

Mike Parkins
Ofcom

Re: Ofcom Consultation 'Higher power limits for licence exempt devices'

Dear Sir,

I wish the text of this document to be considered as a response to the above consultation.

I have read the consultation paper and the associated report from Scientific Generics et al with interest. There are, in my view, some deficiencies in the analysis which are of significant concern. In short, these are that: Although the Amateur Service and the Amateur Satellite Service are shown as users of both of the relevant bands, no substantive analysis has been carried out on the possible interference to these services or of interference to the Amateur Service of other countries; many of the existing commercial users of the licence exempt spectrum have limited access to the technical competencies required to exploit the current allowed power levels to their full potential; health and safety considerations have been covered in only a cursory manner; comparison with other administrations has failed to take into account substantive and relevant geographic and demographic differences; and that, should the regulatory requirements for higher power be kept in line with those for other bands where higher powers are currently permitted, this will effectively dissolve the licence exempt band into the existing regulatory framework for commercial spectrum, thereby raising the commercial and technical barriers to entry. This is likely to be counter to the objectives of Ofcom.

1. Although the Amateur Service and the Amateur Satellite Service are secondary users, these services represent a significant number of users, the impact on whom should, in all fairness, be considered properly along with the purported economic benefits to a small minority of users. This has not been done thus far and this, in my view, makes the current consultation flawed for lack of completeness. The statement in s.8.7.6 of the Scientific Generics report is unjustified. The suggestion that the economic benefit derived from the Amateur Service misses the point of the Amateur Service's very existence: self-training and recreational purposes.

2. The Amateur Satellite Service is a service that is used by the citizens of many nations around the world. Participants in Amateur Radio communication from space include many of the astronauts on board the ISS and, moreover, there have been and continue to be amateur satellites sent into orbit which rely on low power transponders to effect communication. No sensible consideration of the noise-floor increase to these users has been mentioned. The statement in s.8.8.5 of the Scientific Generics report is not justified nor quantified. The extra-

territorial impacts on the Amateur Satellite service appears to have been neglected.

No mention has been made about how the UK will be able to continue to meet its treaty obligations with regard to the Amateur Satellite service with a substantial increase in the noise floor being permitted in both of the bands in question.

Further, no consideration has been given to the impact of higher power signals from fixed services on amateur users abroad (nor, for that matter, on more local commercial users) due to anomalous propagation. Although referred to as anomalous, propagation events such as those caused by temperature inversions are frequent in the summer months and can lead to extraordinary distance communication being possible with remarkably low power. Recently communication was made between the UK and Sweden, over 1000km away, by amateurs using the 10GHz band. Propagation under conditions caused by low level temperature inversions can routinely enable amateur radio operators from parts of the UK communicate with others in Europe using 2.4GHz and substantial distances have been worked on 5GHz as well. A substantive increase in the noise floor in these bands will significantly adversely affect amateur radio operators in the UK and overseas.

3. Many commercial users of these unlicensed bands have limited technical competence to make best use of the equipment that is currently available. For instance, proper radio link planning is carried out by few, the majority preferring a 'suck it and see' approach. I see nowhere in the consultation document any analysis that establishes that the current users are making good use of the existing type-approved power levels and *de minimis* antenna dimensions, or any derived work that indicates that the increased power levels will lead to a quantifiable increase in coverage in, for example, rural areas. The operators mentioned in the Scientific Generics report are mainly larger organisations yet there are many much smaller 'WISPs' operating on a shoe string with, generally, lower levels of technical competence or reduced access to properly calibrated test and measurement equipment.

4. Radio frequency power levels of the magnitudes discussed in the consultation are hazardous. With the current low power levels that are permitted, the safe radius for continuous exposure at 2.4GHz is around 20cm for omnidirectional antennas and significantly greater (on boresight) for directional antennas depending upon the aperture. Once again, nowhere in the consultation is the general health and safety of the public or of the workers in the field properly considered. The statement on health and safety in s.13.4.2 of the Scientific Generics report is not properly quantified. It is well understood that the 2.4GHz band, for instance, is close to a water absorption frequency and the use of higher powers on this band in particular should be treated with great caution. It would seem likely that additional safe use warnings, health and safety guidance

and inspections would be required were the widespread use of higher power levels to be permitted amongst what is substantially an under-skilled user base.

5. Comparison with the US (s.14 of the Scientific Generics report) is not reasonable. In the United States and Canada, rural communities are far more widely separated than they are in the UK. Further, planning regulations permit tower heights many times higher than is usual in the UK, leading to significant improvements in link budgets (due to lower localised vegetation scattering and increased line of sight range) and reduced health and safety hazards (due to the antennas being well away from individuals). To compare the scenarios available to rural operators in North America with the UK is unrealistic in the extreme. Comparison with Australia (s.14.2) is also unrealistic. Adjacent villages in rural Australia can be 50km apart. Adjacent villages in the UK could be less than 1km apart.

6. Finally, I should like to make some comments about the commercial users of these bands. The licence exempt bands have, thus far, been set aside for low power quasi ad-hoc systems. The widespread adoption of the IEEE 802.11 series of standards has led to a significant increase in the use of the 2.4GHz band and the development of fixed wireless broadband services has certainly benefited from the availability of low cost equipment at 5GHz, coupled with the simple licensing scheme, for the establishment of backbone links for rural operators. The development of the IEEE 802.16 series of standards is increasing the usage of the 5GHz band for point to multi-point in addition to the established point-to-point systems. My concern here is that those who pay for the use of licensed spectrum are required to maintain equipment to a high specification in order to be able to use the higher power levels available. However, thus far, although they are generally trying to do a competent job, such requirements have not been placed on the users of the licence exempt spectrum. Interference notwithstanding, I should have preferred to have seen a clear analysis carried out on the regulatory and administrative impact of applying the same level of scrutiny to high power users in the unlicensed bands as is applied to the users of similar power levels in the licensed bands. If, on the other hand, it has been envisaged that no such additional requirements should be established, then I should like to cry 'foul' at this stage most wholeheartedly. It seems to me that, should the power level increases proposed be permitted, it is inevitable that the low-cost base users of this spectrum will continue with their existing practices, unaware of the interference that they are causing to others and safe in the knowledge that Ofcom does not have the resources to chase down every case of interference. Worse, commercial users who adopt good practices, enabling them to do already with the existing power levels what the proposed higher power levels will enable the less technically able businesses to achieve, will also suffer from increased levels of interference. If a full range of competency checks are implemented, this may have the effect of raising the barrier to entry in what was supposed to be an ad-hoc area of spectrum set aside

specifically to allow access to radio spectrum without the cost or administration that is required for other bands.

I consider that the proposals require more work before implementation and I object to the proposed power level increases for the above reasons.

Yours faithfully

Ian Beeby