Ofcom Consultation on Improving access to 5.8 GHz spectrum for broadband fixed wireless access

Response by the Radio Society of Great Britain

September 2017

This response to the above Ofcom consultation document is from the Radio Society of Great Britain (RSGB, www.rsgb.org) on behalf of its members and the wider Amateur Radio community in the UK. The latter includes both individual operators as well as a variety of special interest groups, including the UK Microwave Group (UKuG), AMSAT-UK and British Amateur Television Club (BATC) who have a particular interest in this frequency range.

The RSGB is recognised as one of the leading organisations in the world in the field of amateur radio. It collaborates with its fellow national societies via the International Amateur Radio Union (IARU) through IARU Region 1 (www.iaru-r1.org).

Amateur radio is a science-based technical hobby enjoyed by over three million people worldwide. From a statutory point of view, it is fully recognised by the International Telecommunication Union (ITU) as a Service and is listed in the ITU Radio Regulations as the Amateur Service and the Amateur Satellite Service.

Amateur radio is a hobby that promotes experimentation and innovation in radio techniques and propagation. Despite some unjustified UK-specific amateur licensing restrictions, the 5GHz amateur band is home to a significant and growing amount of innovation which should be allowed to prosper and not suffer from harmful interference.

As detailed in our more specific comments the RSGB feels that the approach to expanding the 5.8GHz BFWA use is incomplete. It has the potential to not only affect our members, but also may impact international satellite projects where there has been and continues to be significant investment.

RSGB Response to the Ofcom consultation questions:

Question 1: Do you agree with our assessment of current road tolling use in the 5.8 GHz band in the UK? Is there other current and future planned use that we are not aware of?

RSGB Response: No comment.

Question 2: Do you agree with our analysis of the options for managing sharing between BFWA and RTTT? Are there additional options which we have not considered which in your opinion would result in a better balance of benefits and risks?

RSGB Response: No comment.

Question 3: Do you agree with our proposal to remove the notch and allow BFWA use in the whole of the 5.8GHz band?

RSGB Response: No.

Whilst the RSGB has no issue with removing the RTTT notch, it does not agree with allowing BFWA use in the whole 5.8GHz band.

1) Amateur-satellite operation (occupying 16% of the 5725-5850 MHz band):

Although not mentioned in the consultation document (e.g. in Clause 3.3), the range 5830 – 5850 MHz is globally allocated to the amateur-satellite service on a secondary basis in the table of frequency allocations in Article 5 of the ITU-R Radio Regulations (ITU-RR). According to the ITU-RR, for the UK, the band is part of a secondary allocation to the **land mobile service** covered by country footnote 5.451. There is no allocation in the ITU-RR for the fixed service applicable to the UK.

The amateur-satellite service is international in its nature and uses this range in accordance with the IARU band plan for space to earth links in conjunction with uplinks in either the 5.6GHz band (see ITU-RR footnote 5.282) or other amateur-satellite uplink bands. This band is the lowest frequency band above 1GHz allocated to the amateur-satellite service in the table of allocations. Currently the 20 MHz 5.8 GHz BFWA channel centred on 5825 MHz is co-frequency with the lowest 5 MHz of the amateur-satellite allocation but 15 MHz of the allocation remains free from the potential of co-frequency BFWA operation.

The addition of the new BFWA channels centred on 5825 MHz and 5835 MHz will negate this freedom and bring the potential for interference to the very low flux density signals that can be successfully received today.

In the European Table of Frequency Allocations (ERC Report 025), footnote ECA23 highlights the amateur-satellite service in the band 5830-5850 MHz (amongst others) and states that "….*In making assignments to other services, CEPT administrations are requested wherever possible to maintain these allocations in such a way as to facilitate the reception of amateur emissions with minimal power flux densities*".

The RSGB can find no evidence in the consultation that any consideration has been given to the request in this footnote.

Amateur-satellite downlink transmissions can be received by any suitably equipped amateur station in any location within the UK (rural or urban). The station might be operated by an individual or it might be part of a club or a group station which may be part of an international collaborative satellite system project.

In common with commercial satellite projects, amateur satellite projects also require long term planning and funding. Often this involves international cooperation including academic and professional collaboration to enable amateur satellite projects to operate alongside educational and research missions being managed by bodies such as the European Space Agency (ESA) and NASA. Funding is usually obtained through voluntary donations and can amount to hundreds of thousands of pounds. UK amateur satellite enthusiasts dedicate a huge amount of time and effort within these collaborative projects which can carry UK amateur developed and built communications payloads. The IARU hosts information relating to frequency clearance for the many international amateur satellite projects and these can be seen at http://www.amsatuk.me.uk/iaru/finished.php . A 5.8GHz band specific example and the diversity of applications can be seen at http://www.amsatuk.me.uk/iaru/finished_detail.php?serialnum=556 .

The UK amateur-satellite enthusiasts in collaboration with UK and overseas academic institutions continue to play a vital role in the development of these many international satellite missions and the RSGB believes that Ofcom should do its utmost to provide certainty of interference free operation to encourage this engagement in this extremely high-tech and innovative field.

2) Coexistence:

Section 3.3 makes a statement that Ofcom "….does not expect the proposal presented here to impact coexistence with these other uses."

The RSGB contests this and can find no evidence to support this in the consultation document. One single BFWA channel has the potential to block all reception of low flux density signals in the entire amateur-satellite segment as it can already in the parts of the band used for low flux density terrestrial reception in 5755 - 5765 MHz or 5820 – 5830 MHz (amounting to 16% of the band). There is no option for the amateur station to change frequency within these sub-bands to escape the interference and maintain operation thereby reducing the amateur utility to zero.

The RSGB can find no specifically relevant studies on compatibility between BFWA operation and the amateur satellite service.

The RSGB notes the Ofcom statement of the 13th of July 2017 concerning the expansion of Wi-Fi (RLAN) applications into the range 5725-5850 MHz and the restriction on the deployment of these devices to indoor operation at power levels no higher than 200mW in order to mitigate the potential for interference into other services.

The RSGB finds this 5.8 GHz band spectrum management proposal contradictory.

3) Demand:

Section 2.7 highlights Ofcom's specific duties relating to the demand for use of spectrum. However the RSGB can find no further evidence of this in the consultation document beyond the reporting of unsubstantiated requests from BFWA operators for access to more spectrum to increase the deliverable data rate. No evidence of band congestion is given or of the denial of broadband

services to citizens and consumers resulting from a failure to accommodate any 5.8 GHz BFWA deployments.

4) Proposal:

The RSGB believes that BFWA services have no regulatory rights or priority over the amateur and amateur-satellite allocations in this band.

Moreover the RSGB had difficulty identifying the characteristics of the 40MHz wide BFWA systems and observes that they are not included in the European ETSI harmonised standard EN302 502 or the UK IR. Only systems operating in 10 and 20 MHz are covered by the ETSI standard. ECC Report 068 considered only 5, 10 and 20MHz systems for compatibility studies. The regulatory requirement for DFS and radar detection in the band could make the maximum capacity of three 40MHz channels troublesome especially if there is a need to change channel as a result of a DFS trigger event.

Therefore given the importance of the allocation to the amateur-satellite service the RSGB offers this alternative proposal for expanding the number of BFWA channels available:

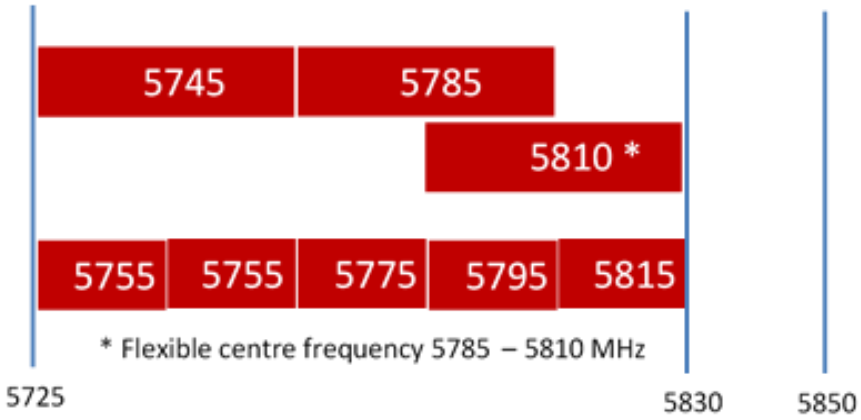

Figure 1 – RSGB Proposal

In the absence of a definitive demand study this proposal at least doubles the number of 40 MHz channels, provides one more 20 MHz channel and flexibility to move the 40MHz channel to avoid overlap with some 20 MHz channels. Flexibility is possible as the ETSI standard identifies a 2.5 MHz channel centre frequency raster and there is no fixed harmonised channel plan identified in the regulatory framework or the ETSI standard.

Importantly for the amateur-satellite community it avoids co-frequency operation and preserves the low noise environment in the international amateur-satellite allocated band.

Question 4: Are there any other considerations that you believe need to be taken into account and that are not already covered in this consultation?

RSGB Response: Yes.

The RSGB cannot find any basis for BFWA services to have regulatory rights or priority over the amateur and amateur-satellite allocations in this band.

Generally speaking the amateur operations have coexisted largely without problem with the current BFWA operations and ISM applications.

However, Ofcom will be aware that the RSGB has raised many concerns about the general increase in the background electronic noise environment resulting from both non-radio communication services and radio communication services that has had the effect of reducing the utility of the amateur bands and in some cases completely blocking their use. In at least one country in Europe, amateur-satellite operations have had to gain permission to operate space to earth links below the amateur-satellite spectrum identified by the ITU-R in 2400-2450 MHz in order to avoid the increase in background noise from RLAN/Wi-Fi services above 2400 MHz and maintain the integrity of their missions.

One channel of 5.8 GHz BFWA operation can completely block the entire amateur terrestrial or satellite band and the only mitigation is to request an alternative channel to the BFWA operator. However it may not be obvious to an amateur operator that BFWA operation is the source of interference and it is probably not obvious to a BFWA operator that they may be causing interference to amateur operations. Therefore the RSGB requests:

1) That on the specific fixed wireless access web page (https://www.ofcom.org.uk/manage-your-licence/radiocommunication-licences/fixed-wireless-access) , Ofcom recognises the amateur and amateur-satellite services that also have legitimate access to certain parts of the band so that BFWA licence holders can be aware of the potential for sensitive amateur radio applications to be active in parts of the band which may result in request to use an alternative BFWA channel if interference is experienced.

2) Ofcom provides public data on the locations of registered 5.8GHz BFWA links.

3) Liberalise the 5765-5820 MHz block also for the amateur service. Uniquely in the UK the amateur licence is restricted to four small blocks at 5650-5670 MHz, 5755-5765 MHz, 5820-5830 MHz and 5830-5850 MHz within the contiguous allocation 5650-5850 MHz. This seriously undermines any possibilities for wider bandwidth digital applications and experimentation for short range ad-hoc data networking. In CEPT and ITU no such restrictions exist on the amateur service. The UK amateur licence could be extended to allow digital wide band modes in the range 5765 – 5820 MHz which might be more compatible with the commercial data services in the range.