



Air-Ground Communications Survey Results



Air-Ground Communications Survey 2023

Results

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Executive Summary

The IAA conducted a survey of General Aviation operators. The purpose of the survey was four-fold;

1. To conduct a Regulatory Impact Assessment regarding the requirement for the allocation of 8.33 kHz channel spaced frequencies in Ireland;
2. To assess the number of 8.33 kHz spacing capable radios in use in aircraft in Ireland;
3. To assess the proliferation of portable Electronic Conspicuity (EC) devices in Ireland; and
4. To better understand any communication difficulties in/near/below the Dublin CTA (FIS 118.5 MHz).

The results of the survey showed that there was a marked increase in the use of 8.33 kHz spacing capable radios indicating that an extension to the current exemption will not be required.

However, the survey also shows that not all aircraft have, as yet, had their radios removed or upgraded. In this case, some frequencies e.g. SNN FIS and DUB FIS, should remain unchanged to prevent inadvertent interference from non-8.33 kHz spacing capable (legacy) radios being used in uncontrolled airspace by pilots in urgency/distress.

The use of portable EC devices appears to be common in Ireland. While they are only permitted to be used in receive mode as the ComReg radio licencing requirements can't be met at this time, they add to the situational awareness of the pilot. It is recommended that the IAA and ComReg consider the establishment of a working group to see how EC devices can be used legally in Ireland.

Reports of Flight Information Service (FIS) difficulties with DUB FIS were all found to be related to attempted communications at locations or heights beyond the calculated area where line-of-sight VHF communications would be expected. It is recommended that the IAA and AirNav Ireland initiate a campaign of information to inform pilots of the limitations of VHF communications. It is also recommended that AirNav Ireland consider assigning a Low-Level Common Frequency for locations where FIS is unavailable. Furthermore, it is recommended that Shannon Information consider not transferring pilots to Dublin Information in locations where Dublin FIS is unavailable.

Introduction

IAA conducted a survey of General Aviation operators, regarding the capabilities of the air-to-ground radios in use, use of Electronic Conspicuity (EC) devices and communications in/near/below the Dublin CTA. The survey was launched on Monday 20th February 2023 and was due to run until 31st March 2023. The end date was subsequently extended until 14th April 2023. The purpose of the survey was four-fold;

1. To conduct a Regulatory Impact Assessment regarding the requirement for the allocation of 8.33 kHz channel spaced frequencies in Ireland;
2. To assess the number of 8.33 kHz spacing capable radios in use in aircraft in Ireland;
3. To assess the proliferation of portable Electronic Conspicuity (EC) devices in Ireland; and
4. To better understand any communication difficulties in/near/below the Dublin CTA (FIS 118.5 MHz).

See Appendix 1 for the survey questions.

This report outlines the results of that survey and provides an analysis of same.

8.33kHz Channel Spacing capability

The frequency band 117.975 – 137 MHz is allocated on a worldwide basis to the Aeronautical Mobile (Radiocommunication) Service (AM(R)S) and is mainly used for

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aeronautical air/ground voice communications and air/ground data communications. This band can support 760 channels, if these channels are spaced by 25 kHz.

The very high number of frequency assignments (channels) in the central European region means that a readily available frequency can rarely be found. This is known as frequency congestion.

To increase the number of channels available, in the medium to long term, it was decided to reduce the channel spacing to 8.33 kHz. This reduction allows for the creation of three channels where before there was only one.

Radios used on aircraft operating in airspace above Flight Level 195 (19,500 ft) have been required to have 8.33 kHz spacing compliant radios for a number of years now. Aircraft flying under Instrument Flight Rules in Class A, B, or C airspace have been obliged to have 8.33 kHz spacing compliant radios since 1 January 2014. Regulation (EU) No 1079/2012 required that all radios used in airspace where carriage of radio is required, be capable of being tuned to frequencies spaced at 8.33 kHz intervals, by 1st January 2018. However, Ireland enjoys an exemption from this requirement until 31 December 2024.

In 2015, the Irish Aviation Authority established a working group to review the impact of Commission Implementing Regulation (EU) No 1079/2012. This group comprised of personnel from different departments in the IAA including Aeronautical Navigation Services (now AirNav Ireland), Airworthiness and Flight Operations. A survey was carried out in April 2015 to establish the status of radio equipment in Ireland. It was shown that nearly 90% of General Aviation aircraft did not have 8.33 kHz channel spacing capable radios.

As noted in recital (10) to the regulation, the requirements for General Aviation aircraft operating under visual flight rules to be equipped with 8.33kHz channel spacing capable radios would impose a considerable cost with limited operational benefit. Also, the working group acknowledged that one solution available to aircraft operators flying in Class G airspace would be to remove the radio completely. This was seen as a retrograde step in terms of aviation safety.

As a result of the survey, the possibility of exempting aircraft from the regulation was considered. An exercise was completed, in conjunction with EUROCONTROL, to assess the impact that such exemptions would have on the network. In the case of Ireland, it was found that such an exemption would have limited impact on the network. Therefore, an exemption to the regulation was issued until 31 December 2024, and all aircraft owners/operators availing of this exemption were encouraged to upgrade their radio in the interim.

The 2023 survey was used as an opportunity to assess the level of compliance with the regulation and the impact of the expiration of the exemption.

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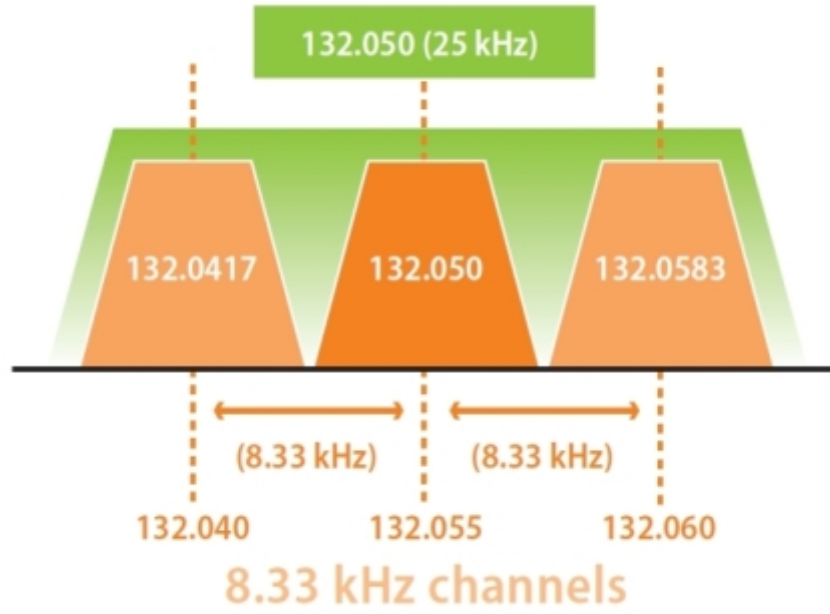


Figure 1 Radio frequency spacing.

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Survey Results regarding 8.33 kHz channel capability

The Survey received 106 valid responses.


Table 1: Types of Radios

Radio Type	No. of respondents
Fixed installation on an aircraft	104
Handheld	2
Total	106

79% of all respondents indicated that their aircraft radios were 8.33kHz channel spacing capable.

7. Is the aircraft radio 8.33 kHz spacing capable?

[More Details](#)

 Insights

- Yes 85
- No 22



Figure 2 8.33 kHz spacing capable

66% of all respondents indicated that their aircraft had a second radio fitted. Of those, 69% were 8.33 kHz channel spacing capable.

Summary /Analysis

The survey results show a marked increase in the number of aircraft which use radios that are 8.33kHz channel capable when compared to the levels noted in the 2015 survey. While this is a positive step, it should be noted that not all aircraft are equipped with such radios. The regulatory compliant solution, as noted in 2015, would be to remove any older radio. This would not enhance safety for pilots operating in Class G airspace. This report recommends that AirNav Ireland consider the retention of FIS frequencies at Shannon and Dublin, and the unassigning of the neighbouring 8.33 kHz spaced frequencies. This would help prevent inadvertent interference from non-8.33 kHz spacing capable (legacy) radios being used in uncontrolled airspace by pilots in urgency/distress.

Please Note:

- i. All new frequencies issued by AirNav Ireland in Ireland must be spaced at 8.33kHz.
- ii. The exemption to the carriage of 8.33kHz spacing capable radios will expire on **31 Dec 2024**.

Recommendations

1. It is recommended that the exemption to (EU) No 1079/2012 not be renewed.

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- It is recommended that the IAA promulgate information to the General Aviation community regarding the requirement to use an 8.33 kHz spacing capable radios after 31 Dec 2024.
- It is recommended that FIS frequencies remain on 127.5 MHz and 118.5 MHz.

Electronic Conspicuity (EC)

EC is a term used for a range of technologies that can help airspace users be more aware of other aircraft in the same airspace. It includes transponders and radios. At the most basic level, aircraft equipped with an EC device effectively signal their presence to other airspace users. This augments the “see and be seen” philosophy traditionally used by pilots in uncontrolled airspace. Additionally, many EC devices may also receive signals from others. This then alerts pilots to the presence of other aircraft which may assist the pilot in being able to visually acquire the aircraft and take avoiding action.

EC devices, such as Mode S Transponders, are mandatory for specific aircraft but are not mandatory for light aircraft and there is no requirement for a transponder or radio for light aircraft operating in Class G airspace. Installing such equipment can be expensive, add excessive weight, and/or have unrealistic power requirements for the aircraft.

Portable EC devices have come on the market which are more suited to light aircraft. They are not a substitute for a transponder and do not fulfil the requirement where the carriage of a transponder is mandatory. However, they could offer the airspace user additional information to increase their situational awareness.

EC devices may use Automatic Dependent Surveillance-Broadcast (ADS-B) technology or the mobile phone network. The Survey aimed to establish the level of use of such devices and whether they were using the ADS-B technology or mobile phone network.

From the 106 respondents, 36% use a portable EC device, 54% do not, and 10% plan on purchasing one in the future. 34% of devices transmit on ADS-B 1090 MHz, 26% transmit on the mobile phone network, 8% receive only, while 32% transmit on ‘other’ which was noted as being FLARM® systems using UHF band (868 MHz).

12. Do you use a portable Electronic Conspicuity (EC) device in the aircraft?

[More Details](#)

[Insights](#)

● Yes	38
● No	58
● I plan on purchasing one in the ...	11



Figure 3 Portable EC Devices on aircraft

When asked if the EC device transmitted a Mode S code from the aircraft, those who had indicated that their EC device transmitted on ADS-B 1090 MHz indicate that it did, while all others with an EC Device indicated that it didn't.

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Analysis of Electronic Conspicuity (EC) use in Ireland

A significant number of the respondents are using portable EC devices. Some reported that the devices are transmitting on the aviation band. Portable EC devices are reported to have significant benefits to pilot's situational awareness.

Such devices, when transmitting from an aircraft, require to be included on the Aircraft Radio Station licence. Under current legislation, however, only installed equipment may be included on an Aircraft Radio Station licence. Therefore, only portable EC devices used in the "receive" mode may be legally used in Ireland.

FLARM®

FLARM® is an EC device used to alert pilots of potential collision between aircraft. It may be installed on light aircraft in accordance with CS-STAN Standard Change. It operates on a frequency of 868 MHz and uses an internal GPS and barometric sensor to forecast data about the aircraft's future track. It shares that information with other FLARM® devices, which allows the system to alert the pilot of a potential conflict.

FLARM® was originally developed for sailplanes and the device is considered a Standard Part in the case of Sailplanes and may be installed without a Form 1. The system, however, is not compatible with Transponder Mode A/C/S, ADS-B, or TCAS/ACAS. It has low power consumption (approx. 10mW) and commonly used in sailplanes, which often operate in close proximity to each other. The effective range is specified as 3 to 5 km.

Recommendations

1. It is recommended that the IAA and ComReg establish a working group to analyse the introduction of portable EC devices into light aircraft in General Aviation in Ireland.
2. It is recommended that the IAA consider implementing measures to encourage the use of EC devices in General Aviation in Ireland.

Communication Difficulties

A "Flight Information Service" (FIS) is a form of Air Traffic Service (ATS) which is available to any aircraft within a Flight Information Region (FIR). Usually, the service has a callsign suffix *information*, such as *Dublin Information*. The FIS provides information and assistance useful for the safe and efficient conduct of the flight, at the request of the pilot. However, when FIS is provided by an Air Traffic Controller, the provision of ATC (Air Traffic Control) always takes precedence over the provision of FIS.

The core elements of FIS may include information about;

- Weather for departure, destination and alternate aerodromes as well as AIRMET and SIGMET;
- Volcanic activity;
- Release of hazardous chemical or radioactive materials,
- changes in the availability of radio navigation services;
- changes in condition of aerodromes and associated facilities;
- unmanned free balloons; and

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- Any other information likely to affect safety e.g. actual information on the use of airspace, activation of danger/restricted areas, known parachute activities as well as traffic information on other flights. Although separation from those other flights remains the responsibility of the PIC.

The IAA's air-ground communications survey included questions to better understand any communication difficulties in/near/below the Dublin CTA (FIS 118.5 MHz).

Of the 106 responses to the survey:

3. 63 indicated that they flew in/near/under the Dublin CTA often (10-20 times) or regularly (20+ times) in the previous 12 months.
 - Of these, 31 indicated that there were times when they couldn't establish or had difficulty establishing two-way communications.

Most of those respondents gave details of where they couldn't establish two-way communications. Some respondents were contacted to clarify their response and amendments to some responses were made to add clarity. All the responses are included in Appendix II to this report.

VHF Radio Communications

FIS in Ireland is provided on a VHF (Very High Frequency) AM (amplitude modulated) radio signal. This is a line-of-sight technology that is affected by atmospheric conditions and terrain. Pilots should never solely rely on FIS as they may not be able to establish communications with the FIS provider.

Pilots may experience poor communications or even no communication when flying through mountainous terrain as VHF radio is line-of-sight technology. Also, depending on the power output of the aircraft radio, the transmitted signal may not be strong enough to reach the FIS. AIC 013/2022 states that "*Flights operating in the Shannon FIR Class G airspace under the Dublin CTA, should contact Dublin Information for traffic information. If no contact is received, traffic can contact Shannon Information who will relay the information.*"

Communications Difficulties analysis

Reports of Flight Information Service (FIS) difficulties with DUB FIS were all found to be related to attempted communications at locations or heights beyond the calculated area where line-of-sight VHF communications would be expected. Pilots are reminded that they may contact Shannon Information in such instances, and to not rely solely on FIS for the safe conduct of their flight.

The UK Aeronautical Information Service has recently launched a VHF Low Level (LL) common frequency for use in areas where FIS is unavailable. This is designed to improve situational awareness when pilots are not in receipt of an Air Traffic Service.

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Recommendations

1. It is recommended that AirNav Ireland consider their handover procedures from Shannon Information to Dublin Information for aircraft at low level where the pilot may not be able to establish two-way communications with Dublin Information.
2. It is recommended that the IAA and AirNav Ireland promulgate information on the technicalities of VHF radio functionality and FIS dependency.
3. It is recommended that AirNav Ireland consider the appropriateness of assigning a Low Level Common Frequency in Ireland.

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Recommendations

8.33kHz channel spacing

1. It is recommended that the exemption to (EU) No 1079/2012 not be renewed.
2. It is recommended that the IAA promulgate information to the General Aviation community regarding the requirement to use an 8.33kHz spacing capable radios after 31 Dec 2024.
3. It is recommended that FIS frequencies remain on 127.5 MHz and 118.5 MHz.

Electronic Conspicuity (EC) devices

4. It is recommended that the IAA and ComReg establish a working group to analyse the introduction of portable EC devices into light aircraft in General Aviation in Ireland in a safe and compliant way.
5. It is recommended that the IAA consider implementing measures to encourage the use of EC devices in General Aviation in Ireland.

Communications Difficulties

6. It is recommended that AirNav Ireland consider their handover procedures from Shannon Information to Dublin Information for aircraft at low level where the pilot may not be able to establish two-way communications with Dublin Information.
7. It is recommended that the IAA and AirNav Ireland promulgate information on the technicalities of VHF radio functionality and FIS dependency.
8. It is recommended that AirNav Ireland consider the appropriateness of assigning a Low-Level Common Frequency in Ireland.



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Appendix II – Responses regarding communications difficulties

Please advise if the two-way radio communication problem was;	Please provide brief details of communication difficulties experienced including; date; time of day; aircraft position including altitude and heading; and details of the aircraft radio in use e.g...
Dublin Flight Information Service had difficulty hearing me or couldn't hear me	<p>One occasion unreadable to Dublin. Date & time unknown. Positioned north of Kilrush field 1500 ft northbound - installed radio On a separate occasion (subsequently) able communicate 5x5 to and from Dublin Info, also successfully checked transponder and ADSB-out operational</p>
Could not establish two-way communications with Dublin Flight Information Service	<p>It's always at around 2000-4000 ft about Wicklow mountains, especially around Baltinglass, Glendalough area. No problem with Shannon info in same area.</p>
both first and second option	<p>13/10/2022 at approx 1300 between Mountmellick and Portarlinton heading 020 at 2000ft, Garmin 530 installed and in use, DUB FIS barely readable, two-way comms eventually established.</p> <p>DUB FIS often has difficulty hearing me or can't hear me south abeam Kilcock heading 270 at 1000ft to 1500ft, Garmin 530 installed and in use. two-way comms often only established following a climb to 2000ft</p>
Could not establish two-way communications with Dublin Flight Information Service	<p>Can't get Dublin south of Edenderry and sometimes southwest of Kinnegad</p>
Could not establish two-way communications with Dublin Flight Information Service	<p>Edenderry and Tullamore areas</p>
Could not establish two-way communications with Dublin Flight Information Service	<p>Edenderry and Tullamore areas</p>
Could not establish two-way communications with Dublin Flight Information Service	<p>Edenderry and Tullamore areas</p>
Could not establish two-way communications with Dublin Flight Information Service	<p>Edenderry and Tullamore areas</p>



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Could not establish two-way communications with Dublin Flight Information Service	Edenderry and Tullamore areas
Could not establish two-way communications with Dublin Flight Information Service	Edenderry and Tullamore areas
Could not establish two-way communications with Dublin Flight Information Service	We routinely monitor Shannon low level when working East Coast - at low ALT ,2000' AMSL there tends to be a black spot between Courtown and Arklow. For our operation we advise Shannon of our intended time to request entry into the Dublin CTZ with Dublin FIS - generally achieving two-way comms North of Arklow >1500' AMSL.
Could not establish two-way communications with Dublin Flight Information Service	Gorey Arklow area at 3500 ft
Could not establish two-way communications with Dublin Flight Information Service	Regular Comms issues beyond a 20nm radius of Dublin airport below 1500ft
I couldn't hear or had difficulty hearing Dublin Flight Information Service	Towards the edge of Dublin's airspace i.e., boundary sign Shannon
	In the past two-way communications with Dublin was not an issue (circa 1500ft, 10nm) from Kilrush airfield. In recent years this has become more difficult.
	In the past I've confirmed comms with Shannon to rule out aircraft issues.
	It maybe purely coincidental but the time frame coincided with the new tower in EIDW.
Could not establish two-way communications with Dublin Flight Information Service	I would be happy to bring someone up if that would help.
Could not establish two-way communications with Dublin Flight Information Service	There is a large area west of Kilcock where Dublin FIS cannot be contacted below 1500 feet despite being close to Dublin.
I couldn't hear or had difficulty hearing Dublin Flight Information Service	
Could not establish two-way communications with Dublin Flight Information Service	Regularly cannot establish two way comms approaching the Dublin CTR from the south at 2000'. As a result I contact Dub Twr before the zone boundary.
	It's a regular occurrence but to give specific dates. 22 and 23 Feb, immediately north and northwest of EICL at 2,000ft and below not far from the Mount Lucas wind farm. Signal became intermittent flying north and then strong two-way close to the Kinnegad Cement factory down to 1200ft. Also experienced difficulties in and around Mountmellick / Portarlinton at and below about 2,200ft.
I couldn't hear or had difficulty hearing Dublin Flight Information Service	

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<p>I couldn't hear or had difficulty hearing Dublin Flight Information Service</p>	<p>It's a regular occurrence but to give specific dates. 22 and 23 Feb, immediately north and northwest of EICL at 2,000ft and below not far from the Mount Lucas wind farm. Signal became intermittent flying north and then strong two-way close to the Kinnegad Cement factory down to 1200ft. Also experienced difficulties in and around Mountmellick / Portarlinton at and below about 2,200ft.</p>
<p>I couldn't hear or had difficulty hearing Dublin Flight Information Service</p>	<p>It's a regular occurrence but to give specific dates. 22 and 23 Feb, immediately north and northwest of EICL at 2,000ft and below not far from the Mount Lucas wind farm. Signal became intermittent flying north and then strong two-way close to the Kinnegad Cement factory down to 1200ft. Also experienced difficulties in and around Mountmellick / Portarlinton at and below about 2,200ft.</p>
<p>I couldn't hear or had difficulty hearing Dublin Flight Information Service</p>	<p>It's a regular occurrence but to give specific dates. 22 and 23 Feb, immediately north and northwest of EICL at 2,000ft and below not far from the Mount Lucas wind farm. Signal became intermittent flying north and then strong two-way close to the Kinnegad Cement factory down to 1200ft. Also experienced difficulties in and around Mountmellick / Portarlinton at and below about 2,200ft.</p>
<p>Dublin Flight Information Service had difficulty hearing me or couldn't hear me</p>	<p>Frequently have issues communicating with Dublin FIS approx 2000' in Mullingar, Monasterevin or EIKH areas. Also poor comms operating 2000' off the Wicklow coast approx south of EINC. Shannon 127*5 often OK in these areas.</p>
<p>Could not establish two-way communications with Dublin Flight Information Service</p>	<p>Many Offshore Maritime Surveys done off the east coast experience poor/no comms with Dublin FIS e.g. 17 Jan 22 approx 5 NM East of Arklow I was able to use Shannon 127.5 but not Dublin.</p>
<p>Could not establish two-way communications with Dublin Flight Information Service</p>	<p>En-route Waterford to Kilrush, Shannon 127.50 would typically like to hand you over to Dublin 118.50 around Carlow Town. 2-way coms won't be possible below 2000ft in that area. Also south of the Wicklow Mountains around Hacketstown, there is no 2 way with Dublin below 3,000ft - not surprisingly as Lugnaquilla is about 2970ft and it is line of sight. Date, time of day and heading are all completely irrelevant in this case.</p>
<p>I couldn't hear or had difficulty hearing Dublin Flight Information Service</p>	<p>May 2021 at 800 ft enroute from a field in Kilkenny to Weston, around Kildare.</p>
<p>Could not establish two-way communications with Dublin Flight Information Service</p>	<p>Regular. Often cancel Flight Plans with Shannon because Dublin is uncontactable. Major blindspot in the Athy area.</p>
<p>Could not establish two-way communications with Dublin Flight Information Service</p>	
<p>Could not establish two-way communications with Dublin Flight</p>	<p>Various dates, during VFR hours, westbound approaching the Shannon FIR A010-A030,</p>



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Information Service	northbound approaching the Scottish FIR, same altitude, west abeam Blessington southbound, same altitude. Fixed TRIG VHF XCVR.
Could not establish two-way communications with Dublin Flight Information Service	Very difficult to ever establish continuous two-way communications with DUB FIS when operating anywhere in the western sides of the Dublin FIS. Often much easier to contact Shannon FIS, despite being within Dublin's airspace. It is hard to define exactly where/when the issues will arise - some days it can be fine, other days there will be no possibility of establishing two way.
All of the above	