Cover sheet for response to an Ofcom consultation

BASIC DETAILS

Consultation title: **Ofcom's proposal to exempt the use of automotive short-range radar equipment at 24GHz from Wireless Telegraphy licensing**

To (Ofcom contact): **Diana Kennedy, diana.kennedy@ofcom.org.uk**
Ofcom, Riverside House,
2a Southwark Bridge Road, London, SE1 9HA

Name of respondent: **Peter E. H. Day , BA (Hons).**
Amateur Radio G3PHO and Chairman UK Microwave Group

Representing (self or organisation/s): **Self.** (a separate UK Microwave Group Response has also been prepared)

Address (if not received by email):

CONFIDENTIALITY

What do you want Ofcom to keep confidential?

Nothing	Ö	Name/address/contact details/job title	
Whole response		Organisation	
Part of the response		If there is no separate annex, which parts?	

If you want part of your response, your name or your organisation to be confidential, can Ofcom still publish a reference to the contents of your response (including, for any confidential parts, a general summary that does not disclose the specific information or enable you to be identified)?

Yes		No	

DECLARATION

I confirm that the correspondence supplied with this cover sheet is a formal consultation response. It can be published in full on Ofcom's website, unless otherwise specified on this cover sheet, and I authorise Ofcom to make use of the information in this response to meet its legal requirements. If I have sent my response by email, Ofcom can disregard any standard email text about not disclosing email contents and attachments.

Ofcom can publish my response: on receipt Ö once the consultation ends

Name *Peter Day* Signed (if hard copy)

Comments on the "Notice of Ofcom's proposal to exempt the use of automotive short-range radar equipment at 24GHz from Wireless Telegraphy licensing - Consultation document"

-- by Peter Day, Amateur Radio Operator G3PHO

Introduction

In submitting these comments I wish to validate my expertise in the area covered by the Ofcom proposal shown above:

1. Amateur Radio Operator G3PHO- I have held this callsign since 1961 and, since 1968, I have been constructing transmit/receive equipment and operating such equipment on all licensed UK amateur radio frequencies from 1296MHz to 47GHz inclusive. My experience on these frequencies forms the basis of my argument that follows and is the result of almost 40 years of experimentation with equipment construction, testing, antenna design and investigations into microwave propagation. In addition, I have considerable experience in operating 24GHz equipment in "portable" conditions, ie on hill tops, roadside laybys (right next to traffic !), exhibitions, conventions as well as from my home location in Sheffield.

2. Car driver - I have been a licensed driver since the same year as I got my amateur radio licence, 1961. Like Ofcom, I have a real desire to see car accidents and road fatalities reduced to as low a level as possible and therefore I warmly welcome Ofcom's contribution to this, though I disagree with Ofcom's plan to use the 24GHz band to do so.

Points of Information

1. UK Radio Amateurs have a PRIMARY allocation at 24GHz

The Amateur and Amateur Satellite Services in IARU Region 1, as defined in ITU Regulations, have a **Primary allocation in the 24GHz band** (24.000 to 24.050GHz) and a Secondary allocation (24.050 to 24.150GHz, with permission of the Secretary of State in the UK – **this permission has never been granted**.

A further Secondary allocation exists (24.150 to 24.250GHz), but is no longer commonly used in ITU/IARU Region 1, principally in the interests of international harmonisation or "commonality of usage", as agreed at the IARU Region 1 Conference, San Marino, 2002, when it was decided to harmonise all Eu amateur work in the 24.000-24.050GHz section.

2. UK Radio amateurs at 24GHz are "weak signal" enthusiasts

Amateur Services employ communication techniques in the Primary segment 24.000 to 24.050GHz which clearly classifies them as "extremely weak signal flux" services.

3. Other licensed users at 24GHz

There also may be high-power signals from other Primary users, from which SRR cannot claim protection.

Analysis and Comments on the Ofcom 24GHz SRR document

Section 1:

(1.3): (i) Allowing licence free operation in this frequency band can, in my opinion, only lead to problems that have not, as yet, even been thought of.

(ii) That Licence Exemption at 24GHz will be withdrawn on 30 June 2013 and yet to allow existing vehicle SRR installations to continue after that date is unwise. There are many cars on the road today that are older than this suggested time period and one can foresee 24GHz equipped vehicles being on the road well after 2020.

Section 2:

(2.1) I applaud Ofcom's involvement in the attempt to halve road fatalities by 2010.

(2.2/2.3) Harmonisation of Europe-wide SRR should be possible very soon without using 24GHz.

I believe that at least one German vehicle manufacturer already has 79GHz equipment installed. Many top models already use 77GHz (Longer Range) radar for brake-assisted cruise control based on Bosch Electronics units with millimetre wave components from UK companies. Other than Digital Signal Processing (and cost targets), there's not much difference between these and the newer 79GHz SRRs.

While I realise that R & D of 79GHz SRR has some way to go, I am not convinced that this cannot be done in the short term, as even "lowly" radio amateurs, working at frequencies around 76GHz, are having contacts in excess of 100km and some are even investigating the possibility of using the Moon as a passive reflector at this frequency.

Readily available amateur radio 76GHz equipment gives RF power output measured in tens of milliWatts and receiver noise figures in low, single digit figures. So, why cannot manufacturers, who are surely years ahead of amateurs in this respect, produce workable 79GHz SRR systems within the next couple of years?

(2.4) Temporary arrangements (ie using 24GHz) often become permanent!

(2.9) See my comments below in (3.5)

Section 3:

(3.5) The document states that existing licensed users of the 24GHz band will be protected from interference by unlicensed equipment but how is this to be (a) investigated and (b) enforced?

With regard to (a,) investigation of interference, there will be little chance of a licensed user identifying an interference source if it is on the move! I also believe that Ofcom do not yet have the resources to cover this work, as there are already outstanding interference problems still requiring investigation even within the Amateur Radio Service, which "polices" itself to a large extent.

Will the SRR equipment be subject to the vehicle M.O.T after three years, in the same way as other safety features (eg seatbelts and airbags) are also examined? Who will be qualified to test RF equipment like this? There may be some inherent problems with retrofitting SRR equipment after an accident or equipment failure. I cannot envisage the average local garage being able to cope with this. As a result, the refitted SRR equipment could then operate outside the standards laid down by the authorities.

However, of greater concern to amateur users of the 24GHz bands is the interference they may unwittingly cause to oncoming vehicle drivers and which may result in an accident. Where does the radio amateur stand here? In a Court of Law, where the cause of an accident is proved to be a radio amateur's 24GHz transmission affecting the braking system of a vehicle, one seems certain that the amateur will be prosecuted. **Will Ofcom spring to the amateur's defence is such a situation?**

Ofcom may not be aware of the present state of 24GHz amateur radio equipment and operating practices … in the UK alone the average 24GHz amateur station will typically have a 500mW to 3 watt transmitter feeding a parabolic antenna of around 35cm to 1.2 metres diameter (ie with antenna gains well in excess of 40dB). My own equipment runs 3 watts into a +40dB gain antenna …i.e an ERP of some 30kW! Radio amateurs use this type of equipment mainly in narrowband modes, SSB and CW, but there are also NBFM telephony and wideband television modes used. While one would hope that none of these could possibly interfere with a vehicle's 24GHz SRR, we can't be sure since **I see no scientific, definitive data in any of the annexes** to the Ofcom document to indicate that such tests have been undertaken.

The amateur activity on this band is almost 100% portable in nature, the operations being from high spots, often on hilltops but frequently on easily accessible **roadside locations**. This is especially so in the southern half of England where access to off road sites seems harder to get than in the North. In view of this there is an inherent danger of roadside located amateurs being in a position where interference to 24GHz SRR is a distinct possibility. Amateurs would take a dim view of them being blamed for interference to unlicensed apparatus.

The next 5 years or so will see increasing use of the 24GHz amateur band as more and more ex-commercial modules, including RF amplifiers, appear on the surplus market. The pattern will most likely follow that of the 10GHz amateur band where a virtual explosion of activity took place with the advent of such surplus equipment, followed by kitsets produced by enterprising amateur equipment designers.

Section 4:

(4.13) The comment that the prohibitive cost of around £2000 per vehicle for fitting 24GHz SRR sensors will act as a limit on uptake of SSR in this country might very well become meaningless in a year or two as more and more manufactures fit the system as a sales gimmick. As demand increases the price of the equipment and its fitting will rapidly fall until most of the deluxe models of even family cars will have it as standard. Safety is a big selling point as the introduction of airbags has shown.

A similar thing happened with in-car GPS navigation systems where prices rapidly fell over a short period of time after their introduction.

(4.15) Long term, 24GHz SRR will create a noise floor level unacceptable to the many licensed users of this area of the spectrum and in particular to the weak signal exponents such as the Radio Amateur and Radio Astronomers. The fact that Ofcom have created exclusion zones around key radio observatories indicates the possibility of such interference from 24GHz SRR

Amateur users of this band include a sizeable number who are interested in space research (including some radio astronomy but mainly using amateur satellites such as those developed and launched by AMSAT) and exponents of Earth-Moon-Earth communcation whereby 24GHz are “bounced” off the Moon’s surface back to Earth. Such operations demand the lowest possible noise floor. Already intercontinental (Europe to North America) have been achieved.

(4.19) Since Radio Astronomy is being protected from 24GHz SRR interference through the exclusion zone concept, why isn’t the same principle being applied to other licensed and primary users of the band?

In this section Ofcom is accepting an *assumption* that there will be little or no interference to amateur radio users but I have not seen the results of an tests in this respect. The UK Microwave Group representing all UK microwave radio enthusiasts) would be happy to assist in such tests!

(4.31) There is a distinct possibility that 24GHz SRR will discourage the commercial development of similar equipment for 79GHz and that the latter band will not, in fact, be adopted after 2013.

SUMMARY

- Ofcom are appearing to impose unlicensed operations in a UK **amateur radio band that up to now enjoyed Primary status** for some of its allocation.

- The possibilities of interference **BY** the radio amateur **TO** these unlicensed SRR receivers is a possibility and could lead to complicated and serious legal implications for the amateur

- The interference **BY** the SRR equipment **TO** the weak signal users is more than a possibility and would lead to an intolerable increase in the "noise floor" of the very sensitive receivers (Noise Figures of less than 2dB) being used by amateurs.

- The licensed users of 24GHz are concerned about the effectiveness of monitoring of such interference and subsequent penalties for non licensed users who cause interference.

- 24GHz SSR may never "go away"— it may become the norm.

This paper was submitted by Peter Day, G3PHO, May 2005.