

- (b) mobile power units, vehicles and power operated loading devices operating within 15 metres (50 ft) of the spilled fuel are shut down; and
- (c) maintenance work of any nature on or within the aircraft is suspended and not recommenced until the spilled fuel has been removed.

4.7 In this subsection:

cabin crew member means a person who:

- (a) is a member of the operating crew, but not the flight crew, of an aircraft; and
- (b) may be assigned to emergency duties in the aircraft under subsection 12 of section 20.11 of the Civil Aviation Orders.

passenger zone in relation to an aircraft, means an area within the aircraft which has:

- (a) seats for 72 or less passengers; and
- (b) an exit.

5 Starting and ground operations of engines

5.1 The pilot in command or in his absence any other person responsible for starting or ground operation of an aircraft shall ensure that:

5.1.1 In the case of land aircraft, passenger loading equipment to permit rapid evacuation of passengers and crew is kept immediately available during the starting of engines.

5.1.2 In the case of seaplanes, water transport of a capacity sufficient to enable rapid evacuation of passengers and crew is immediately available during the starting of engines.

5.1.3 Where any fuel or other flammable material is spilled within 15 metres (50 ft) of an aircraft, the aircraft engines shall not be started or operated until the fire hazard has been removed.

5.1.4 An aircraft engine shall not be started or operated:

- (a) within 5 metres (17 ft) of any sealed building; or
- (b) within 8 metres (25 ft) of other aircraft; or
- (c) within 15 metres (50 ft) of any exposed public area; or
- (d) within 15 metres (50 ft) of any unsealed building in the case of an aircraft with a maximum take-off weight exceeding 5 700 kg (12 566 lb); or
- (e) within 8 metres (25 ft) of any unsealed building in the case of an aircraft with a maximum take-off weight not exceeding 5 700 kg (12 566 lb);

and turbine engines, in addition, shall not be operated within the appropriate distance specified below of any other aircraft, fuelling equipment or exposed public areas which lie to the rear of and within a 15 degree arc either side of the exhaust outlet axis of that engine:

En gin e typ e	Power condition	Minimum distance metres
Tu rbo -pr op	At or below normal slow taxiing power	15 (50 ft)
	At power used to initiate movement of a stationary aircraft	23 (75 ft)
Tu rbo -jet	At or below normal slow taxiing thrust	30 (100 ft)
	At thrust used to initiate movement of a stationary aircraft	46 (150 ft)

Note Fuelling equipment does not include equipment and outlet points of an installation located below ground level when the equipment is stowed and covering hatches are in place.

5.2 The operator of an aircraft shall ensure that all persons who may be required to start the engine of the aircraft are familiar with the method of operation of any installed engine nacelle fire extinguishing equipment.

5.3 The pilot in command and the operator shall ensure that passengers do not embark or disembark or that freight is not loaded or unloaded from the aircraft whilst an engine of the aircraft is operating unless the passengers and/or the loading personnel have been given instruction and guidance to protect them from injury as a consequence of engine operation.

6 Ground operation of aircraft radar equipment

6.1 The requirement of this subsection shall apply to all radar equipment with a nominal peak power output rating in excess of 25 kW.

6.2 During all ground operation, including testing and maintenance of aircraft radar equipment, the operator and person in charge of such equipment shall ensure that:

6.2.1 The equipment is not energised in its normal mode (antenna rotating) unless the sector area scanned by the radar beam is clear of the following objects to a distance of 37 metres (120 ft) from the antenna:

- (a) aircraft being refuelled or defuelled;
- (b) fuel tankers, fuel tanks or fuel storage areas;
- (c) persons or cargo;
- (d) any other aircraft or aircraft hangar.

Note For each radar installation the sector area should be defined in terms of readily distinguishable dimensions preferably related to some feature of the aircraft and should appear in the Aircraft Maintenance Manual.

6.2.2 The equipment is not energised with the antenna stationary and the beam directed towards any of the objects specified in paragraph 6.2.1 unless the distance separating them from the antenna is in excess of 60 metres (200 ft).

6.2.3 The distance specified in paragraphs 6.2.1 and 6.2.2 may be reduced by 75 per cent when an approved beam attenuating device is used between the antenna and any object specified in paragraph 6.2.1.

6.2.4 The equipment is not energised in any radiating mode of operation when the aircraft in which the equipment is fitted is in a hangar or other enclosure unless a suitable microwave energy absorbing shield is fitted over the antenna.

6.2.5 The equipment is not to be operated in any aircraft which is being refuelled or defuelled.

Note During all testing of aircraft radar equipment the beam should, whenever possible, be directed with maximum upward tilt toward a clear area.

minimum equipment list means a list that provides for the operation of aircraft with permissible unserviceabilities, subject to compliance with such conditions, if any, as CASA directs under subregulation 37 (2) of CAR 1988.

permissible unserviceability means any defect or damage that CASA has approved under subregulation 37 (1) of CAR 1988 as a permissible unserviceability.

TAWS-B+ system means a terrain awareness and warning system that is equipped with a visual display and complies with the requirements for Class B equipment expressed in (E)TSO-C151, (E)TSO-C151a or (E)TSO-C151b.

- 2.2 In this Order, a reference to an (E)TSO, a TSO or an ETSO, as defined in subsections 9B and 9D, with an empty bracket at the end of the reference, includes the (E)TSO, TSO or ETSO in a version that contains a number within the bracket.

3 Instrumentation for flight under the Visual Flight Rules (the V.F.R.)

RPT aeroplanes and large charter aeroplanes

3.1 An aeroplane engaged in:

- (a) a regular public transport (**RPT**) operation; or
- (b) a charter operation that has maximum take-off weight exceeding 5 700 kg — a charter operation;

may only be operated under the V.F.R. if it is equipped with the following:

- (c) the instruments specified in Appendix II;
- (d) any other instruments and indicators specified in the aeroplane's flight manual.

Note **V.F.R.** and **flight manual** are defined in subregulation 2 (1) of CAR 1988.

Helicopters

3.2 Subject to paragraph 3A.1, a helicopter may only be operated under the V.F.R. by day if it is equipped with the following:

- (a) the instruments specified in Appendix VI;
- (b) any other instruments and indicators specified in the helicopter's flight manual.

3.2A A helicopter may only be operated under the V.F.R. at night if:

- (a) it is equipped with the instruments specified in Appendix VIII; and
- (b) it is equipped with any other instruments and indicators specified in the helicopter's flight manual;
- (c) for flights under V.F.R. at night which involve flights over land or water where the helicopter's attitude cannot be maintained by the use of visual external surface cues as a result of lights on the ground or celestial illumination:
 - (i) the helicopter is equipped in accordance with subparagraph 4.2 (d) of this Order; or

- (ii) the helicopter is operated by a qualified 2 pilot crew, each with access to flight controls.

Hot air balloons and hot air airships

- 3.3 Subject to paragraph 3A.2, a hot air balloon and a hot air airship may only be operated under the V.F.R. if the balloon or airship is equipped with the following:
 - (a) the instruments specified in Appendix X;
 - (b) any other instruments and indicators specified in the flight manual of the balloon or airship.

Other aircraft in private, aerial work or charter operations

- 3.4 Subject to paragraph 3A.3, an aircraft:
 - (a) engaged in a private, aerial work or charter operation; and
 - (b) not mentioned in paragraphs 3.1 to 3.3;may only be operated under the V.F.R. if it is equipped with the following:
 - (c) the instruments specified in Appendix I;
 - (d) any other instruments and indicators specified in the aircraft's flight manual.

3A Operations to which flight and navigation equipment requirements do not apply

- 3A.1 Paragraph 3.2 does not apply to a helicopter that operates under the V.F.R., and for which an experimental certificate has been issued under paragraph 21.191 (g) or (h) of CASR 1998, if equipment is carried that provides a pilot with the same information that would be obtained by compliance with the requirements of Appendix VI for operations by day, or Appendix VIII if approved for operations by night.
- 3A.2 Paragraph 3.3 does not apply to a balloon that operates by day under the V.F.R.:
 - (a) being an aircraft for which a current certificate of airworthiness as a light sport aircraft (*LSA*) has been issued; or
 - (b) being an aircraft for which an experimental certificate has been issued under paragraph 21.191 (g), (h) or (j), or an LSA for which an experimental certificate has been issued under paragraph 21.191 (k), of CASR 1998;if equipment is carried that provides a pilot with the same information that would be obtained by compliance with the requirements of Appendix X.
- 3A.3 Paragraph 3.4 does not apply to any other aircraft that operates under the V.F.R.:
 - (a) being an aircraft for which a current certificate of airworthiness as an LSA has been issued; or

- (b) being an aircraft for which an experimental certificate has been issued under paragraph 21.191 (g), (h) or (j) or an LSA for which an experimental certificate has been issued under paragraph 21.191 (k), of CASR 1998;

if equipment is carried that provides a pilot with the same information that would be obtained by compliance with the requirements of Appendix I for operations by day, or Appendix IV if approved for operations by night.

- 3A.4 An aircraft referred to in paragraphs 3A.1 to 3A.3 that is approved to operate at night and is equipped with an Electronic Flight Information System (**EFIS**), or other means of electronically displaying the required information, must be provided with a battery-powered back-up, or another form of instrumentation independent of the aircraft electrical system, that is approved by an authorised person as suitable, in the case of a failure of the aircraft electrical system, for the purpose of enabling the pilot to divert to and use a safe landing site.
- 3A.5 If an aircraft equipped as required under paragraph 3A.4 has a battery-powered back-up to an EFIS, the back-up must be of sufficient capacity to power the EFIS panel or other display for 90 minutes and must be fully charged before the commencement of a flight at night.
- 3A.6 Subject to paragraph 3A.7, an Australian registered aircraft may be operated without compliance with the flight and navigation equipment requirements in subsections 3 and 4 of this Order if it can show compliance with an equivalent level of safety, as determined by the type certifying authority for the aircraft, taking into consideration its intended operation.
- 3A.7 The type certifying authority for the aircraft must be a recognised authority.
- 3A.8 In paragraph 3A.7:

recognised authority means an authority of a country listed in regulation 21.012 of CASR 1998.

4 Equipment for flight under the Instrument Flight Rules (the *I.F.R.*)

- 4.1 Subject to subsection 3A, an aeroplane must not be operated under the *I.F.R.* unless it is equipped with:
 - (a) the flight and navigation instruments specified in Appendixes II, III and IV to this Order, as applicable; and
 - (b) any other instruments or indicators specified in the aeroplane flight manual; and
 - (c) the minimum lighting equipment specified in Appendix V to this Order; and
 - (e) in the case of single pilot RPT operations, earphones for the pilot with boom or throat microphone and a press to transmit control on the control column. The earphones and microphone must be compatible with the radio installation in the aeroplane and must be used by the pilot during flight.

- 4.1A Subject to paragraphs 4.1B and 4.1C, an aeroplane engaged:
- (a) in RPT operations; or
 - (b) in charter operations; or
 - (c) in aerial work operations as an air ambulance or for a flying doctor service; must not be operated under the I.F.R. unless it is equipped with a serviceable automatic pilot approved by CASA that has the following capabilities:
 - (d) a capability of operating the flight controls to maintain flight and manoeuvre the aeroplane about the roll and pitch axis;
 - (e) an automatic heading capability;
 - (f) an altitude hold capability.

Note For the purpose of meeting the requirements of subparagraph 4.1A (d), an automatic pilot is taken to have the capability of manoeuvring the aeroplane about the pitch axis if it does so solely to restore the selected altitude after a disturbance.

- 4.1B In spite of paragraph 4.1A, an aeroplane referred to in that paragraph that is not equipped with an automatic pilot in accordance with that paragraph may be operated under the I.F.R., if the aeroplane:
- (a) is equipped with fully functioning dual controls; and
 - (b) has 2 control seats, with 1 control seat occupied by the pilot in command of the aeroplane and the other by a pilot who is authorised under Part 61 of CASR 1998 to conduct the flight.

- 4.1C If the automatic pilot fitted to an aeroplane engaged:
- (a) in charter operations; or
 - (b) in aerial work operations as an air ambulance or for a flying doctor service; loses a capability referred to in paragraph 4.1A, the aeroplane may, if the pilot is satisfied that it is safe to do so, be operated under the I.F.R. by a single pilot at any time within the period of 3 days commencing on the day on which the automatic pilot loses the capability.

4.1D Paragraphs 4.1A, 4.1B and 4.1C apply in addition to, and not in derogation of, paragraph 4.1.

- 4.2 Subject to subsection 3A, a helicopter must not be operated under the I.F.R. unless it is equipped with:
- (a) the flight and navigation instruments specified in Appendixes VII, VIII or IX to this Order, as applicable; and

- (b) any other instruments, indicators or equipment specified in the helicopter flight manual; and
- (c) the minimum lighting equipment specified in Appendix V to this section; and
- (d) an approved automatic pilot or automatic stabilisation system.

Note Because of considerable variation in the individual stability characteristics of different helicopter types and in the associated automatic pilot and automatic stabilisation systems approved by the certification authority in the country of certification, it is not possible to detail precise specifications for this equipment. This consideration also applies to the flight crew complement. Accordingly, each application for approval to conduct I.F.R. category operations will be individually assessed on the basis of the specific helicopter type and its associated automatic pilot or autostabilisation equipment and the proposed operating environment.

5 Windshield clear vision equipment

- 5.1 An aircraft with a flight compartment windshield may only be operated under the V.F.R. or the I.F.R. if it has a means of clearing heavy outside precipitation from the windshield at a rate which ensures an unobstructed view for each pilot.

Note **I.F.R.** is defined in subregulation 2 (1) of CAR 1988.

- 5.2 Paragraph 5.1 does not apply for:
- (a) an aeroplane with an MTOW less than 5 700 kg; or
 - (b) a helicopter with an MTOW less than 2 750 kg maximum;
- if the windshield design satisfies CASA that moderate rain will not impair the pilot's view for take-off, landing or normal flight.

6 Recording equipment

- 6.1 An aircraft of maximum take-off weight:
- (a) in excess of 5 700 kg and which is:
 - (i) turbine-powered; or
 - (ii) of a type first certificated in its country of manufacture on or after 1 July 1965;must not be flown (except in agricultural operations) unless it is equipped with an approved flight data recorder and an approved cockpit voice recorder system;
 - (b) less than, or equal to, 5 700 kg and which is:
 - (i) pressurised; and

- (ii) turbine-powered by more than 1 engine; and
- (iii) of a type certificated in its country of manufacture for operation with more than 11 places; and
- (iv) issued with its initial Australian Certificate of airworthiness after 1 January 1988;

must not be flown unless it is equipped with an approved cockpit voice recorder system.

- 6.1A Paragraph 6.1 does not apply to an aircraft for which there is in force an airworthiness certificate in the agricultural category or the restricted category.
- 6.2 The flight data recorder and cockpit voice recorder systems installed in an aircraft under this Order:
- (a) must comply with the requirements of Civil Aviation Orders 103.19 and 103.20, respectively; and
 - (b) will be considered for approval when CASA has equipment available allowing replay of the recordings.
- 6.3 Where an aircraft is required to be so equipped by this Order, the flight data recorder system must be operated continuously from the moment when the aircraft commences to taxi under its own power for the purpose of flight until the conclusion of taxiing after landing.
- 6.4 Where an aircraft is required to be so equipped by this Order, the cockpit voice recorder system must be operated continuously from the start of the use of the check list before starting engines for the purpose of flight until completion of the final check list at the termination of the flight.
- 6.5 Where an aircraft is required to be so equipped by this Order, the operator must ensure that:
- (a) the flight data recorder retains its last 25 hours of recording; and
 - (b) the cockpit voice recorder retains its last 30 minutes of recording; and
 - (c) data from the last 2 occasions on which the flight data recorder system was calibrated from which the accuracy of the system can be determined are preserved.

- 6.6 The operator of an aircraft which is required by this Order to be equipped with recorders must take action to ensure that during ground maintenance periods the recorders are not activated unless the maintenance is associated with the flight data recording equipment or with the aircraft engines.
- 6.7 An aircraft required to be fitted with a flight data recorder system and/or a cockpit voice recorder system may operate with an unserviceable recorder system for a period of 21 days commencing on the day on which the system was determined to be unserviceable providing that:
- (a) the aircraft does not depart from an aerodrome where staff and equipment are available to replace the unserviceable units; and
 - (b) where the aircraft is required to be fitted with both a flight data recorder and cockpit voice recorder system, 1 system is serviceable; and
 - (c) the aircraft is not operating training or test flights.

7 Assigned altitude indicator and altitude alerting system

- 7.1 Piston-engined aircraft and unpressurised turbine-engined aircraft operating above 15 000 feet in controlled airspace under the I.F.R. (except night V.M.C.) must be equipped with an altitude alerting system.
- 7.2 Pressurised turbine-engined aircraft operating in controlled airspace under the I.F.R. (except night V.M.C.) must be equipped with an altitude alerting system.
- 7.3 Unless equipped with an altitude alerting system, an aircraft operating in controlled airspace under the I.F.R. (except night V.M.C.) must be equipped with an assigned altitude indicator.
- 7.4 An altitude alerting system or an assigned altitude indicator must be so designed and located that:
- (a) it can be readily adjusted for setting from each pilot seat; and
 - (b) the assigned altitude/flight level display is clearly discernible by day and night to all operating flight crew members whose duties involve altitude/flight level assignment monitoring; and
 - (c) altitude/flight levels may be pre-selected unambiguously in increments commensurate with levels at which the aircraft may be operated.
- 7.5 The assigned altitude indicator must be demonstrated to the satisfaction of CASA.
- 7.6 The altitude alerting system must be demonstrated to the satisfaction of CASA and be capable of:

- (a) alerting the pilot upon approaching or departing from a pre-selected level in both climb and descent by aural and/or visual signals in sufficient time to establish level flight at the pre-selected level, except that altitude alerting systems in aircraft first registered in Australia before 1 January 1983 need not alert the pilot when departing from a pre-selected altitude; and
- (b) providing the required signals from sea level to the highest operating altitude approved for the aircraft in which it is installed; and
- (c) being tested without separate equipment to determine proper operation of the alerting signals; and
- (d) accepting necessary barometric pressure settings in millibars if the system or device operates on barometric pressure.

8Radiation indicator

All aeroplanes intended to be operated above 49 000 feet must carry equipment to measure and indicate continuously the dose rate of total cosmic radiation being received (i.e. the total of ionizing and neutron radiation of galactic and solar origin) and the cumulative dose on each flight. The display unit must be readily visible to a flight crew member.

9Ground proximity warning system

9.1 Subject to paragraphs 9.1A and 9.1C, a turbine-engined aeroplane that:

- (a) has a maximum take-off weight of more than 15 000 kg or is carrying 10 or more passengers; and
- (b) is engaged in RPT, or charter, operations;

must not be operated under the I.F.R. unless it is fitted with a ground proximity warning system (**GPWS**) that meets the requirements of Civil Aviation Order 108.36.

9.1A Paragraph 9.1 does not apply to an aeroplane if:

- (a) at any time before the aeroplane is operated under the I.F.R. in RPT, or charter, operations, the person who was, at that time, the holder of the Air Operator's Certificate (**AOC**) authorising the operation of the aeroplane has given to CASA an undertaking in an approved form that the aeroplane will, on or

- before 1 January 2001, be fitted with an approved GPWS that has a predictive terrain hazard warning function; and
- (b) the operations manual provided by the holder of the AOC authorising the operation of the aeroplane sets out the details of a course of training in awareness of controlled flight into terrain; and
 - (c) the pilot in command of the aeroplane, and (if applicable) any other pilot occupying a control seat in the aeroplane, have completed the course of training.
- 9.1B Paragraphs 9.1 and 9.1A cease to have effect at the end of 31 December 2000.
- 9.1C A turbine-engined aeroplane that:
- (a) has a maximum take-off weight of more than 15 000 kg or is carrying 10 or more passengers; and
 - (b) is engaged in RPT, or charter, operations;
- must not be operated under the I.F.R. unless it is fitted with:
- (c) an approved GPWS that has a predictive terrain hazard warning function; or
 - (d) if paragraph 9.1CA applies — a GPWS that meets the requirements of Civil Aviation Order 108.36 (a **CAO 108.36 GPWS**); or
 - (e) if the aeroplane has a maximum take-off weight of 5 700 kg or less, but is carrying 10 or more passengers — a TAWS-B+ system.
- 9.1CA Up to the end of June 2005, an aeroplane may be fitted with a CAO 108.36 GPWS:
- (a) if, immediately before 1 January 2001, paragraph 9.1 applied to the aeroplane; or
 - (b) if the aeroplane first becomes an Australian aeroplane on or after 1 January 2001 (unless it is an aircraft in respect of which an undertaking has been given under paragraph 5.3 of Civil Aviation Order 82.1 or paragraph 10.3 of Civil Aviation Order 82.3 or 82.5, as in force immediately before 1 January 2001); or
 - (c) if:
 - (i) immediately before 1 January 2001, paragraph 9.1 did not apply to the aeroplane because of paragraph 9.1A; and
 - (ii) the holder of the AOC authorising the operation of the aeroplane (the AOC holder) provides satisfactory evidence to CASA, in accordance with

paragraph 9.1CB, that it is not possible to fit the aeroplane with an approved GPWS that has a predictive terrain hazard warning function.

9.1CB For the purposes of sub-subparagraph 9.1CA (c) (ii), evidence is taken to be satisfactory only if it is:

- (a) a statement, in writing, to the AOC holder from the manufacturer of an approved GPWS that has a predictive terrain hazard warning function; or
- (b) a statutory declaration by the AOC holder;

to the effect that the FAA's list of supplemental type certificates does not include any reference to a supplemental type certificate relating to the fitting of an aeroplane of the same type with an approved GPWS that has that function.

9.1D For the purposes of this subsection:

- (a) a GPWS has a ***predictive terrain hazard warning function*** if it employs an aircraft navigation system and a terrain database to compute a display of terrain along, and in the vicinity of, the flight path of an airborne aeroplane in order to provide the flight crew of the aeroplane with a warning of any terrain that may endanger the aeroplane if its flight path were to remain unchanged; and
- (b) the GPWS is taken to be approved only if it meets:
 - (i) the requirements set out in FAA notice N 8110.64 as in force on 15 August 1999; or
 - (ii) the standard for the Class A Terrain Awareness Warning System specified in TSO C-151, TSO C-151a or TSO C-151b.

9.2 A GPWS must be demonstrated to the satisfaction of CASA to be capable of providing automatically a timely and distinctive warning to the flight crew when the aeroplane is in potentially hazardous proximity to the earth's surface.

9.3 Except as provided in paragraph 9.4, an aeroplane required to be fitted with a GPWS must not commence a flight with that equipment unserviceable.

9.4 An aeroplane required to be fitted with a GPWS must not depart with that equipment unserviceable from an aerodrome where facilities are available to repair or replace the GPWS and in no case must an aeroplane be operated with its GPWS

unserviceable for a period exceeding 24 hours from the time the equipment was determined to be unserviceable.

9B Directions relating to carriage and use of automatic dependent surveillance – broadcast equipment

9B.1 This subsection applies to aircraft engaged in private, aerial work, charter or RPT operations in Australian territory.

9B.2 In subsections 9B and 9C, and Appendix XI:

ADS-B means automatic dependent surveillance – broadcast.

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

aircraft address means a unique code of 24 binary bits assigned to an aircraft by:

- (a) CASA when the aircraft is registered on the Australian Civil Aircraft Register; or
- (b) the relevant RAAO for the aircraft when the aircraft is placed on its aircraft register.

approved equipment configuration means an equipment configuration that:

- (a) meets the conditions for approval set out in Appendix XI; or
- (b) is approved in writing by CASA.

Note Equipment configurations approved by CASA are published in Appendix D of Advisory Circular 21-45.

ATC means air traffic control.

EASA means the European Aviation Safety Agency.

EASA AMC 20-24 means EASA document AMC 20-24 titled *Certification Considerations for Enhanced ATS in Non-Radar Areas using ADS-B Surveillance (ADS-B-NRA) via 1090 MHz Extended Squitter*, dated 2 May 2008.

EHS DAPs means enhanced surveillance downlink of aircraft parameters.

(E)TSO means FAA Technical Standard Order and/or European Technical Standard Order.

ETSO means European Technical Standard Order of the EASA.

FAA means the Federal Aviation Administration of the United States.

FDE means Fault Detection and Exclusion, a feature of a GNSS receiver that excludes faulty satellites from position computation.

FL 290 means flight level 290.

Note Flight level 290 is defined in subregulation 2 (1) of CAR 1988.

GNSS means the Global Navigation Satellite System installed in an aircraft to continually compute the position of the aircraft by use of the GPS.

GPS means the Global Positioning System.

HPL means the Horizontal Protection Level of the GNSS position of an aircraft as an output of the GNSS receiver or system.

Mode A is a transponder function that transmits a 4-digit octal identification code for an aircraft when interrogated by an SSR, the code having been assigned to the aircraft by ATC for the relevant flight sector.

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 code for an aircraft's pressure altitude when interrogated by an SSR.

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

Mode S is a monopulse radar interrogation technique that improves the accuracy of the azimuth and range information of an aircraft, and uses a unique aircraft address to selectively call individual aircraft.

NAA has the same meaning as in regulation 1.4 of CASR 1998.

Note "NAA, for a country other than Australia, means:

- (a) the national airworthiness authority of the country; or
- (b) EASA, in relation to any function or task that EASA carries out on behalf of the country."

NIC means Navigation Integrity Category as specified in paragraph 2.2.3.2.7.2.6 of RTCA/DO-260A.

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

RAAO means a recreational aviation administration organisation that is recognised by CASA.

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*, dated 13 September 2000.

RTCA/DO-260A means RTCA Inc. document RTCA/DO-260A titled *Minimum Operational Performance Standards for 1090 MHz Automatic Dependent Surveillance – Broadcast (ADS-B) and Traffic Information Services – Broadcast (TIS-B)*, dated 10 April 2003.

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

SSR means a secondary surveillance radar system that is used by ATC to detect an aircraft equipped with a radar transponder.

TSO means Technical Standard Order of the FAA.

9B.3 If an aircraft carries ADS-B transmitting equipment for operational use in Australian territory, the equipment must comply with an approved equipment configuration.

9B.4 If an aircraft carries serviceable ADS-B transmitting equipment for operational use in Australian territory, the equipment must transmit:

(a) a flight identification that corresponds exactly to the aircraft identification mentioned on the flight notification filed with ATC for the flight; or

(b) if no flight notification is filed for the flight — a flight identification that is:

(i) for an aircraft registered on the Australian Civil Aircraft Register and operating wholly within Australian territory — the aircraft's registration mark; or

(ii) for an Australian aircraft registered by a RAAO — in accordance with the organisation's operations manual; or

a. another flight identification directed or approved by ATC.

9B.5 If an aircraft carries serviceable ADS-B transmitting equipment that complies with an approved equipment configuration, the equipment must be operated continuously during the flight in all airspace at all altitudes unless the pilot is directed or approved otherwise by ATC.

9B.6 If an aircraft carries ADS-B transmitting equipment which does not comply with an approved equipment configuration, the aircraft must not fly in Australian territory unless the equipment is:

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

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

- 9B.7 However, the equipment need not be deactivated as mentioned in paragraph 9B.6 if the aircraft is undertaking an ADS-B test flight in V.M.C. in airspace below FL 290.
- 9B.8 On and after 12 December 2013, any aircraft that is operated at or above FL 290 must carry serviceable ADS-B transmitting equipment that complies with an approved equipment configuration by meeting the conditions for approval set out in Appendix XI.
- 9B.9 An aircraft:
- (a) that is manufactured on or after 6 February 2014; and
 - (b) that is operated under the I.F.R.;
- must carry serviceable ADS-B transmitting equipment that complies with an approved equipment configuration by meeting the conditions for approval set out in Appendix XI.
- 9B.10 On and after 2 February 2017, an aircraft:
- (a) that is manufactured before 6 February 2014; and
 - (b) that is operated under the I.F.R.;
- must carry serviceable ADS-B transmitting equipment that complies with an approved equipment configuration by meeting the conditions for approval set out in Appendix XI.
- 9B.11 On and after 4 February 2016, an aircraft that is operated under the I.F.R. in airspace:
- (a) that is Class A, B, C or E; and
 - (b) that is within the arc of a circle that starts 500 NM true north from Perth aerodrome and finishes 500 NM true east from Perth aerodrome;
- must carry serviceable ADS-B transmitting equipment that complies with an approved equipment configuration by meeting the conditions for approval set out in Appendix XI.
- 9B.12 Paragraphs 9B.8 to 9B.11 do not apply to an aircraft if:

- (a) the aircraft owner, operator or pilot has written authorisation from CASA, based on a safety case, for the operation of the aircraft without the ADS-B transmitting equipment; or
- (b) the equipment is unserviceable for a flight, and each of the following applies:
 - (i) the flight takes place within 3 days of the discovery of the unserviceability;
 - (ii) at least 1 of the following applies for the flight:
 - (A) flight with unserviceable equipment has been approved by CASA, in writing, subject to such conditions as CASA specifies;
 - (B) the unserviceability is a permissible unserviceability set out in the minimum equipment list for the aircraft and any applicable conditions under subregulation 37 (2) of CAR 1988 have been complied with;
 - (iii) ATC clears the flight before it commences despite the unserviceability.

9C Standards for Mode S transponder equipment

- 9C.1 This subsection applies to an aircraft engaged in private, aerial work, charter or RPT operations.
- 9C.2 If the aircraft carries Mode S transponder equipment (the *equipment*), the equipment must meet the standards set out in this subsection.
- 9C.3 The equipment must be of a type that is authorised by:
 - (a) the FAA, in accordance with TSO-C112() as in force on 5 February 1986, or a later version as in force from time to time; or

- (b) at least 1 of the following applies for the flight:
 - (i) flight with unserviceable equipment has been approved by CASA, in writing, subject to such conditions as CASA specifies;
 - (ii) the unserviceability is a permissible unserviceability set out in the minimum equipment list for the aircraft, and any applicable conditions under subregulation 37 (2) of CAR 1988 have been complied with;
- (c) ATC clears the flight despite the unserviceability.

10 Serviceability

10.1 In the case of a charter or RPT aircraft, all instruments and equipment that it carries, or is fitted with, under subregulation 207 (2) of CAR 1988 must be serviceable before take-off, unless:

- (a) flight with unserviceable instruments or equipment has been approved by CASA, subject to such conditions as CASA specifies; or
- (b) the unserviceability is a permissible unserviceability set out in the minimum equipment list for the aircraft and any applicable conditions under subregulation 37 (2) of CAR 1988 have been complied with; or
- (c) CASA has approved the flight with the unserviceable instrument or equipment and any applicable conditions that CASA has specified, in writing, have been complied with; or
- (d) the unserviceable instrument or equipment is a passenger convenience item only and does not affect the airworthiness of the aircraft.

Note Equipment referred to in paragraph 10.1 includes oxygen and protective breathing equipment, emergency lifesaving equipment, seats, seat belts and safety equipment that are required to meet an applicable standard, and other instruments and equipment required to be carried or fitted under this Order.

10.1A A private or aerial work aircraft must not be operated:

- (a) under the V.F.R., unless:
 - (i) all instruments and equipment required to be fitted to the aircraft under subsection 3 are serviceable before take-off; or
 - (ii) CASA has approved the flight with the unserviceable instrument or equipment and any applicable conditions that CASA has specified, in writing, have been complied with; or
- (b) under the I.F.R., unless:
 - (i) all instruments and equipment required to be fitted to the aircraft under subsection 4 are serviceable before take-off; or

- (ii) CASA has approved the flight with the unserviceable instrument or equipment and any applicable conditions that CASA has specified, in writing, have been complied with.

10.2 Where flight is conducted with unserviceable instruments or equipment under the provisions of paragraph 10.1 or 10.1A, the unserviceable instruments or equipment must be prominently placarded “UNSERVICEABLE” or removed from the aircraft.

Note Where an instrument or piece of equipment performs more than 1 function, it is permissible to placard as unserviceable only the function(s) which are unserviceable.

10.3 The holder of an AOC authorising an RPT operation must:

- (a) have a minimum equipment list or lists for the aircraft used to conduct those operations; and
- (b) include each list in the operations manual for the aircraft to which that list applies.

10.4 The holder of an AOC authorising charter operations:

- (a) may have a minimum equipment list or lists for the aircraft used to conduct those operations; and
- (b) must include each list in the operations manual for the aircraft to which that list applies.

Appendix I

Instruments required for flight under the V.F.R.

(Limited to aircraft specified in subsection 3, paragraph 3.1)

1 The flight and navigational instruments required for flights under the V.F.R. are:

- (a) an airspeed indicating system; and
- (b) an altimeter, with a readily adjustable pressure datum setting scale graduated in millibars; and
- (c)
 - (i) a direct reading magnetic compass; or
 - (ii) a remote indicating compass and a standby direct reading magnetic compass; and
- (d) an accurate timepiece indicating the time in hours, minutes and seconds. This may be carried on the person of the pilot or navigator.

2 In addition to the instruments required under clause 1, aircraft, other than helicopters, engaged in charter, or aerial work, operations and operating under the V.F.R., must be equipped with:

- (a) a turn and slip indicator (agricultural aeroplanes may be equipped with a slip indicator only); and
- (b) an outside air temperature indicator when operating from an aerodrome at which ambient air temperature is not available from ground-based instruments.

Appendix II

Instruments required for:

- (i) aeroplanes engaged in RPT operations; and**
- (ii) aeroplanes engaged in charter operations which have a maximum take-off weight greater than 5 700 kg**

- 1 The flight and navigation instruments required are:
 - (a) an airspeed indicating system with means of preventing malfunctioning due to either condensation or icing; and
 - (b) 2 sensitive pressure altimeters; and
 - (c)
 - (i) a direct reading magnetic compass; or
 - (ii) a remote indicating compass and a standby direct reading magnetic compass; and
 - (d) an accurate timepiece indicating the time in hours, minutes and seconds; and
 - (e) a rate of climb and descent indicator (vertical speed indicator); and
 - (f) an outside air temperature indicator; and
 - (g) 2 attitude indicators (artificial horizons); and
 - (h) a heading indicator (directional gyroscope or equivalent approved by CASA); and
 - (i) a turn and slip indicator except that only a slip indicator is required when a third attitude indicator usable through flight attitudes of 360 degrees of pitch and roll is installed in accordance with paragraph (k) of this Appendix; and
 - (j) a means of indicating whether the power supply to those instruments requiring power is working satisfactorily; and
 - (k) in turbo-jet aeroplanes having a maximum take-off weight greater than 5 700 kg and in turbo-prop aeroplanes having a maximum take-off weight greater than 18 000 kg a third attitude indicator which:
 - (i) is powered from a source independent of the electrical generating system; and
 - (ii) continues to provide reliable indications for a minimum of 30 minutes after total failure of the electrical generating system; and

- (iii) is operative without selection after total failure of the electrical generating system; and
 - (iv) is located on the instrument panel in a position which will make it plainly visible to, and usable by, any pilot at his station; and
 - (v) is appropriately lighted during all phases of operation; and
- (l) in turbo-jet aeroplanes with operating limitations expressed in terms of Mach number, a Mach number indicator (Machmeter).
- 2 (a) For aeroplanes above 5 700 kg maximum take-off weight, the instruments used by the pilot in command and which are specified in paragraphs 1 (a), (b), (e) and (l) of this Appendix must be capable of being connected either to a normal or an alternate static source but not both sources simultaneously. Alternatively, the aeroplane may be fitted with 2 independent static sources each consisting of a balanced pair of flush static ports of which 1 is used for the instruments specified above. Instruments and equipment other than flight instruments provided for use by the pilot in command, must not be connected to the normal static system that operates the instruments of the pilot in command;
- (b) for aeroplanes not above 5 700 kg maximum take-off weight, the instruments specified in paragraphs 1 (a), (b), (e) and (l) of this Appendix must be capable of being connected to either a normal or alternate static source but not both sources simultaneously. Alternatively, the aeroplane may be fitted with a balanced pair of flush static ports.
- 3 The instruments specified in paragraphs 1 (g), (h) and (i) of this Appendix must have duplicated sources of power supply.
- 4 CASA may, having regard to the type of aeroplane, approve an attitude indicator incorporated in an automatic pilot system being 1 of the 2 attitude indicators required by paragraph 1 (g) of this Appendix.
- 5 A gyro-magnetic type of remote indicating compass installed to meet the requirements of paragraph 1 (c) (ii) of this Appendix may also be considered to meet the requirement for a heading indicator specified in paragraph 1 (h) of this Appendix, provided that it has a duplicated power supply.
- 6 For V.F.R. flight, the following instruments may be unserviceable:
- (a) the attitude indicator required by paragraph 1 (k);

- (b) 1 of the attitude indicators required by paragraph 1 (g) provided that the attitude indicator required by paragraph 1 (k) is serviceable or an attitude indicator has been provided to meet the requirements of paragraph 1 (i) and is serviceable;
- (c) the turn and slip indicator or slip indicator and attitude indicator required by paragraph 1 (i).

Appendix III

Instruments required for aeroplanes with a maximum take-off weight not greater than 5 700 kg engaged in charter operations under the I.F.R. (except night V.M.C.) excluding freight only charter operations

- 1 The flight and navigation instruments required are:
 - (a) an airspeed indicating system with means of preventing malfunctioning due to either condensation or icing; and
 - (b) 2 sensitive pressure altimeters; and
 - (c)
 - (i) a direct reading magnetic compass; or
 - (ii) a remote indicating compass and a standby direct reading magnetic compass; and
 - (d) an accurate timepiece indicating the time in hours, minutes and seconds; and
 - (e) a rate of climb and descent indicator (vertical speed indicator); and
 - (f) an outside air temperature indicator; and
 - (g) 2 attitude indicators (artificial horizons); and
 - (h) a heading indicator (directional gyroscope or equivalent approved by CASA); and
 - (i) a turn and slip indicator except that only a slip indicator is required when a third attitude indicator usable through flight attitude of 360 degrees pitch and roll is installed; and
 - (j) a means of indicating whether the power supply to the gyroscopic instruments is working satisfactorily; and
 - (k) in turbo-jet aeroplanes with operating limitations expressed in terms of Mach number, a Mach number indicator (Machmeter).
- 2 The instruments specified in paragraphs 1 (a), (b), (e) and (k) of this Appendix must be capable of being connected to either a normal or alternate static source but not both sources simultaneously. Alternatively, they may be connected to a balanced pair of flush static ports.
- 3 The instruments specified in paragraphs 1 (g), (h) and (i) of this Appendix must have duplicated sources of power supply.

4 CASA may, having regard to the type of aeroplane, approve an attitude indicator incorporated in an automatic pilot system as being 1 of the 2 attitude indicators required by paragraph 1 (g) of this Appendix.

5 A gyro-magnetic type of remote indicating compass installed to meet the requirements of subparagraph 1 (c) (ii) of this Appendix may also be considered to meet the requirement for a heading indicator specified in paragraph 1 (h) of this Appendix, provided it has a duplicated power supply.

Appendix IV

Instruments required for aeroplanes engaged in:

- (i) aerial work and private operations under the I.F.R. (including night V.M.C.); and**
- (ii) charter operations under night V.M.C; and**
- (iii) I.F.R. freight only charter operations in aeroplanes with maximum take-off weight not greater than 5 700 kg.**

1 The flight and navigational instruments required are:

- (a) an airspeed indicating system; and
- (b) a sensitive pressure altimeter; and
- (c)
 - (i) direct reading magnetic compass; or
 - (ii) a remote indicating compass and a standby direct reading magnetic compass; and
- (d) an accurate timepiece indicating the time in hours, minutes and seconds, except that this may be omitted if it is carried on the person of the pilot or navigator; and
- (e) a rate of climb and descent indicator (vertical speed indicator) for other than night V.M.C. flights; and
- (f) an outside air temperature indicator; and
- (g) an attitude indicator (artificial horizon); and
- (h) a heading indicator (directional gyroscope); and
- (i) a turn and slip indicator except that only a slip indicator is required when a second attitude indicator usable through flight attitudes of 360 degrees of pitch and roll is installed; and
- (j) means of indicating whether the power supply to the gyroscopic instruments is working satisfactorily; and
- (k) except for aeroplanes engaged in night V.M.C. flights, means of preventing malfunctioning due to either condensation or icing of at least 1 airspeed indicating system.

2 The instruments specified in paragraphs 1 (a), (b), (e) and (k) of this Appendix must be capable of being connected to either a normal or an alternate static source but not both sources simultaneously. Alternatively, they may be connected to a balanced pair of flush static ports.

3 Except for aeroplanes engaged in night V.M.C. private and aerial work operations the instruments specified in paragraphs 1 (g), (h) and (i) of this Appendix must have duplicated sources of power supply unless the turn and slip indicator or the second attitude indicator specified in paragraph 1 (i) has a source of power independent of the power operating other gyroscopic instruments.

4 A gyro-magnetic type of remote indicating compass installed to meet the requirements of subparagraph 1 (c) (ii) of this Appendix may be considered also to meet the requirement for a heading indicator specified in paragraph 1 (h) of this Appendix, provided that such installation complies with the power supply requirements of clause 3 of this Appendix.

Appendix V

Electric lighting equipment flight under the I.F.R. at night (including night V.M.C.)

The electric lighting equipment is:

1 Instrument illumination

Illumination for all instruments and equipment, used by the flight crew, that are essential for the safe operation of the aircraft. The illumination must be such that:

- (a) all illuminated items are easily readable or discernible, as applicable; and
- (b) its direct or reflected rays are shielded from the pilot's eyes; and
- (c) its power supply is so arranged that in the event of the failure of the normal source of power, an alternative source is immediately available; and
- (d) it emanates from fixed installations.

2 Intensity control

Means of controlling the intensity of the illumination of instrument lights, unless it can be demonstrated that non-dimmed instrument lights are satisfactory under all conditions of flight likely to be encountered.

3 Landing lights

2 landing lights except that, in accordance with the provisions of regulation 308 of CAR 1988, aircraft engaged in private and aerial work operations and charter operations not carrying passengers for hire and reward are exempted from this requirement provided that 1 landing light is fitted.

Note A single lamp having 2 separately energised filaments may be approved as meeting the requirement for 2 landing lights.

4 Passenger compartment lights

Lights in all passenger compartments.

5 Pilots' compartment lights

Means of lighting the pilots' compartment to provide illumination adequate for the study of maps and the reading of flight documents.

6 Position and anti-collision lights

Equipment for displaying the lights prescribed in regulation 196 of CAR 1988.

Note In accordance of the provision of subregulation 195 (1) of CAR 1988, position and anti-collision lights must be displayed at night and in conditions of poor visibility.

7 Emergency lighting

Emergency lighting and a shock-proof electric torch for each crew member at the crew member station.

Appendix VI

Instruments required for V.F.R. operations — helicopters

- 1 The flight and navigational instruments required are:
 - (a) an airspeed indicating system; and
 - (b) a pressure altimeter with a readily adjustable pressure datum setting scale graduated in millibars; and
 - (c)
 - (i) a direct reading magnetic compass; or
 - (ii) a remote indicating magnetic compass and a standby direct reading magnetic compass; and
 - (d) an accurate timepiece indicating hours, minutes and seconds. This may be carried on the person of the pilot or navigator.
- 2 In addition to the instruments required under clause 1, helicopters engaged in RPT, charter, or aerial work, operations and operating under the V.F.R. must be equipped with:
 - (a) a slip indicator; and
 - (b) an outside air temperature indicator when operating from or to a location at which ambient air temperature is not available from ground-based instruments.

Appendix VII

Instruments required for I.F.R. operations in helicopters (except night V.M.C.)

1 The flight and navigational instruments required in a helicopter which is required to be operated by 2 pilots are:

- (a) 2 airspeed indicators together with 1 airspeed indicating system with means of preventing malfunction due to either condensation or icing; and
- (b) 2 sensitive pressure altimeters; and
- (c) (i) a direct reading magnetic compass; or
(ii) a remote indicating compass and a standby direct reading magnetic compass; and
- (d) an accurate timepiece indicating the time in hours, minutes and seconds; and
- (e) 2 instantaneous vertical speed indicators; and
- (f) an outside air temperature indicator; and
- (g) 2 attitude indicators (artificial horizons) having a 5 inch dial presentation and a standby attitude indicator positioned so as to be usable by the pilot in command and plainly visible by both pilots by day and by night; and
- (h) a heading indicator (directional gyroscope); and
- (i) 2 slip indicators; and
- (j) provision to indicate whether the power supply to the gyroscopic instruments is working satisfactorily.

2 The minimum flight and navigation instruments required in a helicopter which is operated by a single pilot are:

- (a) an airspeed indicating system with means of preventing malfunction due to either condensation or icing; and
- (b) 2 sensitive pressure altimeters; and
- (c) (i) a direct reading magnetic compass; or
(ii) a remote indicating compass and a standby direct reading magnetic compass; and
- (d) an accurate timepiece indicating the time in hours, minutes and seconds; and
- (e) instantaneous vertical speed indicator; and
- (f) an outside air temperature indicator; and

- (g) an attitude indicator having a 5 inch dial presentation and a standby attitude indicator positioned so as to be usable by the pilot; and
- (h) a heading indicator (directional gyroscope); and
- (i) a slip indicator; and
- (j) provision to indicate whether the power supply to the gyroscopic instruments is working satisfactorily.

3 The instruments specified in paragraphs 1 (a), (b) and (e) and 2 (a), (b) and (e) of this Appendix must be capable of being connected to more than 1 static source or must be connected to a balanced pair of flush static ports. Instruments and equipment other than mandatory flight instruments must not be connected to the static system that operates the instruments used by the pilot in command.

4 The instruments specified in paragraphs 1 (h) and 2 (h) must have a duplicated source of power supply.

5 The 5 inch dial attitude indicators specified in paragraphs 1 (g) and 2 (g) must have duplicate sources of power supply. The standby attitude indicator must have a power source independent of the electrical generating system and must operate independent of any other attitude indicating system installed.

6 The standby attitude indicator installation specified in paragraphs 1 (g) and 2 (g) must be one in which:

- (a) the indicator complies with US Technical Standard Order C4c or equivalent specification acceptable to CASA; and
- (b) the indicator and its lighting will continue to operate for 30 minutes following the failure of the electrical power generating system without any action by the flight crew; and
- (c) the position size and lighting of the instrument display allows its use from the pilot in command's operating station by day and by night; and
- (d) the operation is independent of other attitude indicator installations.

7 CASA may, having regard to the type of helicopter, approve an attitude indicator incorporated in an automatic pilot system as being 1 of the 2 attitude indicators required by paragraph 1 (g) of this Appendix.

8 A gyro-magnetic type of remote indicating compass installed to meet the requirements of subparagraph 1 (c) (ii) and 2 (c) (ii) of this Appendix may be

considered also to meet the requirement for a heading indicator specified in paragraph 1 (h) or 2 (h) of this Appendix, provided that such installation complies with the power supply requirements of clause 4 of this Appendix.

9 CASA may, having regard to the type of helicopter, and the flight presentation, response and acuity standard of the instrument concerned, approve the use of attitude indicators which have a dial presentation of less than 5 inches, in lieu of the indicators specified at paragraphs 1 (g), 2 (g) and 5 of this Appendix.

Appendix VIII

Instruments required for night V.M.C. flight in helicopters except while engaged in agricultural operations

- 1 The flight and navigational instruments required are:
 - (a) an airspeed indicating system; and
 - (b) a sensitive pressure altimeter; and
 - (c)
 - (i) a direct reading magnetic compass; or
 - (ii) a remote indicating compass and a standby direct reading magnetic compass; and
 - (d) an accurate timepiece indicating the time in hours, minutes and seconds. This may be carried on the person of the pilot or navigator; and
 - (e) an outside air temperature indicator; and
 - (f) an attitude indicator (artificial horizon); and
 - (i) standby attitude indicator; or
 - (ii) turn indicator; and
 - (g) a heading indicator (directional gyroscope); and
 - (h) a slip indicator; and
 - (i) a vertical speed indicator; and
 - (j) means of indicating whether the power supply to the gyroscopic instruments is working satisfactorily.
- 2 For operations onto vessels or platforms at sea by night an instantaneous vertical speed indicator is required in place of the vertical speed indicator specified at paragraph 1 (i) of this Appendix.
- 3 The attitude indicator and standby attitude indicator or turn indicator as specified in paragraph 1 (f) of this Appendix, must have separate and independent power sources.
- 4 A gyro-magnetic type of remote indicating compass installed to meet the requirements of subparagraph 1 (c) (ii) of this Appendix may be considered also to meet the requirement for a heading indicator specified in paragraph 1 (g) of this

Appendix, provided that such installation complies with the power supply requirements of clause 3 of this Appendix.

Appendix IX

Instruments required for helicopters engaged in night V.M.C. agricultural operations

The flight and navigational instruments required are:

- (a) an airspeed indicating system; and
- (b) a sensitive pressure altimeter; and
- (c)
 - (i) a direct reading magnetic compass; or
 - (ii) a remote indicating compass and a standby direct reading magnetic compass; and
- (d) an accurate timepiece indicating the time in hours, minutes and seconds. This may be carried on the person of the pilot or navigator; and
- (e) an outside air temperature indicator; and
- (f) an attitude indicator (artificial horizon); and
- (g) a vertical speed indicator; and
- (h) a slip indicator; and
- (i) a means of indicating whether the power supply to the gyroscopic instrument is working satisfactorily.

- (b) that is conducted by a flight examiner who holds an instrument rating flight test endorsement.
- (5) The holder of an instrument rating is authorised to conduct an instrument approach operation in an aircraft using a procedure of a particular kind only if the holder has:
 - (a) completed training in the conduct of instrument approach operations using the procedure; and
 - (b) demonstrated, to a person mentioned in subregulation (6), his or her competence in the conduct of instrument approach operations using the procedure.
- (6) For paragraph (5)(b), the persons are as follows:
 - (a) CASA;
 - (b) an examiner who is authorised to conduct an instrument approach operation using the same procedure;
 - (c) a person who holds an approval under regulation 61.040 to assess the holder's competence.

61.865 Limitations on exercise of privileges of instrument ratings—endorsements

- (1) The holder of an instrument rating is authorised to pilot an aircraft mentioned in column 2 of an item in Part 1 of table 61.890 under the IFR, or at night under the VFR, only if the holder also holds the endorsement mentioned in column 1 of the item.
- (2) The holder of an instrument rating is authorised to conduct an instrument approach operation mentioned in column 2 of an item in Part 2 of table 61.890 only if the holder also holds the endorsement mentioned in column 1 of the item.

61.870 Limitations on exercise of privileges of instrument ratings—recent experience: general

- (1) This regulation applies to the holder of an instrument rating subject to subregulation (1A).
- (1A) This regulation does not apply to the holder if:
 - (a) the holder has successfully completed an operator proficiency check that covers IFR operations within the previous 3 months; or
 - (b) both:
 - (i) the holder is successfully participating in an operator's training and checking system for an IFR operation; and

- (ii) the operator holds an approval under regulation 61.040 for the system for this subregulation.
- (2) The holder is authorised to pilot an aircraft under the IFR only if the holder has conducted at least 3 instrument approach operations within the previous 90 days in an aircraft or an approved flight simulation training device for the purpose.
- (3) The holder is authorised to pilot an aircraft of a particular category under the IFR only if the holder has conducted at least one instrument approach operation within the previous 90 days in an aircraft of the same category or an approved flight simulation training device for the purpose.
- (4) The holder is authorised to conduct a 2D instrument approach operation only if the holder has conducted a 2D instrument approach operation within the previous 90 days in an aircraft or an approved flight simulation training device for the purpose.
- (5) The holder is authorised to conduct a 3D instrument approach operation only if the holder has conducted a 3D instrument approach operation within the previous 90 days in an aircraft or an approved flight simulation training device for the purpose.
- (6) The holder is authorised to conduct an azimuth guidance operation only if the holder has conducted an azimuth guidance operation within the previous 90 days in an aircraft or an approved flight simulation training device for the purpose.
- (7) The holder is authorised to conduct a course deviation indicator operation only if the holder has conducted a course deviation indicator operation within the previous 90 days in an aircraft or an approved flight simulation training device for the purpose.

Note: Azimuth guidance operations and course deviation indicator operations are instrument approach operations: see the definitions of those terms in regulation 61.010.

61.875 Limitations on exercise of privileges of instrument ratings—recent experience: single pilot

- (1) The holder of an instrument rating is authorised to pilot an aircraft under the IFR in a single-pilot operation only if the holder has conducted a flight or simulated flight under the IFR in a single-pilot operation within the previous 6 months.
- (2) For subregulation (1), the flight or simulated flight must:
 - (a) have a duration of at least one hour; and
 - (b) include at least one instrument approach or simulated instrument approach.

61.880 Limitations on exercise of privileges of instrument ratings—instrument proficiency check

- (1) The holder of an instrument rating is authorised to exercise the privileges of the rating in an aircraft of a particular category only if the holder has a valid instrument proficiency check for the aircraft category.
- (2) However:
 - (a) the holder is authorised to exercise the privileges of the rating in a multi-engine aeroplane only if the holder has a valid instrument proficiency check for multi-engine aeroplanes; and
 - (b) the holder is authorised to exercise the privileges of the rating in a multi-engine helicopter only if the holder has a valid instrument proficiency check for multi-engine helicopters.
- (3) Subject to subregulations (4) and (4B), for subregulations (1) and (2), the holder is taken to have a valid instrument proficiency check for the aircraft category, or for multi-engine aeroplanes or helicopters, during the following periods:
 - (a) if the holder passes the flight test for the instrument rating in a relevant aircraft—the period from when the holder passes the flight test to the end of the 12th month after the month in which the holder passes the flight test;
 - (b) if:
 - (i) the holder passes the flight test for an instrument endorsement in a relevant aircraft; and
 - (ii) the flight test is conducted more than 6 months after the holder passes the flight test for the rating;
the period from when the holder passes the flight test for the endorsement to the end of the 12th month after the month in which the holder passes the flight test for the endorsement;
 - (c) if the holder successfully completes an operator proficiency check that covers IFR operations in the relevant aircraft, and that is conducted by a flight examiner who holds an instrument rating flight test endorsement—the period from when the holder successfully completes the check to the end of the 12th month after the month in which the holder successfully completes the check;
 - (d) if:

- (i) the holder is successfully participating in an operator's training and checking system for an IFR operation in the relevant aircraft; and
 - (ii) the operator holds an approval under regulation 61.040 for the system for this subregulation and operations in the relevant aircraft;
 - the period during which the holder is successfully participating in the system;
 - (e) if the holder successfully completes an instrument proficiency check for the relevant aircraft—the period from when the holder successfully completes the check to the end of the 12th month after the month in which the holder successfully completes the check;
 - (f) if:
 - (i) the holder is taken to have a valid instrument proficiency check under any of paragraphs (a) to (e) for the relevant aircraft (the *existing check*); and
 - (ii) within 3 months before the validity of the existing check expires, the holder successfully completes an instrument proficiency check for the relevant aircraft;
 - the period from when the validity of the existing check expires to the end of the 12th month after the validity of the existing check expires.
- (4) If, at any time, the holder attempts, but does not successfully complete, an instrument proficiency check mentioned in subregulation (4A) (the *failed check*), the holder is no longer taken to have a valid instrument proficiency check for:
- (a) the aircraft category in which the holder attempted the failed check; or
 - (b) multi-engine aircraft of the category in which the holder attempted the failed check.
- (4A) For subregulation (4), the failed check may be any of the following:
- (a) an instrument proficiency check for an aircraft category;
 - (b) an instrument proficiency check for multi-engine aeroplanes or helicopters;
 - (c) an instrument proficiency check for an aircraft type.
- (4B) If the holder is taken to have a valid instrument proficiency check for the relevant aircraft only because of the holder's participation in an operator's training and checking system, the check is taken to be valid only for operations conducted by the operator.
- (5) For paragraphs (3)(e) and (f), the holder successfully completes an instrument proficiency check for the relevant aircraft if:
- (a) CASA or a flight examiner:

- (i) assesses the holder's competency to conduct operations under the IFR in a relevant aircraft as meeting the standards mentioned in the Part 61 Manual of Standards for an instrument proficiency check in the relevant aircraft; and
- (ii) endorses the holder's licence document to the effect that the holder has completed the instrument proficiency check; and
- (iii) includes in the endorsement the matters mentioned in subregulation (8); or
- (b) a person mentioned in subregulation (7) assesses the holder as competent to conduct operations under the IFR in a relevant aircraft, and CASA or a flight examiner:
 - (i) conducts an oral assessment of the holder's knowledge of IFR operation procedures to the standards mentioned in the Part 61 Manual of Standards for an instrument proficiency check; and
 - (ii) endorses the holder's licence document to the effect that the holder has completed the instrument proficiency check; and
 - (iii) includes in the endorsement the matters mentioned in subregulation (8).
- (6) For paragraphs (3)(e) and (f), the instrument proficiency check must be conducted in a relevant aircraft or an approved flight simulation training device for the proficiency check.
- (7) For paragraph (5)(b), the person is the holder of an approval under regulation 61.040 to conduct the proficiency check.
- (8) For subparagraphs (5)(a)(iii) and (b)(iii), the matters are:
 - (a) the date on which the instrument proficiency check is conducted; and
 - (b) the aircraft to which the instrument proficiency check relates.
- (9) In this regulation:

relevant aircraft, for an instrument proficiency check, means:

- (a) if the instrument proficiency check is for an aircraft category—a single-engine or multi-engine aircraft of that category; or
- (b) if the instrument proficiency check is for multi-engine aeroplanes—a multi-engine aeroplane; or
- (c) if the instrument proficiency check is for multi-engine helicopters—a multi-engine helicopter.

61.885 Requirements for grant of instrument ratings

- (1) An applicant for an instrument rating must:
 - (a) hold a private pilot licence, commercial pilot licence or air transport pilot licence; and
 - (b) meet the requirements for the grant of:
 - (i) at least one instrument endorsement mentioned in column 1 of an item in Part 1 of table 61.890; and
 - (ii) at least one instrument endorsement mentioned in column 1 of an item in Part 2 of table 61.890.

Note 1: Paragraph (a) is satisfied if the applicant holds a certificate of validation of an overseas flight crew licence that is equivalent to a private pilot licence, commercial pilot licence or air transport pilot licence: see item 36 of Part 2 of the Dictionary.

Note 2: An application for a pilot licence mentioned in paragraph (a) and an instrument rating may be made at the same time: see subregulation 61.155(2).

- (2) The applicant must also have:
 - (a) passed the aeronautical knowledge examination for the instrument rating; and
 - (b) completed flight training for the instrument rating; and
 - (c) passed the flight test mentioned in the Part 61 Manual of Standards for the instrument rating and the aircraft category rating associated with the applicant's pilot licence; and
 - (d) met the aeronautical experience requirements mentioned in subregulation (5).

Note 1: For paragraph (a), for the conduct of aeronautical knowledge examinations, see Division 61.B.3.

Note 2: For paragraph (b), for the requirements for flight training, see Division 61.B.2.

Note 3: For paragraph (c), for the conduct of flight tests, see Division 61.B.4.

Note 4: For paragraph (d), for the determination of a person's flight time and other aeronautical experience, see Division 61.A.2.

- (3) For paragraph (2)(b), the flight training must have been conducted in an aircraft of the same category as the aircraft in which, or the aircraft represented by the flight simulation training device in which, the flight test is conducted.
- (4) For paragraph (2)(c), the flight test must be conducted in an aircraft unless the applicant has previously held:
 - (a) an instrument rating; or
 - (b) an overseas rating that CASA is satisfied is equivalent to an instrument rating; or

- (c) a qualification issued by the Australian Defence Force that CASA is satisfied is equivalent to an instrument rating.
- (5) For paragraph (2)(d), the applicant must have aeronautical experience that includes:
 - (a) at least 50 hours of cross-country flight time as pilot in command; and
 - (b) at least 40 hours of instrument time, including:
 - (i) at least 10 hours of dual instrument time; and
 - (ii) either:
 - (A) if subregulation (6) applies—at least 10 hours of instrument flight time; or
 - (B) in any other case—at least 20 hours of instrument flight time.
- (6) This subregulation applies if any instrument ground time relied on by an applicant for paragraph (5)(b) is:
 - (a) completed in an approved flight simulator for the purpose; and
 - (b) supervised by a pilot instructor who holds an instrument rating training endorsement.
- (7) For subregulation (5), the cross-country flight time and instrument flight time must have been conducted in an aircraft of the same category as the aircraft in which, or the aircraft represented by the flight simulation training device in which, the flight test is conducted.

61.887 Removal of instrument rating conditions about acting as pilot in command under IFR

- (1) This regulation applies to the holder of an instrument rating granted on the basis of regulation 202.272 or 202.274 if the rating is subject to the condition that the holder is not authorised to act as pilot in command under the IFR.
- (2) CASA must remove the condition, to the extent that it relates to a particular aircraft category or class, if:
 - (a) the holder applies to CASA for the removal of the condition; and
 - (b) the holder meets the requirements under this Part for the grant of:
 - (i) an instrument rating; and
 - (ii) an instrument endorsement that would authorise the holder to pilot an aircraft of that category or class under the IFR.

Division 61.M.2—Privileges and requirements for grant of instrument endorsements

61.890 Kinds of instrument endorsement

The kinds of instrument endorsement are set out in column 1 of table 61.890.

Table 61.890 Instrument endorsements

Item	Column 1 Endorsement	Column 2 Activities authorised	Column 3 Requirements
<i>Part 1—Aircraft category/class endorsements</i>			
1	Single-engine aeroplane instrument endorsement	Pilot an aeroplane of the single-engine aeroplane class under the IFR or at night under the VFR	<p>Single-engine aeroplane class rating or type rating for a type of single-engine aeroplane</p> <p>At least 10 hours of dual instrument time in an aeroplane or an approved flight simulation training device for the purpose</p> <p>At least 5 hours of aeronautical experience at night as pilot of an aeroplane or an approved flight simulation training device for the purpose, including at least one hour of dual flight and one hour of solo night circuits</p>
2	Multi-engine aeroplane instrument endorsement	Pilot an aeroplane under the IFR or at night under the VFR	<p>Multi-engine aeroplane class rating or type rating for a type of multi-engine aeroplane</p> <p>At least 10 hours of dual instrument time in a multi-engine aeroplane or an approved flight simulation training device for the purpose</p> <p>At least 5 hours of aeronautical experience at night as pilot of an aeroplane or an approved flight simulation training device for the purpose, including at least one hour of dual flight and one hour of solo night circuits</p>

3	Single-engine helicopter instrument endorsement	Pilot a single-engine helicopter under the IFR or at night under the VFR	<p>Single-engine helicopter class rating or type rating for a type of single-engine helicopter</p> <p>At least 10 hours of dual instrument time in a helicopter or an approved flight simulation training device for the purpose</p> <p>At least 5 hours of aeronautical experience at night as pilot of a helicopter or an approved flight simulation training device for the purpose, including at least 3 hours of dual flight and one hour of solo night circuits</p>
4	Multi-engine helicopter instrument endorsement	Pilot a helicopter under the IFR or at night under the VFR	<p>Type rating for a type of multi-engine helicopter</p> <p>At least 10 hours of dual instrument time in a multi-engine helicopter or an approved flight simulation training device for the purpose</p> <p>At least 5 hours of aeronautical experience at night as pilot of a helicopter or an approved flight simulation training device for the purpose, including at least 3 hours of dual flight and one hour of solo night circuits</p>
5	Powered-lift aircraft instrument endorsement	Pilot a powered-lift aircraft under the IFR or at night under the VFR	<p>Type rating for a type of powered-lift aircraft</p> <p>At least 10 hours of dual instrument time in a powered-lift aircraft or an approved flight simulation training device for the purpose</p> <p>At least 5 hours of aeronautical experience at night as pilot of a helicopter or powered-lift aircraft or an approved flight simulation training device for the purpose, including at least 3 hours of dual flight and one hour of solo night circuits</p>
6	Gyroplane instrument endorsement	Pilot a gyroplane under the IFR or at night under the VFR	<p>Gyroplane aircraft class rating or type rating for a type of gyroplane</p> <p>At least 10 hours of dual instrument flight time in a gyroplane</p> <p>At least 5 hours of aeronautical experience at night as pilot of a helicopter or gyroplane or an approved flight simulation training device for the purpose, including at least 3 hours of dual flight and one hour of solo night circuits</p>

- 7 Airship instrument Pilot an airship under the Airship class rating or type rating for a type of endorsement IFR or at night under the airship VFR
- At least 10 hours of dual instrument time in an airship or an approved flight simulation training device for the purpose
- At least 5 hours of aeronautical experience at night as pilot of an airship or an approved flight simulation training device for the purpose, including at least 3 hours of dual flight and one hour of solo night circuits

Part 2—Instrument approach endorsements

-
- 8 IAP 2D instrument Conduct a 2D instrument endorsement approach operation
-
- 9 IAP 3D instrument Conduct a 3D instrument endorsement approach operation IAP 2D instrument endorsement
-

61.895 Privileges of instrument endorsements

Subject to Subpart 61.E, Division 61.M.1 and regulation 61.900, the holder of an endorsement mentioned in column 1 of an item in table 61.890 is authorised to conduct the activity mentioned in column 2 of the item.

Note: Subpart 61.E sets out certain limitations that apply to all pilot licences, and ratings and endorsements on pilot licences.

61.900 Limitations on exercise of privileges of instrument endorsements

- (1) The holder of an endorsement mentioned in column 1 of an item in Part 2 of table 61.890 is authorised to conduct an instrument approach operation in IMC using a navigation system of a particular kind only if the holder has previously conducted:
 - (a) an instrument approach operation; or
 - (b) a simulated instrument approach operation in a flight simulation training device; using a navigation system of that kind.
- (2) The holder of an IAP 3D instrument endorsement is authorised to conduct a 3D instrument approach operation only if:
 - (a) the holder passed the flight test for the endorsement within the previous 24 months; or
 - (b) the holder's most recent instrument proficiency check included a 3D instrument approach operation; or
 - (c) both:
 - (i) the holder is successfully participating in an operator's training and checking system for an operation that includes 3D instrument approaches; and
 - (ii) the operator holds an approval under regulation 61.040 for the system for this subregulation.
- (3) For paragraph (2)(b), an instrument proficiency check includes an operator proficiency check:
 - (a) that covers IFR operations; and
 - (b) that is conducted by a flight examiner who holds an instrument rating flight test endorsement.

61.905 Requirements for grant of instrument endorsements

(1) An applicant for an endorsement mentioned in column 1 of an item in table 61.890 must hold:

- (a) an instrument rating; and
- (b) the rating or endorsement (if any) mentioned in column 3 of the item.

Note: Subregulation (1) is satisfied, in relation to a required licence, rating or endorsement, if the applicant holds a certificate of validation of an overseas flight crew licence, rating or endorsement that is equivalent to the required licence, rating or endorsement: see item 36 of Part 2 of the Dictionary.

(2) The applicant must also have:

- (a) completed flight training for the endorsement; and
- (b) met the aeronautical experience requirements (if any) mentioned in column 3 of the item; and
- (c) passed the flight test mentioned in the Part 61 Manual of Standards for the endorsement.

Note 1: For paragraph (a), for the requirements for flight training, see Division 61.B.2.

Note 2: For paragraph (b), for the determination of a person's flight time and other aeronautical experience, see Division 61.A.2.

Note 3: For paragraph (c), for the conduct of flight tests, see Division 61.B.4.