Chapter 11—Equipment

Division 1—General

11.01 Purpose of Chapter 11

(1) For the purposes of subregulation 121.460(1) of CASR, this Chapter prescribes requirements relating to:

(a) the fitment and non-fitment of equipment to an aeroplane; and

(b) the carrying of equipment on an aeroplane; and

(c) equipment that is fitted to, or carried on, an aeroplane.

Note: Requirements in relation to equipment may also be in relation to the inoperability of the equipment.

(2) 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.

11.02 Standards etc.

In this Chapter, a reference in a provision to a document that is applied, adopted or incorporated for the purposes of the provision is a reference to the document as it exists or is in force from time to time, unless the contrary intention is expressly stated by the reference being to a specifically dated version of the document.

11.03 Aeroplane operator—Chapter 11 requirements

(1) The operator of an aeroplane must ensure that each requirement set out in this Chapter that applies in relation to the aeroplane is met.

(2) The pilot in command of an aeroplane for a flight must ensure that each of the requirements mentioned in the following provisions is met for the aeroplane and the flight:

(a) subsections 11.16(1) to (6);

(b) subsection 11.18(2);

(c) section 11.22;

(d) subsections 11.42(2) and (3);

(f) subsections 11.67(1) to (7);

(g) subsections 11.68(1) and (2).

(3) A person other than the aeroplane operator, or, for the provisions mentioned in subsection (2), the pilot in command of an aeroplane for a flight, may also be

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subject to a requirement mentioned in a provision of this Chapter, as specified in the provision setting out the requirement.

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Division 2—Approvals, visibility and inoperative equipment

11.04 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 be compliant with the requirements of, or 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;
- (d) a portable megaphone;
- (e) a sea anchor and other equipment for mooring;
- (f) a first-aid kit, an emergency medical kit or a universal precaution kit;
- (g) survival equipment, including signalling equipment.

(3) Before a foreign-registered aeroplane begins a flight, the equipment fitted to, or carried on, the aeroplane must have been approved by the national aviation authority 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 be compliant with the requirements of, or approved under, Part 21 of CASR; and
- (b) for a foreign-registered aeroplane—the equipment need not have been approved by the national aviation authority of the aeroplane's State of registry; and
- (c) no information provided by the equipment may be used by a flight crew member to comply with any requirement of this Chapter in relation to equipment that is required to be fitted or carried for 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 affect the safety of other aircraft or interfere with the proper functioning of an air traffic service.

Note: An example of surveillance equipment that could affect the safety of other aircraft is equipment that transmits a signal on a frequency used by ADS-B but does not provide the proper information. Similarly, equipment could transmit improper information to an air traffic service surveillance system.

11.05 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.

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(3) Emergency equipment that is required to be fitted to, or carried on, an aeroplane for a flight under this Chapter must be easily accessible for immediate use in the event of an emergency.

11.06 Serviceability of equipment

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

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

(b) the equipment:

(i) is inoperative because of a defect that has been approved as a permissible unserviceability for the aeroplane for the flight; and

(ii) is fitted or carried in accordance with the permissible unserviceability.

Note: For paragraph (a), a minimum equipment list (a MEL) can only permit equipment that is 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 11.20 contains an allowable time period of 72 hours related to flights with inoperative altitude alerting equipment. A 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.

MELs are approved under regulation 91.935 of CASR.

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Division 3—Flight instruments

11.07 Flight instrument requirements

(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 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 IFR 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;

(e) attitude;

(f) vertical speed;

(g) stabilised heading.

(3) Despite subsections (1) and (2), 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 must meet the requirements mentioned in column 2 of the item.

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Table 11.07—Requirements for flight instruments

Item	Column 1 Flight information	Column 2 Requirements
1	Indicated airspeed	1. 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. 2. The equipment for indicated airspeed must include a means of preventing malfunction due to condensation or icing.
2	Pressure altitude	1. 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 which measures flight levels or altitudes in metres, the equipment must be calibrated in metres or 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	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 immediately accessible to, a pilot for the duration of the flight.
4	Turn and slip	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. 2. 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 other gyroscopic instruments; or (b) a second independent source of attitude information is available.
5	Attitude	The equipment must have an alternate power supply in addition to its primary power supply: (a) unless the equipment has a source of power independent of the source of turn and slip information; or (b) a second independent source of attitude information is available.

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Table 11.07—Requirements for flight instruments

Item	Column 1 Flight information	Column 2 Requirements
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	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. Note: A gyro-magnetic type of remote indicating compass meets this requirement if it has a primary power supply and an alternate power supply.

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Division 4—Operational equipment

11.08 Radiocommunication systems

(1) An aeroplane for a flight, in any class of airspace, must be fitted with at least 2 independent radiocommunication systems:
  (a) collectively capable of communication on all frequencies necessary to meet the reporting, broadcast and listening watch requirements under regulations 91.630, 91.635, 91.640 and 91.675 of CASR, from any point on the route of the flight, including in the event of any diversions; and
  (b) each capable of receiving meteorological information at any time during the flight; and
  (c) at least one of which must have 2-way voice communication capability; and
  (d) at least one of which must provide for communication on the aeronautical emergency frequency 121.5 MHz.

(2) Subsection (3) applies if the aeroplane is a 2-engine aeroplane and has an EDTO approval with a maximum diversion time that is more than 180 minutes.

(3) At least one radiocommunication system fitted to the aeroplane must, for an EDTO flight under the approval:
  (a) be capable of providing immediate satellite-based voice communication (SATCOM/SATVOICE); and
  (b) provide communication capability:
    (i) between the flight crew and air traffic services; and
    (ii) between the flight crew and the operational control centre.

11.09 Navigation equipment

(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
  (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).

Note: For paragraph (a), GNSS equipment authorised in accordance with (E)TSO-C129 is unlikely to support ADS-B position source equipment requirements.

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(2) Without affecting the requirements under subsections (5) and (6), an aeroplane must be fitted with at least:
  (a) two approved GNSS (not including an approved GNSS authorised under (E)TSO-C129); or
  (b) subject to subsection (4), one approved GNSS and either:
    (i) one ADF; or
    (ii) one VOR.

(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-129a;
  (b) (E)TSO-C145a;
  (c) (E)TSO-C146a;
  (d) (E)TSO-C196a;

then the relevant options must be connected.

(4) For paragraph (2)(b), an approved GNSS must not be one authorised in accordance with (E)TSO-C129 unless:
  (a) the aeroplane is manufactured before 6 February 2014; and
  (b) the approved GNSS fitted to the aeroplane is installed before 6 February 2014.

(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 operational flight plan; and
  (b) the requirements of:
    (i) relevant air traffic services; 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.

Note: Section 11.03 of the Part 91 Manual of Standards prescribes, under regulation 91.255 (which is applicable generally) requirements relating to oceanic airspace. When entering oceanic airspace that requires the use of RNP 2, RNP 4 or RNP 10 navigation specification, the crew must check whether at least 2 long range navigation systems (LRNS) are operable. If less than 2 LRNSs are operable, then air traffic control must be informed of the situation.

11.10 Automatic pilot

(1) Subject to subsection (3), an aeroplane must be fitted with an automatic pilot.

(2) The automatic pilot must have at least the following modes:
  (a) an altitude holding mode;
  (b) a heading mode.

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(3) Subsection (1) does not apply if the aeroplane is fitted with fully functioning dual controls.

11.11 Equipment to ensure clear view through the windshield

(1) An aeroplane with a maximum take-off weight of more than 5 700 kg must be fitted with equipment to remove precipitation from the area of windshield directly in front of a pilot's seat.

(2) An aeroplane with a maximum take-off weight of 5 700 kg or less must:
   (a) meet the requirement under subsection (1) as if it applied to the aeroplane; or
   (b) have a windshield whose design is such that moderate rain will not impair the pilot's view for take-off, landing or normal flight.

Note: Subsection 11.07(2) of the Part 91 Manual of Standards requires RVSM operations to be conducted in accordance with the requirements of the authorised aeronautical information. For an aeroplane that does not have an automatic pilot with the altitude hold function serviceable, operations in RVSM airspace may be restricted as a result of these requirements.

11.12 Internal doors and curtains

(1) If an aeroplane has any of the following:
   (a) an internal door;
   (b) a curtain;

through which a passenger in a passenger seat must pass to reach a passenger emergency exit, the door or curtain must be fitted in accordance with this section.

(2) An internal door, or curtain, must have a means of being secured open.

(3) There must be:
   (a) a placard placed on an internal door indicating that the door must be secured open during take-off and landing; and
   (b) a means for a crew member to open a door that is normally accessible to, and lockable by, a passenger.

(4) There must be a placard adjacent to a curtain indicating that the curtain must be secured open during take-off and landing.

11.13 Survival equipment—remote areas and over water

(1) A flight of an aeroplane that will be conducted in or through a remote area (within the meaning given by section 26.63 of the Part 91 MOS) must carry survival equipment that is appropriate for sustaining life in the area in or through which the flight will be conducted.

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(2) A flight of an aeroplane that will be conducted over water where the aeroplane is required to carry a life raft under Division 12 of this Chapter must carry the following:

(a) survival equipment that is appropriate for sustaining life in the area in, or through which, the flight will be conducted;

(b) signalling equipment such that the distress signals set out in Appendix 1 to ICAO Annex 2, *Rules of the Air*, can be made if required.

11.14 Equipment to measure and record cosmic radiation

(1) An aeroplane for a flight above FL 490 must be fitted with equipment to measure and display, in a unit that is readily visible to a flight crew member piloting the aeroplane, the total cosmic radiation received in the aeroplane's cabin.

(2) For the purposes of subsection (1), the equipment must continuously measure and display:

(a) the dose rate of total cosmic radiation being received during the flight; and

(b) the cumulative dose of total cosmic radiation received on each flight.

(3) In this section:

total cosmic radiation means the sum total of ionizing and neutron radiation of galactic and solar origin.

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Division 5—Lighting systems

11.15 Cockpit and cabin lighting requirements

(1) An aeroplane operating by 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 by night must:
  (a) illuminate each item of equipment that may be used by the flight crew; and
  (b) illuminate the documents that may be used by the flight crew, including checklists and flight documents; and
  (c) be compatible with each item of equipment that may be used by a pilot; and
  (d) be arranged in a way that:
    (i) enables all placards and instrument markings to be read from each pilot's normal sitting position in a pilot's seat in the aeroplane; and
    (ii) each pilot'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 by night must be fitted with anti-collision lights.

(2) The anti-collision light equipment fitted to an aeroplane must comprise:
  (a) at least one 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 comprising one 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;

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(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 comprising 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 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 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), (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.

11.17 Landing lights

An aeroplane operating by 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 by night must be fitted with navigation lights.

(2) If required to be fitted under subsection (1), the navigation lights must be displayed during a flight and when operating on the movement area of an aerodrome.

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Division 6—Alerting and warning system requirements

11.19 Altitude alerting system and assigned altitude indicator

(1) The following aeroplanes must be fitted with altitude alerting equipment in accordance with subsection (2):

(a) a piston-engine aeroplane operating in controlled airspace above FL 150;

(b) a 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 or visual 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) must be fitted with altitude alerting equipment at least in the form of an assigned altitude indicator.

11.20 Aeroplane flown with inoperative altitude alerting equipment or assigned altitude indicator

Despite section 11.19, altitude alerting equipment may be inoperative at the beginning of a flight only if:

(a) the flight:

(i) begins within 72 hours of the time the equipment was found to be inoperative; and

(ii) is from an aerodrome at which there is no facility for the equipment 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.

11.21 Airborne collision avoidance system (ACAS)

(1) In this instrument:

approved ACAS means an ACAS that is authorised in writing by CASA or the national aviation authority of a recognised country in accordance with one of the following:

(a) (E)TSO-C119c;

(b) (E)TSO-C219.

resolution advisory, or ***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.

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

(2) An aeroplane mentioned in subsection (3) must be fitted with an approved ACAS.

(3) For subsection (2), the aeroplane must be a turbine-engine aeroplane that:

(a) either:

(i) has a maximum take-off weight of more than 15 000 kg; or

(ii) has a maximum certificated passenger seating capacity of more than 30; or

(b) is first registered, in Australia or elsewhere, on or after 1 January 2014, and:

(i) has a maximum take-off weight of more than 5 700 kg but not more than 15 000 kg; or

(ii) has a maximum certificated passenger seating capacity of more than 19 but not more than 30.

11.22 ACAS—requirements for use

(1) During the period mentioned in subsection (2), an approved ACAS fitted to an aeroplane under section 11.21, or a TCAS fitted to an aeroplane as mentioned in section 11.21A, 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.

11.23 Flight with inoperative ACAS or TCAS

(1) An approved ACAS, or a TCAS mentioned in section 11.21A, may be inoperative at the beginning of a flight only if:

(a) the flight:

(i) begins from an aerodrome at which there is no facility for the ACAS or TCAS to be replaced, within 72 hours of the time the ACAS or TCAS was found to be inoperative; or

(ii) is to an aerodrome at which there is a facility for the ACAS or TCAS to be repaired or replaced; and

(b) if the aeroplane is required to be fitted with an altitude alerting system—that system is not also inoperative.

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11.24 Terrain awareness and warning system (TAWS)

(1) In this section:

TAWS-Class A means a terrain awareness and warning system that:

(a) meets the performance requirements for Class A equipment in (E)TSO-C151b; and

(b) is authorised in writing by CASA or the national aviation authority of a recognised country.

TAWS-Class B means a terrain awareness and warning system that:

(a) meets the performance requirements for Class B equipment in (E)TSO-C151b; and

(b) is authorised in writing by CASA or the national aviation authority of a recognised country.

(2) A turbine-engine aeroplane must be fitted with a TAWS-Class A.

(3) A piston-engine aeroplane must be fitted with a TAWS-Class A or a TAWS-Class B.

11.25 Flight with inoperative TAWS equipment

A TAWS fitted in accordance with section 11.24 may be inoperative at the beginning of a flight but only if the flight begins:

(a) from an aerodrome at which there is no facility for the TAWS to be repaired or replaced; and

(b) within 24 hours of the time the TAWS was found to be inoperative.

11.26 Airborne weather radar equipment

(1) An aeroplane must be fitted with airborne weather radar equipment.

11.27 Flight with inoperative airborne weather radar equipment

(1) Despite section 11.26, airborne weather radar equipment 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 the alternate 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 7—Flight recorders

11.28 Definitions—flight recorders

In this instrument:

CVR means cockpit voice recorder.

FDR means flight data recorder.

flight recorder means a combination recorder, FDR or CVR.

Note: A combination recorder is an item of equipment that combines the functions of a flight data recorder and a cockpit voice recorder: see the definition of the term in the CASR Dictionary.

11.29 Flight data recorder

One FDR must be fitted to an aeroplane that has a maximum take-off weight of more than 5 700 kg and is:

(a) turbine-powered; or

(b) of a type first certificated in its country of manufacture on, or after, 1 July 1965.

11.30 Cockpit voice recorder

One CVR must be fitted to:

(a) an aeroplane that has a maximum take-off weight of more than 5 700 kg and which:

(i) is turbine-powered; or

(ii) is of a type first certificated in its country of manufacture on. or after, 1 July 1965.

(b) a multi-engine turbine-powered aeroplane that:

(i) has a maximum take-off weight of 5 700 kg or less; and

(ii) is pressurised; and

(iii) is type certificated in its country of manufacture for operation with more than 11 seats (including seats specifically designed for the use of crew members); and

(iv) was first issued with a certificate of airworthiness after 1 January 1988.

11.31 Combination recorders

If the combined effect of sections 11.29 and 11.30 is that the aeroplane must be fitted with both one FDR and one CVR, the requirements may be met by the fitment of:

(a) 2 combination recorders; or

(b) one FDR and one combination recorder; or

(c) one CVR and one combination recorder.

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11.32 FDR, CVR and combination recorder technical requirements

(1) An FDR or a combination recorder must comply with one of the following:
   (a) the requirements of *Civil Aviation Order 103.19 Instrument 2007*, as in force from time to time;
   (b) (E)TSO-C124a.

Note: These standards include the minimum recording time requirements.

(2) A CVR or a combination recorder must comply with one of the following:
   (a) the requirements of *Civil Aviation Order 103.20 Instrument 2007*, as in force from time to time;
   (b) (E)TSO-C123a.

Note: These standards include the minimum recording time requirements.

(3) The operator of an aeroplane that is required to be fitted with any of the following must ensure that, at any time:
   (a) for an FDR or a combination recorder—the recorder retains its last 25 hours of flight data recording; and
   (b) for a CVR or a combination recorder—the recorder retains its last 30 minutes of cockpit voice recording; and
   (c) for an FDR or a combination recorder—data are preserved from the last 2 occasions on which flight data recording was calibrated.

Note: The purpose of paragraph (c) is to enable determination of the accuracy of recorded data.

11.33 Use of FDR, CVR and combination recorders

(1) Subject to subsection (4), an FDR fitted to an aeroplane under this Division must record continuously from the time the aeroplane begins moving under its own power, until the time the flight is terminated and the aeroplane can no longer move under its own power.

(2) Subject to subsection (4), a CVR fitted to an aeroplane under this Division must:
   (a) start to record before the aeroplane first begins moving under its own power for a flight; and
   (b) as far as practicable, if electrical power is available, start to record as early as possible during the cockpit checks before the engines are started at the beginning of the flight; and
   (c) record continuously until the termination of the flight when the aeroplane is no longer capable of moving under its own power and the engines have been shut down; and
   (d) as far as practicable, if electrical power is available, continue recording until as close as possible to the conclusion of the cockpit checks immediately following engine shutdown at the end of the flight.

(3) The FDR and the CVR within a combination recorder fitted to an aeroplane under this Division must record continuously during the same periods as an FDR and a CVR are required to operate under subsections (1) and (2).

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(4) If:

(a) there is no auxiliary power unit or other alternative power source for the aeroplane; and

(b) it is reasonably necessary to preserve the aeroplane's primary power source in order to start the aeroplane's engines; and

(c) the flight data recorder is operated continuously during the period beginning just before the engines are started for take-off and ending when the final pilot checklist is completed at the end of the flight;

then, a CVR fitted to an aeroplane under this Division must record continuously during the period:

(d) beginning after the engines are started for the flight; and

(e) ending when the final pilot checklist is completed at the end of the flight.

(5) An FDR or combination recorder fitted to an aeroplane under this Division must not be operated during maintenance of the aeroplane or of an aeronautical product fitted to the aeroplane, except if the maintenance is to the recorder or an aeroplane engine.

(6) For subsection (5), an auxiliary power unit fitted to the aeroplane is not an aeroplane engine unless it is capable of propelling the aeroplane.

11.34 Flight with an inoperative FDR, CVR or combination recorder

(1) An FDR, CVR or combination recorder fitted onto an aeroplane may be inoperative at the beginning of a flight, only if:

(a) the flight begins from a departure aerodrome with no facility for the flight recorder to be repaired or replaced; and

(b) any requirements that apply under paragraphs (2)(a) to (d) are met.

(2) For paragraph (1)(b), the requirements are:

(a) if the aeroplane is only required to be fitted with one CVR or FDR—the inoperative CVR or FDR has not been inoperative for more than 21 days; and

(b) if the aeroplane is required to be fitted with both one CVR and one FDR:

(i) the inoperative CVR or FDR has not been inoperative for more than 21 days; and

(ii) the other recorder is operative; and

(c) if the aeroplane is fitted with one combination recorder—the inoperative combination recorder has not been inoperative for more than 3 days; and

(d) if the aeroplane is fitted with more than one combination recorder:

(i) the inoperative combination recorder has not been inoperative for more than 21 days; and

(ii) at least one combination recorder is operative.

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11.35 Data link recorder

(1) With effect from the beginning of 2 December 2023, this section applies to an aeroplane that:

(a) is:

(i) first issued with a certificate of airworthiness, or an authorisation (however described) equivalent to a certificate of airworthiness issued by the NAA of a Contracting State, on or after 1 January 2016; or

(ii) modified on or after 1 January 2016 to install and utilise any of the data link communications application types listed in column 1 of table 11.35(4); and

(b) is required under section 11.30 to be fitted with a CVR; and

(c) has the capability to operate data link communications.

(2) The following requirements apply to the aeroplane:

(a) data link communications messages must be recorded;

(b) the recording must be on a flight recorder capable of preserving the recordings in the event of any accident to the aeroplane;

(c) the recording must be capable of correlation to the relevant contents of the CVR.

(3) The flight recorder mentioned in subsection (2) must be capable of recording for at least the same duration as the CVR fitted under section 11.30.

(4) For the purposes of subsection (2), the recording of data link communications messages for an application type mentioned in column 1 of an item in table 11.35(4), as described in column 2 of the item, must meet the recording content requirement of each symbol mentioned in column 3 of the item, in accordance with subsection (5) and as described in table 11.35(5).

Table 11.35(4)—Requirements for recording of data link communications messages for applications

Item	Column 1 Application type	Column 2 Application description	Column 3 Recording content
1	Data link initiation	This includes any application used to log on to, or initiate, a data link service. In Future Air Navigation System (FANS)-1/A and air traffic navigation (ATN), these are ATS facilities notification (AFN) and context management (CM) respectively	C

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Table 11.35(4)—Requirements for recording of data link communications messages for applications

Item	Column 1 Application type	Column 2 Application description	Column 3 Recording content
2	Controller/pilot communication	This includes any application used to exchange requests, clearances, instructions and reports between the flight crew and air traffic controllers. In FANS-1/A and ATN, this includes the controller pilot data link communications (CPDLC) application. It also includes applications used for the exchange of oceanic clearances (OCL) and departure clearances (DCL) as well as data link delivery of taxi clearances	C
3	Addressed surveillance	This includes any surveillance application in which the ground sets up contracts for delivery of surveillance data. In FANS-1/A and ATN, this includes the automatic dependent surveillance-contract (ADS-C) application. Where parametric data are reported within the message, they must be recorded unless data from the same source are recorded on the FDR	C
4	Flight information	This includes any service used for delivery of flight information to specific aircraft. This includes, for example, data link aviation weather report service (D-METAR), data link-automatic terminal service (D-ATIS), digital Notice to Airmen (D-NOTAM) and other textual data link services	C
5	Aircraft broadcast surveillance	This includes elementary and enhanced surveillance systems, as well as automatic dependent surveillance-broadcast (ADS-B) output data. Where the parametric data sent by the aeroplane are reported within the message, they must be recorded unless data from the same source are recorded on the FDR	M*
6	Aeronautical operational control data	This includes any application transmitting or receiving data used for AOC operations, including data in relation to the initiation, continuation, diversion or termination of a flight in the interests of the safety of the aircraft and the regularity and efficiency of the flight	M*

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(5) For subsection (4), the recording content requirement for a symbol mentioned in column 1 of an item in table 11.35(5) is that described in column 2 of the item.

Table 11.35(5)—Requirements for recording content

Item	Column 1 Recording content symbol	Column 2 Recording content symbol's requirements
1	C	Complete contents recorded
2	M	Information that enables correlation with any associated records stored separately from the aeroplane
3	*	Applications that are to be recorded only as far as practicable given the architecture of the system

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Division 8—Aeroplane interior communication systems

11.36 Flight crew intercommunication system

(1) An aeroplane must be fitted with a flight crew intercommunication system that consists of one headset, and one microphone that is not of the hand-held type, for each flight crew member for the flight.

(2) The aeroplane must also be fitted with, or carry, either:
  (a) another headset, and another microphone not of the hand-held type, in addition to those carried under subsection (1); or
  (b) a hand-held microphone and cockpit speaker that can enable any flight crew member to conduct all required communications within the crew or external to the aeroplane.

11.37 Crew interphone system

(1) This section applies if:
  (a) a cabin crew member is required to be carried on an aeroplane for a flight; or
  (b) a crew member occupies a crew station remote from the flight deck.

(2) An aeroplane must be fitted with a crew interphone system (the ***interphone system***) in accordance with this section.

(3) The interphone system, other than its handsets, headsets, microphones, selector switches and signalling devices, must operate independently of:
  (a) the flight crew intercommunication system; and
  (b) the public-address system.

(4) The interphone system must be readily accessible for use by:
  (a) each flight crew member from the flight crew member's seat in the flight crew compartment (cockpit); and
  (b) each cabin crew member at the cabin crew member's crew station.

(5) The interphone system must enable any crew member to activate an incoming call alert that:
  (a) uses aural or visual signals; and
  (b) distinguishes between normal and emergency calls.

(6) The interphone system must provide 2-way communication between the following:
  (a) the flight crew compartment (cockpit) and each crew station in a passenger compartment;
  (b) the flight crew compartment (cockpit) and each galley located other than on the same level as a passenger compartment;
  (c) the flight crew compartment (cockpit) and each crew rest area located other than on the same level as a passenger compartment;

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(d) the flight crew compartment (cockpit) and each crew station that is:
  (i) located other than on the same level as a passenger compartment; and
  (ii) not accessible from a passenger compartment;
(e) the flight crew compartment (cockpit) and ground personnel who, when using the system, are not in full view from the cockpit.

11.38 Public-address system

(1) An aeroplane must be fitted with a public-address system, in accordance with this section, to enable crew members to address the passengers whether the aeroplane is in flight or on the ground.

(2) The public-address system, other than handsets, headsets, microphones, selector switches and signalling devices, must operate independently of:
  (a) the flight crew intercommunication system; and
  (b) the crew interphone system (if any).

(3) The public-address system must be readily accessible for use by each flight crew member from the flight crew member's seat in the flight crew compartment.

(4) At each emergency exit with an adjacent cabin crew seat on the same level as a passenger compartment (a ***relevant location***), there must be a handset or microphone operable by the cabin crew member while seated.

(5) Despite subsection (4), a single handset or microphone may serve more than one relevant location, but only if the 2 relevant locations are so close as to allow unassisted verbal communication between the seated cabin crew members.

(6) The public-address system must be operable within 10 seconds of activation by a cabin crew member at each relevant location.

(7) Announcements made using the public-address system must be audible at all of the following:
  (a) passenger seats;
  (b) toilets;
  (c) galleys;
  (d) cabin crew stations;
  (e) crew rest areas.

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Division 9—Oxygen equipment and oxygen supplies

11.39 Definitions for Division 9, Chapter 11

In this Division:

assisting crew member means a crew member assisting a flight crew member with the flight crew member's duties.

quick-donning mask means an oxygen mask that:

(a) is for a flight crew member's personal use; and

(b) within 5 seconds of it being deployed and ready for use, the flight crew member can, with 1 hand, place over the face, secure and seal.

required cabin crew member means a cabin crew member required for the flight of an aeroplane under regulation 121.635 of CASR.

standard temperature and pressure means 0 degrees Celsius at a pressure of 760 mm Hg.

STPD means standard temperature and pressure dry.

11.40 Supplemental oxygen—pressurised aeroplanes

(1) A pressurised aeroplane operated at a pressure altitude above 10 000 ft (a ***relevant aeroplane***) must be fitted with, or carry, supplemental oxygen equipment capable of storing and dispensing supplemental oxygen to crew members and passengers.

(2) Subject to subsection (2A), a relevant aeroplane must carry sufficient supplemental oxygen to meet the requirements set out in table 11.40.

(2A) If:

(a) the relevant aeroplane is certified to fly with a pressure altitude of only 25 000 ft or below; and

(b) the aeroplane is able to safely descend within 4 minutes to a cabin pressure altitude of 13 000 ft;

then the supplemental oxygen supply requirements in table 11.40 may be reduced as mentioned in subsection (2B).

(2B) For subsection (2A):

(a) for a person mentioned in column 1 of item 2 of the table (required cabin crew members)—to a supply for each required cabin crew member for the entire period when the cabin pressure altitude is between 10 000 ft and 13 000 ft; and

(b) for a person mentioned in column 1 of item 3 of the table (passengers and crew not covered by item 1 or 2 of the table)—to a supply for 10% of the passengers and those crew, for the entire period when the cabin pressure altitude is between 10 000 ft and 13 000 ft.

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(3) For a person mentioned column 1 of an item in the table, supplemental oxygen must be made available through an oxygen dispensing unit in accordance with the supply requirements mentioned for the item in column 2.

(4) Each flight crew member and assisting crew member must use the supplemental oxygen that is made available to each of them in accordance with the supply requirements mentioned in column 2 of item 1 of the table.

Table 11.40—Supplemental oxygen: requirements for pressurised aeroplanes

Item	Column 1 Person	Column 2 Supplemental oxygen supply requirements
1	Flight crew members or assisting crew members	1. There must be supply for each flight crew member and for each assisting crew member for the entire period when the cabin pressure altitude is above 13 000 ft. 2.(a) For an aeroplane that is not flown at any time during a flight above a pressure altitude of 25 000 ft—for any period exceeding 30 minutes, when the cabin pressure altitude is above 10 000 ft but not above 13 000 ft, there must be supply for each flight crew member and for each assisting crew member for ***the entire period***; (b) Without otherwise affecting paragraph (a): (i) there must be a minimum of at least 30 minutes supply for each flight crew member and for each assisting crew member even if ***the entire period*** may be less than 30 minutes; and (ii) the supply mentioned in subparagraph (i) must encompass the quantity of oxygen necessary for the aeroplane descending at a constant rate: (A) from the lesser of the aeroplane's maximum certified operating altitude and a pressure altitude of 25 000 ft; and (B) to a pressure altitude of 10 000 ft in 10 minutes; followed by 20 minutes at a pressure altitude of 10 000 ft. 3.(a) For an aeroplane that is flown at any time during the flight above a pressure altitude of 25 000 ft —for any period exceeding 30 minutes when the cabin pressure altitude is above 10 000 ft but not above 13 000 ft, there must be supply for each flight crew member and for each assisting crew member for ***the entire period***. (b) Without otherwise affecting paragraph (a): (i) there must be at least 2 hours supply for each flight crew member and for each assisting crew member even if ***the entire period*** may be less than 2 hours; and (ii) the supply mentioned in subparagraph (i) must encompass the quantity of oxygen necessary for the aeroplane descending at a constant rate:

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Table 11.40—Supplemental oxygen: requirements for pressurised aeroplanes

Item	Column 1 Person	Column 2 Supplemental oxygen supply requirements
		(A) from the aeroplane's maximum certified operating altitude; and (B) to a pressure altitude of 10 000 ft in 10 minutes; followed by a time period of 110 minutes at a pressure altitude of 10 000 ft.
2	Required crew members	1. For any period when the cabin pressure altitude is above 13 000 ft there must be: (a) supply for the entire period; and (b) at least 30 minutes supply for each required cabin crew member, even if the entire period may be less than 30 minutes; and (c) the supply mentioned in paragraph (b) must encompass the quantity of oxygen necessary for the aeroplane descending at a constant rate: (i) from the aeroplane's maximum certified operating altitude; and (ii) to a pressure altitude of 10 000 ft in 10 minutes; followed by a time period of 20 minutes at a pressure altitude of 10 000 ft. 2. For any period exceeding 30 minutes when the cabin pressure altitude is above 10 000 ft, but not above 13 000 ft, there must be supply for each required cabin crew member for the entire period.
3	Passengers, and crew members not covered by item 1 or 2 of this table	1.(a) For any period when the cabin pressure altitude is above 15 000 ft, there must be supply for each of the persons for ***the entire period***. (b) Without otherwise affecting paragraph (a): (i) there must be at least 10 minutes supply for each of the persons even if the entire period is less than 10 minutes; and (ii) the supply mentioned in subparagraph (i) must encompass the quantity of oxygen necessary for the aeroplane descending at a constant rate: (A) from the aeroplane's maximum certified operating altitude; and (B) to a pressure altitude of 15 000 ft in 10 minutes. 2. For any period when the cabin pressure altitude is above 14 000 ft but not above 15 000 ft, there must be supply for the entire period for at least 30% of the passengers. 3. For any period exceeding 30 minutes when the cabin pressure altitude is above 10 000 ft but not above 14 000 ft, there must be supply for the entire period for at least 10% of the persons mentioned in column 1.

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11.41 Supplemental oxygen—unpressurised aeroplanes

(1) An unpressurised aeroplane operated at a pressure altitude above 10 000 ft (a ***relevant aeroplane***) must carry sufficient supplemental oxygen to meet the requirements set out in table 11.41.

(2) A relevant aeroplane to which subsection (1) applies must be fitted with, or carry, supplemental oxygen equipment capable of storing and dispensing supplemental oxygen to crew members and passengers.

(3) For a person mentioned in column 1 of an item of the table, supplemental oxygen must be made available in accordance with the supply requirements mentioned for the item in column 2.

(4) Each flight crew member and assisting crew member must use the supplemental oxygen that is made available to each of them in accordance with the supply requirements mentioned in column 2 of item 1 of the table.

Table 11.41—Supplemental oxygen: requirements for unpressurised aeroplanes

Item	Column 1 Person	Column 2 Supplemental oxygen supply requirements
2	Flight crew members, assisting crew members and required cabin crew members	1. There must be supply for each of the persons for the entire period when the cabin pressure altitude is above 13 000 ft. 2. For any period exceeding 30 minutes when the cabin pressure altitude is above 10 000 ft but not above 13 000 ft, there must be supply for each of the persons for the entire period.
3	Passengers and crew members not covered by item 2 of this table	1. For any period when the cabin pressure altitude is above 13 000 ft, there must be supply for each of the persons for the entire period. 2. For any period exceeding 30 minutes when the cabin pressure altitude is above 10 000 ft but not above 13 000 ft, there must be supply for the entire period for at least 10% of the the persons mentioned in column 1.

11.42 Oxygen masks usage requirements—pressurised aeroplane above FL 250

(1) This section applies for a flight of a pressurised aeroplane that is flown above FL 250 at any time during the flight.

(2) At least one pilot occupying a pilot seat:

(a) must be wearing a sealed oxygen mask (securely worn) that:

(i) is being supplied with supplemental oxygen; or

(ii) automatically supplies supplemental oxygen when the cabin pressure altitude is at or above 14 000 ft; or

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(b) must have access to a quick-donning mask that is supplied with supplemental oxygen when the mask is donned.

(3) During the period when the aeroplane is flown above FL 450 during the flight, at least one pilot occupying a pilot seat must be wearing one of the following that is being supplied with supplemental oxygen:
(a) a sealed oxygen mask (securely worn);
(b) a quick-donning mask.

11.43 Oxygen dispensing units for passengers in a pressurised aeroplane

(1) Subsection (2) applies for a pressurised aeroplane that:
(a) is of a type that was first issued with either of the following, on or after 9 November 1998:
(i) a certificate of airworthiness; or
(ii) an authorisation (however described) equivalent to a certificate of airworthiness issued by the national aviation authority of a Contracting State; and
(b) either:
(i) is flown at or above FL 250 at any time during the flight; or
(ii) if flown below FL 250—cannot safely descend from its flight level to a cabin pressure altitude of less than 13 000 ft within a period of 4 minutes in the event of a cabin depressurisation.

(2) For the passengers mentioned in item 3 of table 11.40:
(a) the oxygen dispensing units must be automatically deployable; and
(aa) the units must be immediately available to each passenger on the flight, wherever seated; and
(b) the number of dispensing units must exceed the number of passenger seats by 10% (***additional units***); and
(c) the additional units must be evenly distributed throughout the passenger compartment.

11.44 Protective breathing equipment—flight crew members

(1) When an aeroplane begins a flight, it must be carrying protective breathing equipment (***PBE***) for each flight crew member in accordance with this section.

(2) The PBE:
(a) must protect the wearer's eyes, nose and mouth; and
(b) in relation to the part protecting the wearer's eyes:
(i) must not adversely affect vision in any noticeable way; and
(ii) must allow corrective glasses to be worn in a normal position; and
(c) must be able to supply oxygen continuously for at least 15 minutes.

Note: The oxygen supply for the PBE for each flight crew member can be provided by the supplemental oxygen required under section 11.40 or 11.41 (as applicable to the flight).

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(3) The protective breathing equipment for a flight crew member must be accessible for immediate use at the flight crew member's crew station.

(4) The PBE must not prevent, or be likely to prevent, a flight crew member from effectively using any crew intercommunications or radiocommunications equipment fitted to, or carried on, the aeroplane.

11.45 Portable protective breathing equipment

(1) When a pressurised aeroplane begins a flight, it must be carrying portable protective breathing equipment (***portable PBE units***) in accordance with this section.

(2) Each portable PBE unit:
   (a) must protect the wearer's eyes, nose and mouth; and
   (b) in relation to the part of the unit protecting the wearer's eyes:
      (i) must not adversely affect vision in any noticeable way; and
      (ii) must allow corrective glasses to be worn in a normal position; and
   (c) must be able to supply oxygen, or a mixture of oxygen and another suitable gas, continuously for at least 15 minutes.

(3) Portable PBE units must be located as follows:
   (a) for a flight where no crew members other than the minimum flight crew members are carried—1 portable PBE unit must be located in, or as close as practicable to, the flight crew compartment;
   (b) as far as practicable—1 portable PBE unit must be located adjacent to each of the hand-held fire extinguishers required to be carried on the flight under Division 11 of this Chapter;
   (c) if compliance with paragraph (b) is not practicable—1 portable PBE unit must be located adjacent to each individual cabin crew member crew station that is being used by a cabin crew member for the flight.

(4) Portable PBE units must not prevent, or be likely to prevent, a crew member from effectively using any crew intercommunications or radiocommunications equipment fitted to, or carried on, the aeroplane.

11.46 First-aid oxygen equipment—pressurised aeroplane

(1) In this section:

First-aid oxygen means a supply of undiluted oxygen for any passengers who, for physiological reasons, may still require oxygen when:
   (a) there has been a cabin depressurisation; and
   (b) the amounts of supplemental oxygen supply otherwise required under this Division have been exhausted.

(2) Until immediately before 2 December 2023, an aeroplane must comply with the requirements related to first-aid oxygen (however described) in accordance with:
   (a) Civil Aviation Order 20.4, and Civil Aviation Order 108.26, as in force immediately before the commencement of this instrument; or

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(b) this section.

(3) With effect from the beginning of 2 December 2023, an aeroplane must be fitted with or carry first-aid oxygen in accordance with this section.

(4) This section applies to a pressurised aeroplane that:
   (a) is flown above FL 250 at any stage during the flight; and
   (b) carries a passenger on the flight.

(5) When the aeroplane begins the flight, it must carry, for use in first aid, such a volume of first-aid oxygen as will provide an average oxygen gas flow rate, calculated assuming dry oxygen gas at standard temperature and pressure, of 3 litres per minute per person:
   (a) for whichever of the following is the greater number of persons:
      (i) 2% of the number of passengers carried on the flight;
      (ii) 1 person; and
   (b) for the flight period after a cabin depressurisation event during which the aeroplane's cabin pressure altitude is above 8 000 ft but is not above 15 000 ft.

(6) When the aeroplane begins the flight, it must carry, for use in dispensing first-aid oxygen, a sufficient number of specific first-aid oxygen dispensing units relative to the number of passengers on board, but in no case less than 2 such units.

(7) An oxygen dispensing unit:
   (a) must be capable of generating a flow rate, calculated assuming dry oxygen gas at standard temperature and pressure, of at least 4 litres per minute per person STPD; and
   (b) may have a means of reducing the flow to not less than 2 litres per minute per person STPD at any altitude.

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Division 10—Emergency locator transmitters

11.47 Carriage of ELTs

(1) Until immediately before 2 December 2023, an aeroplane for a flight must be fitted with or carry emergency locator transmitters (***ELTs***) in accordance with:
  (a) regulation 252A of CAR, and subsection 6 of Civil Aviation Order 20.11 (as it applies to ELTs), as each of those provisions is in force immediately before the commencement of this instrument; or
  (b) this Division.

(2) For the purposes of paragraph (1)(a), if immediately before 2 December 2021 the aeroplane flight would have been:
  (a) classed as a charter flight—then the ELT requirements are those that would have applied to such a charter flight; and
  (b) classed as an RPT flight—then the ELT requirements are those that would have applied to such an RPT flight.

(3) With effect from the beginning of 2 December 2023, an aeroplane must be fitted with or carry ELTs in accordance with sections 11.48 to 11.51.

11.48 ELT must be fitted or carried

An aeroplane that has the characteristics mentioned in columns 1 and 2 of an item in table 11.48, must be fitted with, or carry, at least the number and kind of ELTs mentioned in column 3 of the item.

Table 11.48—Emergency locator transmitters

Item	Column 1 Maximum certificated passenger seating capacity of the aeroplane	Column 2 Date certificate of airworthiness was first issued, or date an authorisation (however described) equivalent to a certificate of airworthiness issued by the NAA of a Contracting State, was first issued	Column 3 ELT requirements—at least:
1	Greater than 19	After 1 July 2008	2 ELTs, at least one of which must be an automatic ELT
2	Greater than 19	On or before 1 July 2008	Either: 1 automatic ELT; or 2 ELTs
3	19 or less	After 1 July 2008	1 automatic ELT
4	19 or less	On or before 1 July 2008	1 ELT

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11.49 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 SAR 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.

11.50 Automatic ELT

(1) An ***automatic ELT*** is an ELT in accordance with section 11.49 that meets the requirements mentioned in subsection (2).

(2) For the purposes of 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)TSO-C126;

(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).

11.51 Survival ELT

(1) A ***survival ELT*** is an ELT in accordance with section 11.49 that meets the requirements mentioned in subsection (2).

(2) For the purposes of 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;

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(iii) a type authorised by the FAA or EASA in accordance with (E)TSO-C126;

(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).

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Division 11—Portable emergency equipment

11.52 Hand-held fire extinguishers

(1) In this section:

Class A cargo or baggage compartment has the meaning given within FAR 25.857, as in force from time to time.

Class B cargo or baggage compartment has the meaning given within FAR 25.857, as in force from time to time.

Class E cargo compartment has the meaning given within FAR 25.857, as in force from time to time.

(2) An aeroplane must carry at least the following number of hand-held fire extinguishers:

(a) one in the flight crew compartment;

(b) one in each galley, or (in the case that a galley is not in a passenger, crew or cargo compartment) readily accessible for use in the galley;

(c) one that is accessible to the crew members, and that is conveniently located for use, in relation to each of the following:

(i) a Class A cargo or baggage compartment;

(ii) a Class B cargo or baggage compartment;

(iii) a Class E cargo compartment;

(d) for an aeroplane with the maximum operational passenger seat configuration mentioned in an item of column 1 of table 11.52—the number of extinguishers mentioned in column 2 of the item, conveniently located to provide adequate availability for use in each passenger compartment;

Table 11.52—Requirements for number of hand-held fire extinguishers

Item	Column 1 Maximum operational passenger seat configuration	Column 2 Number of extinguishers
1	7-30	1
2	31-60	2
3	61-200	3
4	201-300	4
5	301-400	5
6	401-500	6
7	501-600	7
8	601 or more	8

(e) despite paragraphs (a) and (d), for an aeroplane with a maximum operational passenger seat configuration of not more than 9, in which the

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flight crew and the passengers occupy the same compartment—one fire extinguisher, readily available to the pilot in command;

(f) despite paragraphs (a) and (d)—for an aeroplane with a maximum operational passenger seat configuration of more than 9, in which the flight crew and the passengers occupy the same compartment:

(i) one fire extinguisher, readily available to the pilot in command; and

(ii) one fire extinguisher, readily available to the passengers.

(3) The type and quantity of extinguishing agent for the required fire extinguishers must:

(a) be suitable for the type of fire likely to occur in the compartment where the extinguisher is intended to be used; and

(b) be such as to minimise the hazard of toxic gas concentration in compartments occupied by persons.

11.53 First-aid kits

(1) This section applies on and after 2 December 2023.

(2) Subject to subsection (3), an aeroplane for a flight must carry the number of first-aid kits mentioned in column 2 of the item in table 11.53 that states, in column 1 of the item, the maximum operational passenger seat configuration of the aeroplane.

Table 11.53—First-aid kits

Item	Column 1 Maximum operational passenger seat configuration of:	Column 2 Number of first-aid kits:
1	0-100	1
2	101-200	2
3	201-300	3
4	301-400	4
5	401-500	5
6	501 or more	6

(3) Subsection (2) does not apply if an aeroplane takes off from an aerodrome at which no facility exists for first-aid kits to be replenished or replaced, provided that the aeroplane carries a sufficient number of first-aid kits, taking into consideration the number of passengers on board for, and the duration of, the flight.

(4) For the purposes of subsection (2), a first-aid kit must:

(a) contain sufficient supplies for the number of persons to be carried on a flight of the aeroplane; and

(b) be readily recognisable as a first-aid kit; and

(c) be readily accessible by each crew member for a flight when the aeroplane is on the ground or water and not in operation.

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11.54 Emergency medical kit

(1) This section applies to an aeroplane that:
  (a) has a maximum operational passenger seat configuration of more than 30; and
  (b) is engaged in a passenger transport operation or medical transport operation; and
  (c) during the flight, will be flown further from an aerodrome mentioned in subsection (2) than the distance the aeroplane can fly in 60 minutes, in still air and ISA conditions, at its normal cruising speed.

(2) For the purposes of paragraph (1)(c), the aerodrome is an aerodrome:
  (a) at which qualified medical assistance is ordinarily available; or
  (b) from which medical assistance is readily accessible.

(3) The aeroplane must carry an emergency medical kit.

11.55 Universal precaution kits

(1) This section applies to an aeroplane that is engaged in a passenger transport operation or a medical transport operation.

(2) The aeroplane must carry the number of universal precaution kits mentioned in column 2 of the item in table 11.55 that states, in column 1 of the item, the maximum operational passenger seat configuration of the aeroplane.

Table 11.55—Universal precaution kits

Item	Column 1 Maximum operational passenger seat configuration of:	Column 2 Number of universal precaution kits:
1	250 or less	1
2	More than 250	2

(3) Subsection (2) does not apply if an aeroplane takes off from an aerodrome at which no facility exists for universal precaution kits to be replenished or replaced, provided that the aeroplane carries a sufficient number of universal precaution kits, taking into consideration the number of passengers on board for, and the duration of, the flight.

11.56 Crash axe or crowbar

An aeroplane must carry a crash axe or a crowbar safely but accessibly stowed in its flight crew compartment (cockpit).

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11.57 Megaphones

(1) This section applies to an aeroplane that:
  (a) has a maximum operational passenger seat configuration of more than 60; and
  (b) is engaged in a passenger transport operation or a medical transport operation.

(2) The aeroplane must carry at least the number of portable, battery-powered, megaphones (***megaphones***) mentioned in column 2 of the item in table 11.57 that states, in column 1 of the item, the maximum operational passenger seat configuration of the aeroplane.

Table 11.57—Megaphones

Item	Column 1 Maximum operational passenger seat configuration of:	Column 2 Number of megaphones—at least:
1	100 or less	1
2	More than 100	2

(3) If 1 megaphone is carried in an aeroplane under this section, it must be kept in a place where it is readily accessible from a crew member's seat.

(4) If 2 megaphones are carried in an aeroplane under this subsection, they must be distributed through the passenger cabin or cabins so as to be readily accessible to crew members.

(5) Each megaphone must:
  (a) be able to perform its function throughout any flight on which it is carried; and
  (b) be designed for ease of handling and use with one hand; and
  (c) have a volume control or adequate acoustic feedback suppression.

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Division 12—Equipment for flights over water

11.58 Sea anchors etc. and sound signals—seaplanes and amphibians

(1) This section applies to a flight of an aeroplane if:
  (a) the aeroplane is a seaplane or an amphibian; and
  (b) the flight involves take-off from, or landing on, water.

(2) When the aeroplane begins the flight, it must carry the following:
  (a) a sea anchor;
  (b) other equipment for mooring.

(3) If the flight is conducted on or over water to which the International Regulations apply, the aeroplane must carry equipment for making the sound signals required by the International Regulations for the flight.

Note: The expression ***International Regulations*** is defined in the CASR Dictionary.

11.59 Life jacket carriage requirements

(1) This section applies to a flight of an aeroplane:
  (a) if the aeroplane is a seaplane or an amphibian; or
  (b) for an aeroplane that is not a seaplane or an amphibian—if during the flight the aeroplane is flown more than 50 NM from an area of land that is suitable for a forced landing.

(2) When the aeroplane begins the flight, it must carry the following:
  (a) for each infant on board—a life jacket, or another equally effective flotation device, that may have a whistle;
  (b) for each other person on board—a life jacket that must have a whistle.

(3) This section does not apply if:
  (a) the aeroplane is flown over water for the purpose of climbing after take-off from, or descending to land at, an aerodrome; and
  (b) the aeroplane is flown in accordance with a navigational procedure that is normal for the climb or descent at the aerodrome.

11.60 Stowage of life jackets

(1) This section applies to an aeroplane that is required to carry an approved life jacket or a flotation device under section 11.59.

(2) Subject to subsection (3), when the aeroplane begins the flight, unless the life jacket or flotation device is being worn:
  (a) each infant's life jacket or flotation device must be stowed where it is readily accessible by an adult responsible for the infant, in the event of an emergency evacuation; and
  (b) each other person's life jacket must be stowed where it is readily accessible from the person's seat in the event of an emergency evacuation.

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(3) Subsection (2) does not apply if:

(a) the operator's emergency procedures provide for the following to occur when preparing the cabin for ditching:

(i) the distribution of infant life jackets or flotation devices;

(ii) the distribution of a life jacket to a second child occupying a single seat; and

(b) each crew member on the flight who has duties to conduct these emergency procedures has successfully completed training in the procedures.

11.62 Life raft carriage requirements

(1) When an aeroplane begins a flight to which this section applies, it must carry sufficient life rafts to provide a place on a life raft for each person on the aeroplane.

(2) This section applies to a flight of an aeroplane if, during the flight, the aeroplane is flown further over water than the following distances from a suitable forced landing area situated on land:

(a) for a jet-driven multi-engine aeroplane with a maximum take-off weight of more than 2 722 kg—whichever is the shorter of the following:

(i) the distance the aeroplane would fly in 2 hours at its normal cruising speed in still air;

(ii) 400 NM;

(b) for a turbine-engine propeller-driven aeroplane with a maximum take-off weight of more than 5 700 kg—whichever is the shorter of the following:

(i) the distance the aeroplane would fly in 2 hours at its normal cruising speed in still air;

(ii) 400 NM;

(c) for any other aeroplane—whichever is the shorter of the following:

(i) the distance the aeroplane would fly in 30 minutes at its normal cruising speed in still air;

(ii) 100 NM.

(3) For the purposes of subsection (1), when working out the number of life rafts to be carried on an aeroplane:

(a) the capacity of a life raft is the rated capacity specified by the manufacturer for the life raft; and

(b) the number of infants on board the aeroplane need not be taken into account.

(4) Any overload capacity of a life raft is not to be taken into account in determining its capacity for the purposes of paragraph (3)(a).

11.63 Stowage of life rafts

(1) This section applies to an aeroplane that is required to carry a life raft under section 11.62.

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(2) The life raft must be stowed and secured so that it can be readily deployed if the aeroplane has to ditch.

(3) If a life raft is stowed in a compartment or container, the compartment or container must be conspicuously marked as containing the life raft.

11.64 Underwater locating device (ULD)

(1) In this section:

approved ULD means an underwater locating device that is authorised by CASA or the national aviation authority of a recognised country in accordance with one of the following:

(a) TSO-C200;

(b) ETSO-C200.

tail section means the tail assembly of an aeroplane consisting of its vertical and horizontal stabilizers, and including its fin, rudder, and elevators.

(2) With effect from the beginning of 2 December 2023, this section applies to a flight of an aeroplane if:

(a) the aeroplane has a maximum take-off weight of more than 27 000 kg; and

(b) under this Division, the aeroplane is required to carry a life raft for the flight.

(3) For the flight, the aeroplane must be fitted with an approved ULD that meets the requirements in subsection (4).

(4) For subsection (3), the approved ULD must:

(a) not be installed in or on the aeroplane's wings or any part of its tail section; and

(b) be automatically activated as soon as the aeroplane's fuselage enters any body of water; and

(c) when activated—continuously, and for at least 30 days' duration, emit a sound signal on the 8.8 kHz frequency.

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Division 13—Surveillance equipment

11.65 Definitions

In this instrument:

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 11.70;

(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 11.69; 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 a Mode C transponder that is authorised:

(a) by CASA or the national aviation authority 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 national aviation authority 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 national aviation authority 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 an approved Mode S transponder.

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

(a) when the aircraft is registered on the Australian Civil Aircraft Register—CASA; or

(b) when the aircraft is a foreign-registered aircraft—the relevant national aviation authority.

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. It 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.

secondary surveillance radar (***SSR***) 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.

11.66 Carriage of surveillance equipment

An aeroplane in an operation mentioned in column 1 of an item in table 11.66, in the class of airspace mentioned in column 2 of the item, must be fitted with surveillance equipment that meets the requirements mentioned in column 3 of the item.

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Table 11.66—Surveillance equipment requirements		
Item	Column 1 Class of airspace	Column 2 Requirements
1	Any (Classes A, B, C, D, E, and G)	At least 1 approved ADS-B OUT equipment configuration.
2	Class B or C – at certain aerodromes	For an aeroplane operating at one of the following aerodromes: (a) Brisbane (YBBN); (b) Sydney (YSSY); (c) Melbourne (YMML); (d) Perth (YPPH); at least 1 approved Mode S transponder.

11.67 Operation of surveillance equipment—general requirements

(1) The requirements of this section are subject to section 11.71.

(2) Surveillance equipment required to be fitted to, or carried on, an aircraft by section 11.66 must be continuously operated during the circumstances mentioned in section 11.66.

Note: Continuous operation for a transponder means that the equipment must be operated in a mode that enables an SSR response to be transmitted.

(3) Subsection (2) does not apply if air traffic control has issued an instruction that the surveillance equipment is not to be operated.

(4) If an aircraft is fitted with more than 1 approved transponder, only 1 transponder is to be operated at any time.

(5) For each transponder, the Mode A code must be set:
(a) to the transponder code assigned by air traffic control for the flight; or
(b) if no transponder code is so assigned—to the relevant standard code in table 11.67(5).

Table 11.67(5)—Transponders: Mode A standard codes		
Item	Column 1 Situation	Column 2 Mode A code
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

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Table 11.67(5)—Transponders: Mode A standard codes		
Item	**Column 1** **Situation**	**Column 2** **Mode A code**
6	Ground testing by aircraft maintenance staff	2100

(6) For paragraph (5)(b), for a situation mentioned in column 1 of an item in the table, the Mode A code is the number mentioned in column 2 for the item.

(6A) Subject to subsection (6B), if an emergency situation described in an item of column 1 of table 11.67(6A) 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.

Table 11.67(6A)—Transponders: Mode A emergency codes		
Item	**Column 1** **Situation**	**Column 2** **Mode A code**
1	Unlawful interference	7500
2	Loss of radiocommunication	7600
3	In flight emergency (unless otherwise instructed by air traffic control)	7700

(6B) Despite subsection (6A), a pilot of an aircraft for a flight does not have to set a Mode A code mentioned in column 2 of table 11.67(6A) if the pilot reasonably believes that maintaining an existing Mode A code would result in a safer outcome.

(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 or an approved ADS-B OUT equipment configuration must be determined by:

(a) a barometric encoder of a type authorised by CASA or the NAA of a recognised country, 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).

11.68 Mode S transponders and ADS-B OUT—specific requirements

(1) 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 notification is filed with air traffic control for the flight—the aircraft identification mentioned on the flight notification;

(ii) if no flight notification is filed with air traffic control for the flight—the aircraft registration mark.

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(2) 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 (3)—the aircraft flight identification.

(3) Transmission of the aircraft flight identification by an approved Mode S transponder is optional for an aeroplane that was first certificated in its country of manufacture before 9 February 2012 (an ***older aeroplane***). However, an older aeroplane that is equipped to transmit, may transmit its aircraft flight identification.

(4) 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, 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 air traffic control. Operators need to ensure that EHS DAPs are being transmitted.

(5) If an approved Mode S transponder is fitted to an aeroplane first certificated in its country of manufacture on or after 9 February 2012:
  (a) having a certificated maximum take-off weight above 5 700 kg; or
  (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 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.

(6) 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.

(7) The pilot in command of an aeroplane for a flight must ensure the requirements in subsections (1) and (2) are met for the aeroplane and the flight.

Note: The aeroplane operator is also subject to the requirements in subsections (1) and (2), and each other requirement in this section and this Chapter that applies in relation to the aeroplane and a flight: see subsection 11.03(2).

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11.69 Alternate GNSS position source for ADS-B OUT—requirements

(1) For an aeroplane first certificated in its country of manufacture on or after 8 December 2016, an alternate GNSS position source is acceptable if the source:

(a) is certified by CASA or the national aviation authority 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 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 aeroplane first certificated in its country of manufacture 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.

Note: The following GNSS receivers meet the requirements of this section, namely, those certified to (E)TSO-C145a or (E)TSO-C146a, or later versions; or those manufactured to comply with (E)TSO-C196a. Some later versions of GNSS receivers certified to (E)TSO-C129 may also meet the requirements, i.e. those having FDE and HPL features incorporated.

11.70 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 national aviation authority of a recognised country, during type certification, as meeting the standards of EASA AMC 20-24 or EASA CS-ACNS; and

(b) the aircraft flight manual or flight manual supplement attests to the certification; and

(c) the GNSS system meets the performance requirements mentioned in subsection 11.69(1).

(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 aircraft flight manual attests to the certification; and

(c) the GNSS system meets the performance requirements mentioned in subsection 11.69(1).

(3) For an aeroplane first certificated in its country of manufacture 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 aircraft flight manual attests to the certification; and

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(c) the GNSS system meets the performance requirements mentioned in subsection 11.69(1).

(4) For an aeroplane first certificated in its country of manufacture 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 aircraft flight manual attests to the certification; and

(c) the GNSS system meets the performance requirements mentioned in subsection 11.69(2).

11.71 Aeroplane flown with no operative surveillance equipment

Where this Chapter requires surveillance equipment to be fitted to an aeroplane, the equipment 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 surveillance equipment to be repaired or replaced; and

(b) ends not more than 72 hours after the time the surveillance equipment was found to be inoperative.

Note: See also section 11.06 for additional requirements related to a flight with inoperative equipment. For a flight with no operative surveillance equipment, 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 operative surveillance equipment.

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