

Advisory Circular

AC 91-2 (1)

Use of GPS in Lieu of DME in Instrument Approach Procedures

Revised Issue

06 July 2006

GENERAL

Civil Aviation Authority Advisory Circulars (AC) contain information about standards, practices and procedures that the Director has found to be an Acceptable Means of Compliance (AMC) with the associated rule.

An AMC is not intended to be the only means of compliance with a rule, and consideration will be given to other methods of compliance that may be presented to the Director. When new standards, practices or procedures are found to be acceptable, they will be added to the appropriate Advisory Circular.

PURPOSE

This Advisory Circular provides methods, acceptable to the Director, for establishing distance whenever a required DME facility is not available.

RELATED CAR

This AC relates specifically to Civil Aviation Rule Part 91, Sections 413 (c), 421 (6) (i), 423 (c) (5) (ii), 423 (c) (6) (iii) and AIP Supplement 3/97 dated 4 December 1997.

CHANGE NOTICE

This AC is a revision of AC 91-2, the initial issue of which was dated 6 July 2005.

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1. Applicability

The relevant sections of CAR Part 91, quoted on page 1, relate to the use of DME for distance indication in departure, holding and approach procedures. The reference to AIP Supplement 3/97, also quoted on page 1, relates to the use of GPS distance information in GPS or DME/GPS Departure procedures and GPS or DME/GPS Arrival procedures. It has now been determined that there are circumstances in which GPS distance information may be used, in any situation where DME distance information cannot be obtained, to conduct a departure, holding or approach procedure.

Adherence to the specifications contained herein will allow the substitution of GPS for DME distance, whenever indicated on an IAL chart. As an enhancement to the provisions of AIP Supplement 3/97, the same operational flexibility can be applied to a DME Departure or DME Arrival procedure – that is, a Departure or Arrival procedure that currently only provides for DME distance information. Note that, although there is no specific regulatory reference to the use of DME in ILS procedures, as will be seen herein, this AC applies equally to all types of procedures which primarily require the use of a terrestrial radionavigation aid.

IAL charts will be revised as soon as possible to formally incorporate all the above provisions.

2. Approval

Aircraft involved in IFR flight that can comply with the specifications of this AC may use GPS in lieu of DME for NDB/DME, L/DME, VOR/DME, ILS/DME and LLZ/DME. In the case of a DME Descent, or DME Homing and Descent procedure, GPS may be only used in lieu of DME when so specified on the chart and :-

- (a) the DME required for the procedure is able to be selected from the database, or
- (b) the DME is co-located with the NDB or VOR and the co-ordinates of these nav aids exist in the database.

3. Requirements

The following requirements must be satisfied for GPS to be used in lieu of DME :-

(a) Airworthiness Requirements

- (1) GPS navigation equipment must have TSO C129, C129a, C145, C145a, C146 or C146a (or CAA approved equivalent) authorisation;
- (2) GPS receivers must be installed in Papua New Guinea civil registered aircraft in accordance with the CAAP 35-1; and
- (3) Automatic barometric aiding function, as provided by TSO C129, C129a, C145, C145a, C146 or C146a must be functional.

Note : Operators should be aware that TSO C129, C129a, C145, C145a, C146 or C146a receivers may not be able to take advantage of future enhanced GPS capabilities, such as Wide or Local Area Augmentation Systems (WAAS or LAAS).

(b) Operational Requirements

- (1) Operating instructions for GPS navigation equipment must be carried on board the aircraft and, for commercial operations, incorporated into the operator's exposition (or Operations Manual).
- (2) GPS navigation equipment must be operated in accordance with manufacturer's operating instructions and any additional requirements specified in the approved aircraft flight manual, or flight manual supplement.

- (3) In addition to GPS, aircraft must be fitted with serviceable radionavigation systems as specified in CAR Part 91.519, or the operator's approved Minimum Equipment List.
- (4) The database medium (card, chip, etc) must be current and of a kind endorsed by the receiver manufacturer.
- (5) Co-ordinates of the destination aid to which the procedure relates must not be capable of modification by the operator or crew.
- (6) RAIM must be available before descending below the LSALT/MSA.
- (7) The destination azimuth aid (VOR, NDB, L, LLZ or ILS) nominated in the IAL chart must be used to provide primary track guidance during the procedure.
- (8) GPS must not be used as a navigation reference for flight below the LSALT/MSA, except as provided in this AC, or as otherwise approved by the CAA.
- (9) Pilots must have completed the training for the use of GPS under the IFR as detailed in AIP Supplement 3/97 and their log books must be endorsed in accordance with paragraph 7 of that AIP Supplement.

4. Flight Notification

Qualified pilots of aircraft equipped with GPS systems that comply with the specifications of this AC should indicate compliance as follows :-

- (a) On domestic flight plan, insert "**NAV/GPSRNAV**" in the Remarks section.
- (b) On ICAO flight plan, insert "**Z**" in field 10, and **NAV/GPSRNAV** in field 18.

5. Review

Comments related to this AC will be sought from operators on or after 6 December, 2006, but operators and pilots are encouraged to provide submissions, reports or comments at any time. It is hoped that this formal review will produce results that will allow the ASR Directorate to make suitable amendments to CAR Part 91, to formalise this approval and to, therefore, make it an examinable item in flight crew examinations and oral tests.