



Australian Government
Civil Aviation Safety Authority

Instrument number CASA 383/05

I, BRUCE ROBERT GEMMELL, Deputy Chief Executive and Chief Operating Officer, a delegate of CASA, make this instrument under regulation 179A of the *Civil Aviation Regulations 1988 (CAR 1988)*.

[Signed B. Gemmell]

Bruce Gemmell
Deputy Chief Executive and
Chief Operating Officer

2 November 2005

Instructions — route specifications

1 Duration

This instrument:

- (a) commences on the day after it is registered on the Federal Register of Legislative Instruments; and
- (b) stops having effect at the end of July 2008.

2 Revocation

Instrument CASA 101/95 is revoked.

3 Application

This instrument applies to aircraft operating under the I.F.R.

4 Instructions

I issue the instructions in Schedule 1.

Schedule 1 Instructions

1 I.F.R. flights to be navigated to comply with operating limitations

The pilot in command must navigate the aircraft in accordance with operating limitations mentioned in clause 4 for the route to be flown.

2 Equipment to be carried on I.F.R. flights

The pilot in command may conduct a flight under the I.F.R. only if the aircraft is equipped with serviceable radio equipment that is capable of receiving signals from the navigation aids relevant to the aircraft's route.

3 Position fixing

- (1) If the pilot in command is navigating by means of radio navigation equipment, he or she must obtain a positive position fix:
 - (a) by using a non-directional beacon; or
 - (b) by using a VHF omni-directional radio range; or
 - (c) by using distance measuring equipment; or
 - (d) determined by the intersection of 2 or more position lines from radio navigation aids that intersect at an angle of at least 45°; or
 - (e) by using satellite navigation systems known collectively as the Global Navigation Satellite System (*GNSS*).
- (2) For paragraph (1) (d):
 - (a) if the only radio navigation aids used are non-directional beacons — the intersection of the position lines must be not more than 30 miles from each of the beacons; or
 - (b) in any other case — each position line must be within the rated coverage of the radio navigation aid.

4 I.F.R. flights

- (1) The pilot in command must ensure that the aircraft is navigated by:
 - (a) a full-time licensed flight navigator; or
 - (b) a self-contained navigation system; or
 - (c) a long-range radio navigation system; or
 - (d) use of a radio navigation system; or
 - (e) during daylight — visual reference to the ground or water.
- (2) The pilot in command may navigate in accordance with paragraph (1) (d) only on routes on which the aircraft can be navigated as follows:
 - (a) after making a positive position fix, and allowing for possible tracking errors of $\pm 9.5^\circ$ from that fix, the aircraft must come within the rated coverage of a radio aid that can be used to fix the position of the aircraft;
 - (b) the maximum time period between positive position fixes must not be more than 2 hours.
- (3) The pilot in command may navigate in accordance with paragraph 4 (1) (e) only:
 - (a) on route segments where suitable en route navigation aids are not available; and
 - (b) if the weather conditions are suitable for V.M.C. flight; and

- (c) if visual position fixes are possible at intervals of not more than 30 minutes.
- (4) If the airborne weather radar system fitted in an aircraft operating under the I.F.R. becomes unserviceable during a flight, the pilot in command:
 - (a) may continue the flight; and
 - (b) if the pilot does so — must avoid penetration of any cloud formation likely to be associated with severe turbulence.

5 Radio navigation aids

- (1) If the pilot in command uses radio navigation aids as the primary means of navigation, he or she must ensure that:
 - (a) the aircraft is navigated by reference to an aid that:
 - (i) the pilot is qualified to use; and
 - (ii) provides the most precise track guidance for the aircraft; and
 - (b) only those aids that define the relevant track are used for track keeping.
- (2) Subclause (3) applies if:
 - (a) the aircraft is in controlled airspace; and
 - (b) the pilot in command notices that aircraft has deviated from the correct track.
- (3) The pilot must immediately take action to regain track.
- (4) For this clause, the radio navigation aids are taken to have the following level of precision in order from the most precise to the least precise:
 - (a) localiser;
 - (b) GPS;
 - (c) VHF omni-directional radio range;
 - (d) non-directional beacon;
 - (e) locator.

6 Radio navigation systems

- (1) An aircraft undertaking the kind of operation mentioned in an item of the following table must be equipped with serviceable and approved radio navigation systems:
 - (a) of the number and kind mentioned in the item; and
 - (b) that comply with the conditions mentioned for the item.

Item	Kind of operation	Number	Systems type	Conditions
1	Regular public transport	2	ADF or VOR or TSO C145a or C146a GNSS	Any combination that includes at least 1 ADF or VOR
		and 1	DME or GPS	Notes 2, 3, 4, 5, 7
		or 2	C145a or C146a GNSS or equivalent	Notes 6, 7
2	Charter or aerial work, above 5 700 kg MTOW	2	ADF or VOR or TSO- C145a or C146a GNSS	Any combination that includes at least 1 ADF or VOR
		and 1	DME or GPS	Notes 2, 3, 4, 5, 7
		or 2	C145a or C146a GNSS or equivalent	Notes 6, 7
3	Charter or aerial work, 5 700 kg or less MTOW, and private	1	ADF or VOR or TSO- C145a or C146a GNSS	Applicable to operations in non-controlled airspace Notes 6, 7
4	Charter or aerial work, 5 700 kg or less MTOW, and private	2	ADF, VOR, DME or GPS	Applicable to operations in controlled airspace — any combination which includes at least 1 ADF or VOR Note 3
		or 1	or TSOC145a or TSO- C146a GNSS	Notes 6, 7
5	NGT VFR	1	ADF, VOR or GPS	Note 3
6	ILS and localizer	1	75 Mhz marker beacon receiver	Not required for CAT 1 operations when serviceable DME or GPS is fitted and glideslope guidance and accuracy can be checked by reference to DME information provided on the appropriate instrument approach chart Note 5

Note 1 The equipment mentioned in this table is the minimum required to be serviceable for any flight under the I.F.R. or at night under the V.F.R. Additional radio navigation equipment may be required to meet the navigation requirements for AIP ENR 1.1 para 19.1.1 and the alternate requirements of ENR 1.1 para 72.3.1, depending on the navigation aids available and the weather conditions prevailing over the planned route and at the destination.

Note 2 Aircraft may continue to operate with unserviceable DME and GPS equipment in Class G airspace. In controlled airspace, where Air Traffic Service uses radar as the primary means of separating aircraft, operation with unserviceable DME or GPS is permitted if the aircraft is fitted with a serviceable secondary surveillance radar (**SSR**) transponder. This does not relieve the aircraft from the requirement for 2 ADF, VOR, TSO-C145a or TSO-146a GNSS receivers.

Note 3 In this item, **GPS** means GNSS equipment certified to TSO-C129, C129a, C145a, C146a or equivalent as determined by CASA.

Note 4 If TSO-C145a or TSO-146a GNSS equipment is carried to meet the requirement for 2 ADF, VOR, TSO-C145a or TSO-C146a GNSS receivers, the requirement for 1DME or GPS receiver is also met.

Note 5 GNSS receivers that comply with GPS navigation equipment standards detailed in TSO C129, C129a, C145, C146a or a design standard issued by CASA under regulation 21 of CAR 1988, may be used instead of DME for instrument approaches for which DME is required subject to the following conditions:

- (a) the substitute DME reference position can be selected from the database; and
- (b) the reference position used is annotated on the approach chart.

Note 6 CASA may approve equivalent equipment to GPS receivers certified to TSO C129, C129a, C145a or C146a.

Note 7 GPS receivers must be fitted in accordance with AC21-36 or other equivalent advisory information.

- (2) If DME or GPS is installed in an aircraft to meet a requirement in the table to subclause (1), the aircraft may operate while the DME or GPS is unserviceable:
 - (a) outside controlled airspace; or
 - (b) in controlled airspace, if:
 - (i) Air Traffic Service uses radar as the primary means of separating aircraft; and
 - (ii) the aircraft is equipped with a serviceable secondary surveillance radar transponder.

7 Advice to Air Traffic Service if aircraft is off-track

- (1) If the aircraft is in controlled airspace, the pilot in command may deviate from track only:
 - (a) with clearance from Air Traffic Service; or
 - (b) in an emergency.
- (2) If the pilot in command is using radionavigation aids as the primary means of navigation, he or she must immediately tell Air Traffic Service if the aircraft is found to be off-track by any of the following deviations:
 - (a) if track guidance is provided by a localizer or a VHF omni-directional radio range or RNAV (GNSS) — at least half-scale deflection of the course deviation indicator;

- (b) if the track guidance is provided by a non-directional beacon or locator — at least 5° from the specified bearing;
 - (c) if the track guidance is provided by distance measuring equipment — at least 2 miles from the required arc;
 - (d) if navigating by visual reference to the ground or water — more than 1 mile from the cleared track.
- (3) Subclause (4) applies if:
- (a) the aircraft is in controlled airspace; and
 - (b) the pilot in command considers it necessary to divert from the track given by Air Traffic Service; and
 - (c) the pilot in command is out of radio contact with Air Traffic Service.
- (4) The pilot in command must issue, on the appropriate frequencies, a PAN radio call specifying the details of the diversion.

8 Long flights over water

- (1) Subclause (2) applies if the aircraft:
- (a) is on a long flight over water; and
 - (b) is operating in an oceanic control area; and
 - (c) has deviated from the route specified in its Air Traffic Service clearance.
- (2) The pilot in command must take action to regain the specified route within 200 miles from the position where the deviation was observed.

9 Avoiding controlled airspace

- (1) If the aircraft is outside controlled airspace or a restricted area, the pilot in command must apply the applicable tolerances mentioned in this clause to the aircraft's flight path to ensure that the controlled airspace or the restricted area is not infringed.
- (2) If the pilot in command is navigating the aircraft by use of radio navigation aids, he or she must apply, for each navigation aid mentioned in the following table, the tolerance mentioned in the table for the aid.

Navigation aid	Tolerance
Non-directional radio beacon	± 6.9°
VHF omni-directional radio range	±5.2°
Tactical air navigation aid	±5.2°
Dead reckoning	±12°

- (3) Subject to subclause (5), the pilot in command must apply the tolerance mentioned in the following table for the height range within which the aircraft is operating if the pilot:
- (a) is operating with the parameters mentioned in the table; and

- (b) is operating the aircraft at a height above the mean sea level that is within the range mentioned in the table for the aircraft; and
- (c) is navigating the aircraft by visual reference.

Aircraft type	Operating height of the aircraft above mean sea level	Tolerance
All aircraft	10 001 feet to FL 200	± 8 miles
	FL 205 to FL 300	± 12 miles
	FL 305 to FL 400	± 16 miles
Gliders	0 feet to 10 000 feet	± 5 miles

- (4) Subject to subclause (5), the pilot in command must apply the tolerance mentioned in the following table for the height range within which the aircraft is operating if the pilot:

- (a) is operating an aircraft mentioned in the table; and
- (b) is operating the aircraft at a height above ground level that is within the range mentioned in the table for the aircraft; and
- (c) is navigating the aircraft by visual reference.

Operations	Operating height of the aircraft above ground level	Tolerance
Powered aircraft operating during daylight	0 feet to 2 000 feet	± 1 mile
	2 001 feet to 5 000 feet	± 2 miles
	5 000 feet to 10 000 feet	± 4 miles
Powered aircraft operating at night	2 001 feet to 5 000 feet	± 3 miles
	5 000 feet to 10 000 feet	± 5 miles

- (5) If the pilot in command is using area navigation, he or she must apply a tolerance of ± 14 miles.