

# INTERNATIONAL CIVIL AVIATION ORGANIZATION



## EUROPEAN PRINCIPLES AND PROCEDURES FOR THE ALLOCATION OF SECONDARY SURVEILLANCE RADAR MODE S INTERROGATOR CODES (IC)

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## **1. SCOPE**

1.1 The European principles and procedures for the allocation of Secondary Surveillance Radar Mode S Interrogator Codes (IC) (EUR Doc 024) have been produced on behalf of the European Air Navigation Planning Group (EANPG).

1.2 The purpose of EUR Doc 024 is to detail the requirements to be met by the States of the ICAO European (EUR) Region to comply with the provisions of the European Basic Air Navigation Plan (EUR ANP) (Doc 7745, Volume I) and the European Facilities and Services Implementation Document (EUR FASID) (Doc 7754, Volume II) as they pertain the management of Secondary Surveillance Radar (SSR) Mode S interrogator Codes (IC) in the ICAO EUR Region.

1.3 The technical requirements and associated procedures may also be adopted by States in adjoining ICAO Regions which elect to participate in the management of Secondary Surveillance Radar (SSR) Mode S interrogator Codes (IC).

## **2. INTRODUCTION**

2.1 The introduction of SSR Mode S in the European region has highlighted the need for a coordinated approach to the allocation of the relevant Interrogator Codes (IC) used by both ground based and airborne platforms. The design of the Mode S system limits the number of codes available (excluding zero) to 15 Interrogator Identifier (II) codes and 63 Surveillance Identifier (SI) codes. In order to avoid ambiguity in the operation of the system it is essential that each IC is protected from interference by other IC operating in coincident or contiguous airspace.

2.2 With an increasing number of fixed and mobile interrogators over an expanding area careful management of the IC allocations becomes both necessary and urgently required over the whole of the EUR Region to ensure the problems are resolved to the extent possible.

2.3 In 2002, it was determined that the installation scene had developed to the extent that regional air navigation agreement on Mode S ICs allocation principles and procedure was necessary. Accordingly the EANPG, at its 44th meeting on 2-5 December 2002, formally agreed to the inclusion of the EUR principles and procedure Procedures for SSR Mode S Interrogator Code (IC) Allocation in the ICAO EUR Air Navigation Plan (Doc 7754). Supplement Table CNS 6 of the ICAO EUR ANP FASID provides the latest status of the SSR Mode S Interrogator Code (IC) Allocations for the ICAO EUR Region. The Table is updates on a semi-annual basis and published on the ICAO EUR/NAT website. Physically, the regional coordination is conducted through the IC Allocation Cell provided by Eurocontrol on request of the ICAO EANPG.

2.4 In 2011, the 53<sup>rd</sup> Meeting of the ICAO EANPG determined that the EUR Principles and Procedures for SSR Mode S Interrogator Code (IC) Allocation should be transferred from the ICAO EUR ANP (Doc 7754) into a separate ICAO EUR Doc 024.

## **3. CIVIL/MILITARY COOPERATION**

3.1 At the outset of the considerations on an agreed IC allocation process it was noted that there was a need for cooperation in the procedures from all States of the Region over whose territory Mode S operations may take place. Since such operations may be either military or civil, cooperation with the military authorities in States should be encouraged throughout the Region.

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## **4. SYSTEMS SUBJECT TO ALLOCATION**

4.1 The principle of operation of Mode S interrogators requires the coordinated allocation of an IC to operate if at least one of the following conditions is true:

- a. The interrogator relies, at least partly, on UF11/DF11 All Call interrogations and replies in order to acquire Mode S targets;
- b. The interrogator locks-out acquired Mode S targets to All Call interrogations;
- c. The interrogator uses multisite communications protocols for datalink applications:
  - i. Air Initiated Comm-B (AICB) with site reservation,
  - ii. multisite uplink Standard or Extended Length Message (SLM or ELM), or
  - iii. multisite downlink SLM or ELM protocols.

4.2 If none of the above conditions is true then the coordinated allocation of an IC is not necessary.

## **5. GENERAL PRINCIPLES**

5.1 Procedures contained in this Attachment are designed to ensure technical and operational compatibility between interrogators. In no way do they diminish the responsibility of National Authorities to approve and licence operators and/or installations in accordance with national regulations.

5.2 Code allocations are made through National Authorities or certain other international bodies. Operators requiring an allocation of codes should make application to the appropriate authority in the first instance.

5.3 Code allocations are subject to revalidation by the Focal Point at regular intervals (typically 5 years). It is the responsibility of the States concerned to initiate any requests for prolongation through the agreed procedures. Codes are not transferable between installations and should be relinquished on the cessation of operation of the installation to which they were allocated.

5.4 Code allocations are not made to mobile installations for which special modes of acquisition are used. However, a number of separate Interrogator Codes might be reserved for special military purpose.

5.5 The accurate determination of specific code allocations depends upon the full cooperation of the States concerned. Thus it will be necessary for national authorities to release the geographical positions of Mode S radar ground installations and their coverage areas to assist the code allocation process. However, such data will not be released outside the IC Allocation Cell without the consent of the authority concerned. For its part, the IC Allocation Cell should be aware of the implications and issues surrounding civil/military IFF/SSR systems in both the operational and technical sense.

5.6 Operators may need to accept alternative IC assignments within the life of the original allocation application. In some cases operating restrictions/conditions may be imposed to ensure the use of Mode S ICs is optimised throughout the EUR Region.

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5.7 Installations used for Test, Research and Development should normally operate on a single code established by the IC Allocation Cell and approved by the MICoG. Since these installations may have overlapping coverage they should coordinate their activities through the IC Allocation Cell. In order to avoid unnecessary RF pollution in the 1090 MHz band, MICoG decided that TRD sites allocated II code 14 would need to use permanent lockout in their entire coverage, and would not be allowed to use All Call lockout override.

## **6. ALLOCATION PROCEDURES**

6.1 Provisions regarding the actions concerning the implementation and monitoring of Mode S IC allocations have been agreed by the EANPG. In this connection, the management of the plan is exercised by Eurocontrol in close coordination with the ICAO EUR/NAT Regional Office. Technical facilities for the determination of IC are based on software programmes available within the IC Allocation Cell to whom enquiries of a technical nature should be directed.

6.2 The IC Allocation Cell works on behalf of, and in close cooperation with, the ICAO Regional Office to establish the IC allocations for the EUR Region. To approve the allocations and to oversee and provide guidance to the IC Allocation Cell the Mode S IC Coordination Group (MICoG), representative of the national regulatory authorities of States implementing Mode S and those international organisations applying for ICs, meets at regular intervals for the purpose. Members of the MICoG or their nominees act as Focal Points of contact between the IC Allocation Cell and the State concerned. The IC Allocation Cell is currently located at Eurocontrol Headquarters.

6.3 Requests for the allocation of an IC may be made to the IC Allocation Cell by those national authorities of the European Region which are empowered to issue, amend or revoke approvals to operate SSR Interrogators, or by a properly designated authority in the case of international organisations.

6.4 Applications for IC allocations must state whether the allocation is required for a temporary or permanent installation.

6.5 States expecting to introduce or change SSR Mode S facilities are requested to advise both the ICAO Regional Office and Eurocontrol as to their intentions. Notification of requests for IC allocation should normally be submitted at least 168 days before the subject installation is to be taken into operation to give adequate time for the application to be processed and any difficulties to be resolved. The allocation process may be undertaken concurrently with a State's examination of the operator's application providing the application has been submitted through the national authority. In exceptional circumstances, where the application cannot be submitted on time, it will be handled under the Ad-Hoc procedure. Codes allocated under this procedure must not interfere with any of the already issued codes.

6.6 Operators of interrogators should apply to the appropriate authority who will ensure that the requirements for operation, technically and procedurally, are met. Having satisfied itself that this is so and that, subject to IC allocation, approval to operate the installation should be given, the appropriate authority will transmit the application to the IC Allocation Cell. If, after having forwarded an application, an authority finds it cannot grant an approval to operate the installation it should immediately notify the IC Allocation Cell and withdraw the application. Applications will not be processed other than from the appropriate authority.

6.7 Requests for allocation shall be raised via the MICA Online Tool. Access to the tool is available from the MICA Cell on request and after approval by the Focal Point.

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6.8 The IC Allocation Cell will employ agreed and updated IC Allocation methodology to establish the allocation of an appropriate Interrogator Code(s) based upon the data supplied. The proposed Interrogator Code(s) and the respective conditions for use (such as coverage requirements) are subject to review by the Focal Point during the review phase within the IC Allocation Cycle. Final approval of the allocation by the Focal Point is required. Detailed explanation of the methodology for allocation is reproduced in the CNS Supplement - SSR Mode S Interrogator Code (IC) Allocations for the EUR Region. (To be issued at a later date.)

6.9 In the event difficulty is encountered by the IC Allocation Cell in providing an IC allocation because of overlapping coverage with one or more Mode S installations in the same State, resolution should be attempted by the national authority of the State concerned, with assistance from the IC Allocation Cell.

6.10 In the event of difficulty encountered in providing an IC Allocation because of overlapping coverage with one or more Mode S installations in adjacent States, resolution should be attempted as follows:

- a) by mediation between the IC Allocation Cell and the Focal Points of the States concerned, or,
- b) by tabling the difficulty at a meeting of the MICoG.

6.11 In the event the difficulty cannot be resolved by the steps above, the Chairman of the MICoG, in coordination with the Director, ICAO Regional Office, will propose the appropriate forum for resolution of the difficulty.

6.12 Specific allocations of Mode S Interrogator Codes to installations currently implemented or planned for implementation within the next few years are contained in the CNS Supplement - SSR Mode S Interrogator Code (IC) Allocations for the EUR Region. (To be issued at a later date.)