



Ofcom Consultation:

## **Supporting innovation in the 100-200 GHz range:**

Proposals to increase access to Extremely High Frequency (EHF) spectrum

## **Response by the Radio Society of Great Britain**

**20<sup>th</sup> March 2020**

This response to the above Ofcom consultation document is from the Radio Society of Great Britain (RSGB, [www.rsgb.org](http://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](http://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. The EHF spectrum has seen a series of world leading developments in terms of frequency accuracy, communication distances and innovative technical developments

In the UK amateur usage and developments has extended beyond our 122, 134 and 241 GHz allocated bands. Courtesy of Ofcom Licence Variations for experimentation, impressive results have been pioneered using class-leading frequency stable equipment at 288 GHz.

Meanwhile in February 2020 an astonishing world record distance of 139km [1] was achieved for two-way communication using less than a milliwatt of power in the 122 GHz band. The distance record set in the California mountains is particularly notable as this frequency suffers from severe atmospheric losses due to an oxygen molecular resonance that adds to significant conventional free-space path losses.



## Consultation Questions & Answers

*Question 1: Do you have any comments on our analysis of the current use of spectrum bands in the frequency range 100-200 GHz, or the potential future use of these frequencies? Do you have any comments on current or future use of the specific bands 116-122 GHz, 174.8-182 GHz and 185-190 GHz?*

Radio amateurs do experiment in the millimetre-wave bands (as highlighted in section 3.25) and often take advantage of technological developments in nearby frequency bands to develop experimental systems for their own objectives.

Amateurs have proven that effective communications can take place at these cutting-edge frequencies (and higher) using narrowband systems. Therefore, the RSGB takes a positive view of the objectives behind these initiatives.

*Question 2: Are there any further bands above 100 GHz which you think Ofcom should consider making available on a technology and service neutral basis? Which benefits might be realised from enabling access to further bands?*

RSGB and IARU volunteers are aware of ongoing and concerning developments in CEPT SE24 (notably Work Item 71). This is referred to in section 3.15 of the consultation and we note that deep concerns were recently elevated all the way up to the top ECC level of CEPT.

In brief, an industry proposal would see UWB licence exempt use over-riding ITU-R RR5.340, which protects key passive allocations. The proposed UWB range includes a series of key weak signal frequencies in the amateur service, as well as those used by earth observation. We consider such proposals unjustified and would set an unwelcome precedent, given the alternative ample spectrum available.

*Question 3: Do you have any comments on the approach we have used to assess the potential effect of our proposals on EESS? [Our full technical analysis is set out at annex 6.]*

*Question 4: Do you have any comments on our proposals to authorise devices to operate on a licence-exempt basis in the 116-122 GHz, 174.8-182 GHz and 185-190 GHz bands?*

*Question 5: Do you have any comments on our proposal to create a 'Spectrum Access: EHF' licence to authorise increased power use in the 116-122 GHz, 174.8-182 GHz and 185-190 GHz bands?*

In respect of Q3-5: Whilst we are comfortable with the specific proposals, we take the opportunity to repeat our concern in answer to Question-2 should the bands be significantly expanded.

### Reference:

- [1] New distance record on the 122GHz band  
<https://rsqb.org/main/blog/news/gb2rs/headlines/2020/02/21/new-distance-record-on-the-122ghz-band/>