



**IRISH RADIO  
TRANSMITTERS SOCIETY**  
Since 1932

**Amateur Radio  
in Ireland**

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**PATRON Michael D. Higgins  
PRESIDENT OF IRELAND**

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Response to the  
  
Consultation on ComReg's Draft Radio  
Spectrum Management Strategy 2019 to  
2021

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# **PART 1**

## **Introduction**

The Irish Radio Transmitters Society (IRTS) welcomes the opportunity provided by the Commission for Communications Regulation (ComReg) to comment on the Draft Radio Spectrum Management Strategy 2019 to 2021 published on 3 August 2018, document ComReg 18/74. Part 1 of this document is a scene setting section whilst Part 2 deals with specific suggestions concerning various issues which IRTS believe falls within the remit of a spectrum management strategy framework.

The IRTS was founded in 1932. It is a non profit organisation and is the Irish national society that represents licensed amateur radio operators in Ireland in respect of government and public relation matters. The IRTS is an active member of the International Amateur Radio Union (IARU), which is a sector member of the Radiocommunication (R) and Telecommunication Development (D) sectors of the International Telecommunication Union (ITU). The IARU also has observer status in all six regional telecommunication organisations, including the European Conference of Postal and Telecommunications administrations (CEPT), which addresses European technical telecommunications regulatory matters, often under mandate from the European Commission. IRTS Members hold within IARU Region 1 the roles of Chairman of the Political Relations Committee (PRC) and Chairman of the Spectrum and Regulatory Liaison Committee (SRLC). The SRLC Chairman represents IARU-R1 in the Frequency Management Working Group and the Conference Preparatory Working Group of CEPT as well as in ITU-R Study Group 5 (terrestrial radiocommunications).

## **Amateur Service**

Amateur radio internationally is part of the leisure category of radiocommunications applications but has the distinction of being defined as a radiocommunications service in the ITU Radio Regulations<sup>1</sup>, an international treaty instrument. In Article 5 of the Radio Regulations a number of frequency bands have been allocated to the amateur service and amateur-satellite service throughout the radio frequency spectrum.

Article 1.56 of the Radio Regulations describes the Amateur Service as," a radiocommunication service for the purpose of self-training, intercommunication and technical investigations carried out by amateurs, that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest."

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<sup>1</sup> Radio Regulations of the International Telecommunication Union, Geneva.

It is primarily a hobby in which participants use various types of radio communications equipment to communicate with other radio amateurs for public service, recreation and self-training and technical investigations. The term ‘amateur’ is not a reflection on the skills of the participants, which are often addressing state of the art techniques in radiocommunications; rather, the term ‘amateur’ indicates that amateur radio communications are not primarily involved in any commercial activities.

In Ireland radio amateurs, having passed an appropriate technical and regulatory examination, are licensed by the Commission for Communications Regulation (ComReg) under the Wireless Telegraphy (Amateur station Licence) Regulations, 2009 (S I No. 192 of 2009) Radio amateurs establish radiocommunications stations in order to conduct experiments with a view to the development of science or technique. Amateur stations utilise but are not limited to frequency bands allocated in Ireland to the amateur service. Irish radio amateurs are therefore involved in the recreational, public service, self training, technical investigations and experimentation aspects of the global amateur radio movement.

Amateur radio operators enjoy personal (and often worldwide) radio communications with each other and in many jurisdictions (including Ireland) are able to support their communities with emergency and disaster communications as appropriate, while increasing their personal knowledge of electronics and radio theory.

In furtherance of public service emergency activities a group of radio experimenters formed the Amateur Radio Emergency Network (AREN). This network operates under the umbrella of the IRTS and is essentially run by the AREN organisation in co-operation with ComReg. The Network was sanctioned following Ireland’s adoption of Resolution 640 (1979) of the ITU Radio Regulations, which provides for the utilisation of amateur radio communications in emergency situations. Previously, Irish radio experimenters were licensed to communicate only with other radio amateurs nationally and internationally. ComReg, however, now extends the terms and conditions of the licences’ of radio amateurs who are members of AREN to permit them to pass messages on behalf of a range of designated emergency services. It is worth mentioning that the contribution of amateur radio operators to providing communications in times of emergency or natural disasters throughout the world is well recognised and documented.

A side benefit of amateur and experimental radio is the fostering of an interest in STEM subjects in children and young people, which in many instances will stimulate an educational and career path for the person involved. This in turn may create a greater pool of professionally qualified persons, which are available for employment in the Irish ICT sector.

There are approximately three million amateur stations in the world, a number that is increasing at the rate of 7% annually. The number and variety of modes of emission used by radio amateurs are also expanding, creating internal pressures within the amateur service for their accommodation at the expense of users of established modes such as single-sideband telephony and manual Morse code telegraphy operations. These new modes include digital

voice, data and image. Their use improves the efficiency of amateur operations, but also increases the popularity of amateur radio and therefore the amount of frequency congestion.

Four years after the launch of the first man-made satellite (Sputnik) amateur radio enthusiasts launched OSCAR 1 (Orbital Satellite Carrying Amateur Radio) in 1961. Since then the amateur satellite programme has developed significantly and today ARISS (Amateur Radio on the International Space Station) allows school children throughout the world to speak with the astronauts while the FunCube project allows schools to experience orbital physics and satellite telemetry experiments.

In addition amateur radio operators continue to investigate propagation effects and are contributing to a greater understanding of how radio waves propagate for small percentages of time. Such scientific and investigative work requires frequency allocations in key parts of the spectrum and an extensive beacon network in order to conduct measurements over long periods of time.

In the context of the self-training and technical investigation aspects of amateur radio, the IRTS welcomed the Minister for Communications, Energy and Natural Resources'<sup>2</sup> commitment in the Department's 2014 Consultation on Spectrum Policy Priorities, to ensure that an adequate amount of useful spectrum continues to be available for amateur radio and scientific applications. Spectrum for these applications is important from an educational, research and recreational perspective and is vital in helping to ensure an ongoing interest in technology and in furthering our understanding of radio propagation and communications.

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<sup>2</sup> The Department of Communications, Energy and Natural Resources (DCENR) is now the Department of Communications, Climate Action and Environment (DCCAÉ)

## **PART 2**

### **General**

The Irish Radio Transmitters Society (IRTS) has studied the document 'Consultation on Radio Spectrum Management strategy 2019 – 2021 and wishes to submit the following observations.

IRTS in common with IARU and most IARU member societies around the World continues to have three major concerns and objectives:

1. Ensure an adequate supply of suitable spectrum is allocated and is available to the amateur service and amateur-satellite service in the range 0 kHz to 3THz,
2. Ensure the overall noise floor in all current frequency bands does not increase to a level where small signal reception is not feasible in a typical domestic environment, which would make the hobby unattractive to many persons, and
3. Make every effort to encourage young people to take an interest in radiocommunications and other ICT subjects through amateur radio, thus facilitating a motivated and knowledgeable nucleus of people who are likely to be employed in the ICT sector in later years.

IRTS fully appreciates the valuable nature of spectrum and of the need to ensure that a balance is struck between the competing demands of the commercial sector, defence and public safety, the scientific community and others. Spectrum for amateur radio applications is important from an educational, research and recreational perspective and is vital in helping to ensure our ongoing interest in technology and in furthering our understanding of radio propagation and communications as well as participating in public service activities. In this regard there are thousands of radio amateurs around the World who spend their personal time training in order to provide communications and services when requested to do so. As climate change continues to influence global weather patterns with increasing severity, so the public service role for the amateur service is also likely to rise.

Although ComReg has major responsibilities with regard to implementing national spectrum policy and dealing with the many commercial users of the radio spectrum, the Society continues to find its interaction with ComReg to be very effective and productive. The Society enjoys a very good working relationship with both ComReg and DCCAE and would wish the dual complementary roles of ComReg and DCCAE to continue.

IRTS takes the view that it will probably be increasingly the case that changes in spectrum usage will be processed initially at the level of the regional telecommunications organisations such as CEPT before more general changes are processed through WRCs of the ITU. IRTS experience of this process has been generally positive. It is however unfortunate that a number of smaller administrations cannot attend project teams (PT) of the CEPT Conference Preparatory Group which become active as soon as a WRC has

finished and the provisional agenda for the next WRC is agreed. In Europe it is these PTs which are initially addressing WRC agenda items, including the consideration of European Common Proposals (ECP) as well as the CEPT position and brief. IRTS persons who attend PT meetings as IARU delegates often find that it is only the administrations opposing amateur items which speak and significantly influence the initial CEPT position. However with more administrations present in the PTs attending discussions on amateur items as well as other minority interest agenda items there would likely be a more balanced approach to the debate on these items. This would avoid the need to deal with such matters at the CPG which smaller administrations attend.

IRTS is also concerned that administrations with diminishing resources take a neutral position internationally on amateur radio agenda items when nationally they are supportive of the amateur movement and its needs. Such neutrality impacts the likelihood of finding sufficient support for ECPs on amateur issues proposed by IARU and other administrations. IRTS would appreciate a review of the situation in CEPT and perhaps some mechanism of resource sharing could be implemented by the smaller administrations and a system of multi country input documentation developed.

## **Licensing and Regulatory Matters**

The spectrum requirements which IRTS has outlined in later sections of this response need to be addressed against the pertinent definitions and regulations in regulatory texts as follows:

The possession and use of radio equipment in Ireland is governed by the Wireless Telegraphy Act 1926, (Act No 45 of 1926), (as amended), which stipulates that an appropriate Wireless Telegraphy licence must be held, unless licence exempted.

“‘Wireless Telegraphy’ means the emitting and receiving, or emitting only or receiving only, over paths which are not provided by any material substance constructed or arranged for that purpose, of electric, magnetic or electromagnetic energy of a frequency not exceeding 3 million megahertz, whether or not such energy serves the conveying (whether they are actually received or not) of communications, sounds, signs, visual images or signals, or the actuation or control of machinery or apparatus.”.

These requirements are considered important since CEPT as a consequence of the EU’s Radio Equipment Directive (RED) is attempting to develop a regulatory framework for the use of spectrum below 8.3 kHz.

Although in Ireland there is currently no allocation or licensing regime for the use of spectrum below 8.3 kHz it is different in some other jurisdictions which include a lower band limit of 8.3 or 9 kHz in their legislation or regulations and do not require a licence to possess Wireless Telegraphy equipment. In these jurisdictions the use of this spectrum is not regulated and could be said to be exempt from licensing even though licensed radio amateurs are engaged in experimentation. In this regard surprising results have been achieved with very modest equipment.

Whilst recognising that an authorisation is required to operate below 8.3 kHz IRTS requests that means be devised to permit Irish radio amateurs to participate in the experiments being undertaken by amateurs in other countries.

A similar issue arises in Ireland concerning the use of frequencies above 3 THz which is not considered in Irish legislation to be Wireless Telegraphy and in addition is not subject to the possession of a licence. In this regard IRTS seeks clarity that such equipment would be exempt from licensing.

The following table is an extension of the one which can be found in Article 2.1 of the Radio Regulations since it includes a definition of ELF, SLF and ULF frequency designations as well as ‘unofficial’ designations THF and MHF covering the range 300 GHz to 30 THz. The sub 8.3 kHz range includes VLF, ULF, SLF and ELF frequencies.

| <b>Band Number</b> | <b>Symbols</b>   | <b>Frequency Range</b> | <b>Corresponding Metric Sub-Division</b> |
|--------------------|------------------|------------------------|--|
| 1                  | ELF              | 3 to 30 Hz             |  |
| 2                  | SLF              | 30 to 300 Hz           |  |
| 3                  | ULF              | 300 to 3000 Hz         |  |
| 4                  | VLF              | 3 to 30 kHz            | Myriametric waves                        |
| 5                  | LF               | 30 to 300 kHz          | Kilometric waves                         |
| 6                  | MF               | 300 to 3000 kHz        | Hectometric waves                        |
| 7                  | HF               | 3 to 30 MHz            | Decametric waves                         |
| 8                  | VHF              | 30 to 300 MHz          | Metric waves                             |
| 9                  | UHF              | 300 to 3000 MHz        | Decimetric waves                         |
| 10                 | SHF              | 3 to 30 GHz            | Centimetric waves                        |
| 11                 | EHF              | 30 to 300 GHz          | Millimetric waves                        |
| 12                 | THF <sup>3</sup> | 300 to 3000 GHz        | Decimillimetric waves                    |
| 13                 | TBD <sup>4</sup> | 3 to 30 THz            |  |

Table 1 – Extended Radio Frequency and Wavelength Ranges

Concerning sub-millimetre radio spectrum requirements in this document, IRTS is seeking access to EHF frequency bands allocated to the amateur service above 70 GHz, some THF frequency bands at circa 500 GHz, 700 GHz and 1-3 THz and lastly spectrum above 3 THz.

<sup>3</sup> THF = Tremendously High frequencies (300 – 3000 GHz)

<sup>4</sup> TBD = To be decided (3 – 30 THz)

## Detailed Frequency Management Issues

IRTS is an active member society of IARU and is fully involved through IARU at the international and regional level, firstly in the identification of spectrum requirements through the ITU process of WRCs and secondly through the CEPT process by means of appropriate amendments to the European Common Allocation (ECA) table. Once allocations to the amateur service are included in the Radio Regulations and/or ECA, IARU Region 1 has a tradition of developing band plans to cater for all interests. National IARU member societies then develop the IARU plan to take account of any unique national requirements. IRTS believes that the amateur service should continue to self-regulate how individual frequencies and sub-bands should be utilised. Indeed IRTS has been engaged in recent months with a consultative exercise to develop national band plans in the 30.0-69.9 MHz range, which the amateur service in Ireland gratefully received as a result of the last spectrum consultation conducted by ComReg.

Table 2 below provides IRTS' spectrum aspirations for the period stated in the consultation document. Column 2 of Table 1 details frequency bands of interest and column 3 provides the reasons for proposed access or change in status. Further explanation on some of the frequency bands is provided in the text following Table 2 below.

| Band | Frequency Range     | Notes/Reason for Proposal  |
|------|---------------------|--|
| 1    | Sub 8.3 kHz         | Currently being addressed in CEPT forums. See suggested footnote   |
| 2    | 5 250 – 5 450 kHz   | Request transfer of 5 280 kHz, 5 300 kHz, 5 332 kHz, 5 348 kHz 5 400 kHz and 5 405 kHz from A1.4 to A1.3 of the Amateur Station Licence Guidelines 09/45. This would provide more flexibility to avoid primary services operating in 5 351.5 – 5 366.5 kHz |
| 3    | 50 – 54 MHz         | To harmonise 50 MHz allocation with Regions 2 and 3. See also Agenda Item 1.1 of WRC-19  |
| 4    | 75.5 - 77.5 GHz     | 75.5-76 GHz as per ECA secondary   |
| 5    | 77.5 - 78.0 GHz     | primary  |
| 6    | 78.0 – 81.0 GHz     | secondary  |
| 7    | 81.0 – 81.5 GHz     | secondary see RR 5.561A  |
| 8    | 122.25 – 123.00 GHz | secondary  |
| 9    | 134.0 – 136.0 GHz   | primary  |
| 10   | 136.0 – 141 GHz     | secondary  |
| 11   | 241.0 – 248.0 GHz   | secondary  |
| 12   | 248.0 – 250.0 GHz   | primary  |
| 13   | 510.0 – 523.0 GHz   | NIB basis – passive services not operating in this band  |
| 14   | 733.0 – 750.0 GHz   | NIB basis – passive services not operating in this band  |
| 14   | ! – 3 THz           | Similar footnote to sub 8.3 kHz  |
| 15   | > 3 THz             | [Licence exempt]   |

Table 2 – IRTS Current Spectrum Interest

## **Table 2 Band Comments**

### **Sub 8.3 kHz**

Prior to 2010 few expected that reliable communications could be achieved by radio amateurs at VLF. Radiated powers are low and antennas utilised are highly inefficient. However, with the advent of powerful weak signal processing software and dedicated work by a few enthusiasts, this has all changed. Some spectacular results have been, and continue to be achieved.

Radio amateurs in several CEPT countries have utilised VLF spectrum for amateur experimentation. In some countries a formal variation to their 'amateur licence' was required in others no authorisation was required as spectrum below 9 kHz is unregulated. For example, German amateurs chose several spot frequencies e.g. 8.97 kHz, 6.47 kHz and 5.17 kHz for technical convenience for their experimentation. Recently a quantitative field-strength estimate has also been conducted demonstrating that amateur stations are unlikely to cause harmful interference to lightning locator systems in the band 8.3 – 9.0 kHz, given their achievable radiated power levels in the microwatt or low milliwatt range. In the United Kingdom, following a compatibility assessment by the regulator, the band 8.7 - 9.1 kHz has been available to amateur licensees for experimental use on a case by case basis. Countries in other ITU regions have also hosted amateur activities on sub 9 kHz frequencies, notably the United States, Australia and Japan.

Recently an amateur signal on 8.971 kHz with an effective radiated power of circa 150 micro Watts has spanned the Atlantic Ocean, from North Carolina in the United States to the United Kingdom a distance of approximately 6194 km. A steady, GPS-locked carrier at 8.971 kHz was transmitted between 0000 and 0600 UTC and sophisticated digital signal processing (DSP) software was used to detect the transmission under both night-time and daylight propagation conditions at the receiver in the UK.

### **Proposal**

In document 17/34 concerning frequencies below 8.3 kHz in national usage column add Amateur Service on a non interference basis (NIB) to services above and below 8.3 kHz.

### **5 250 – 5 450 kHz**

The amateur service was successful in achieving a 15 kHz band in this frequency range at ITU WRC-15 and IRTS is grateful that ComReg released this 15 kHz band in a timely manner. However the allocation has a power limit of 15W eirp. Primary service usage is significant with the result that the frequency band is often unusable. IRTS therefore requests that additional spectrum is made available to the Irish amateur service.

### **Proposal**

IRTS requests the transfer of 5 280 kHz, 5 300 kHz, 5 332 kHz, 5 348 kHz 5 400 kHz and 5 405 kHz from A1.4 to A1.3 of the Amateur Station Licence Guidelines 09/45 with the current operating conditions. This would provide more flexibility to avoid primary services operating in 5 351.5 – 5 366.5 kHz

## **50 – 54 MHz**

Please refer to the section dealing with Agenda Item 1.1 of WRC-19.

## **WARC-79 Microwave Bands**

It is now almost 40 years since an ITU radiocommunication conference allocated EHF frequency bands to the amateur service and amateur satellite service. In Ireland only the band 47.0 – 47.20 GHz in the EHF range currently appears in the guidelines document 09/45.

## **Proposal**

IRTS proposes the release of the following EHF bands to the amateur service and the amateur-satellite service in Ireland:

75.5 - 77.5 GHz on a secondary basis (75.5 – 76.0 GHz as per ECA)

77.5 - 78.0 GHz on a primary basis

78.0 – 81.0 GHz on a secondary basis

81.0 – 81.5 GHz on a secondary basis (see RR 5.561A)

122.25 – 123.00 GHz on a secondary basis

134.0 – 136.0 GHz on a primary basis

136.0 – 141 GHz on a secondary basis

241.0 – 248.0 GHz on a secondary basis

248.0 – 250.0 GHz on a primary basis

## **THF Frequency Range 300 – 3000 GHz**

Terahertz frequencies, also known as sub-millimetre wavelengths are frequencies in the 300GHz - 3THz range. This aligns with the ITU Radio Regulations that have an upper limit of 3THz.

In Ireland the Wireless Telegraphy Act recognises the ITU upper frequency limit and the licensing arrangements for all apparatus up to 3000 GHz (3THz).

In practice the ITU has two sub ranges, both of which are controlled by ITU Radio Regulation footnote 5.565.

- 275-1000 GHz – where important sub-bands for passive services are identified
- 1000-3000 GHz – where there is more flexibility

Licensed Amateurs in the UK, USA and Germany have some access to the THF range based on their own national regulations

Part of this frequency range (275-450 GHz) is currently under study as it is the topic of WRC-19 Agenda Item 1.15.

Concerning 275-1000 MHz IRTS has studied the sub-bands listed in RR 5.565 and has selected two sub-bands which are not in use by passive services and are not the subject of

WRC-19 Agenda Item 1.15, namely 510.0 – 523.0 GHz and 733.0 – 750.0 GHz. For the frequency band 1-3 THz a more flexible approach is proposed.

### **Proposals**

1. IRTS proposes that document 17/34 should reflect the entire frequency range where wireless telegraphy is regulated e.g. 3 Hz to 3 THz.
2. IRTS also proposes (in order not to have a reoccurrence of the post 1979 situation) the release of the following frequency bands to the amateur service and the amateur-satellite service in Ireland:

510.0 – 523.0 GHz  
733.0 – 750.0 GHz

3. In document 17/34 concerning frequencies above 1 THz in the national usage column add Amateur Service on a non interference basis (NIB) to services above and below 1 THz.
4. Also add a note in an appropriate place that the use of frequencies above 3 THz is not subject to licensing.

### **5.2.8 Work Plan Item for the Amateur Service**

Paragraph 5.14 of the consultation document indicates that ComReg will consider allocating the 76 -81 GHz, 134 – 141 GHz and 241 – 250 GHz bands to the amateur service in Ireland and that this would align the Irish table with that of the ECA and Article 5 of the Radio Regulations.

IRTS is grateful for this work item but would request the inclusion of 75.5 – 76.0 GHz as per the ECA and 81.0 – 81.5 GHz as per RR 5.561A. The band 122.25 – 123.00 GHz is also missing from the EHF frequency range.

As mentioned in IRTS' paragraph concerning detailed frequency management issues on page 9 of this document several other spectrum issues have also been raised e.g. amateur access from 3 Hz to 8.3 kHz, tidying up the 5 MHz band, the question of 50 – 54 MHz at WRC-19 and access to THF spectrum in the range 300 GHz to 3 THz. IRTS would be grateful if these items would also be included to ComReg's Work Plan. IRTS also believes that document 17/34 should reflect the entire frequency range where wireless telegraphy is regulated e.g. 3 Hz to 3 THz.

### **5.2.9 Aeronautical, Maritime and Scientific Services**

The last bullet point of paragraph 5.15 in the consultation document indicates that consideration will be given to the possibility of promoting and potentially establishing

“quiet zones” for particular frequency bands around specific areas of radio spectrum research such as Bir Castle.

IRTS assumes that this issue refers to the Irish Low Frequency Array (I-LOFAR) website. I-LOFAR is the Irish station in the European-wide network of radio telescopes, used to observe the Universe at low frequencies in the range 10-240 MHz. After examining the LOFAR web-site it appears that there are two distinct antenna types: the Low Band Antenna (LBA) operates between 10 and 90 MHz and the High Band Antenna (HBA) between 110 and 250 MHz. These "sensors" are organised in aperture array stations. The stations (currently, 36 stations are being constructed in the Netherlands) are distributed over an area about one hundred kilometres in diameter (located in the North-East of the Netherlands). Several international stations are to be built in Germany (5), Sweden (1), the UK (1) and France (1).

This is a very wide frequency range and for the amateur service in Ireland alone could impact allocations at 10 MHz, 14 MHz, 18 MHz, 21 MHz, 24 MHz, 28 MHz, 40 MHz, 50 MHz, 60 MHz, 70 MHz and 144 MHz. Of course many of the lower frequencies will be influenced by long distance ionospheric propagation during periods of high solar flux.

At present IRTS would like to note this development and seek clarity on how amateur licensees would be impacted by this development. Also how many licensees would be affected by the quiet zone(s) envisaged?

## **4.1 International harmonisation of Radio Spectrum**

In addition to the points raised by ComReg in paragraphs 4.4 to 4.8, IRTS believes the following recommendation from WRC-12 is very relevant.

In 2012 the ITU World Radiocommunication Conference (WRC) in Recommendation 34 recommended that future WRCs dealing with principles for the allocation of frequency bands, should

- wherever possible, allocate frequency bands to the most broadly defined services with a view to providing the maximum flexibility to administrations in spectrum use, taking into account safety, technical, operational, economic and other relevant factors;
- wherever possible, allocate frequency bands on a worldwide basis (aligned services, categories of service and frequency band limits) taking into account safety, technical, operational, economic and other relevant factors.

## 4.1.1 World Radiocommunication Conference 2019

IRTS was disappointed to find no mention of the amateur service in paragraph 4.10. It is hoped that at least the three priority items mentioned below will feature in Ireland's priority list in future.

It is also noted that Irish preparations for major ITU and CEPT events are not prepared in the public domain IRTS continues to believe that the situation could be improved at the national and international level since most frequency allocations to the amateur service and amateur-satellite service have to be negotiated at some point in time in ITU and/or CEPT forums. In many countries a representative from the national society is encouraged to participate in the national delegation and IRTS continues to seek for such an opportunity also.

IRTS also seeks an opportunity to discuss these WRC-19 issues with the Irish WRC-19 delegation at the earliest opportunity.

The amateur service has an interest in several WRC-19 agenda items (AI) namely 1.1 (50MHz), 1.7, 1.11, 1.12, 1.13 (IMT or International Mobile 5G telecommunications), 1.15 (above 275 GHz), 1.16 ("5 GHz Wi-Fi"), 9.1.6 (Wireless Power Transmission or WPT) and 10 ("future WRC agendas"). **The amateur service has three priority items underlined above** and a further three having significant interest. The following paragraphs summarise the current status and suggest appropriate actions.

### 1 Agenda Item 1.1 - 50-54 MHz

WRC-19 Agenda item 1.1 addresses the consideration of an allocation in all or part of this frequency band for the amateur service in Region 1 subject to justifying the need for the allocation and subject to satisfactory sharing with existing services. The services concerned are residual television broadcasting in the 50 MHz spectrum, fixed and mobile services already using the spectrum in a few countries and a few wind profiler radars which use frequencies close to 50MHz.

Globally the frequency band 50-54 MHz is currently allocated on a primary basis to the amateur service in ITU Regions 2 and 3 as well as in a number of African countries in ITU Region 1. Based on CEPT considerations, a number of European countries have allowed amateur use in part of this spectrum under Article 4.4<sup>5</sup> of the ITU Radio Regulations (RR). The amateur service is therefore looking for spectrum alignment at WRC-19 in all 3 ITU regions (e.g. globally), with a 4 MHz primary allocation at 50-54

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<sup>5</sup> Article 4.4 - Administrations of the ITU Member States shall not assign to a station any frequency in derogation of either the Table of Frequency Allocations except on the express condition that such a station, when using such a frequency assignment, shall not cause harmful interference to, and shall not claim protection from harmful interference caused by a station operating in accordance with the provisions of the ITU Constitution, the ITU Convention and the ITU Radio Regulations.

MHz. An application based spectrum needs calculation method shows that slightly more than 4 MHz is required on average in CEPT countries, whilst in high density areas over 10 MHz would be required to meet anticipated needs, obviously not feasible at this time. IRTS believes that spectrum sharing can be covered through regulatory footnotes in RR Article 5, which would protect existing television service areas in Eastern Europe and provide a basis for national sharing with respect to the land mobile and fixed services and secondary radiolocation (wind profiler) usage.

- **Global harmonization of the frequency band 50–54 MHz is highly desirable.** Concerning spectrum needs an IARU study shows that, based on the average amateur density in an area of high amateur licensees, the required spectrum is slightly less than 4.2 MHz. Another study conducted by Switzerland concluded that circa 2 MHz was required based on a short duration monitoring programme and reverse engineering of the published logs of participants in an IARU 50 MHz competitive event (amateur radio contest).

A 4 MHz primary allocation to the amateur service in Region 1 would align with the existing amateur service allocation in Regions 2 and 3. Such an allocation in Region 1 would harmonise the current use of the lower 500 kHz for inter-regional communication and allow for emerging wider bandwidth data communications applications, reduced bandwidth digital television and other applications requiring up to 500 kHz channel widths. Such an outcome would in addition satisfy the principles outlined in Recommendation 34 (Rev.WRC-12) encouraging spectrum harmonisation.

- **Sharing studies have shown 50-54 MHz can be successfully shared by the amateur service and analogue television broadcasting.** Harmful interference should not occur if the field strength produced by stations of the amateur service does not exceed 6 dB $\mu$ V/m at the boundaries of the service areas of operational television broadcasting stations. Experience (current RR Article 4.4 usage in Europe and the Middle East) together with the proposed regulatory measures confirm that the allocation of the frequency band 50-54 MHz to the amateur service in Region 1 is unlikely to result in harmful interference being experienced by the broadcasting service.
- Initial studies indicate that co-channel sharing between the amateur service and the fixed and the land mobile service in Region 1 may be difficult in the same geographical area. **Mitigation factors, aligned with current operational experience suggest that harmful interference from the amateur service can be avoided and compatibility should be possible**, also recognising that the band

available to fixed and land mobile equipment in this frequency band is generally 30-88 MHz.

- Concerning wind profiler radars (WPR) the limited numbers of WPR systems in or immediately adjacent to the 50-54 MHz frequency range (and probably the expected low number of amateur systems in the vicinity of WPR installations), allows for sharing to be considered on a case-by-case basis and affected **administrations could establish coordination zones in the specific geographical areas concerned.**
- The CEPT Project Team position that only 2 MHz could be available for the amateur service at 50 MHz was confirmed by CEPT's Conference Preparatory Group (CPG). Although the IARU and IRTS spectrum need remains 4 MHz on a global basis and IARU's application based method supports this view, IARU appreciates that CEPT administrations may not be in a position to allocate this amount of spectrum to the amateur service in Europe. At the CPG, IARU therefore asked for a smaller amount of this spectrum to be on a primary basis, and proposed that 50.0-50.5 MHz be allocated to the amateur service on a shared primary basis and 50.5-52.0 MHz be allocated on a shared secondary basis.

**IRTS requests DCCAE and ComReg to support the IARU 50 MHz compromise** with a 50.0-50.5 MHz primary band and 50.5-52.0 MHz secondary band.

- IARU is also considering suggesting an additional footnote for the ITU Radio Regulations as follows: *In Region 1 with the exception of the countries listed in 5.169 of the Radio Regulations, administrations may allocate all or part of the frequency band 52-54 MHz to their amateur service. When making allocations within this range to their amateur service administrations shall take such steps as may be necessary to prevent harmful interference from their amateur service to radiocommunications of other countries.*

**IRTS requests DCCAE and ComReg support** for such a footnote and the possible **allocation** of the additional spectrum 52-54MHz to the amateur service on a **national basis** following WRC19.

## **2 Agenda Item 1.13 - International Mobile Telecommunications**

IRTS is of the view that the spectrum requirements identified for IMT in the frequency range between 24.25 GHz and 86 GHz can be fully met in the frequency bands that are already allocated to the mobile service on a primary basis, and do not justify the allocation of 47.0-47.2 GHz to the mobile service. This narrow primary allocation is the only spectrum in which amateur experimentation with millimetre wavelengths can be

conducted without practical constraints imposed by sharing with other services. Therefore, **IRTS opposes additional allocations in this band to other services**, including the mobile service. If either or both of the bands that are adjacent to 47.0 - 47.2 GHz are identified for the terrestrial component of IMT, suitable **emission limits must be included** in order to **ensure the protection** of existing and future amateur and amateur-satellite stations in the 47.0-47.2 GHz band.

- IRTS is further of the view that any allocation to IMT in the frequency range 24.25-27.5 GHz shall include full consideration and protection for the amateur and amateur-satellite service's primary allocation at 24-24.05 GHz.
- **IRTS seeks DCCAE and ComReg support to discourage any attempt to suppress the 47.0-47.2 GHz allocation to the amateur service and the amateur-satellite service** for the reasons outlined above,
- **IRTS seeks DCCAE and ComReg support that other services should not be introduced to this band** as it is currently one of the only allocations which are primary and exclusive to the amateur services.

### 3 Agenda Item 9.1.6 - WPT

Agenda item 9.1.6 relates to:

“Studies concerning Wireless Power Transmission for electric vehicles WPT (EV):

- a) to assess the impact of WPT for electric vehicles on radiocommunication services;
- b) to study suitable harmonized frequency ranges which would minimize the impact on radiocommunication services from WPT for electrical vehicles.”

These studies should take into account that the International Electrotechnical Commission (IEC), the International Organization for Standardization (ISO) and the Society of Automotive Engineers (SAE) are in the process of approving standards intended for global and regional harmonization of WPT technologies for electric vehicles.”

Work is under way in both ITU and the RTOs on this subject, as well as in international standards organisations. Until now, no serious discussion has taken place on the implications of the spurious emissions from WPT (EV) systems for authorised radio services operating in the vicinity. The projected deployment of WPT (EV) is very high – there will always be a WPT (EV) installation close by – and IARU's assessment is that new limits for spurious emissions will be needed. The existing limits were not set with 24/7 wideband, high power, and a high deployment density of WPT installations in mind.

Conventional radio services are not well represented in the WPT discussions so far. National administrations have not, in general, expressed a view on the question of spurious levels. In brief:

- WPT (EV) is projected to be deployed widely in the residential environment (urban/suburban/rural),
- Existing CISPR, CEPT or ITU limits for spurious emissions will not prevent harmful interference to radio services – they allow for much to high emission levels since they were not developed with this sort of application in mind,
- WPT (EV) is a 24/7, high power technology with high harmonic content – the potential for harmful interference is very great.
- New limits are needed to safeguard existing radio services (broadcast, amateur, other) which are entitled to receive proper protection from harmful interference,
- Administrations are requested to become involved in the WPT discussions on all levels and to make their views known.

**IRTS hopes that DCCAE and ComReg agree that:**

- There is a **priority need to protect radio services** from high levels of spurious emissions from WPT (EV) systems,
- The high projected density of WPT (EV) deployment means that **existing spurious limits are not appropriate for a high power “always on” technology,**
- Modelling shows that harmful interference could extend to up to 1 km from a WPT (EV) installation under current spurious emissions limits, therefore
- IRTS seeks the support of DCCAE and ComReg to protect vulnerable radio services such that they will be able to operate as intended. At present the spurious emission limits being quoted for WPT (EV) are a long way from what is required and would cause severe interference to radio services in the residential environment.

#### **4 Agenda Items 1.15, 1.16 and 10**

These items are also of interest to the amateur service. AI 1.15 only covers identification of frequency bands only for the fixed and mobile service above 275 GHz. IRTS believes that all radiocommunication services, including the amateur service should be able to achieve future allocations above 275 GHz and IRTS has requested such allocations in this document, see item 13 and 14 of Table 2. IRTS believes it to be important to ensure that the amateur service is also included in any future work on the identification of frequency allocations to radiocommunication services above 275 GHz. Such proposals may come up under WRC-19 agenda item 10 (agendas for future WRCs) and IRTS hopes that CEPT

administrations would support the needs of the amateur service in any planning exercise in spectrum above 275 GHz.

AI 1.16 concerns the needs of the Wi-Fi community for additional spectrum resources including 5 650-5 850 MHz (a secondary amateur allocation) where they are proposing a primary mobile allocation to meet the needs of Wireless Access Systems (WAS) and Radio Local Area Networks (RLAN). From a European amateur standpoint such extended use may create additional problems since an IP based INTRANET for radio amateurs called HAMNET has been built which uses the secondary spectrum in 2.3 and 5 GHz.

The amateur community can do little about how this agenda item progresses in respect of the affected primary services but would wish to maintain the secondary amateur allocation since sharing may remain possible.

AI 10 is the agenda item which looks at future WRC agendas. IRTS does not foresee any amateur items below 275 GHz required for WRC-23 or WRC-27.

## Summary

IRTS would like to extend its thanks to ComReg for the opportunity to respond to this consultation and hopes that the Irish telecommunications regulator will be favourably disposed to the suggestions and requests outlined in this document. These have been prepared in order to address the global concerns and objectives of the International Amateur Radio Union of which IRTS is the Irish member society:

1. Ensure an adequate supply of suitable spectrum is allocated and is available to the amateur service and amateur-satellite service in the range 3 Hz to 3THz,
2. Ensure the overall noise floor in all current frequency bands does not increase to a level where small signal reception is not feasible in a typical domestic environment, which would make the hobby unattractive to many persons, and
3. Make every effort to encourage young people to take an interest in radiocommunications and other ICT subjects through amateur radio, thus facilitating a motivated and knowledgeable nucleus of people who are likely to be employed in the ICT sector in later years.

During the period of the strategy the IRTS would wish to see the following implemented. In particular in view of the CEPT and ITU timetable for WRC-19 preparation IRTS would like an early exchange of views on IRTS proposals addressing WRC issues:

- Availability of sub 8.3 kHz spectrum for use by the amateur service in Ireland,
- Transfer of 5 280 kHz, 5 300 kHz, 5 332 kHz, 5 348 kHz 5 400 kHz and 5 405 kHz from A1.4 to A1.3 in document 09/45,
- Support of the IARU position for the frequency band 50-54 MHz in CEPT and ITU preparations for Agenda Item 1.1 of WRC-19

- Release EHF spectrum allocated to the amateur service in the ECA and Article 5 of the RR in the range 75.5 - 250 GHz (including 81-81.5 GHz and 122.25 – 123.00 GHz)
- Release THF spectrum for the amateur service in the bands 510-523 GHz and 733-750 GHz as well as 1 – 3 THz
- Clarify any terms for using spectrum above 3 THz.
- Clarify the position for amateur licensees in the vicinity of Birr Castle
- Support the IARU/IRTS position generally in respect of CEPT preparations for ITU WRC-19 - agenda items 1.1, 1.13, 1.15, 1.16, 9.1.6 and 10

IRTS remains at ComReg's disposal if further information or clarification is required. The IRTS would also like to state that **nothing in this document** needs to be considered as restricted or confidential.