, flight

- (1) The operator, and pilot in command, of an aeroplane must each ensure that for a flight of the aeroplane:
  - (a) the amount of usable fuel on board the aeroplane is determined before the flight commences, and recorded; and

- (b) regular in-flight fuel amount checks are conducted.

Note: Procedures to ensure that a flight of the aeroplane is conducted in accordance with the fuel requirements stated in this Chapter, including procedures for how regular in-flight fuel amount checks will be conducted for a flight, must be included in the operator's exposition: see regulation 135.205, and paragraphs 119.205(1)(h) and (o), of CASR.

- (2) The pilot in command must do all of the following at each in-flight fuel amount check:
  - (a) determine the amount of usable fuel remaining;
  - (b) compare planned fuel consumption with actual fuel consumption;
  - (c) determine whether the remaining usable fuel is sufficient to meet:
    - (i) if a point of in-flight replanning has been specified by the operator for the flight and the flight has not proceeded past the point — the requirements of subsection 7.04(2); and
    - (ii) otherwise — the requirements of subsection 7.04(3);
  - (d) calculate the amount of usable fuel expected to be remaining when the aeroplane lands at the destination aerodrome.

## 7.06 Procedures if fuel reaches specified amount

- (1) If the pilot in command of an aeroplane for a flight becomes aware that the amount of usable fuel in the aeroplane on landing at the destination aerodrome would be less than the fuel required under subsection 7.04(3), the pilot in command must:
  - (a) take into account the traffic and operational conditions likely to be prevailing on arrival at:
    - (i) the destination aerodrome; and
    - (ii) if a destination alternate aerodrome is required for the flight — the destination alternate aerodrome; and
    - (iii) any en-route alternate aerodrome; and
  - (b) proceed to an aerodrome mentioned in paragraph (a) that enables the pilot in command to continue to meet the requirements stated in section 7.04.
- (2) The pilot in command must request from ATS the duration of any likely delay in landing if unforeseen factors could result in the aeroplane landing at the destination aerodrome with less than the following amounts of fuel remaining:
  - (a) final reserve fuel;
  - (b) destination alternate fuel, if required.
- (3) The pilot in command must declare to ATS a “minimum fuel” state if:
  - (a) the pilot in command is committed to land the aeroplane at an aerodrome in accordance with this section; and
  - (b) it is calculated that if there is any change to the existing air traffic control clearance issued to the aeroplane in relation to that aerodrome, the aeroplane will land with less than the final reserve fuel remaining.

Note 1: The declaration of “minimum fuel” informs ATS that all planned aerodrome options have been reduced to a specific aerodrome of intended landing and any change to the existing clearance may result in landing with less than final reserve fuel. This is not an emergency situation, but an indication that an emergency situation is possible should any additional delay happen.

Note 2: Pilots in command should not expect any form of priority handling because of a “minimum fuel” declaration. ATS will, however, advise the flight crew of any additional expected delays, and coordinate when transferring control of the aeroplane to ensure other ATS units are aware of the flight’s fuel state.

- (4) If the pilot in command of an aeroplane for a flight becomes aware that the amount of useable fuel on board upon landing at the nearest aerodrome where a safe landing can be made would be less than the final reserve fuel, the pilot in command must declare a situation of “emergency fuel” by broadcasting “MAYDAY, MAYDAY, MAYDAY FUEL”.

Note: The emergency fuel declaration is a distress message.





# Chapter 10— Performance

## Division 1 — Small aeroplanes

### Subdivision 1—Preliminary

#### 10.01 Application of Division 1

This Division applies in relation to the operation of the following aeroplanes:

- (a) a propeller-driven aeroplane with an MTOW of not more than 5 700 kg;
- (b) a jet-driven, single-engine aeroplane with an MTOW of not more than 5 700 kg;
- (c) a jet-driven, multi-engine aeroplane with an MTOW of not more than 2 722 kg.

#### 10.02 Definitions for this Division

In this Division:

***approved landing factor***, for a propeller-driven aeroplane, means the landing factor for which the aeroplane operator holds an approval under regulation 135.020 of CASR.

***approved take-off factor***, for a propeller-driven aeroplane, means the take-off factor for which the aeroplane operator holds an approval under regulation 135.020 of CASR.

***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 NAA of the country.

***factored landing distance***: see section 10.11.

***factored take-off run***: see section 10.04.

***landing distance available***, for a landing of an aeroplane at an aerodrome, means the length of runway at the aerodrome established by the aeroplane's operator to be available and suitable for the ground run of an aeroplane landing.

***landing distance required***, for an aeroplane, means the landing distance for the aeroplane calculated in accordance with the relevant requirements stated in the aeroplane's flight manual.

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

- (a) the ambient temperature;

- (b) the temperature assumed to be the ambient temperature determined using the procedures, stated in the aeroplane operator's exposition, for estimating the ambient temperature at take-off for the purpose of determining take-off performance.

*safe area*, of an aerodrome, means an area of land or water, before the start of the landing distance available for a landing of an aeroplane at the aerodrome, which:

- (a) has no obstacles; and
- (b) has a surface that is not suitable to be used for the ground run of the aeroplane during landing.

*standard landing factor* means:

- (a) for an aeroplane with an MTOW of not more than 2 000 kg—1.15; and
- (b) for an aeroplane with an MTOW of more than 2 000 kg, but less than 4 500 kg—a factor derived by linear interpolation, between 1.15 and 1.43, according to the aeroplane's MTOW; and
- (c) for an aeroplane with an MTOW of 4 500 kg or more—1.43.

*standard take-off factor* means:

- (a) for an aeroplane with an MTOW of not more than 2 000 kg—1.15; and
- (b) for an aeroplane with an MTOW of more than 2 000 kg, but less than 3 500 kg—a factor derived by linear interpolation between 1.15 and 1.25, according to the aeroplane's MTOW; and
- (c) for an aeroplane with an MTOW of 3 500 kg or more—1.25.

*take-off distance available*, for a take-off of an aeroplane at an aerodrome, means the total of:

- (a) the length of the take-off run available for a runway at the 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 to 50 ft AGL, for the aeroplane, calculated in accordance with the relevant requirements stated in the aeroplane's flight manual.

*take-off run available*, for a runway at an aerodrome, means the length of the runway available and suitable for the ground run of an aeroplane taking off at the aerodrome.

*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.

## Subdivision 2—Take-off performance

### 10.03 Purpose of Subdivision 2

The purpose of this Subdivision is to prescribe requirements for subregulation 135.345(1) of CASR.

- Note 1: Regulation 135.340 of CASR requires a calculation that relates to an aeroplane's performance for a flight to be made using performance data set out in the aeroplane's

aircraft flight manual instructions or performance data, for the aeroplane, approved by CASA. See the Dictionary for the definition of *aircraft flight manual instructions*.

Note 2: Regulation 91.055 of CASR makes it an offence if an aircraft is operated in a manner that creates a hazard to another aircraft, a person or property.

#### 10.04 Meaning of *factored take-off run*

The *factored take-off run*, for an aeroplane of the kind mentioned in column 1 of an item in Table 10.04, is the take-off run required, for the aeroplane, multiplied by the factor mentioned in column 2 of the item.

**Table 10.04—Factored take-off run**

<b>Item</b>	<b>Column 1</b>	<b>Column 2</b>
	<b>Aeroplane</b>	<b>Factor</b>
1	Aeroplane for which: (a) there is a flight manual; and (b) there is no approved take-off factor	The standard take-off factor for the aeroplane
2	Propeller-driven aeroplane for which there is an approved take-off factor	The approved take-off factor for the aeroplane

#### 10.05 Approval of take-off factor for a propeller-driven aeroplane

CASA may, under regulation 135.020 of CASR, approve a take-off factor for a propeller-driven aeroplane, for operations at a particular aerodrome, which is less than the standard take-off factor for the aeroplane, only if the proposed take-off factor has been risk-assessed by the aeroplane's operator for operations at the aerodrome.

#### 10.06 Maximum permitted take-off weight

The operator, and pilot in command, must each ensure that, at take-off, the aeroplane's weight does not exceed each of the following:

- (a) a weight that would enable the aeroplane to meet the requirements stated in sections 10.07 to 10.09;
- (b) a weight that, taking account of the expected consumption of fuel and oil for the flight, will ensure a landing weight that does not exceed the maximum landing weight;
- (c) a weight that will ensure a landing weight that, taking account of the expected consumption of fuel and oil for the flight, complies with Subdivision 3.

Note: The weight at take-off for an aeroplane is also limited by the *maximum take-off weight* for the aeroplane, which in the Dictionary, for a type certificated aeroplane, is defined to mean the maximum take-off weight for the aeroplane permitted by its flight manual. It is an offence under regulation 91.095, or 135.040, of CASR if an aeroplane is not operated in accordance with the aeroplane's aircraft flight manual instructions.

## 10.07 Take-off requirements

- (1) The operator, and pilot in command, must each ensure:
  - (a) the factored take-off run, for a take-off of the aeroplane from a runway at an aerodrome, does not exceed the take-off run available for the runway; and
  - (b) the take-off distance required for a take-off of the aeroplane from the runway does not exceed the take-off distance available for the runway; and
  - (c) any clearway forming part of the take-off distance available for the runway does not exceed half the length of the take-off run available for the runway.
- (2) For the purposes of subsection (1), the following matters must be taken into account:
  - (a) the take-off configuration of the aeroplane;
  - (b) the pressure altitude, and presumed temperature, at the aerodrome;
  - (c) the type of runway surface, and runway surface condition;
  - (d) the runway slope in the direction of take-off;
  - (e) unless otherwise accounted for in the performance data set out in the aeroplane's aircraft flight manual instructions, not more than 50% of the headwind component, or not less than 150% of the tailwind component, for the runway.

## 10.08 Initial climb performance and obstacle clearance

- (1) This section applies if the flight of an aeroplane is an IFR flight, or VFR flight at night.
- (2) The operator, and pilot in command, must each ensure that until the aeroplane reaches the minimum height (the **relevant height**) for the flight in accordance with regulation 91.265, 91.267, 91.277, or 91.305, of CASR, as applicable:
  - (a) for all flights — the aeroplane has the performance to clear all obstacles by a safe margin, as determined by the operator's exposition; and
  - (b) for flights not conducted in VMC by day — the aeroplane has the performance to reach, and maintain, the relevant height.
- (3) For the purposes of subsection (2), the following matters must be taken into account:
  - (a) the take-off configuration of the aeroplane;
  - (b) the pressure altitude, and presumed temperature, at the aerodrome;
  - (c) the obstacles, if any, in the vicinity of the take-off path and en route;
  - (d) the forecast weather en route.

## 10.09 En route obstacle clearance for multi-engine aeroplane

- (1) The operator, and pilot in command, of a multi-engine aeroplane must each ensure that the aeroplane has the performance to conduct the flight in accordance with regulation 91.265, 91.267, 91.277, or 91.305, of CASR, as applicable, if:
  - (a) an engine of the aeroplane becomes inoperative, during a flight, before the aeroplane reaches the planned cruising altitude, or cruising level, for the flight; and
  - (b) each remaining engine of the aeroplane is operating within the maximum continuous power limitations stated in the aeroplane's flight manual.
- (2) Subsection (1) does not apply if the operator's exposition states procedures requiring the pilot in command to have a plan, in the circumstances mentioned in subsection (1), that enables the aeroplane to return to the departure aerodrome, or divert to a take-off alternate aerodrome, clear of all ground, water and obstacles.
- (3) The procedures mentioned in subsection (2) may include drift-down procedures, provided that the procedures enable the aeroplane to descend, and land, at an aerodrome with at least 2 000 ft vertical separation from all ground, water and obstacles within 5 nautical miles on either side, or ahead, of the aeroplane's track until established within the aerodrome's circuit area.

## Subdivision 3—Landing performance

### 10.10 Purpose of Subdivision 3

The purpose of this Subdivision is to prescribe requirements for subregulation 135.350(1) of CASR.

### 10.11 Meaning of *factored landing distance*

For an aeroplane mentioned in column 1 of an item in Table 10.11, conducting a landing mentioned in column 2 of the item, the *factored landing distance* is the landing distance required, for the aeroplane, multiplied by the factor mentioned in column 3 of the item.

**Table 10.11—Factored landing distance**

Item	Column 1 Aeroplane	Column 2 Landing	Column 3 Factor
1	Propeller-driven aeroplane for which: (a) there is a flight manual; and (b) there is no approved landing factor	A landing that is not part of a land and hold short operation	The standard landing factor for the aeroplane
2	Propeller-driven aeroplane for which there is an approved landing factor	A landing that is not part of a land and hold short operation	The approved landing factor for the aeroplane

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**Table 10.11—Factored landing distance**

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<b>Item</b>	<b>Column 1</b>	<b>Column 2</b>	<b>Column 3</b>
	<b>Aeroplane</b>	<b>Landing</b>	<b>Factor</b>
3	Jet-driven aeroplane	A landing that is not part of a land and hold short operation	1.67
4	Aeroplane not mentioned in item 1, 2 or 3	A landing that is: (a) part of a land and holdshort operation; and (b) on a dry runway intowind	1.67
5	Aeroplane not mentioned in item 1, 2 or 3	A landing that is: (a) part of a land and holdshort operation; and (b) not on a dry runway intowind	1.92

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### **10.12 Approval of landing factor for a propeller-driven aeroplane**

CASA may, under regulation 135.020 of CASR, approve a landing factor for a propeller-driven aeroplane, for operations at a particular aerodrome, which is less than the standard landing factor for the aeroplane, only if the proposed landing factor has been risk assessed by the aeroplane’s operator for operations at the aerodrome.

### **10.13 Maximum permitted landing weight**

The operator, and pilot in command, must each ensure that, for the landing of the aeroplane at any aerodrome, the aeroplane’s weight does not exceed each of the following:

- (a) a weight that would enable the aeroplane to meet the requirement stated in section 10.14;
- (b) a weight that would enable, if a safe landing could not be conducted and a missed approach was necessary to be conducted, the avoidance of obstacles in the vicinity of the missed approach path by a safe margin, as determined by the operator’s exposition.

Note: The weight at landing for an aeroplane is also limited by the *maximum landing weight* for the aeroplane, which in the Dictionary, for a type certificated aeroplane, is defined to mean the maximum landing weight for the aeroplane permitted by its flight manual. It is an offence under regulation 91.095, or 135.040, of CASR if an aeroplane is not operated in accordance with the aeroplane’s aircraft flight manual instructions.

### **10.14 Landing distance requirement**

- (1) The operator, and pilot in command, must each ensure the factored landing distance, for a landing of the aeroplane on a runway at an aerodrome, does not exceed the landing distance available for the runway.





- (2) For the purposes of subsection (1), the following matters must be taken into account:
- (a) the landing configuration of the aeroplane;
  - (b) unless a short landing operation, under an approval under section 10.15, is being conducted — that the aeroplane crosses the runway threshold at a height of 50 ft;
  - (c) the aerodrome elevation;
  - (d) the type of runway surface, and runway surface condition;
  - (e) the runway slope in the direction of landing;
  - (f) unless otherwise accounted for in the performance data set out in the aeroplane's aircraft flight manual instructions, not more than 50% of the headwind component, or not less than 150% of the tailwind component, for the runway;
  - (g) the obstacles, if any, in the vicinity of the approach flight path.

# Chapter 11—Equipment

## Division 1—General

### 11.01 Purpose of Chapter 11 etc.

- (1) This Chapter prescribes requirements for subregulation 135.370(1) of CASR.
- (2) The requirements apply to the aeroplane's operator, unless a provision of this Chapter states that a requirement applies to another person, in which case it applies to the operator and other person.
- (3) In addition to the operator, the requirements stated in the following provisions also apply to the pilot in command of the aeroplane:
  - (a) subsections 11.16(3) to (6);
  - (b) subsection 11.18(2);
  - (c) subsections 11.42(3) and (4);
  - (d) subsections 11.57(1) to (3);
  - (e) subsections 11.61(1) to (7);
  - (f) subsections 11.62(1) and (2).
- (4) A person other than the operator, or, for the provisions mentioned in subsection (3), the pilot in command, may also be subject to a requirement stated in a provision of this Chapter, as stated in the provision setting out the requirement.
- (5) In this Chapter, unless the contrary intention appears in, or for, a particular provision:
  - (a) a reference to a pilot seeing, or viewing, anything from a pilot's seat is taken to mean that the thing is seen or viewed from the pilot's normal sitting position in the seat; and
  - (b) any mention of feet (or ft) in the context of an altitude is taken to mean feet above mean sea level (AMSL), unless otherwise stated; and
  - (c) for any reference to the fitment, or carriage, of equipment, the equipment referred to must be operative.

## Division 2—Approvals, visibility and inoperability

### 11.02 Approval of aeroplane equipment

- (1) Before a registered aeroplane begins a flight, any equipment that is required to be fitted to, or carried on, the aeroplane under this Chapter must meet the requirements of, or be approved under, Part 21 of CASR.
- (2) Subsection (1) does not apply to any of the following:
  - (a) an item of equipment used to display the time;
  - (b) an independent portable light, for example, a flashlight or torch;
  - (c) a headset;

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- (d) a portable megaphone;
  - (e) a sea anchor and other equipment for mooring;
  - (f) a first-aid kit, emergency medical kit or universal precaution kit;
  - (g) survival equipment, including signalling equipment.
- (3) Before a foreign-registered aeroplane begins a flight, the equipment required by this Chapter to be fitted to, or carried on, the aeroplane must have been approved by the NAA of the aeroplane's State of registry.
- (4) If equipment is carried on an aeroplane, although not required by this Chapter to be fitted or carried, then:
- (a) the equipment need not meet the requirements of, or be approved under, Part 21 of CASR; and
  - (b) for a foreign-registered aeroplane — the equipment need not have been approved by the NAA of the aeroplane's State of registry; and
  - (c) no information, or data, provided by the equipment may be used by a flight crew member, of the aeroplane, to comply with any requirement of the civil aviation legislation in relation to communications or navigation; and
  - (d) the equipment, whether functional or otherwise, must not at any time affect the airworthiness of the aeroplane; and
  - (e) if the equipment is surveillance equipment — the equipment, whether functional or otherwise, must not at any time adversely affect the safety of other aircraft or interfere with the proper functioning of an air traffic service.

### 11.03 Visibility, and accessibility, of equipment

- (1) This section applies in relation to equipment that is required, under this Chapter, to be fitted to, or carried on, an aeroplane for a flight.
- (2) Any equipment that is for a pilot's manual or visual use in, or from, the cockpit must be visible to, and usable by, the pilot from the pilot's seat in the aeroplane.
- (3) Emergency equipment that is required, under this Chapter, to be fitted to, or carried on, an aeroplane for a flight must be easily accessible for immediate use in the event of an emergency.

### 11.04 Serviceability of equipment

Any equipment required by this Chapter to be fitted to, or carried on, an aircraft for a flight must be operative unless:

- (a) another section of this Chapter provides otherwise; or

Note: A minimum equipment list (a **MEL**), approved under regulation 91.935 of CASR, may only permit equipment required to be fitted to, or carried on, an aircraft by this Chapter, to be unserviceable within the limits of the requirements stated in this Chapter. For example, section 11.21 provides for an allowable period of 72 hours in relation to flights of an aeroplane with inoperative altitude alerting equipment. An MEL would not be approved if it contained a maximum period for altitude alerting equipment to be inoperative that was greater than the period specified by either a master minimum equipment list (MMEL) or the legislation.

- (b) the equipment:
  - (i) is inoperative because of a defect that has been approved as a permissible unserviceability for the aircraft for the flight; and
  - (ii) is fitted, or carried, in accordance with the permissible unserviceability.

## **Division 3—Flight instruments**

### **11.05 Day VFR flight instrument requirements**

- (1) An aeroplane in an operation under the VFR by day must be fitted with equipment for measuring and displaying the following flight information:
  - (a) indicated airspeed;
  - (b) pressure altitude;
  - (c) magnetic heading;
  - (d) time;
  - (e) Mach number — but only for an aeroplane with operating limitations expressed in terms of Mach number;
  - (f) turn and slip;
  - (g) outside air temperature.
- (2) An aeroplane in an operation under the VFR by day, for which 2 pilots are required under the civil aviation legislation or the aeroplane's flight manual, must be fitted with equipment, separate from, and independent of, the corresponding equipment mentioned in subsection (1), for measuring and displaying the following flight information:
  - (a) indicated airspeed;
  - (b) pressure altitude;
  - (c) Mach number — but only for an aeroplane with operating limitations expressed in terms of Mach number
  - (d) turn and slip.
- (3) Despite subsections (1) and (2), for an aeroplane in an operation under the VFR by day, the equipment for measuring and displaying the flight information mentioned in column 1 of an item in Table 11.05(3) must meet the requirements mentioned in column 2 of the same item.

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**Table 11.05(3)**

**VFR flight by day**

<b>Item</b>	<b>Column 1 Flight information</b>	<b>Column 2 Requirements</b>
1	Pressure altitude	The equipment must: (a) have an adjustable datum scale calibrated in millibars or hPa; and (b) be calibrated in feet, except that, if a flight is conducted in a foreign country that measures flight levels or altitudes in metres, the equipment must be calibrated in metres or fitted with a conversion placard or device.
2	Magnetic heading	The equipment must be: (a) a direct reading magnetic compass; or (b) a remote indicating compass and standby direct reading magnetic compass.
3	Time	1. The equipment must display accurate time in hours, minutes, and seconds. 2. The equipment must be: (a) fitted to the aeroplane; or (b) worn by, or be immediately accessible to, the pilot for the duration of the flight.

**11.06 Night VFR flight instrument requirements**

- (1) An aeroplane in an operation under the VFR at night must be fitted with equipment for measuring and displaying the following flight information:
- (a) indicated airspeed;
  - (b) pressure altitude;
  - (c) magnetic heading;
  - (d) time;
  - (e) Mach number — but only for an aeroplane with operating limitations expressed in terms of Mach number;
  - (f) turn and slip;
  - (g) attitude;
  - (h) vertical speed;
  - (i) stabilised heading;
  - (j) outside air temperature;
  - (k) whether the supply of power to gyroscopic instruments, if any, is adequate.

(2) An aeroplane in an operation under the VFR at night, for which 2 pilots are required under the civil aviation legislation or the aeroplane’s flight manual, must be fitted with equipment, separate from, and independent of, the corresponding equipment mentioned in subsection (1), for measuring and displaying the following flight information:

(a) indicated airspeed;

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(b) pressure altitude;

(c) Mach number — but only for an aeroplane with operating limitations expressed in terms of Mach number

(d) turn and slip;

(e) attitude;(f) vertical speed;

(g) stabilised heading.

(3) Despite subsections (1) and (2), for an aeroplane in an operation under the VFR at night, the equipment for measuring and displaying the flight information mentioned in column 1 of an item in Table 11.06(3) must meet the requirements mentioned in column 2 of the same item.

**Table 11.06(3)—Requirements for flight instruments – VFR flight at night**

<b>Item</b>	<b>Column 1 Flight information</b>	<b>Column 2 Requirements</b>
1	Indicated airspeed	<p>1. For an aeroplane that has an MTOW of not more than 5 700 kg, the equipment must be capable of being connected to:</p> <p>(a) an alternate static system that:</p> <p>(i) is selectable by a pilot; and</p> <p>(ii) includes a selector that can open, or block, the aeroplane’s static source and alternative static source at the same time; or</p> <p>(b) a balanced pair of flush static ports.</p> <p>2. For an aeroplane that has an MTOW of more than 5 700 kg, the equipment must be capable of being connected to:</p> <p>(a) an alternate static system that:</p> <p>(i) is selectable by a pilot; and</p> <p>(ii) includes a selector that can open, or block, the aeroplane’s static source and alternative static source at the same time; or</p> <p>(b) 2 independent static sources, each consisting of a balanced pair of flush static ports.</p>

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**Table 11.06(3)—Requirements for flight instruments – VFR flight at night**

<b>Item</b>	<b>Column 1 Flight information</b>	<b>Column 2 Requirements</b>
2	Pressure altitude	<p>1. The equipment must:</p> <ul style="list-style-type: none"> <li>(a) have an adjustable datum scale calibrated in millibars or hPa; and</li> <li>(b) be calibrated in feet, except that, if a flight is conducted in a foreign country that measures flight levels or altitudes in metres, the equipment must be calibrated in metres or fitted with a conversion placard or device.</li> </ul> <p>2. For an aeroplane that has an MTOW of not more than 5 700 kg, the equipment must be capable of being connected to:</p> <ul style="list-style-type: none"> <li>(a) an alternate static system that: <ul style="list-style-type: none"> <li>(i) is selectable by a pilot; and</li> <li>(ii) includes a selector that can open, or block, the aeroplane’s static source and alternative static source at the same time; <ul style="list-style-type: none"> <li>or</li> </ul> </li> </ul> </li> <li>(b) a balanced pair of flush static ports.</li> </ul> <p>3. For an aeroplane that has an MTOW of more than 5 700 kg, the equipment must be capable of being connected to:</p> <ul style="list-style-type: none"> <li>(a) an alternate static system that: <ul style="list-style-type: none"> <li>(i) is selectable by a pilot; and</li> <li>(ii) includes a selector that can open, or block, the aeroplane’s static source and alternative static source at the same time; <ul style="list-style-type: none"> <li>or</li> </ul> </li> </ul> </li> <li>(b) 2 independent static sources, each consisting of a balanced pair of flush static ports.</li> </ul>
3	Magnetic heading	<p>The equipment must be:</p> <ul style="list-style-type: none"> <li>(a) a direct reading magnetic compass; or</li> <li>(b) a remote indicating compass and standby direct reading magnetic compass.</li> </ul>
4	Time	<p>1. The equipment must display accurate time in hours, minutes and seconds.</p> <p>2. The equipment must be:</p> <ul style="list-style-type: none"> <li>(a) fitted to the aeroplane; or</li> <li>(b) worn by, or be immediately accessible to, the pilot for the duration of the flight.</li> </ul>

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<b>Item</b>	<b>Column 1 Flight information</b>	<b>Column 2 Requirements</b>
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**Table 11.06(3)—Requirements for flight instruments – VFR flight at night**

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5	Turn and slip	<p>1. The equipment must display turn and slip information, except where a second independent source of attitude information is available, in which case only the display of slip information is required.</p> <p>2. The equipment must have an alternate power supply in addition to its primary power supply unless:</p> <p>(a) the equipment has a source of power independent of the power operating other gyroscopic instruments; or</p> <p>(b) a second independent source of attitude information is available that has a source of power independent of the power operating other gyroscopic instruments.</p>
6	Attitude	<p>The equipment must have an alternate power supply in addition to its primary power supply:</p> <p>(a) unless the turn and slip equipment has a source of power independent of the power operating other gyroscopic instruments; or</p> <p>(b) a second independent source of attitude information is available that has a source of power independent of the power operating other gyroscopic instruments.</p>
7	Vertical speed	<p>1. For an aeroplane that has an MTOW of not more than 5 700 kg, the equipment must be capable of being connected to:</p> <p>(a) an alternate static system that:</p> <p>(i) is selectable by a pilot; and</p> <p>(ii) includes a selector that can open, or block, the aeroplane's static source and alternative static source at the same time; or</p> <p>(b) a balanced pair of flush static ports.</p> <p>2. For an aeroplane that has an MTOW of more than 5 700 kg, the equipment must be capable of being connected to:</p> <p>(a) an alternate static system that:</p> <p>(i) is selectable by a pilot; and</p> <p>(ii) includes a selector that can open, or block, the aeroplane's static source and alternative static source at the same time; or</p> <p>(b) 2 independent static sources, each consisting of a balanced pair of flush static ports.</p>

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### **11.07 IFR flight instruments**

- (1) An aeroplane in an operation under the IFR must be fitted with equipment for measuring and displaying the following flight information:
- (a) indicated airspeed;
  - (b) pressure altitude;
  - (c) magnetic heading;
  - (d) time;
  - (e) Mach number — but only for an aeroplane with operating limitations

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expressed in terms of Mach number;



**Table 11.06(3)—Requirements for flight instruments – VFR flight at night**

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<b>Item</b>	<b>Column 1 Flight information</b>	<b>Column 2 Requirements</b>
8	Stabilised heading	<p>The equipment must have an alternate power supply in addition to its primary power supply:</p> <ul style="list-style-type: none"><li>(a) unless the turn and slip equipment has a source of power independent of the power operating other gyroscopic instruments; or</li><li>(b) a second independent source of attitude information is available that has a source of power independent of the power operating other gyroscopic instruments.</li></ul> <p>Note: A gyro-magnetic type of remote indicating compass meets this requirement if it has a primary power supply and alternate power supply.</p>

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- (f) turn and slip;
- (g) attitude;
- (h) vertical speed;
- (i) stabilised heading;
- (j) outside air temperature;
- (k) whether the supply of power to gyroscopic instruments, if any, is adequate.

(2) An aeroplane in an operation under the IFR, for which only a single pilot is required under the civil aviation legislation and aeroplane’s flight manual, must be fitted with equipment, separate from, and independent of, the corresponding equipment mentioned in subsection (1), for measuring and displaying pressure altitude and attitude.

(3) An aeroplane in an operation under the IFR, for which 2 pilots are required under the civil aviation legislation or aeroplane’s flight manual, must be fitted with equipment, separate from, and independent of, the corresponding equipment mentioned in subsection (1), for measuring and displaying the following flight information:

- (a) indicated airspeed;
- (b) pressure altitude;

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- (c) Mach number — but only for an aeroplane with operating limitations expressed in terms of Mach number
  - (d) turn and slip;
  - (e) attitude;(f) vertical speed;
  - (g) stabilised heading.
- (4) An aeroplane in an operation under the IFR that has an MTOW of more than 5 700 kg must be fitted with standby attitude equipment that, for the avoidance of doubt, is additional to the attitude equipment required under subsections (1), (2) or (3).
- (5) Despite subsections (1) to (4), for an aeroplane in an operation under the IFR, the equipment for measuring, and displaying, the flight information mentioned in column 1 of an item in Table 11.07(5) must meet the requirements mentioned in column 2 of the same item.

**Table 11.07(5)—Requirements for flight instruments – IFR flight**

Item	Column 1 Flight information	Column 2 Requirements
1	Indicated airspeed	<p>1. For an aeroplane that has an MTOW of not more than 5 700 kg, the equipment must be capable of being connected to:</p> <ul style="list-style-type: none"> <li>(a) an alternate static system that: <ul style="list-style-type: none"> <li>(i) is selectable by a pilot; and</li> <li>(ii) includes a selector that can open, or block, the aeroplane’s static source and alternative static source at the same time; or</li> </ul> </li> <li>(b) a balanced pair of flush static ports.</li> </ul> <p>2. For an aeroplane that has an MTOW of more than 5 700 kg, the equipment must be capable of being connected to:</p> <ul style="list-style-type: none"> <li>(a) an alternate static system that: <ul style="list-style-type: none"> <li>(i) is selectable by a pilot; and</li> <li>(ii) includes a selector that can open, or block, the aeroplane’s static source and alternative static source at the same time; or</li> </ul> </li> <li>(b) 2 independent static sources, each consisting of a balanced pair of flush static ports.</li> </ul> <p>3. At least 1 unit of equipment for indicated airspeed must include a means of preventing malfunction due to condensation or icing.</p>

**Table 11.07(5) Requirements for flight instruments IFR flight**

Item	Column 1 Flight information	Column 2 Requirements

2	Pressure altitude	<p>1. The equipment must:</p> <p>(a) have an adjustable datum scale calibrated in millibars or hPa; and</p> <p>(b) be calibrated in feet, except that, if a flight is conducted in a foreign country that measures flight levels or altitudes in metres, the equipment must be calibrated in metres or fitted with a conversion placard or device.</p> <p>2. For an aeroplane that has an MTOW of not more than 5 700 kg, the equipment must be capable of being connected to:</p> <p>(a) an alternate static system that:</p> <p style="margin-left: 20px;">(i) is selectable by a pilot; and</p> <p style="margin-left: 20px;">(ii) includes a selector that can open, or block, the aeroplane's static source and alternative static source at the same time; or</p> <p>(b) a balanced pair of flush static ports.</p> <p>3. For an aeroplane that has an MTOW of more than 5 700 kg, the equipment must be capable of being connected to:</p> <p>(a) an alternate static system that:</p> <p style="margin-left: 20px;">(i) is selectable by a pilot; and</p> <p style="margin-left: 20px;">(ii) includes a selector that can open, or block, the aeroplane's static source and alternative static source at the same time; or</p> <p>(b) 2 independent static sources, each consisting of a balanced pair of flush static ports.</p>
3	Magnetic heading	<p>The system must be:</p> <p>(a) a direct reading magnetic compass; or</p> <p>(b) a remote indicating compass and standby direct reading magnetic compass.</p>
4	Time	<p>1. The equipment must display accurate time in hours, minutes and seconds.</p> <p>2. The equipment must be:</p> <p>(a) fitted to the aeroplane; or</p> <p>(b) worn by, or be immediately accessible to, the pilot for the duration of the flight.</p>
5	Turn and slip	<p>1. The equipment must display turn and slip information, except where a third independent source of attitude information is available, in which case only the display of slip information is required.</p> <p>2. The equipment must have an alternate power supply in addition to its primary power supply.</p>
6	Attitude	<p>The equipment must have an alternate power supply in addition to its primary power supply.</p>

**Table 11.07(5)—Requirements for flight instruments – IFR flight**

Item	Column 1 Flight information	Column 2 Requirements
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7	Vertical speed	<p>1. For an aeroplane that has an MTOW of not more than 5 700 kg, the equipment must be capable of being connected to:</p> <p>(a) an alternate static system that:</p> <p style="margin-left: 20px;">(i) is selectable by a pilot; and</p> <p style="margin-left: 20px;">(ii) includes a selector that can open, or block, the aeroplane's static source and alternative static source at the same time; or</p> <p>(b) a balanced pair of flush static ports.</p> <p>2. For an aeroplane that has an MTOW of more than 5 700 kg, the equipment must be capable of being connected to:</p> <p>(a) an alternate static system that:</p> <p style="margin-left: 20px;">(i) is selectable by a pilot; and</p> <p style="margin-left: 20px;">(ii) includes a selector that can open, or block, the aeroplane's static source and alternative static source at the same time; or</p> <p>(b) 2 independent static sources, each consisting of a balanced pair of flush static ports.</p>
8	Stabilised heading	<p>The equipment must have an alternate power supply in addition to its primary power supply.</p> <p>Note: A gyro-magnetic type of remote indicating compass meets this requirement if it has a primary power supply and alternate power supply.</p>
9	Standby attitude	<p>The system must:</p> <p>(a) have a source of power independent of the electrical generating system; and</p> <p>(b) operate independently of other attitude systems; and</p> <p>(c) continue to operate without any action by a flight crew member, for a period of 30 minutes following the failure of the electrical power generating system.</p>

## Division 4—Operational equipment

### 11.08 Radiocommunication systems

- (1) An aeroplane, for a flight, must be fitted with 1 radiocommunication system that is capable of continuous communication on all frequencies necessary to meet reporting, broadcast and listening watch requirements under regulations 91.630, 91.635, 91.640, and 91.675 of CASR.

- (2) Subject to subsection (3), and without limiting subsection (1), for a flight in any class of airspace, an aeroplane must be fitted with at least 2 independent radiocommunication systems:
- (a) each capable, under normal operating conditions, of communicating with an appropriate ground station from any point on the route, including in the event of any diversion; and
  - (b) each capable of receiving meteorological information at any time during the flight; and
  - (c) at least one of which must have two-way voice communication capability; and
  - (d) at least one of which must provide for communication on the aeronautical emergency frequency 121.5 MHz.
- (3) Despite subsection (2), an aeroplane for a VFR flight by day must be fitted with the following radiocommunication systems:
- (a) at least 1 VHF radiocommunication system;
  - (b) if a VHF radiocommunication system would not allow for continuous communication with ATS at all stages of the flight — one of the following:
    - (i) an additional radiocommunication system capable of continuous two-way communications with ATS or the rotorcraft’s operator;
    - (ii) an additional radiocommunication system capable of, after activation of the system by a crew member of the rotorcraft, sending an automatic notification to the rotorcraft’s operator, or a person nominated by the operator, which:
      - (A) notifies the operator or person of an emergency situation during the flight; and
      - (B) includes information about the rotorcraft’s general location.
- Note: The notification may involve a signal from the radiocommunication system being relayed via multiple communication technologies, for example, satellite relays or mobile phone networks.
- (4) If an additional radiocommunication system is fitted to the rotorcraft under paragraph (3)(b), the system must only be used for communications with ATS, the rotorcraft’s operator or a person nominated by the operator, during the flight, when VHF communications with ATS are not available.

## 11.09 Navigation equipment

Note: For an aircraft entering oceanic airspace with RNP 2, RNP 4, or RNP 10, navigation specification capability, see subsections 11.03(1B) and (1C) of the Part 91 Manual of Standards in relation to long range navigation systems (LRNS) operability requirements. The term *oceanic airspace* is defined in subsection 11.01(2) of the Part 91 Manual of Standards.

(1) In this section:

*approved GNSS* means:

- 
- (a) a GNSS system that is authorised in accordance with one of the following:
    - (i) (E)TSO-C129;
    - (ii) (E)TSO-C145;

- (iii) (E)TSO-C146;
- (iv) (E)TSO-C196a; or

Note: GNSS equipment authorised in accordance with (E)TSO-C129 is unlikely to support ADS-B position source equipment requirements. (b) a multi-sensor navigation system that:

- (i) includes GNSS and inertial integration; and
- (ii) is approved under Part 21 of CASR as providing a level of performance equivalent to a GNSS system mentioned in subparagraph (a)(ii), (iii) or (iv).

(2) Without limiting the requirements under subsections (5) and (6), an aeroplane for a VFR flight at night must be fitted with:

- (a) an approved GNSS; or (b)  
an ADF or VOR.

(3) Subject to subsections (7) and (8), and without limiting the requirements under subsections (5) and (6), an aeroplane for an IFR flight must be fitted with at least:

- (a) 2 approved GNSS; or
- (b) 1 approved GNSS and either:
  - (i) 1 ADF; or (ii) 1 VOR.

(4) For subsections (2) and (3), if an approved GNSS unit is provided with the automatic barometric aiding options stated in any of the following (the **relevant options**):

- (a) (E)TSO-C129a;
- (b) (E)TSO-C145a;
- (c) (E)TSO-C146a;
- (d) (E)TSO-C196a;

then the relevant options must be connected.

(5) The navigation equipment fitted to an aeroplane must be such that, in the event of the failure of any navigation equipment at any stage of a flight, sufficient navigation equipment remains to enable the aeroplane to navigate in accordance with:

- (a) the aeroplane's operational flight plan; and (b) the requirements of:
  - (i) ATS; and
  - (ii) the airspace in which the aeroplane is planned to be flown.

(6) For any aerodrome at which it is planned, or intended, that an aeroplane may land in IMC, the aeroplane's equipment must be capable of providing guidance to a point from which a safe visual, or instrument, landing may be conducted.

(7) For paragraph (3)(a), an approved GNSS used to comply with that paragraph may not be authorised in accordance with (E)TSO-C129.

- (8) For paragraph (3)(b), an approved GNSS fitted to the aeroplane must not be one authorised in accordance with (E)TSO-C129, unless:
- (a) the aeroplane was manufactured before 6 February 2014; and
  - (b) the GNSS was installed before 6 February 2014.

### **11.10 Automatic pilot**

- (1) An aeroplane operated by a single pilot for:
  - (a) an IFR flight; or
  - (b) a VFR flight at night; must be fitted with an automatic pilot.
- (2) An automatic pilot fitted to an aeroplane under subsection (1) must have at least the following modes: (a) an altitude-hold mode; (b) a heading mode.
- (3) An automatic pilot may be inoperative at the beginning of a flight only if the flight is conducted in VMC by day.

## Division 5—Lighting systems

### 11.15 Cockpit, and cabin, lighting requirements

- (1) An aeroplane operating at night must be fitted with (or carry, as applicable) the following lighting equipment:
  - (a) cockpit lighting that meets the requirements mentioned in subsection (2); (b) cabin lighting that enables each occupant of the aeroplane to see and use:
    - (i) the occupant's seatbelt and oxygen facilities, if any; and
    - (ii) the normal and emergency exits;
  - (c) for each flight crew member — an independent portable light accessible to the flight crew member from the flight crew member's normal seat in the aeroplane;
  - (d) for each other crew member (if any) — an independent portable light accessible to the crew member at the crew member's crew station.

- (2) Cockpit lighting equipment of an aeroplane operating at night must:
  - (a) illuminate each item of equipment that may be used by a flight crew member; and
  - (b) illuminate the documents that may be used by a flight crew member, including checklists and flight documents; and
  - (c) be compatible with each item of equipment that may be used by a flight crew member; and
  - (d) be arranged in a way that:
    - (i) enables all placards and instrument markings to be read from each flight crew member's normal sitting position in a flight crew member's seat in the aeroplane; and
    - (ii) each flight crew member's eyes are shielded from direct and reflected light; and
  - (e) be adjustable so that the intensity of the lighting can be varied for the light conditions.
- (3) Cockpit lighting equipment of an aeroplane operating by day must meet the requirements in paragraphs (2)(a) to (c) if natural light does not adequately illuminate the items of equipment and documents mentioned in paragraphs (2)(a) and (b).

### 11.16 Anti-collision lights

- (1) An aeroplane operating by day, or at night, must be fitted with anti-collision lights.
- (2) The anti-collision light equipment fitted to an aeroplane must consist of:
  - (a) at least 1 red beacon light; or



- (b) at least 2 white strobe lights; or
  - (c) a combination of all of the lights mentioned in paragraphs (a) and (b).
- (3) For anti-collision light equipment consisting of 1, or more, red beacon lights only, the lights must be displayed as follows:
- (a) for a turbine-engine aeroplane — from immediately before the engines are started until the time the engines are shut down at the end of the flight;
  - (b) for any other aeroplane — from immediately after the engines are started until the time the engines are shut down at the end of the flight.
- (4) For anti-collision light equipment consisting of white strobe lights only, the lights must be displayed as follows:
- (a) for a turbine-engine aeroplane — from immediately before the engines are started until the time the engines are shut down at the end of the flight;
  - (b) for any other aeroplane — from immediately after the engines are started until the time the engines are shut down at the end of the flight.
- (5) For anti-collision light equipment consisting of a combination of red beacon lights and white strobe lights, the lights must be displayed as follows:
- (a) for the red beacon lights — in accordance with the requirements stated in subsection (3);

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- (b) for the white strobe lights — in accordance with the following:
    - (i) if the aeroplane, on its way to the runway from which it will take off, or on its way from the runway on which it has landed, crosses any other runway that is in use for take-offs or landings (an **active runway**) — while the aeroplane is crossing the active runway;
    - (ii) from the time the aeroplane first enters the runway from which the aeroplane will take off until the time the aeroplane leaves the runway on which it has landed.
- (6) Subsections (3) to (5) do not apply if the pilot in command reasonably believes that, in the circumstances, reflection or glare from the anti-collision light system may cause a hazard to an aircraft.

### 11.17 Landing lights

An aeroplane operating at night must be fitted with at least:

- (a) 2 landing lights; or
- (b) a single landing light, having 2 independent and separately energised illumination sources.

### 11.18 Navigation lights

- (1) An aeroplane operating at night must be fitted with navigation lights.
  - (2) When required to be fitted, navigation lights must be displayed during a flight or
- 
- on the movement area of an aerodrome.

## Division 6—Alerting and warning system requirements

### 11.19 Definitions for Division 6

In this Division:

**ACAS** means airborne collision avoidance system.

**airborne collision avoidance system** has the meaning given in the Dictionary.

**approved ACAS** means an ACAS that is authorised in writing by CASA, or the NAA of a recognised country, in accordance with one of the following:

- (a) (E)TSO-C119c; (b)
- (E)TSO-C219.

**GPWS** means ground proximity warning system.

**resolution advisory (RA)**, for an ACAS, means an indication given to the flight crew recommending:

- (a) a manoeuvre intended to provide separation from all threats; or
- (b) a manoeuvre restriction intended to maintain existing separation.

**TAWS** means terrain awareness and avoidance system.

**traffic advisory (TA)**, for an ACAS, means an indication given to the flight crew that a certain intruder aircraft is a potential threat.

### 11.20 Altitude alerting equipment and assigned altitude indicator

- (1) The following aeroplanes, if operating under the IFR, must be fitted with altitude alerting equipment in accordance with subsection (2):
    - (a) a piston-engine aeroplane, or unpressurised turbine-engine aeroplane, operating in controlled airspace above FL 150;
    - (b) a pressurised turbine-engine aeroplane.
  - (2) For subsection (1), the altitude alerting equipment must:
    - (a) include an assigned altitude indicator; and
    - (b) alert the flight crew if the aeroplane approaches a preselected altitude; and
    - (c) alert the flight crew, including by an aural warning, if the aeroplane deviates from a preselected altitude.
  - (3) An aeroplane that is not required to be fitted with altitude alerting equipment under subsection (1), that is operating under the IFR in controlled airspace, must be fitted with altitude alerting equipment at least in the form of an assigned altitude indicator.
  - (4) This section applies subject to section 11.21.
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### **11.21 Aeroplane flown with inoperative altitude alerting equipment or assigned altitude indicator**

Altitude alerting equipment (the *equipment*) or an assigned altitude indicator (the *indicator*), fitted to an aeroplane under section 11.20, may be inoperative at the beginning of a flight of the aeroplane, but only if:

- (a) the flight:
  - (i) begins within 72 hours of the time the equipment, or indicator, was found to be inoperative; and
  - (ii) is from an aerodrome at which there is no facility for the equipment, or indicator, to be repaired or replaced; and
- (b) for an aeroplane that is required to be fitted with an ACAS — the ACAS is not also inoperative.

Note: For a flight of an aeroplane fitted with inoperative altitude alerting equipment, section 11.07 of the Part 91 Manual of Standards states requirements in relation to air traffic control clearances.

### **11.22 Airborne collision avoidance system—ACAS**

- (1) An aeroplane mentioned in subsection (2) must be fitted with an approved ACAS.
- (2) For subsection (1), the aeroplane must be a turbine-engine aeroplane that:
  - (a) has an MTOW of more than 5 700 kg; and

(b) was first issued with a certificate of airworthiness on, or after, 1 January 2014.

### **11.23 ACAS—requirements for use**

- (1) During the period mentioned in subsection (2), an approved ACAS fitted to an aeroplane under section 11.22 must be activated in a mode that enables a resolution advisory to be produced.
- (2) For subsection (1), the period begins when the aeroplane commences the take-off for the flight and ends when the aeroplane lands for the flight.
- (3) Despite subsection (1), if the aeroplane's flight manual requires the ACAS to be operated in another mode in specified circumstances, the ACAS may be operated in that mode in those circumstances.

Note: For example, the RA indication mode (using traffic advisory (TA) indication only or equivalent) may be inhibited if this is called for by an abnormal procedure specified in the aeroplane's flight manual.

### **11.24 Flight with inoperative ACAS**

An approved ACAS fitted to an aeroplane under section 11.22 may be inoperative at the beginning of a flight of the aeroplane only if:

- (a) either:
  - (i) the flight begins:
    - (A) from an aerodrome at which there is no facility for the ACAS to be repaired or replaced; and
    - (B) within 72 hours of the time the ACAS was found to be inoperative; or
  - (ii) the flight is to an aerodrome at which there is a facility for the ACAS to be repaired or replaced; and
- (b) if the aeroplane is required to be fitted with an altitude alerting system or assigned altitude indicator, as applicable — the system or indicator is not also inoperative.

### **11.25 Terrain awareness and warning system (TAWS)**

- (1) This section applies to an aeroplane, for an IFR flight or VFR flight at night, which:
  - (a) is conducting a passenger transport operation or medical transport operation; and
  - (b) has an MTOW of more than 5 700 kg or is carrying 10 or more passengers.
- (2) With effect from the beginning of 2 December 2023, a turbine-engine aeroplane must be fitted with a TAWS-Class A.
- (3) With effect from the beginning of 2 December 2023, a piston-engine aeroplane must be fitted with a TAWS-Class A or TAWS-Class B.

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(4) This section applies subject to sections 11.25A and 11.26.

## 11.27 Airborne weather radar equipment

- (1) In this section:

**relevant aeroplane** means:

- (a) a pressurised turbine-engine aeroplane; or
- (b) a pressurised piston-engine aeroplane with an MTOW of more than 5 700 kg, which is required, under the Regulations, to be flown by 2 or more pilots.

- (2) This section applies to a relevant aeroplane, for an IFR flight or VFR flight at night, that is conducting a passenger transport operation or medical transport operation.
- (3) A relevant aeroplane must be fitted with airborne weather radar equipment.
- (4) This section applies subject to section 11.28.

## 11.28 Flight with inoperative airborne weather radar equipment

- (1) Airborne weather radar equipment, fitted to an aeroplane under section 11.27, may be inoperative at the beginning of a flight only if none of the relevant forecasts or reports indicate that potentially hazardous weather conditions exist:
- (a) in the flight path along which the aeroplane will be flown; or
  - (b) if the operational flight plan for the flight includes an alternate aerodrome — in the flight path to that aerodrome.
- (2) In this section:

**potentially hazardous weather conditions** means such potential weather conditions as can be detected by airborne weather radar equipment.

**relevant forecasts or reports** means any of the following:

- (a) an authorised weather forecast in relation to the flight;
- (b) an authorised weather report in relation to the flight.

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## Division 10—Emergency locator transmitters

### 11.47 Carriage of ELTs

*Automatic ELT*

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- (1) Subject to subsections (3) and (4), when an aeroplane begins a flight, it must be fitted with an automatic ELT.

- (2) For subsection (1), if the automatic ELT has a switch marked, however described, as ‘armed’, the pilot in command must ensure that the switch is set to this position at the time the flight begins.
- (3) Subsection (1) only applies to an aeroplane that during the flight is flown more than 50 nautical miles from the departure aerodrome for the flight.
- (4) Subsection (1) does not apply to a flight of an aeroplane if:
  - (a) the aeroplane is fitted with an unserviceable automatic ELT, and the flight is for the purpose of taking the aeroplane to a place for the repair, or refitting, of the ELT; and
  - (b) a survival ELT is carried on the aeroplane during the flight; and (c) no passengers are carried on the flight.

*Survival ELT*

- (5) Subject to subsection (6), when an aeroplane begins a flight, it must be fitted with, or carry, a survival ELT.

- (6) Subsection (5) only applies to an aeroplane that:
  - (a) during the flight is flown 50 nautical miles or less from the departure aerodrome for the flight; and
  - (c) the aeroplane is not fitted with an automatic ELT.

*Additional ELT requirements*

- (7) For subsections (4) and (5), a survival ELT must be carried in one of the following locations on the aeroplane:
  - (a) on the person of a crew member;
  - (b) in, or adjacent to, a life raft;
  - (c) adjacent to an emergency exit used for evacuation of the aeroplane in an emergency.
- (8) If the aeroplane is required to carry a life raft equipped with a survival ELT under Division 12, the requirement under that Division is additional to the requirement under subsection (5).

#### **11.48 ELT — basic technical requirements**

In this Division, an ELT is a transmitter that meets the following requirements:

- (a) if the transmitter is activated — the transmitter must transmit simultaneously on 121.5 MHz and 406 MHz;
- (b) if the transmitter is fitted to, or carried on, an Australian aeroplane — the transmitter must be registered with the Australian Maritime Safety Authority (AMSA) and with no other authority;
- (c) if the transmitter is fitted to, or carried on, a foreign-registered aeroplane — the transmitter must be registered with the authority of the aeroplane's State of registry that is responsible for search and rescue services, and not with AMSA;
- (d) the transmitter must, for identification purposes, be coded in accordance with the requirements for the transmitter in Appendix 1 to Chapter 5 of Part II, Voice Communications, in Volume III of ICAO Annex 10, Aeronautical Telecommunications;
- (e) if the transmitter is fitted with a lithium-sulphur dioxide battery — the battery must be authorised by the FAA, or EASA, in accordance with (E)TSO-C142a.

#### **11.49 Requirements to be classed as an automatic ELT**

- (1) In this Division:

*automatic ELT* is an ELT that meets the requirements mentioned in subsection (2).
- (2) For subsection (1), the ELT:
  - (a) must be automatically activated on impact; and

- (b) must be one of the following types:
  - (i) a type authorised by the FAA, or EASA, in accordance with (E)TSOC126;
  - (ii) a type authorised by EASA in accordance with:
    - (A) for operation on 121.5 MHz — ETSO-2C91a; and
    - (B) for operation on 406 MHz — ETSO-2C126;
  - (iii) a type approved under Part 21 of CASR as having a level of performance equivalent to a type of transmitter mentioned in subparagraph (i) or (ii).

### 11.50 Requirements to be classed as an survival ELT

- (1) In this Division:
 

*survival ELT* is an ELT that meets the requirements mentioned in subsection (2).
- (2) For subsection (1), the ELT must be: (a) removable from the aeroplane; and (b) one of the following types:
  - (i) an emergency position-indicating radio beacon of a type that meets the requirements of AS/NZS 4280.1:2003;
  - (ii) a personal locator beacon of a type that meets the requirements of AS/NZS 4280.2:2003;
  - (iii) a type authorised by the FAA, or EASA, in accordance with (E)TSOC126;
  - (iv) a type authorised by EASA in accordance with:
    - (A) for operation on 121.5 MHz — ETSO-2C91a; and
    - (B) for operation on 406 MHz — ETSO-2C126;
  - (v) a type approved under Part 21 of CASR as having a level of performance equivalent to a type mentioned in subparagraph (i), (ii), (iii) or (iv).

## Division 13—Transponders and surveillance equipment

### 11.59 Definitions

In this Division:

**ADS-B** means automatic dependent surveillance – broadcast.

**ADS-B OUT** means the functional capability of an aircraft or vehicle to periodically broadcast its state vector (position and velocity) and other information derived from on-board systems in a format suitable for ADS-B IN capable receivers.

**aircraft address** means a unique combination of 24 bits available for assignment to an aircraft for the purpose of air-ground communications, navigation, and surveillance.

**alternate ADS-B OUT equipment configuration**: see paragraph (b) of the definition of **approved ADS-B OUT equipment configuration**.



**approved ADS-B OUT equipment configuration** means an equipment configuration capable of ADS-B OUT operation on the ground and in flight, and that is one of the following:

- (a) an approved Mode S transponder with ADS-B capability connected to an approved GNSS position source;
- (b) an alternate ADS-B OUT equipment configuration meeting the requirements mentioned in section 11.64;
- (c) another system approved under Part 21 of CASR as having a level of performance equivalent to a system mentioned in paragraph (a) or (b).

**approved GNSS position source** means a GNSS position source that is:

- (a) authorised by the FAA or EASA in accordance with one of the following:
  - (i) (E)TSO-C145a;
  - (ii) (E)TSO-C146a;
  - (iii) (E)TSO-C196a; or
- (b) an alternate GNSS position source meeting the requirements mentioned in section 11.63; or
- (c) another system approved under Part 21 of CASR as having a level of performance equivalent to performance in accordance with paragraph (a) or (b).

**approved Mode A/C transponder** means a Mode A transponder, or Mode C transponder, which is authorised:

- (a) by CASA, or the NAA of a recognised country, in accordance with TSO-C74c or ETSO-C74d; or
- (b) by CASA in accordance with ATSO-1C74c.

**approved Mode S transponder** means a Mode S transponder that is:

- (a) authorised by CASA, or the NAA of a recognised country, in accordance with TSO-C112 or ETSO-2C112a; or

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- (b) another system approved under Part 21 of CASR as having a level of performance equivalent to a system mentioned in paragraph (a).

**approved Mode S transponder with ADS-B capability** means an approved Mode S transponder that is:

- (a) authorised by CASA, or the NAA of a recognised country, in accordance with (E)TSO-C166; or
- (b) another system approved under Part 21 of CASR as having a level of performance equivalent to a system mentioned in paragraph (a).

**approved transponder** means an approved Mode A/C transponder or approved Mode S transponder.

**assigned aircraft address** means an aircraft address that is assigned to an aircraft by:

- (a) for an aircraft registered on the Australian Civil Aircraft Register — CASA; or
- (b) for an aircraft that is a foreign-registered aircraft — the relevant NAA.

**DAPs** means Mode S EHS downlink aircraft parameters.

**EASA AMC 20-24** means Annex II to ED Decision 2008/004/R titled *Certification Considerations for the Enhanced ATS in Non-Radar Areas using ADS-B Surveillance (ADS-B-NRA) Application via 1090 MHz Extended Squitter*, dated 2 May 2008, of EASA.

**EASA CS-ACNS** means Annex I to ED Decision 2013/031/R titled *Certification Specifications and Acceptable Means of Compliance for Airborne Communications, Navigation and Surveillance CS-ACNS*, dated 17 December 2013, of EASA, or any later version.

**FDE** means fault detection and exclusion, a feature of a GNSS receiver that excludes faulty satellites from position computation.

**HPL** means the horizontal protection level of the GNSS position of an aircraft as an output of the GNSS receiver or system.

**Mode A** is a transponder function that transmits a 4-digit octal identification code for an aircraft's identity when interrogated by an SSR.

**Mode A code** is the 4-digit octal identification code transmitted by a Mode A transponder function.

**Mode C** is a transponder function that transmits a 4-digit octal identification code for an aircraft's pressure altitude when interrogated by an SSR.

**Mode S** is a transponder function that uses a unique aircraft address to selectively call individual aircraft, and supports advanced surveillance using Mode S EHS, Mode S ELS, or Mode S ES capabilities.

**Mode S EHS** means Mode S enhanced surveillance, which is a data transmission capability of a Mode S transponder.

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**Mode S ELS** means Mode S elementary surveillance, which is a data transmission capability of a Mode S transponder.

**Mode S ES** means Mode S extended squitter, which is a data transmission capability of a Mode S transponder used to transmit ADS-B OUT information.

**NACp** means Navigation Accuracy Category – Position as specified in paragraph 2.4.3.2.7.2.7 of RTCA/DO-260B.

**NIC** means Navigation Integrity Category as specified in paragraph 2.2.8.1.16 of RTCA/DO-260B.

**NUCp** means Navigation Uncertainty Category – Position as specified in paragraph 2.2.8.1.5 of RTCA/DO-260.

**RTCA/DO-229D** means document RTCA/DO-229D titled *Minimum Operational Performance Standards for Global Positioning System/Wide Area Augmentation System Airborne Equipment*, dated 13 December 2006, of the RTCA Inc. of Washington D.C. USA (**RTCA Inc.**).

**RTCA/DO-260** means RTCA Inc. document RTCA/DO-260 titled *Minimum Operational Performance Standards for 1090 MHz Automatic Dependent Surveillance – Broadcast (ADS-B)*, dated 13 September 2000.

**RTCA/DO-260B** means RTCA Inc. document RTCA/DO-260B titled *Minimum Operational Performance Standards for 1090 MHz Extended Squitter Automatic Dependent Surveillance – Broadcast (ADS-B) and Traffic Information Services – Broadcast (TIS-B)*, dated 2 December 2009.

**SSR, or secondary surveillance radar**, means a surveillance radar system which uses transmitters/receivers (interrogators) and transponders.

**SIL** means Source Integrity Level, as specified in paragraph 2.2.3.2.7.2.9 of RTCA/DO-260B.

**surveillance radar** means radar equipment used to determine the position of an aircraft in range and azimuth. **transponder** means an aircraft's SSR transponder.

## 11.60 Carriage of transponders and surveillance equipment

- (1) An aeroplane for a flight for which a transponder is required under this section must be fitted with an approved transponder that meets the requirements relevant to the intended operation and class of airspace.
- (2) For subsection (1), an aeroplane in an operation mentioned in column 1 of an item in Table 11.60(2), in the class of airspace mentioned in column 2 of the item, must be fitted with surveillance equipment meeting the requirements mentioned in column 3 of the item.

**Table 11.60(2)—Surveillance equipment requirements**

Item	Column 1 Operation	Column 2 Class of airspace	Column 3 Requirements
1	IFR	Any (Classes A, B, C, D, E and G)	At least 1 approved ADS-B OUT equipment configuration.
2	Any (IFR or VFR)	Class B or C — at certain aerodromes	<p>For an aeroplane operating at one of the following aerodromes:</p> <p>(a) Brisbane (YBBN);</p> <p>(b) Sydney (YSSY);</p> <p>(c) Melbourne (YMML); (d) Perth (YPPH);</p> <p>at least 1 approved Mode S transponder.</p> <p><i>Note</i> An approved Mode S transponder with ADS-B capability is not required to transmit ADS-B OUT for a VFR flight.</p>
3	VFR	Class A, B, C or E	<p>(a) For an aeroplane first issued with a certificate of airworthiness on or after 6 February 2014, or modified by having its transponder replaced on or after 6 February 2014 — at least 1 approved Mode S transponder with ADS-B capability; or</p> <p>(b) for any other aeroplane — at least 1 approved transponder.</p> <p><i>Note</i> An approved Mode S transponder with ADS-B capability is not required to transmit ADS-B OUT for a VFR flight.</p>

4	VFR	Class G — from 10 000 ft and above	<p>(a) For an aeroplane first issued with a certificate of airworthiness on or after 6 February 2014, or modified by having its transponder replaced on or after 6 February 2014 — at least 1 approved Mode S transponder with ADS-B capability; or</p> <p>(b) for any other aeroplane — at least 1 approved transponder.</p> <p><i>Note</i> An approved Mode S transponder with ADS-B capability is not required to transmit ADS-B OUT for a VFR flight.</p>
5	VFR	Class A — from FL 290 and above	At least 1 approved ADS-B OUT equipment configuration.

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### **11.61 Operation of transponders — general requirements**

- (1) During the period mentioned in subsection (2), a transponder fitted to an aeroplane for a flight must be operated in a mode that enables an SSR response to be transmitted.
- (2) For subsection (1), the period begins when the aeroplane commences the take-off for the flight and ends when the aeroplane lands for the flight.
- (3) However, an aeroplane must not operate a transponder if ATC issues an instruction that the transponder is not to be operated.
- (4) Only one transponder may be operated at any time.
- (5) For each transponder, the Mode A code must be set:
  - (a) to the transponder code assigned by ATC for the flight; or
  - (b) if no transponder code is so assigned — to the relevant standard code in Table 11.61(5)(b).
- (6) For paragraph (5)(b), for a situation mentioned in column 1 of an item in Table 11.61(5)(b), the Mode A code is the number mentioned in column 2 for the item.
- (7) If an approved transponder capable of reporting pressure altitude is fitted to an aeroplane for a flight, it must be operated with altitude reporting enabled.
- (8) Pressure altitude information reported by an approved transponder must be determined by a barometric encoder of a type authorised by CASA or the NAA of a recognised country in accordance with (E)TSO-C88a.

**Table 11.61(5)(b)—Transponders: Mode A standard codes**

<b>Item</b>	<b>Column 1 Situation</b>	<b>Column 2 Mode A code</b>
1	(a) Flights in Class A, B, C or D airspace; (b) IFR flights in Class E airspace;.	3000
2	IFR flights in Class G airspace.	2000
3	VFR flights in Class E or Class G airspace.	1200
4	Flights in Class G over water at a distance greater than 15 nautical miles from shore.	4000
5	Flights engaged in coastal surveillance.	7615
6	Ground testing by aircraft maintenance staff.	2100
7	Unlawful interference.	7500
8	Loss of radiocommunication.	7600
9	In flight emergency, unless otherwise instructed by ATC.	7700

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### **11.62 Mode S transponders — specific requirements**

- (1) An approved Mode S transponder fitted to an aeroplane for a flight must be configured in accordance with the following:
  - (a) the assigned aircraft address must be entered into the equipment;
  - (b) as far as practicable for the equipment — with one of the following forms of aircraft flight identification entered into the equipment:
    - (i) if a flight notification is filed with ATS for the flight — the aircraft identification mentioned in the flight notification;
    - (ii) if no flight notification is filed with ATS for the flight — the aircraft registration mark.
  
- (2) An approved ADS-B OUT equipment configuration fitted to an aeroplane for a flight must be configured in accordance with the following:
  - (a) the assigned aircraft address must be entered into the equipment;
  - (b) with one of the following forms of aircraft flight identification entered into the equipment:
    - (i) if a flight plan is filed with ATS for the flight — the aircraft identification mentioned in the flight notification;
    - (ii) if no flight plan is filed with ATS for the flight — the aircraft registration mark.

- (3) An approved Mode S transponder must transmit each of the following when interrogated on the manoeuvring area of an aerodrome or in flight:
  - (a) the assigned aircraft address;
  - (b) the Mode A code;
  - (c) the Mode C code;
  - (d) subject to subsection (4) — the aircraft flight identification.
- (4) Transmission of the aircraft flight identification by an approved Mode S transponder is optional for an aeroplane that was first issued with a certificate of airworthiness before 9 February 2012 (an *older aeroplane*). However, an older aeroplane that is equipped to transmit, may transmit its aircraft flight identification.
- (5) If an approved Mode S transponder transmits any Mode S EHS DAPs, the transmitted DAPs must comply with the standards stated in paragraph 3.1.2.10.5.2.3 and Table 3-10 of Volume IV, *Surveillance and Collision Avoidance Systems*, of ICAO Annex 10.
 

Note 1: Paragraph 3.1.2.10.5.2.3 includes paragraphs 3.1.2.10.5.2.3.1, 3.1.2.10.5.2.3.2 and 3.1.2.10.5.2.3.3.

Note 2: Australian Mode S SSR supports EHS DAPs. Transmission of Mode S EHS DAPs that are not in accordance with the ICAO standards may provide misleading information to ATC. Operators need to ensure that EHS DAPs are being transmitted.
- (6) If an approved Mode S transponder is fitted to an aeroplane first issued with a certificate of airworthiness on or after 9 February 2012: (a) having a certificated MTOW above 5 700 kg; or

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- (b) that is capable of normal operation at a maximum cruising true airspeed above 250 kts;
 

the transponder's receiving and transmitting antennae must:
- (c) be located in the upper and lower fuselage; and
- (d) operate in diversity, as stated in paragraphs 3.1.2.10.4 to 3.1.2.10.4.5 (inclusive) of Volume IV, *Surveillance and Collision Avoidance Systems*, of ICAO Annex 10.
 

Note: Paragraph 3.1.2.10.4.2.1 is recommendatory only.
- (7) An aeroplane must not fly in Australian territory if it is fitted with Mode S transponder equipment other than an approved ADS-B OUT equipment configuration, unless the equipment is:
  - (a) deactivated; or
  - (b) set to transmit only a value of zero for the NUCp, NACp, NIC or SIL.
 

Note: It is considered equivalent to deactivation if NUCp, NACp, NIC or SIL is set to continually transmit only a value of zero.

### **11.63 Alternate GNSS position source for ADS-B OUT — requirements**

- (1) For an aeroplane first issued with a certificate of airworthiness on or after 8 December 2016, an alternate GNSS position source is acceptable if the source:
  - (a) is certified by CASA or the NAA of a recognised country for use in IFR flight; and
  - (b) has included in its specification and operation the following:
    - (i) FDE, computed in accordance with the definition of the term at paragraph 1.7.3 of RTCA/DO-229D;
    - (ii) the output function HPL, computed in accordance with the definition of the term at paragraph 1.7.2 of RTCA/DO-229D;
    - (iii) functionality that, for the purpose of HPL computation, accounts for the absence of the SA of the GPS in accordance with paragraph 1.8.1.1 of RTCA/DO-229D.
- (2) For an aeroplane first issued with a certificate of airworthiness before 8 December 2016, an alternate GNSS position source is acceptable if it meets the requirements of subsection (1), other than subparagraph (1)(b)(iii) which is optional.

### **11.64 Alternate ADS-B OUT equipment configuration — requirements**

- (1) An alternate ADS-B OUT equipment configuration is acceptable if:
  - (a) it has been certified by CASA or the NAA of a recognised country, during type certification, as meeting the standards of EASA AMC 20-24 or EASA CS-ACNS; and
  - (b) the aeroplane's flight manual or flight manual supplement attests to the certification; and
  - (c) the GNSS system meets the performance requirements mentioned in subsection 11.63(1).

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- (2) An alternate ADS-B OUT equipment configuration is acceptable if:
  - (a) it has been certified by EASA, during type certification, as meeting the standards of EASA AMC 20-24; and
  - (b) the aeroplane's flight manual attests to the certification; and
  - (c) the GNSS system meets the performance requirements mentioned in subsection 11.63(1).
- (3) For an aeroplane first issued with a certificate of airworthiness on or after 8 December 2016, an equipment configuration is acceptable if:
  - (a) it has been certified by the FAA, during type certification, as meeting the standards of 14 CFR 91.227; and
  - (b) the aeroplane's flight manual attests to the certification; and
  - (c) the GNSS system meets the performance requirements mentioned in subsection 11.63(1).



- (4) For an aeroplane first issued with a certificate of airworthiness before 8 December 2016, an equipment configuration is acceptable if:
- (a) it has been certified by the FAA, during type certification, as meeting the standards of 14 CFR 91.227; and
  - (b) the aeroplane's flight manual attests to the certification; and
  - (c) the GNSS system meets the performance requirements mentioned in subsection 11.63(2).

### **11.65 Aeroplane flown with inoperative transponder**

An approved transponder may be inoperative at the beginning of a flight if the flight:

- (a) begins from an aerodrome at which there is no facility for the approved transponder to be repaired or replaced; and
- (b) ends not more than 72 hours after the time the approved transponder was found to be inoperative.

Note: See also section 11.04 for additional requirements related to a flight with inoperative equipment. For a flight with an inoperative transponder, within controlled airspace or at a controlled aerodrome, Division 11.2 of the Part 91 Manual of Standards has requirements related to air traffic control clearances. Whether a clearance is issued, or when a clearance may be issued, could be affected by the flight not being conducted with an operative transponder.



# **Extracts From Part 61 CASR**

Regulation 61.007

- (7) Subparts 61.G to 61.K make particular provision for each kind of pilot licence, including:
  - (a) the privileges of the licence; and
  - (b) limitations on the exercise of the privileges; and(c) the requirements for the grant of the licence.
- (8) Subparts 61.L to 61.U provide for ratings and endorsements on pilot licences, setting out:
  - (a) the privileges of each rating or endorsement; and
  - (b) limitations on the exercise of the privileges of the rating or endorsement; and
  - (c) the requirements for the grant of the rating or endorsement;and
  - (d) for the flight instructor, simulator instructor and flight examiner ratings—obligations that apply to the holder of the rating.
- (9) Subparts 61.V to 61.Y provide for flight engineer licences, and ratings and endorsements on flight engineer licences.
- (10) Subpart 61.Z makes particular provision for glider pilot licences.

**61.007 Application of Part 61**

- (1) This Part applies to flight in a registered aircraft of any of the following categories:
  - (a) aeroplane;
  - (b) helicopter;
  - (c) powered-lift aircraft;
  - (d) gyroplane;(e) airship.
- (2) The Part applies also to flight in a registered glider.

**61.010 Definitions for Part 61**

In this Part:

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***aerial application endorsement*** means an endorsement mentioned in column 1 of table 61.1120.

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***aerial application operation*** means a flight that is carried out by an aircraft to apply application material.

***aerial application proficiency check*** means an assessment, against the standards mentioned in the Part 61 Manual of Standards, of a pilot's competency to exercise the privileges of an aerial application rating. ***aeronautical experience***: see regulation 61.075.

***aeronautical knowledge examination***, for a flight crew licence, rating or endorsement, means an examination set under regulation 61.215 for the grant of the licence, rating or endorsement. ***aeroplane***: see regulation 61.025.

***approved course of professional development***, for a provision of this Part, means a course of professional development for which the provider holds an approval under regulation 61.040 for the provision.

***approved course of training***, for a provision of this Part, means a course of training:

- (a) for which the provider holds an approval under regulation 61.040 for the provision; or
- (b) that a Part 141 or 142 operator is authorised to conduct; or
- (c) that a person holds an approval under regulation 141.035 or 142.040 to conduct.

***approved flight simulation training device***: a flight simulation training device is an ***approved flight simulation training device*** for a purpose if:

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- (a) a Part 141 operator's operations manual, or a Part 142 operator's exposition, states that the device may be used for the purpose; or
  - (b) the operator of the device holds an approval under regulation 60.055 or 61.040 to use the device for the purpose; or
  - (c) the device is:
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## Regulation 61.010

**basic instrument flight training** means flight training in the units of competency for instrument flight mentioned in the Part 61 Manual of Standards for the grant of a private pilot licence or commercial pilot licence. **category** of aircraft: see regulation 61.015.

**category specific**: a rating or endorsement is **category specific** if the rating or endorsement applies only to an aircraft category that is specified on the rating or endorsement.

**Certificate IV in Training and Assessment** means a Certificate IV in Training and Assessment issued by a registered training organisation under the Australian Qualifications Framework.

Note: See [www.aqf.edu.au/](http://www.aqf.edu.au/).

**certificate of validation** means a certificate of validation granted under Subpart 61.C.

**circling approach** means an extension of an instrument approach operation that includes a visual circling manoeuvre to position an aircraft for a landing. **class** of aircraft: see regulation 61.020.

**conduct**, as a verb, means:

- (a) in relation to a flight operation—to occupy a flight control seat in an aircraft while the operation takes place; or

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- (b) in relation to a simulated flight operation—to occupy a flight control seat in a flight simulation training device while the simulated operation takes place; or
- (c) in relation to an operation of a tethered helicopter—to occupy a flight control seat in the tethered helicopter while the operation takes place.

***course deviation indicator operation*** means an instrument approach operation using a course deviation indicator for lateral navigation guidance.

***cross-country flight*** means a flight along a pre-planned route during which the pilot uses geometry, topography or radio navigation aids to determine the aircraft's position and course.

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## Regulation 61.010

- (i) qualified (however described) by the national aviation authority of a recognised foreign State; and
- (ii) approved for the purpose by the national aviation authority.

***approved flight simulator***: a flight simulator is an ***approved flight simulator*** for a purpose if:

- (a) a Part 141 operator's operations manual, or a Part 142 operator's exposition, states that the simulator may be used for the purpose; or
- (b) the operator of the simulator holds an approval under regulation 60.055 to use the simulator for the purpose; or (c) the simulator is:
  - (i) qualified (however described) by the national aviation authority of a recognised foreign State; and
  - (ii) approved for the purpose by the national aviation authority.

***associated***: an aircraft category rating is ***associated*** with a pilot licence if:

- (a) for an application for the pilot licence—the application includes an application for the rating; or
- (b) in any other case—the rating was granted on the basis of the applicant having met the requirements for the grant of the pilot licence with the rating.

Note: An aircraft category rating has effect only for the pilot licence with which it is associated: see regulation 61.725.

***aviation English language proficiency assessment*** means an aviation English language proficiency assessment conducted under regulation 61.255.

***aviation English language proficiency assessor*** means the holder of an approval under regulation 61.270 to conduct an aviation English language proficiency assessment.

***azimuth guidance operation*** means an instrument approach operation using azimuth bearings for lateral navigation guidance.



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- (b) a flight engineer type rating; or (c)  
a cruise relief type rating.

***type specific***: a rating or endorsement is ***type specific*** if the rating or endorsement applies only to an aircraft type that is specified on the rating or endorsement.

***variant***, in relation to an aircraft model (the ***first model***), means another aircraft model that CASA has prescribed by a legislative instrument under regulation 61.055 as a variant of the first model.

**61.015 Definition of *category* of aircraft for Part 61**

Each of the following is a ***category*** of aircraft:

- (a) aeroplane;  
(b) helicopter;  
(c) powered-lift aircraft; (d) gyroplane; (e) airship.

**61.020 Definition of *class* of aircraft for Part 61**

- (1) Each of the following is a ***class*** of aircraft:
- (a) single-engine aeroplane;  
(b) multi-engine aeroplane;  
(c) single-engine helicopter;  
(d) single-engine gyroplane; (e) airship.
- (2) For this Part, the single-engine aeroplane class includes:
- (a) multi-engine centre-line thrust aeroplanes; and  
(b) multi-engine aeroplanes that are prescribed by a legislative instrument under regulation 61.050 (Prescription of multi-engine aeroplanes included in single-engine aeroplane class).

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**Regulation 61.100**

(b) the pilot in command of the flight is authorised by the operator or the operator's Part 142 operator to conduct the supervision of the person.

- (3) For paragraph (1)(c), this subregulation applies to the flight if:
- (a) the person is supervised by a flight instructor or flight examiner; and
  - (b) the person is not receiving flight training.

**61.100 Definition of *flight time* as flight engineer for Part 61**

A person's *flight time* as a flight engineer is:

- (a) if the person is a flight engineer—the duration of a flight during which the person performs the duties of a flight engineer; and
- (b) if the person is a flight engineer instructor—the duration of a flight during which the person exercises the privileges of his or her flight engineer instructor rating; and
- (c) if the person is a flight engineer examiner—the duration of a flight during which the person exercises the privileges of his or her flight engineer examiner rating; and
- (d) if the person is the holder of a cruise relief flight engineer type rating—any time spent performing the duties of a flight engineer during flight.

**61.105 Definition of *instrument flight time* for Part 61**

- (1) A person's *instrument flight time* is:
- (a) for the holder of an authorisation mentioned in subregulation (2) other than a flight instructor or flight examiner—any time spent piloting an aircraft solely by reference to instruments and without external visual reference points in IMC or simulated IMC; and

- (b) for a person who does not hold an authorisation mentioned in subregulation (2)—any dual instrument flight time; and
- (c) for a flight instructor—any time spent conducting training

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mentioned in regulation 61.1165, or a flight review, during dual instrument flight time in IMC; and

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- (d) for a flight examiner—any time spent conducting a flight test or proficiency check during instrument flight time in IMC.
- (2) For paragraph (1)(a), the authorisations are as follows:
- (a) an instrument rating;
  - (b) a private instrument rating;
  - (c) for flight in an aeroplane or powered-lift aircraft—an air transport pilot licence;
  - (d) for flight in an aeroplane—a multi-crew pilot licence.

**61.110 Definition of *instrument ground time* for Part 61**

A person's *instrument ground time* is:

- (a) for the holder of an authorisation mentioned in subregulation 61.105(2) other than a simulator instructor or flight examiner—any time spent conducting simulated flight in a flight simulation training device solely by reference to instruments and without simulated external visual reference points; and
  - (b) for a person who does not hold an authorisation mentioned in subregulation 61.105(2)—any dual instrument ground time.
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**Division 61.M.1**

61.855

## **Subpart 61.M—Instrument ratings**

### **Division 61.M.1—Privileges and requirements for grant of instrument ratings**

#### **61.855 Privileges of instrument ratings**

Subject to Subpart 61.E and regulations 61.860 to 61.880, the holder of an instrument rating is authorised to pilot an aircraft:

- (a) under the IFR; or
- (b) at night under the VFR.

Note: Subpart 61.E sets out certain limitations that apply to all pilot licences, and ratings and endorsements on pilot licences.

#### **61.860 Limitations on exercise of privileges of instrument ratings—general**

- (1) The holder of an instrument rating is authorised to conduct an instrument approach operation of a particular kind as pilot in command of an aircraft only if the aircraft is equipped for that kind of operation.
- (2) The holder of an instrument rating is authorised to pilot an aircraft in a single-pilot operation under the IFR only if the holder has:
  - (a) passed the flight test for the rating in a single-pilot aircraft; or
  - (b) completed an instrument proficiency check in a single-pilot aircraft.
- (3) The holder of an instrument rating is authorised to conduct a circling approach under the IFR on a flight only if:
  - (a) the holder passed the flight test for the rating within the previous 12 months, and the flight test included a circling approach; or
  - (b) the holder's most recent instrument proficiency check included a circling approach; or

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(c) both:

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- (i) the holder is successfully participating in an operator's training and checking system for an operation that includes circling approaches; and
  - (ii) the operator holds an approval under regulation 61.040 for the system for this subregulation.
- (4) For paragraph (3)(b), an instrument proficiency check includes an operator proficiency check:
  - (a) that covers IFR operations; and
  - (b) that is conducted by a flight examiner who holds an instrument rating flight test endorsement.
- (5) The holder of an instrument rating is authorised to conduct an instrument approach operation in an aircraft using a procedure of a particular kind only if the holder has:
  - (a) completed training in the conduct of instrument approach operations using the procedure; and
  - (b) demonstrated, to a person mentioned in subregulation (6), his or her competence in the conduct of instrument approach operations using the procedure.
- (6) For paragraph (5)(b), the persons are as follows:
  - (a) CASA;
  - (b) an examiner who is authorised to conduct an instrument approach operation using the same procedure;
  - (c) a person who holds an approval under regulation 61.040 to assess the holder's competence.

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**61.865 Limitations on exercise of privileges of instrument ratings—  
endorsements**

- (1) The holder of an instrument rating is authorised to pilot an aircraft mentioned in column 2 of an item in Part 1 of table 61.890 under the IFR, or at night under the VFR, only if the holder also holds the endorsement mentioned in column 1 of the item.
  - (2) The holder of an instrument rating is authorised to conduct an instrument approach operation mentioned in column 2 of an item in Part 2 of table 61.890 only if the holder also holds the endorsement mentioned in column 1 of the item.
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**61.870 Limitations on exercise of privileges of instrument ratings—  
recent experience: general**

- (1) This regulation applies to the holder of an instrument rating subject to subregulation (1A).
  - (1A) This regulation does not apply to the holder if:
    - (a) the holder has successfully completed an operator proficiency check that covers IFR operations within the previous 3 months; or
    - (b) both:
      - (i) the holder is successfully participating in an operator's training and checking system for an IFR operation; and
      - (ii) the operator holds an approval under regulation 61.040 for the system for this subregulation.
- (2) The holder is authorised to pilot an aircraft under the IFR only if the holder has conducted at least 3 instrument approach operations within the previous 90 days in an aircraft or an approved flight simulation training device for the purpose.
- (3) The holder is authorised to pilot an aircraft of a particular category under the IFR only if the holder has conducted at least one instrument approach

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operation within the previous 90 days in an aircraft of the same category or an approved flight simulation training device for the purpose.

- (4) The holder is authorised to conduct a 2D instrument approach operation only if the holder has conducted a 2D instrument approach operation within the previous 90 days in an aircraft or an approved flight simulation training device for the purpose.
  - (5) The holder is authorised to conduct a 3D instrument approach operation only if the holder has conducted a 3D instrument approach operation within the previous 90 days in an aircraft or an approved flight simulation training device for the purpose.
  - (6) The holder is authorised to conduct an azimuth guidance operation only if the holder has conducted an azimuth guidance operation within the previous 90 days in an aircraft or an approved flight simulation training device for the purpose.
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- (7) The holder is authorised to conduct a course deviation indicator operation only if the holder has conducted a course deviation indicator operation within the previous 90 days in an aircraft or an approved flight simulation training device for the purpose.

Note: Azimuth guidance operations and course deviation indicator operations are instrument approach operations: see the definitions of those terms in regulation 61.010.

**61.875 Limitations on exercise of privileges of instrument ratings—  
recent experience: single pilot**

- (1) The holder of an instrument rating is authorised to pilot an aircraft under the IFR in a single-pilot operation only if the holder has conducted a flight or simulated flight under the IFR in a single-pilot operation within the previous 6 months.
- (2) For subregulation (1), the flight or simulated flight must:
- (a) have a duration of at least one hour; and
  - (b) include at least one instrument approach or simulated instrument approach.

**61.880 Limitations on exercise of privileges of instrument ratings—  
instrument proficiency check**

- (1) The holder of an instrument rating is authorised to exercise the privileges of the rating in an aircraft of a particular category only if the holder has a valid instrument proficiency check for the aircraft category.
- (2) However:
- (a) the holder is authorised to exercise the privileges of the rating in a multi-engine aeroplane only if the holder has a valid instrument proficiency check for multi-engine aeroplanes; and
  - (b) the holder is authorised to exercise the privileges of the rating in a multi-engine helicopter only if the holder has a valid instrument proficiency check for multi-engine helicopters.
- (3) Subject to subregulations (4) and (4B), for subregulations (1) and (2), the holder is taken to have a valid instrument proficiency check

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for the aircraft category, or for multi-engine aeroplanes or helicopters, during the following periods:

- (a) if the holder passes the flight test for the instrument rating in a relevant aircraft—the period from when the holder passes the flight test to the end of the 12th month after the month in which the holder passes the flight test;
- (b) if:
  - (i) the holder passes the flight test for an instrument endorsement in a relevant aircraft; and
  - (ii) the flight test is conducted more than 6 months after the holder passes the flight test for the rating;  
the period from when the holder passes the flight test for the endorsement to the end of the 12th month after the month in which the holder passes the flight test for the endorsement;
- (c) if the holder successfully completes an operator proficiency check that covers IFR operations in the relevant aircraft, and that is conducted by a flight examiner who holds an instrument rating flight test endorsement—the period from when the holder successfully completes the check to the end of the 12th month after the month in which the holder successfully completes the check;
- (d) if:
  - (i) the holder is successfully participating in an operator's training and checking system for an IFR operation in the relevant aircraft; and
  - (ii) the operator holds an approval under regulation 61.040 for the system for this subregulation and operations in the relevant aircraft;  
the period during which the holder is successfully participating in the system;
- (e) if the holder successfully completes an instrument proficiency check for the relevant aircraft—the period from when the holder

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successfully completes the check to the end of the 12th month after the month in which the holder successfully completes the check;

(f) if:

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- (i) the holder is taken to have a valid instrument proficiency check under any of paragraphs (a) to (e) for the relevant aircraft (the *existing check*); and
  - (ii) within 3 months before the validity of the existing check expires, the holder successfully completes an instrument proficiency check for the relevant aircraft;  
the period from when the validity of the existing check expires to the end of the 12th month after the validity of the existing check expires.
- (4) If, at any time, the holder attempts, but does not successfully complete, an instrument proficiency check mentioned in subregulation (4A) (the *failed check*), the holder is no longer taken to have a valid instrument proficiency check for:
- (a) the aircraft category in which the holder attempted the failed check;  
or
  - (b) multi-engine aircraft of the category in which the holder attempted the failed check.
- (4A) For subregulation (4), the failed check may be any of the following:
- (a) an instrument proficiency check for an aircraft category;
  - (b) an instrument proficiency check for multi-engine aeroplanes or helicopters;
  - (c) an instrument proficiency check for an aircraft type.

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- (4B) If the holder is taken to have a valid instrument proficiency check for the relevant aircraft only because of the holder's participation in an operator's training and checking system, the check is taken to be valid only for operations conducted by the operator.
- (5) For paragraphs (3)(e) and (f), the holder successfully completes an instrument proficiency check for the relevant aircraft if:
- (a) CASA or a flight examiner:
    - (i) assesses the holder's competency to conduct operations under the IFR in a relevant aircraft as meeting the standards mentioned in the Part 61 Manual of Standards for an instrument proficiency check in the relevant aircraft; and

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- (ii) endorses the holder's licence document to the effect that the holder has completed the instrument proficiency check; and
  - (iii) includes in the endorsement the matters mentioned in subregulation (8); or
- (b) a person mentioned in subregulation (7) assesses the holder as competent to conduct operations under the IFR in a relevant aircraft, and CASA or a flight examiner:
- (i) conducts an oral assessment of the holder's knowledge of IFR operation procedures to the standards mentioned in the Part 61 Manual of Standards for an instrument proficiency check; and
  - (ii) endorses the holder's licence document to the effect that the holder has completed the instrument proficiency check; and
  - (iii) includes in the endorsement the matters mentioned in subregulation (8).

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- (6) For paragraphs (3)(e) and (f), the instrument proficiency check must be conducted in a relevant aircraft or an approved flight simulation training device for the proficiency check.
- (7) For paragraph (5)(b), the person is the holder of an approval under regulation 61.040 to conduct the proficiency check.
- (8) For subparagraphs (5)(a)(iii) and (b)(iii), the matters are:
- (a) the date on which the instrument proficiency check is conducted; and
  - (b) the aircraft to which the instrument proficiency check relates.
- (9) In this regulation:
- relevant aircraft*, for an instrument proficiency check, means:
- (a) if the instrument proficiency check is for an aircraft category—a single-engine or multi-engine aircraft of that category; or
  - (b) if the instrument proficiency check is for multi-engine aeroplanes—a multi-engine aeroplane; or
  - (c) if the instrument proficiency check is for multi-engine helicopters—a multi-engine helicopter.

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**61.885 Requirements for grant of instrument ratings**

- (1) An applicant for an instrument rating must:
- (a) hold a private pilot licence, commercial pilot licence or air transport pilot licence; and
  - (b) meet the requirements for the grant of:
    - (i) at least one instrument endorsement mentioned in column 1 of an item in Part 1 of table 61.890; and
    - (ii) at least one instrument endorsement mentioned in column 1 of an item in Part 2 of table 61.890.

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Note 1: Paragraph (a) is satisfied if the applicant holds a certificate of validation of an overseas flight crew licence that is equivalent to a private pilot licence, commercial pilot licence or air transport pilot licence: see item 36 of Part 2 of the Dictionary.

Note 2: An application for a pilot licence mentioned in paragraph (a) and an instrument rating may be made at the same time: see subregulation 61.155(2).

(2) The applicant must also have:

- (a) passed the aeronautical knowledge examination for the instrument rating; and
- (b) completed flight training for the instrument rating; and
- (c) passed the flight test mentioned in the Part 61 Manual of Standards for the instrument rating and the aircraft category rating associated with the applicant's pilot licence; and
- (d) met the aeronautical experience requirements mentioned in subregulation (5).

Note 1: For paragraph (a), for the conduct of aeronautical knowledge examinations, see Division 61.B.3.

Note 2: For paragraph (b), for the requirements for flight training, see Division 61.B.2.

Note 3: For paragraph (c), for the conduct of flight tests, see Division 61.B.4.

Note 4: For paragraph (d), for the determination of a person's flight time and other aeronautical experience, see Division 61.A.2.

- (3) For paragraph (2)(b), the flight training must have been conducted in an aircraft of the same category as the aircraft in which, or the aircraft represented by the flight simulation training device in which, the flight test is conducted.

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- (4) For paragraph (2)(c), the flight test must be conducted in an aircraft unless the applicant has previously held:
- (a) an instrument rating; or
  - (b) an overseas rating that CASA is satisfied is equivalent to an instrument rating; or
  - (c) a qualification issued by the Australian Defence Force that CASA is satisfied is equivalent to an instrument rating.
- (5) For paragraph (2)(d), the applicant must have aeronautical experience that includes:
- (a) at least 50 hours of cross-country flight time as pilot in command; and
  - (b) at least 40 hours of instrument time, including:
    - (i) at least 10 hours of dual instrument time; and
    - (ii) either:
      - (A) if subregulation (6) applies—at least 10 hours of instrument flight time; or
      - (B) in any other case—at least 20 hours of instrument flight time.
- (6) This subregulation applies if any instrument ground time relied on by an applicant for paragraph (5)(b) is:
- (a) completed in an approved flight simulator for the purpose; and
  - (b) supervised by a pilot instructor who holds an instrument rating training endorsement.
- (7) For subregulation (5), the cross-country flight time and instrument flight time must have been conducted in an aircraft of the same category as the aircraft in which, or the aircraft represented by the flight simulation training device in which, the flight test is conducted.

**61.887 Removal of instrument rating conditions about acting as pilot in command under IFR**

- (1) This regulation applies to the holder of an instrument rating granted on the basis of regulation 202.272 or 202.274 if the rating

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is subject to the condition that the holder is not authorised to act as pilot in command under the IFR.

- (2) CASA must remove the condition, to the extent that it relates to a particular aircraft category or class, if:
- (a) the holder applies to CASA for the removal of the condition; and
  - (b) the holder meets the requirements under this Part for the grant of:
    - (i) an instrument rating; and
    - (ii) an instrument endorsement that would authorise the holder to pilot an aircraft of that category or class under the IFR.



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**Division 61.M.2—Privileges and requirements for grant of instrument endorsements**

**61.890 Kinds of instrument endorsement**

The kinds of instrument endorsement are set out in column 1 of table 61.890.

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**Table 61.890 Instrument endorsements**

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<b>Column 1</b>	<b>Column 2</b>	<b>Column 3</b>
<b>Item</b>	<b>Endorsement</b>	<b>Activities Requirements authorised</b>
<i>Part 1—Aircraft category/class endorsements</i>		
1	Single-engine aeroplane instrument endorsement	Pilot an aeroplane of the single-engine aeroplane class under the IFR or at night under the VFR
		Single-engine aeroplane class rating or type rating for a type of single-engine aeroplane At least 10 hours of dual instrument time in an aeroplane or an approved flight simulation training device for the purpose At least 5 hours of aeronautical experience at night as pilot of an aeroplane or an approved flight simulation training device for the purpose, including at least one hour of dual flight and one hour of solo night circuits

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2	Multi-engine aeroplane instrument endorsement	Pilot an aeroplane under the IFR or at night under the VFR	Multi-engine aeroplane class rating or type rating for a type of multi-engine aeroplane At least 10 hours of dual instrument time in a multi-engine aeroplane or an approved flight simulation training device for the purpose At least 5 hours of aeronautical experience at night as pilot of an aeroplane or an approved flight simulation training device for the purpose, including at least one hour of dual flight and one hour of solo night circuits
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**Table 61.890 Instrument endorsements**

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<b>Item</b>	<b>Column 1 Endorsement</b>	<b>Column 2 Activities authorised</b>	<b>Column 3 Requirements</b>
3	Single-engine helicopter instrument endorsement	Pilot a single-engine helicopter under the IFR or at night under the VFR	Single-engine helicopter class rating or type rating for a type of single-engine helicopter At least 10 hours of dual instrument time in a helicopter or an approved flight simulation training device for the purpose At least 5 hours of aeronautical experience at night as pilot of a helicopter or an approved flight simulation training device for the purpose, including at least 3 hours of dual flight and one hour of solo night circuits
4	Multi-engine helicopter instrument endorsement	Pilot a helicopter under the IFR or at night under the VFR	Type rating for a type of multi-engine helicopter At least 10 hours of dual instrument time in a multi-engine helicopter or an approved flight simulation training device for the purpose At least 5 hours of aeronautical experience at night as pilot of a helicopter or an approved flight simulation training device for the purpose, including at least 3 hours of dual flight and one hour of solo night circuits

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5	Powered-lift aircraft instrument endorsement	Pilot a powered-lift aircraft under the IFR or at night under the VFR	<p>Type rating for a type of powered-lift aircraft</p> <p>At least 10 hours of dual instrument time in a powered-lift aircraft or an approved flight simulation training device for the purpose</p> <p>At least 5 hours of aeronautical experience at night as pilot of a helicopter or powered-lift aircraft or an approved flight simulation training device for the purpose, including at least 3 hours of dual flight and one hour of solo night circuits</p>
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**Table 61.890 Instrument endorsements**

Item	Column 1 Endorsement	Column 2 Activities authorised	Column 3 Requirements
6	Gyroplane instrument endorsement	Pilot a gyroplane under the IFR or at night under the VFR	<p>Gyroplane aircraft class rating or type rating for a type of gyroplane</p> <p>At least 10 hours of dual instrument flight time in a gyroplane</p> <p>At least 5 hours of aeronautical experience at night as pilot of a helicopter or gyroplane or an approved flight simulation training device for the purpose, including at least 3 hours of dual flight and one hour of solo night circuits</p>

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7	Airship instrument endorsement	Pilot an airship under the IFR or at night under the VFR	Airship class rating or type rating for a type of airship At least 10 hours of dual instrument time in an airship or an approved flight simulation training device for the purpose At least 5 hours of aeronautical experience at night as pilot of an airship or an approved flight simulation training device for the purpose, including at least 3 hours of dual flight and one hour of solo night circuits
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*Part 2—Instrument approach endorsements*

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8	IAP 2D instrument endorsement	Conduct a 2D instrument approach operation	
9	IAP 3D instrument endorsement	Conduct a 3D instrument approach operation	IAP 2D instrument endorsement

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**Division 61.M.2** Privileges and requirements for grant of instrument endorsements

**Regulation 61.895**

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**61.895 Privileges of instrument endorsements**

Subject to Subpart 61.E, Division 61.M.1 and regulation 61.900, the holder of an endorsement mentioned in column 1 of an item in table 61.890 is authorised to conduct the activity mentioned in column 2 of the item.

Note: Subpart 61.E sets out certain limitations that apply to all pilot licences, and ratings and endorsements on pilot licences.

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**61.900 Limitations on exercise of privileges of instrument endorsements**

- (1) The holder of an endorsement mentioned in column 1 of an item in Part 2 of table 61.890 is authorised to conduct an instrument approach operation in IMC using a navigation system of a particular kind only if the holder has previously conducted:
  - (a) an instrument approach operation; or
  - (b) a simulated instrument approach operation in a flight simulation training device;  
using a navigation system of that kind.
- (2) The holder of an IAP 3D instrument endorsement is authorised to conduct a 3D instrument approach operation only if:
  - (a) the holder passed the flight test for the endorsement within the previous 24 months; or
  - (b) the holder's most recent instrument proficiency check included a 3D instrument approach operation; or
  - (c) both:
    - (i) the holder is successfully participating in an operator's training and checking system for an operation that includes 3D instrument approaches; and
    - (ii) the operator holds an approval under regulation 61.040 for the system for this subregulation.
- (3) For paragraph (2)(b), an instrument proficiency check includes an operator proficiency check:
  - (a) that covers IFR operations; and
  - (b) that is conducted by a flight examiner who holds an instrument rating flight test endorsement.

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**61.905 Requirements for grant of instrument endorsements**

(1) An applicant for an endorsement mentioned in column 1 of an item in table 61.890 must hold:

- (a) an instrument rating; and
- (b) the rating or endorsement (if any) mentioned in column 3 of the item.

Note: Subregulation (1) is satisfied, in relation to a required licence, rating or endorsement, if the applicant holds a certificate of validation of an overseas flight crew licence, rating or endorsement that is equivalent to the required licence, rating or endorsement: see item 36 of Part 2 of the Dictionary.

(2) The applicant must also have:

- (a) completed flight training for the endorsement; and
- (b) met the aeronautical experience requirements (if any) mentioned in column 3 of the item; and
- (c) passed the flight test mentioned in the Part 61 Manual of Standards for the endorsement.

Note 1: For paragraph (a), for the requirements for flight training, see Division 61.B.2.

Note 2: For paragraph (b), for the determination of a person's flight time and other aeronautical experience, see Division 61.A.2.

Note 3: For paragraph (c), for the conduct of flight tests, see Division 61.B.4.