

**European Commission Radio Spectrum Committee
FUNDAMENTAL REVIEW OF COMMISSION DECISION
2005/050/EC - 24GHz Automotive Short Range Radar**



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

February 1st 2009

Introduction

This submission is a joint one to the above EC RSC Review from the Radio Society of Great Britain (RSGB, www.rsgb.org.uk) and its national affiliates who have microwave spectrum interests in the 24GHz band - Amsat-UK (www.uk.amsat.org), UK Microwave Group (www.microwavers.org).

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.

Having participated in several consultations and provided previous submissions to regulators in regard of the 24GHz and 77/79GHz Car Radar bands, we are grateful for this further opportunity to contribute. We attach considerable importance to developing both terrestrial and satellite based amateur systems within our 24GHz Primary allocation at 24.0-24.05GHz, and encouraging technology development in the higher millimetre-wave bands.

We are firmly of the belief that nothing should be done to increase the threat of harmful interference to the increasingly popular 24GHz Amateur Services, nor undermine the migration of Automotive SRR to 79GHz, or wider millimetre wave developments in the 60 and 77-81 GHz bands.

Whilst respecting the goals for the automotive e-Safety initiative, we are therefore particularly disturbed by the recent unjustifiable requests for unrestricted use of the new 24-29GHz band by SARA

Attached are our detailed comments. We would be pleased to provide any additional information on request or participate in any future discussions, to the Commission, CEPT, Ofcom(UK) or any other stakeholder who has an interest in these bands.

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RSGB, Amsat-UK & UKuG, February 2009

Detailed Response

General

1. *Is the current EU framework for the provision of radio spectrum for automotive shortrange radar providing sufficient opportunities for the deployment of SRR active road safety equipment without harmful interference to other radio users? If this is not the case, please explain why not and what should be modified.*

Yes – the framework for SRR has made more than enough spectrum available, with reasonable rules.

The automotive industry has simply not exploited it. It has also underestimated fundamental problems with 24GHz SRR such as:-

- The difficulty in developing very high fractional bandwidth equipment at 24GHz (compared to the smaller percentage bandwidth at 79GHz)
- Inadequate frequency reuse due to longer ranges at 24GHz (which leads to co-channel car-car interference)
- Large antennas/arrays being incompatible with car body panels/styling (compared to 60/77/79GHz)
- The higher costs of mitigation and deactivation at 24GHz compared to 79GHz

Road safety impact

2. *Is automotive short-range radar able in your view to make a significant impact on road safety in the European Union? If so, please provide where possible relevant studies, quantitative statistics and estimations of benefits/results.*

At present the limited uptake does not provide enough supporting practical evidence. Whilst recognising the technical studies that led to the SRR system concept, there has to be a fundamental question of whether such a complex systems are suitable or economic for the majority of smaller cars.

Harmful interference

3. *Has any harmful interference between automotive SRR systems and other spectrum users been detected to date? If so, please provide supporting information.*

Not yet, in our 24.0-24.05GHz Primary allocation. However this is largely as a result of the very small numbers so far deployed in cars.

In the same period, Amateur stations have also evolved in numbers and technology at 24GHz and are a combination of nationally licensed beacons and ad-hoc portable and home-based transceivers. One of the reasons originally used by the automotive industry was that 24GHz is a relatively short range band - but this is highly flawed. The majority of the band is away from the water absorption peak. Reception distances for amateur stations can be 100s of km at 24GHz. Examples of data accumulated from the EU Amateur Beacon Propagation database (<http://www.beaconspot.eu/>) for the last few months are plotted in the Appendix. This shows that reception reports from just a few of the many beacons around Europe exhibit significant propagation at 24GHz.

This supports the view that exclusion zones around sensitive installations near 24GHz are justified and that greater frequency reuse without the need for any expensive mitigation is best located in the 79GHz band.

We would also highlight that the increasingly extensive and popular satellite-navigation fits to vehicles result in deactivation zones not incurring any significant cost overhead for SRR installations.

4. Is there any evidence that such interference effects could take place before the reference date (30 June 2013 as defined in Decision 2005/50/EC) or in the foreseeable future beyond this date? Where this is the case, please provide supporting information, including on the potential socio-economic or public interest impact of such interference on other spectrum-using applications.

If the deployment rate remains as modest as it currently is, then it seems unlikely that too many problems will occur over the next few years (particularly due to lower car sales in the current recession). Whilst we still prefer that 2013 is adhered to and the 79GHz band is used, a strictly modest extension to say 2015 may be feasible. However any such decision requires a thorough Impact Assessment for other stakeholders including what damage that might incur to incentives to develop/use 79GHz technology.

Allowed proportion of SRR-equipped vehicles

5. Is the original assumption that a 7.0% concentration of SRR-equipped vehicles at national level operating in the 24 GHz band according to current operational specifications would give rise to harmful interference towards other spectrum users still valid?

Yes

6. If yes, will this continue to be the case until the reference date? Is there any possibility in your view that the 7.0% threshold of 24 GHz SRR-equipped vehicles at national level will be breached before the reference date?

Cannot comment – validated deployment figures and forecasts have not been made publically available with sufficient detail.

7. If not, what should the SRR penetration limit be and when would this concentration be realistically achieved in the market?

No comment

8. What is your opinion on the annual review process which has been taking place to monitor the situation of SRR in the 24 GHz band? Is it adequate or should it be modified?

It seems to be based purely on SARA submissions, which may well have a vested interest.

Other Compatibility Assumptions

9. Are other original assumptions concerning radio compatibility between SRR and other spectrum users in the 24 GHz frequency range still valid? This includes the exclusion zones defined for 24 GHz SRR around radio astronomy sites

NO - Sharing and the potential for Harmful Interference to the Amateur Services was not studied at all in the original ECC Report 24 which is the basis for the current regulations. Any relaxation should have such studies reviewed and oversights corrected – particularly if the new ETSI 24-29 GHz proposals are considered

Placing on the Market

10. Do you have any evidence of unsatisfactory implementation of the Commission Decisions on SRR at national level? Have there been any regulatory difficulties deploying SRR-equipped vehicles?

Yes - Regulations in the UK were unnecessarily delayed by several months compared to the EU directive for mandatory automatic deactivation as can be seen at: <http://www.ofcom.org.uk/consult/condocs/srr/>

11. *What is your opinion on the ability of the Harmonised Standards developed by ETSI to ensure that SRR equipment fulfils the essential requirements of the R&TTE Directive (notably concerning the avoidance of harmful interference) in complement to the EC regulatory measures in this area?*

ETSI Standards for ACC automotive radar permit are too lax and permit considerable out-of-band emissions adjacent to 77GHz, potentially creating problems for the Amateur Service and the SRR band at 79GHz. The new draft ETSI standard for unrestricted 24-29GHz use is extraordinarily naive (nor at all acceptable to the Amateur Services) and it is clear that CEPT should play a greater and earlier role in instilling technical excellence to avoid subsequent issues with respect to sharing studies and harmful interference.

12. *Is there any evidence that 24 GHz automotive SRR equipment has been placed on the market in a stand-alone mode or retrofitted in vehicles already on the market?*

No comment

13. *Is there any evidence of significant imports of SRR-equipped cars from outside the European Union?*

No comment

The permanent 79 GHz band

14. *Has the development of automotive SRR technology in the 79 GHz range been proceeding in a satisfactory fashion? If not, what do you perceive to be the main barriers to the uptake of the 79 GHz band as the permanent band for automotive SRR in the medium term? What could be done to overcome such barriers?*

The automotive industry has been noticeably dragging its feet as it clings to (but does not succeed at) 24GHz and thus not availing itself of, nor incentivising, developments from millimetre wave semiconductor and systems developers. This has wider implication for European electronics industry where companies have invested (or are prepared to) at 79GHz but not seen the forecast demand. Stimulating growth via volume production of automotive radar at 79GHz frequencies would have many benefits in other sectors in adjacent bands inc. multi-gigabit WLANs, aviation, security etc

Alternative Technologies

15. *Which other technologies/applications (radio-based or not) are or may be able to replicate the operational functions of 24 GHz SRR? Please explain any similarities and differences from SRR.*

Suggested rf alternatives include existing narrower band 24 or 77GHz ACC technology with improved signal processing and enhanced beam forming. In addition this might be supplemented by Lidar/infrared sensors (which need not be licensed) . The potential of Intelligent Transport Systems car-car comms at 5.9 or 63GHz for cooperative brake warnings etc has considerable potential to reduce accidents

16. *If alternative systems are under development, estimate the time that would be required before a significant commercial availability and what regulatory or other support actions would be required to enable such technologies.*

A key factor is that any extended deadline or relaxation for 24GHz SRR or, worse still, unrestricted 24-29GHz alternatives would severely undermine any incentive for such innovative developments.

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The Global Dimension

17. Would global harmonisation of operating conditions for automotive SRR be beneficial? Can this benefit be quantified? If beneficial, what action should be taken by the European Commission together with the Member States to foster convergence with other regions in the world for automotive SRR?

The Commission should also examine the options for making the 57-64GHz band available to automotive radar (as per Japan). Semiconductor developments are both easier and more plentiful than 79GHz and could also complement 63GHz Intelligent Transport Systems.

Other Issues

18. Are there any other considerations concerning automotive short-range radar which you would like to bring to the attention of the European Commission?

It is important the review does not rely purely on indirect evidence from the automotive industry for the state of play of electronics development at 24 vs 79GHz. Many of our members work professionally in the electronics industry and are concerned that such an approach would give a blinkered view as well as damage the broader health of European millimetre wave semiconductor and electronics systems developments.

With regard to the recent unrestricted ETSI 24-29GHz proposal, we repeat that we are appalled by such a naive and poorly thought out document. Whilst we are relaxed regarding other uses of 24.05-24.25GHz (our secondary allocation), It is important that harmful interference is avoided in the Amateur Services Primary allocation at 24-24.05GHz.

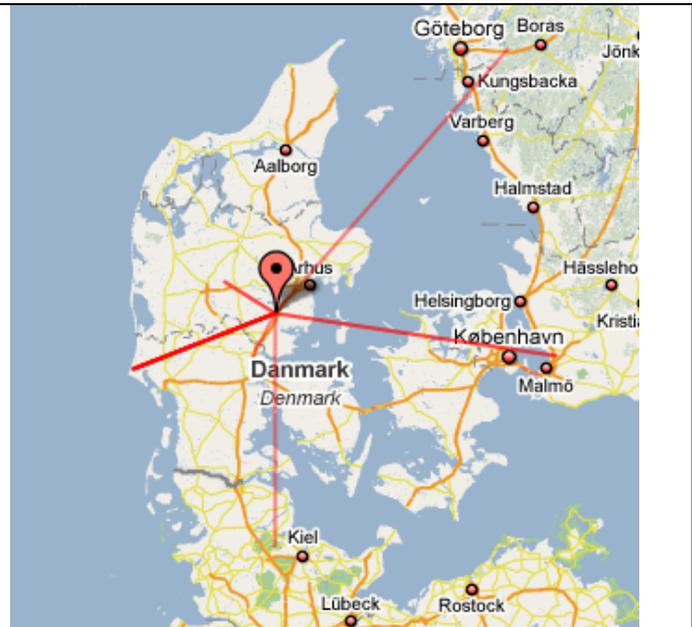
Fundamentally the most economic solutions are those with the least complexity (eg no need for deactivation or other mitigation mechanisms) and the least potential for harmful interference. Thus the Commission is encouraged to pro-actively promote take up of the 79 (or 60GHz) band for Automotive SRR.

RSGB, Amsat-UK, UKuG – January 2009.

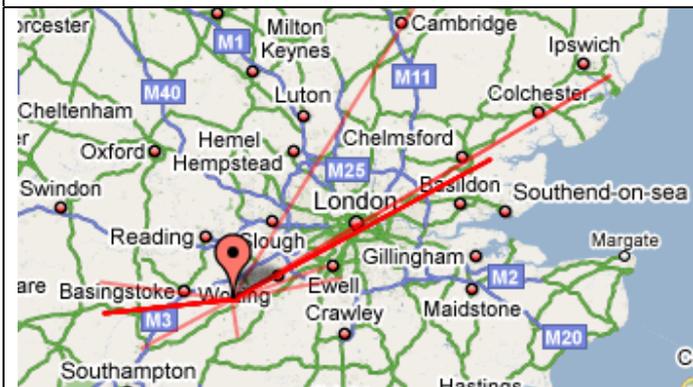
Appendix – Examples of Amateur Service Propagation Beacons and Reception Distances at 24.048GHz



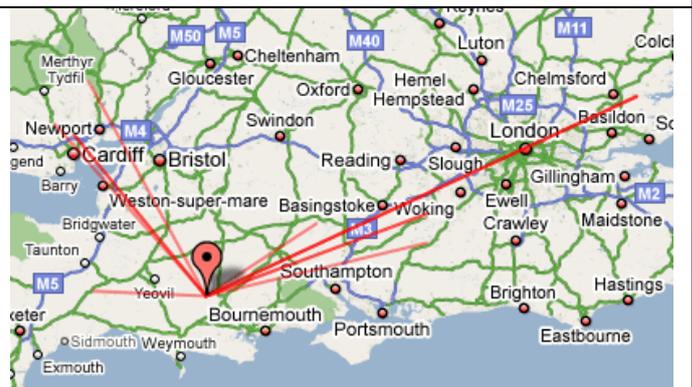
Locations of some UK 24.048GHz Propagation Beacons



Reception reports for OZ5SHF, Denmark



Reception Reports for GB3FNM, Farnham



Reception Reports for GB3SCK, Bell Hill Dorset

Source: <http://www.beaconspot.eu/>

Notes:

In the UK, Ofcom the UK regulator licenses unattended beacons in most amateur bands. At 24GHz, these are based on typically 100mW -1Watt sources into 10dB omnidirectional antennas and provide a valuable calibration and propagation service to individual amateurs equipped with mainly directional personal equipment.

In common with IARU Region-1 recommendations, the Amateur Services Primary Allocation at 24.0-24.05GHz is used, centred on 24.048GHz