



**ADF RECEIVER CARRIAGE IN UK AIRSPACE.**

**1 Introduction**

1.1 The purpose of this Circular is to inform all aircraft operators, flying IFR in UK airspace, about routes and instrument flight procedures (departure, arrival, holding and approaches) for which the carriage of Automatic Direction Finding (ADF) equipment is required and those instrument flight procedures which, although developed using criteria which assumes use of ADF, may nevertheless be flown without the carriage of ADF equipment.

**2 Background**

2.1 Article 39, in conjunction with Schedule 5, of the Air Navigation Order 2009 requires that aircraft flying IFR in the UK in Controlled Airspace, and/or flying above FL 245, carry ADF equipment in the aircraft. The increased application of RNAV on ATS routes and terminal flight procedures and the allowance under European rules for commercial air transportation<sup>1</sup> are increasingly making the mandatory carriage of ADF redundant.

2.2 The extension to the B-RNAV (RNAV 5) mandate has rendered Non Directional Beacons (NDBs) redundant in operation on the ATS route structure. As a result, en-route NDBs are currently being withdrawn and replaced with waypoints. By contrast, there are still a relatively large number of instrument flight procedures based upon NDB associated with aerodromes remaining in the UK.

2.3 The NDB is used in instrument flight procedures either as a means to navigate to and from the aerodrome, fly the instrument approach and/or provide guidance for the missed approach procedure. Such instrument flight procedures are designed and validated to be flown with specific navigation aids and therefore should not be flown without such navigation aids unless specifically authorised.

2.4 The information provided below identifies those instrument flight procedures where carriage and use of ADF remains a requirement and those where an alternative means may be used.

**3 Routes and Procedures that may be flown with an equivalent means to ADF equipment**

**3.1 En-route Operations**

En-route operations within UK airspace require aircraft to be equipped and authorised to operate an approved RNAV system. The RNAV performance must be equal to or better than B-RNAV (RNAV 5). Aircraft are not required to carry ADF equipment when flying such procedures

**3.2 Terminal Airspace Operations**

Terminal operations include Standard Arrivals (STARs) and Standard Departures (SIDs) and interception of Precision Approaches eg. ILS transition. Aircraft are not required to carry ADF equipment when flying such procedures, even if part of the procedure is dependent upon an NDB, subject to the aircraft being equipped with area navigation equipment which enables the navigation performance capability notified, prescribed or otherwise designated for that airspace to be maintained.

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**Note:**<sup>1</sup> Under EU-OPS 1.865, an ADF system need not be installed, provided that the use of ADF is not required in any phase of the planned flight. An operator may operate an aeroplane that is not equipped with an ADF provided that it is equipped with alternative equipment authorised, for the route being flown, by the Authority. The reliability and the accuracy of alternative equipment must allow safe navigation for the intended route.

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3.3 An RNAV system for use in terminal airspace operations must:

- Have the complete procedure to be flown stored in the navigation data base;
- Have the capability of direct selection of the procedure by its name without the need to select each waypoint individually, and;
- Be approved for terminal airspace operations.

**Notes:**

1. If GNSS is a sensor input to the navigation system, the operator should carry out a predictive RAIM (or equivalent) assessment for the route or procedure to be flown with the alarm limit criteria set to 1 NM;
2. It is the responsibility of the operator to ensure that the data quality and integrity of the navigation data base containing the procedures have been assured<sup>2</sup>;
3. A navigation system approved for P-RNAV (RNAV 1) and with GNSS positioning is considered as compliant with the criteria outlined in this section;
4. Where flights are conducted with an alternative means to carriage and use of an ADF, it is the responsibility of the operator to ensure adherence to the nominal path of the promulgated instrument flight procedure and compliance with any environmental constraints e.g., Noise Preferential Routes (NPR).

**4 Procedures that must be conducted with ADF equipment**

4.1 NDB Non-Precision Approach

Pilots wishing to fly an NDB instrument approach procedure must ensure that their aircraft carries ADF equipment and it is operational.

4.2 Precision or Non-Precision Approaches with Missed Approach based upon NDB

The missed approach based upon an NDB is an integral part of the approach procedure and therefore an aircraft must be equipped with ADF to conduct the missed approach procedure.

Commercial aircraft operators having an RNAV system with an approved RNP capability may, on a case by case basis in this particular case, seek authorisation foregoing the requirement to carry an ADF receiver. UK operators should seek such authorisation through their Flight Operations Inspector and non-UK operators should contact the Controlled Airspace Section at the address below.

**5 Additional Information**

5.1 Further information can be obtained from:

Controlled Airspace Section  
Directorate of Airspace Policy  
CAA House, K6  
45-59 Kingsway  
London  
WC2B 6TE

Phone: 020-7453 6511  
Email: CAS.Mailbox@caa.co.uk

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**Note:** <sup>2</sup> For commercial air transportation, EU-OPS 1.873 requires that an operator shall not use a navigation data base which supports an airborne navigation application as a primary means of navigation unless the navigation data base supplier holds a Type 2 Letter of Acceptance (LoA) or equivalent, or has other approved procedures in place.