
ENR 1.6 RADAR SERVICES AND PROCEDURES

1. PRIMARY RADAR

1.1 Supplementary Services

A radar unit normally operates as an integral part of the parent ATS unit and provides radar service to aircraft, to the maximum extent practicable, to meet the operational requirement. Many factors, such as radar coverage, controller workload and equipment capabilities, may affect these services, and the radar controller shall determine the practicability of providing or continuing to provide radar services in any specific case.

Primary Radar heads are located at Cork, Dublin and Shannon Airports.

1.2 The application of radar control

1.2.1 Radar identification is achieved according to the provisions specified by ICAO.

1.2.2 The radar control service provided may include

- a. radar separation of arriving, departing and en-route traffic;
- b. radar monitoring of arriving, departing and en-route traffic to provide information on any significant deviation from the normal flight path;
- c. radar vectoring when required;
- d. assistance to aircraft in emergency;
- e. assistance to aircraft crossing controlled airspace;
- f. warnings and position information on other aircraft considered to constitute a hazard;
- g. information to assist in the navigation of aircraft.

1.2.3 Full details of the Primary Radar Service offered are available from the relevant ATS Unit.

1.3 Radar and Air-ground Communication Failure Procedures

1.3.1 Radar and radio failure procedures

Aircraft Transmitter Failure

In the event of loss of radio contact with the aircraft due to failure of the aircraft Transmitter, the radar controller first determines whether the aircraft is receiving his transmissions by requesting the pilot to make a turn before attempting to establish contact on another frequency.

Radar Equipment Failure

In the event of radar equipment failure, the radar controller immediately takes action to establish standard IFR separation between aircraft under his control.

Ground Communication Failure

In the event of failure of ground radio communications used for Radar Control, aircraft should immediately establish radio contact with the appropriate ATS Unit, i.e. ACC, APP, TWR.

1.3.2 Procedures relating to air-ground communications failure in controlled airspace
Action by Air Traffic Control

1.3.2.1 Air Traffic Control will maintain suitable separation between the aircraft experiencing the communications failure and other aircraft, based on the assumption that the aircraft which has experienced communications failure will: -

1.3.2.1.1 If in Visual Meteorological Conditions:

- a. continue to fly in Visual Meteorological Conditions
- b. land at the most suitable aerodrome;
and
- c. report its arrival by the most expeditious means to the appropriate Air Traffic Control Unit.

1.3.2.1.2 If in Instrument Meteorological Conditions, or when the weather conditions are such that it does not appear feasible to complete the flight in accordance with [1.3.2.1.1](#)

1. unless otherwise prescribed on the basis of the regional air navigation agreement, maintain the last assigned speed and level, or minimum flight altitude if higher, for a period of 20 minutes following the aircraft's failure to report its position over a compulsory reporting point and thereafter adjust level and speed in accordance with the filed flight plan;
2. proceed according to the current flight plan to the appropriate designated navigation aid/hold serving the destination aerodrome and, when required to ensure compliance with [1.3.2.1.2.3](#) below, hold over this aid/hold until commencement of descent.
3. commence descent from the navigation aid/hold specified at, or as close as possible to, the expected approach time last received and acknowledged, or, if no expected approach time has been received and acknowledged, at or as close as possible to the estimated time of arrival resulting from the current flight plan.
4. complete a normal instrument approach procedure as specified for the designated navigation aid/hold; and
5. Land, if possible, within thirty minutes after the estimated time of arrival specified in [1.3.2.1.2.3](#) above or the last acknowledged expected approach time whichever is later.

1.3.2.2 Action taken to ensure suitable separation will cease to be based on the assumption stated in [1.3.2.1.1](#) when:

1. It is determined that the aircraft is following a procedure differing from that in [1.3.2.1.1](#)
or
2. Through the use of electronic or other aids, Air Traffic Control Units determine that action differing from the required by [1.3.2.1.1](#) may be taken without impairing safety;
or
3. Positive information is received that the aircraft has landed.

1.3.2.3 Resumption of Normal Operations

If the aircraft has not reported within 30 minutes after:-

1. the estimated time of arrival furnished by the Pilot;
or
2. the estimated time of arrival calculated by the Control Centre;
or
3. The last acknowledged expected approach time whichever is the later, pertinent information concerning the aircraft will be forwarded to aircraft operators or their designated representatives and pilots in command of any aircraft concerned. After consultation with operators, or their designated representatives and pilots in command of any aircraft concerned, normal operations may be resumed. It is the responsibility of the aircraft operators to their designated representatives and pilots in command of aircraft, to determine whether they will resume operations or take other action.

1.3.2.4 Navigation Aid/Hold to be used

AERODROME	NAVIGATION AID/HOLD
CORK	ROVAL Hold for RWY 16
	GODSA Hold for RWY 34
	UPLM Hold for RWY 07
	GINGI Hold for RWY 25
DUBLIN ACC NORTH	see EIDW AD 2.22.5.3.2.1 for RWY 28L
	KERAV Hold for ILS approach RWY 16, RWY 34
	ULTAG Hold for ILS approach RWY 10R
DUBLIN ACC SOUTH	see EIDW AD 2.22.5.3.2.4 for RWY 28L
	NASRI Hold for ILS approach RWY 10R
	ULTAG hold for ILS approach RWY 16
	SORIN Hold for ILS approach RWY 34

AERODROME	NAVIGATION AID/HOLD
SHANNON	DERAG for ILS approach RWY 24
	ELPOM for ILS approach RWY 06

1.3.3 Communications Failure - Departing Aircraft

1. A departing controlled IFR flight operating in instrument meteorological conditions, having acknowledged an initial or intermediate clearance to climb to a level other than the one specified in the current flight plan for the en-route phase of the flight, and experiencing two-way radio communication failure should, if no time limit or geographical limit was included in the climb clearance, maintain for a period of three minutes the level to which it was cleared and then continue its flight in accordance with the current flight plan.

Note: The effect of this procedure is to introduce a uniform clearance limit for application in cases where the use of tactical control methods by the air traffic control makes it impracticable to include a time limit or a geographical limit in each climb clearance.

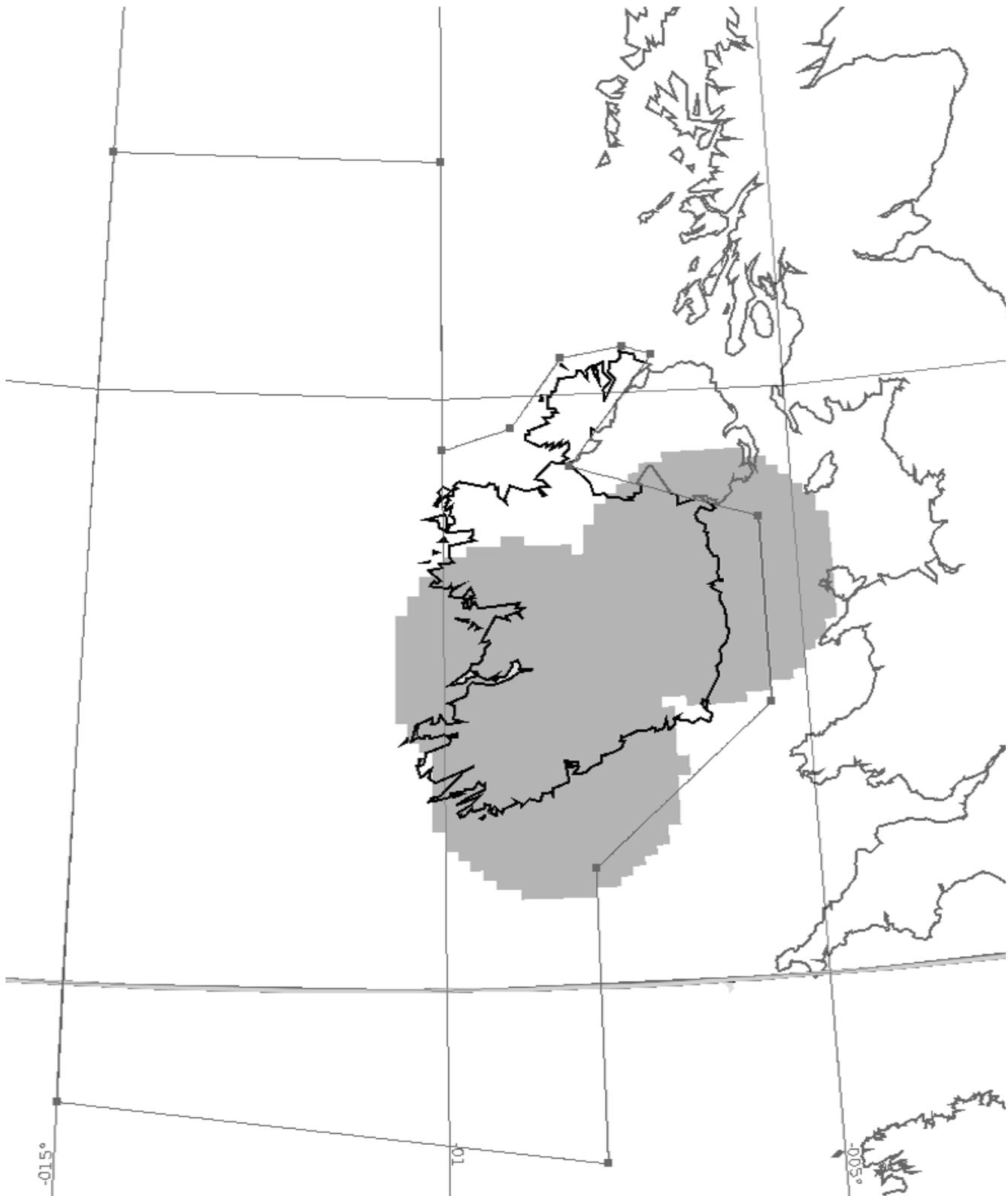
Note: The level specified in the current flight plan means the level contained in the en-route air traffic control clearance acknowledged by the pilot.

2. A departing controlled IFR flight being vectored by radar away from the route specified in its current flight plan and experiencing two-way radio communication failure should proceed in the most direct manner to the route specified in the current flight plan.

1.4 Voice and CPDLC position reporting requirements

Refer to [GEN 3.4 3.9 CPDLC Services](#) for further information

1.5 Graphic portrayal of area of radar coverage



2. SECONDARY SURVEILLANCE RADAR

Airborne Equipment

In pursuance of Article 52 (2) of the schedule of the Air Navigation (Operations) Order, 2002, (S.I. No. 437 of 2002), all aircraft operated in accordance with the Instrument Flight Rules (IFR) in controlled airspace within the Shannon FIR/UIR shall be equipped with and maintain in operation, Secondary Surveillance Radar (SSR) Transponders capable of responding to Mode A interrogations with 4096 codes and to Mode C interrogations with Automatic Pressure Altitude Reporting.

The Relevant standards for SSR Transponders are contained in Annex 10 Volume IV

The Irish Aviation Authority as the Competent Authority and National Supervisory Authority designated and nominated by the Minister in pursuance of S.I No.469 of 2003, European Communities (European Aviation Safety Agency) Regulations, 2003 and S.I No.95 of 2008, European Communities (European Aviation Safety Agency) Regulations, 2008 and as provided in S.I No 72 of 2004, the Irish Aviation Authority (Rules of the AIR) Order, 2004 and, in accordance with Commission Implementing Regulation (EU) No.923/2012, SERA.6005, Requirements for communications and SSR transponder (b) (1), hereby prescribes the following:

- All airspace that has been classified as Class C within the Shannon Flight Information Region and Shannon Upper Flight Information Region is hereby designated as a transponder mandatory zone (TMZ). All flights operating in a TMZ shall carry and operate SSR transponders capable of operating on Modes A and C or on Mode S, unless in compliance with alternative provisions prescribed by the Air Navigation Service Provider (ANSP) that has been designated for that particular airspace.
- An aircraft so equipped but with its transponder temporarily unserviceable may be admitted to Class C airspace only, at the discretion of the ATS Unit responsible for air traffic services provision in that airspace, on an exceptional case by case basis only, provided that the aircraft concerned shall immediately vacate such airspace when so instructed by the ATS Unit concerned.

SSR Ground Equipment

The SSR equipment is: -

- a. Associated with primary radar.
- b. Capable of interrogating on Modes A and C.
- c. Capable of decoding up to 4096 codes.

SSR Service

Radar service is provided in the Shannon FIR/UIR in accordance with procedures specified in ICAO DOC 4444 – ATM 501/15 as supplemented by ICAO Regional Procedures.

The airspace within which radar services may be provided comprises those parts of the Shannon FIR/UIR within range of the Shannon, Dublin (3 Stations), Mount Gabriel (2 Stations), Cork, Woodcock Hill, Malin and Dooncarton MSSR stations.

Operating Procedures

Operation of Transponders

Except in cases of Emergency [ENR 1.6.2.1](#), Unlawful interference [ENR 1.6.2.2.1](#), Radio failure [ENR 1.6.2.2.2](#) or as specified in sub-paragraph [b](#), below, pilots shall operate the transponder and select modes and codes in accordance with ATC instructions.

Aircraft operators and flight crew are reminded of the following requirement when entering Shannon **FIR/UIR/SOTA/NOTA**

Pilots of aircraft about to enter the Shannon FIR/UIR shall

- a. If proceeding from an area where specific instructions concerning the setting of the transponder have been received from ATC, maintain that setting until otherwise instructed.
- b. If proceeding from an area where no specific instructions concerning the setting of the transponder have been received, operate the transponder on **Mode A code 2000** before entry and maintain that code setting until otherwise instructed.
- c. Pilots shall not operate the SSR SPI feature unless requested by ATC.

NOTE: There have been numerous occasions where aircraft are not squawking 2000 but still squawking a code from a previous domestic Air Navigation Service Provider.

Flights entering the Shannon FIR/UIR/SOTA/NOTA are further requested to establish radio contact with Shannon Control as follows:

- Where traffic is entering the Shannon FIR/UIR/SOTA/NOTA flight crew are requested to contact Shannon Control on the assigned frequency at or before entry point at 15W.
- Northbound traffic entering via the SOTA boundary at OMOKO, TAMEL, GELPO or LASNO should make contact after 48N and no later than LASNO, GELPO, TAMEL or OMOKO.
- Southbound traffic entering via the NOTA boundary at AGORI should make contact after 5730N and no later than AGORI.

2.1 Emergency Procedures

2.1.1 The pilot of an aircraft encountering a state of emergency and who has previously been directed by ATC to operate the transponder on a specific code shall maintain this code setting unless otherwise advised by ATC.

2.1.2 In all other circumstances, the transponder shall be set to Mode A code 7700.

2.1.3 Notwithstanding the procedures at [2.1.1](#), a pilot may select Mode A code 7700 whenever he has specific reason to believe that this would be the best course of action.

Note: Mode A Code 7700 is permanently monitored in the Shannon *FIR/UIR*.

2.2 Air-ground Communication Failure and Unlawful Interference Procedures;

2.2.1 Unlawful Interference Procedures

Pilots of aircraft in flight subjected to unlawful interference shall endeavour to set the transponder to Mode A Code 7500 to give indication of the situation, unless circumstances warrant the use of Code 7700.

Note: Mode A Code 7500 is permanently monitored in the Shannon *FIR/UIR*.

2.2.2 Radio Communication Failure Procedures

The pilot of an aircraft losing two way communications shall set the transponder to Mode A code 7600 and follow the procedures as detailed in [EIDW AD 2.22.5.3](#), [ENR 2.2](#) as appropriate; subsequent control of the aircraft will be based on these procedures.

Note: A controller observing a response on the radio communications failure code will ascertain the extent of the failure by instructing the pilot to operate the SPI feature or to change code. Where it is determined that the aircraft receiver is functioning, further control of the aircraft will be continued using code changes or SPI transmission to acknowledge receipt of clearances issued.

Note: Mode A code 7600 is permanently monitored in the Shannon *FIR/UIR*.

2.3 The system of SSR code assignment

2.3.1 Conspicuity Code

- a. Pilots of uncontrolled aircraft operating within the Shannon FIR shall activate their transponder on Modes A and C and select Code 7000 unless
 - i. a different code is assigned by ATC,
or
 - ii. circumstances require the use of one of the Special Purpose Codes.
- b. The fact that the transponder is set does not mean that the flight is being controlled
- c. Pilots are warned of the need for caution when selecting Code 7000 due to the proximity of the International Special Purpose Emergency Codes.

2.3.2 Code Assignment Method

Since 2011 Ireland is part of the CCAMS area (Central Code Assignment & Management System).

This method of SSR code assignment is a pan-European solution to overcome the current and future shortages of the SSR codes used by Air Traffic Control for radar services.

CCAMS is a service based on a central server which is located in the CFMU Network Management Unit which provides a unique Mode 3/A SSR code to each flight operating in the European region. Assigning codes on a central basis is the most optimum code assignment that can be achieved which avoids code changes and code conflicts while coping with the increased traffic demand.

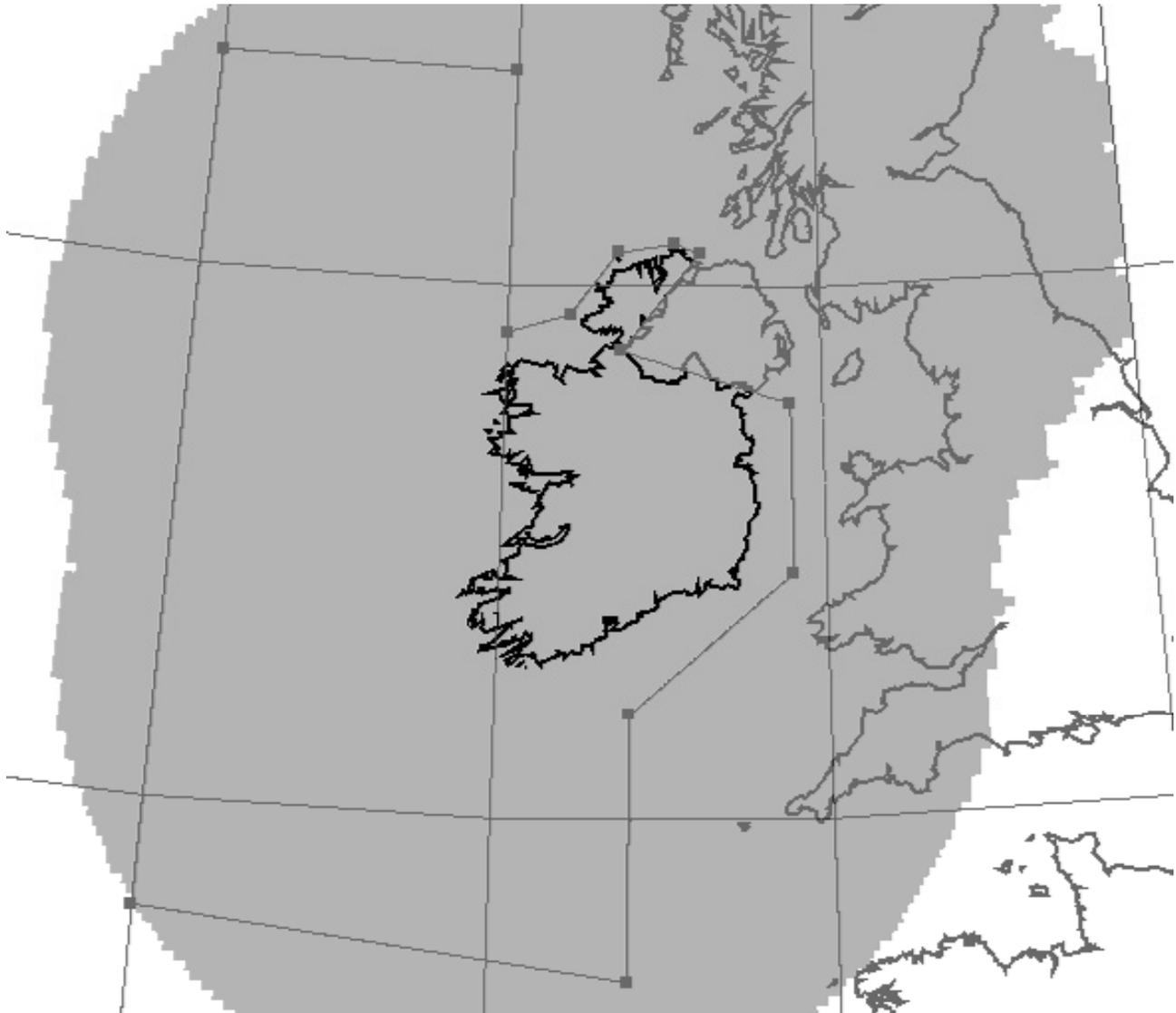
The result of this new SSR code assignment process is that all IFR aircraft in transit throughout the Shannon FIR/UIR, the Shannon Oceanic Transition Area (SOTA) and the Northern Oceanic Transition Area (NOTA) and aircraft departing from within the Shannon FIR will be assigned SSR Codes which Ireland receives on a dynamic basis from CCAMS, which will result in fewer SSR code changes for Pilots as the flight progresses across Europe.

In addition Westbound aircraft in transit through the Shannon FIR/UIR, the Shannon Oceanic Transition Area (SOTA) and the Northern Oceanic Transition Area (NOTA) or westbound aircraft destined for aerodromes within the Shannon FIR will retain the now CCAMS approved SSR Codes which are assigned by the adjacent ACC's.

2.4 Voice and CPDLC position reporting requirements

Refer to [GEN 3.4 3.9 CPDLC Services](#) for further information

2.5 Graphic portrayal of area of SSR coverage



2.6 Phraseology

The phraseology to be used shall conform to that prescribed in ICAO Regional Supplementary Procedures, DOC 7030, RAC section.

When acknowledging mode/code setting instructions pilots shall read back the mode and code to be set.

Flight Plan Notification of SSR Capability

The aircraft SSR capability shall be indicated by the inclusion in item 10 of the flight plan of one of the follow:-

N	NIL	
A	Transponder	Mode A - 4096 Codes

C	Transponder	Mode A – 4096 Codes and Mode C
X	Transponder	Mode S without pressure altitude and without aircraft identification transmission
P	Transponder	Mode S with pressure altitude but without aircraft identification transmission
I	Transponder	Mode S with aircraft identification but without pressure altitude transmission
S	Transponder	Mode S with both aircraft identification and pressure altitude transmission

2.7 SSR Transponder Failure – Action

2.7.1 Pilots of aircraft having experienced transponder failure shall ensure that faulty transponders are restored to normal operation at the earliest possible time, i.e. if possible at the first landing after the event

2.7.2 ATC units will endeavour to provide for continuation of a flight with a faulty transponder in accordance with the original flight plan. However, in certain traffic situations, either in terminal areas or en-route, continuation of the flight may not be possible, particularly when failure is detected shortly after take-off. The aircraft may then be required to return to the departure aerodrome or to land at another aerodrome acceptable to the operator concerned and to ATC.

Note: At the present time, the temporary failure of SSR Mode C alone would not restrict the normal operation of the flight.

2.7.3 Transponder failure before intended Departure

a. At a particular aerodrome where it is not practicable to effect a repair to an unserviceable transponder before intended departure, the aircraft concerned will be permitted to proceed, as directly as possible to the nearest suitable aerodrome where repairs can be made.

b. Before submission of a flight plan, or as soon as possible thereafter pilots of such aircraft shall inform ATC of the defective state of their transponder. When granting clearance to such aircraft, ATS will take into consideration the existing or anticipated traffic situation and may have to modify the time of departure, flight level or route of the intended flight. Subsequent adjustments may become necessary during the course of the flight.

c. The defective state of the transponder shall be indicated in the ICAO flight plan form by inserting in item 10 under "SSR" the letter N for complete un-serviceability or, in case of partial transponder failure, the letter corresponding to the remaining transponder capability as specified in ICAO DOC 4444 - ATM 501/15 Appendix 2.

2.7.4 Transponder Failure after Departure

a. In case of a failure, which is detected after departure, pilots will act in accordance with the last received and acknowledged clearance, or in accordance with any amended clearance which may be issued by ATC.

b. Whenever an aircraft having experienced transponder failure, cannot obtain the required maintenance at the first aerodrome of landing after the event, the provisions contained under "Transponder failure before intended departure" apply.

2.8 Monitoring Codes

Monitoring codes/listening squawks have been introduced in order to help reduce the number of airspace infringements in both the Shannon FIR and Dublin CTA. Pilots are reminded that the selection of a monitoring code/listening squawk does not imply the provision of an ATC Service.

2.8.1 SHANNON FIR

Traffic operating in class G airspace who have not filed a flight plan but who are monitoring or receiving a Flight Information Service on SHANNON Information frequency 127.500MHz are requested to squawk 2655.

2.8.2 DUBLIN CTA

Aircraft operating close to the Dublin Control Zone and not requiring an air traffic control service are strongly advised to monitor the Dublin Flight Information Frequency 118.500MHz. Pilots monitoring this frequency should select the listening squawk 0401 to indicate that they are monitoring the frequency.