

**Ofcom Consultation:
The future role of spectrum sharing for
mobile and wireless data services.
Licensed sharing, Wi-Fi, and dynamic spectrum access**

**Joint response from the Radio Society of Great Britain,
UK Microwave Group, Amsat-UK and BATC.**

November 2013



Introduction

This response is a joint one to the above Ofcom consultation from the Radio Society of Great Britain (RSGB, www.rsgb.org.uk) and its national affiliates who have microwave spectrum interests - Amsat-UK (www.uk.amsat.org), UK Microwave Group (UKuG, www.microwavers.org), and the British Amateur Television Club (BATC, www.batc.org.uk).

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.

The amateur and amateur satellite services have secondary allocations in the 2.4 and 5GHz bands (which would be impacted by further Wi-Fi growth), and are host to a variety of usage including amateur use including terrestrial, Earth-Moon-Earth(EME) and satellite communications.

We are particularly concerned to keep at least some segments available for noise-free weak-signal communications. Whilst recognising that Wi-Fi has an important economic contribution, we also have concerns regards recent moves in a EU Mandate to CEPT that would make 5GHz Wi-Fi co-Primary rather than License-exempt. We would be glad to provide such detail to Ofcom should it be required

Questions & Answers

Question 1: How is demand for indoor wireless data connection speeds and capacity likely to develop over the next 5–10 years?

We note Ofcom list three sub-bands for potential expansion of existing 5GHz Wi-Fi:-

- i) 5350 – 5470MHz
- ii) 5725 – 5850MHz
- iii) 5850 – 5925MHz.

We accept that overall demand for Wi-Fi may increase but do not support such a wide extended band that would affect many other services/applications, without detailed consideration.

Of the three, we have strong concerns re the 5725-5850 MHz section within which are:-

- Globally harmonised weak-signal amateur service applications (inc terrestrial long range contacts, Propagation beacons and Earth-Moon-Earth (EME, aka moonbounce) centred at 5760MHz
- Amateur Satellite downlinks centred around 5840MHz

Furthermore we are absolutely opposed to the premise within a related EU mandate on this topic, which foresees such Wi-Fi being on an unprecedented Co-Primary basis. Any Wi-Fi use (or new use) should continue to be on a licence-exempt non-protected basis – like any other short-range device (SRD). It is a long-standing principle in CEPT that no SRD should claim supremacy over another – we see no reasons for any change to this.

Having been involved in 5GHz sharing studies over the past year we suggest the first sub-band (5.4GHz) be particularly studied for indoor Wi-Fi, whilst the upper bands remains available to current and other envisaged services.

Question 2: Will an extension of the 5 GHz band be required if Wi-Fi is to play a sustainable role in meeting the growing demand for indoor wireless connectivity?

5GHz Wi-Fi, whilst providing additional capacity in congested venues such as conference halls and sports venues, has significantly poorer indoor propagation characteristics. Therefore we would caution against seeing it as a complete solution in domestic situations, where thru-wall attenuation can be significant. Likewise it is unlikely that the wider 160MHz channel bandwidths as advocated by the industry are sustainable and planning on a more realistic basis would be desirable.

At present as Ofcom's own research indicates, there is no evidence whatsoever from existing 5GHz use (by newer dual-band consumer equipment, Homehubs etc) that there is insufficient capacity.

Question 3: Are there other types of indoor wireless applications will require access to alternative spectrum other than that provided by the licence exempt 2.4 and 5 GHz bands used by Wi-Fi?

Working with our UK/IARU colleagues we are aware of developments that include ultra-low energy devices for building sensors and smart grids, in 2.4GHz and a significant development for Wireless Industrial Automation (WIA) in the upper section of the 5GHz band. The latter required significant amateur and other contributions to create draft ECC Report 206.

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Question 4: What role do you think Wi-Fi will play in providing wireless broadband connectivity outdoors over the coming 5-10 years?

Question 5: Will the increased deployment of Wi-Fi access points outdoors create a risk of reduced quality of service performance over the longer term and, if so, will approaches to co-ordinate access point performance be able to mitigate this risk?

Question 6: Will improved approaches to accessing spectrum in licence exempt bands be needed in the longer term to maintain the quality of service achievable for outdoor public mobile broadband and/or M2M services? If so, which approaches are most likely to be adopted and how likely do you think they are to be successful in improving access to spectrum?

In respect of Q4, Q5 and Q6 our strongest concern is interference from Wi-Fi to other services from increased outdoor use and ineffective mitigation/compliance. There should be full consideration of deterministic mitigation measures including, geo-location, adaptive channel/power control, and some restriction on fixed access points, particularly at height outdoors).

Question 7: Which frequency bands are most likely to be best suited to providing geographical shared access, including via a geo-location database approach, for use by mobile broadband, for example small cells and M2M applications?

Question 8: Would access to these bands best be realised through licensing or licence exemption?

Question 9: Do you believe that tiered shared access to a range of spectrum bands has a role in meeting demand for mobile and wireless data and, if so, which applications and devices do you think will be particularly suited to this access model?

Regarding Q7-Q9 - Any decision on any band should have specific considerations. We would prefer to see greater thoroughness and consistency in 'band plans', technical standards and regulatory regime for new wireless/commercial applications, in order that incumbent ITU services including sensitive secondary services such as the amateur and amateur-satellite service are fully considered. Such an approach would be consistent with Ofcom's duty to efficiently manage the spectrum.

Question 10: Do you believe DSA could play an important future role in the future in enabling a better quality of service and low barriers to spectrum access alongside conventional licensed and LE spectrum approaches?

Question 12: Over what timescales could DSA become a mass market proposition?

Dynamic Spectrum Access (DSA) like other techniques faces the challenge that it has to account for hidden nodes, receive-only, weak signal/receivers etc. DSA (like LSA) may require unprecedented levels of cooperation and standardisation between quite different applications/services. Whilst not ruling out further development, any new technique should be capable of offering deterministic protection to incumbent services. Recent geolocation-based developments for TV White Spaces represent a useful step in that direction, whereas we agree with Ofcom that past approaches such as DAA/DFS have exhibited serious weaknesses in this regard and that newer approaches may be required.