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## **RADIO SPECTRUM COMMITTEE**

### **Working Document**

**Subject: Mandate to CEPT to harmonise Radio Spectrum to facilitate a coordinated EU Introduction of Automotive Short-Range Radar (SRR) Systems.**

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Information Society

Rue de la Loi 200, B-1049 Bruxelles/Wetstraat 200, B-1049 Brussel - Belgium - Office: BU33 6/15.  
Telephone: direct line (+32-2)299.01.82., switchboard 299.11.11. Fax: +32.2.296.88.75.  
e-mail : [info-rsc@cec.eu.int](mailto:info-rsc@cec.eu.int)

## **MANDATE TO CEPT TO HARMONISE RADIO SPECTRUM TO FACILITATE A COORDINATED EU INTRODUCTION OF AUTOMOTIVE SHORT-RANGE RADAR SYSTEMS**

### **Title**

A mandate to CEPT to identify radio spectrum for the introduction of automotive short-range radar devices (SRR) in the European Union.

### **Purpose**

Pursuant to art. 4 of the Radio Spectrum Decision, CEPT is mandated to undertake all necessary work to ensure the availability of harmonised radio spectrum in the European Union for the deployment of automotive short-range radar systems to be used for improving road safety. In order to expedite the introduction of this type of radio application in the EU, additional appropriate frequency bands ought to be considered for a limited temporary introduction of SRR systems, besides the identification of permanent SRR spectrum bands for the long term. The protection of other services operating in or near the temporary band(s) must be ensured by introducing specific operating limits for such SRR systems and by moving their operation to the permanent band by a fixed transition date.

### **Justification**

Automotive SRR systems have been identified by the EU policy *eSafety* initiative<sup>1</sup> as a significant technology for the improvement of road safety in Europe by active means, and as one of a number of active and passive measures that could be introduced together to address the overall transport policy goal of cutting road fatalities in Europe by half by 2010<sup>2</sup>.

In this context, the achievement of this policy goal would be supported by enabling the operation of SRR devices in new vehicles sold on the European market at the earliest. For this to happen, radio spectrum needs to be rapidly identified and harmonised at Community level.

### **Background**

In Europe, CEPT ECC/DEC/(02) 01 designates the band 76-77 GHz for vehicular or infrastructure radar systems. However, SRR systems require a wider bandwidth than currently available to obtain the required resolution. Furthermore, the automotive industry<sup>3</sup> holds that the immediate implementation of SRR systems in or around this

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<sup>1</sup>see [http://europa.eu.int/information\\_society/programmes/esafety/index\\_en.htm](http://europa.eu.int/information_society/programmes/esafety/index_en.htm)

<sup>2</sup> Commission Communication on a European Road Safety Action Programme, COM(2003)311, June 2<sup>nd</sup>, 2003 at [http://europa.eu.int/comm/transport/road/library/rsap/com\\_2003\\_0311\\_en.pdf](http://europa.eu.int/comm/transport/road/library/rsap/com_2003_0311_en.pdf) , and Council Conclusions on the European Road Safety Action Programme, June 5<sup>th</sup>, 2003.

<sup>3</sup> SARA (Short Range Automotive Radar Frequency Allocation group) representing 16 car manufacturers and 11 automotive components companies.

frequency range would not be feasible at the present time, given the stated relative lack of maturity and cost-effectiveness of the available technology for this band. The automotive industry believes that in the short term operation around the 24 GHz band is the only commercially-viable solution, with a subsequent migration to the 77 GHz or to another band after some years, by which time appropriate technology solutions are expected to have become cost-effective and the SRR concept validated in the market.

The SRR systems proposed by the automotive industry<sup>4</sup> for the initial market introduction of SRR devices use ultra-wide band transmission principles and emit with a bandwidth of 5 GHz around a carrier, potentially affecting the operation of several existing and important radio applications operating in or near the 24 GHz band, such as passive Earth Observation services, wireless telecommunications fixed links, the Radio Astronomy Service (RAS), and various short-range device applications (SRDs)<sup>5</sup>. It should be underlined that some of these services also play a major role in the security and well-being of European citizens, in particular space-borne passive sensing for meteorological applications.

Based on studies on compatibility between SRR systems and the Fixed Service, the Earth Exploration Satellite Service and the Radio Astronomy Service, CEPT studies<sup>6</sup> indicate that an unlimited deployment of SRR systems at 24 GHz will create unacceptable harmful interference to important existing radio applications operating in or close to this band.

The protection of all concerned services<sup>7</sup> must be taken into account and safeguarded in the designation of spectrum for automotive SRR systems. Technical or regulatory solutions to protect other radio services must therefore be considered, while avoiding undue delays in the introduction of this technology. In this context, some proposals about a programmed phased approach have been discussed in the Electronic Communications Committee (ECC) of CEPT, with SRR systems initially deployed in or near the 24 GHz band for a limited period of time during which their numbers would be expected to remain below a level where interference could become harmful to other existing users. The second part of this phased approach would consist in a proposed migration of the operation of automotive SRR devices to a permanent band.

The compatibility studies carried out by CEPT so far conclude that harmful interference to the FS and EESS services from SRR devices operating in the 24 GHz band according to agreed industry specifications will not be significant as long as the maximum density of cars and other vehicles equipped with SRR systems remains limited and in any case below 10% of all vehicles within visibility of victim radio services.

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<sup>4</sup> Such as defined by draft ETSI Harmonised Standard EN 301 091

<sup>5</sup> The band 24-24.25 GHz is designated for ISM applications.

<sup>6</sup> ECC Report 23 on the compatibility of automotive collision warning short range radars operating at 24 GHz with FS, EESS and Radio Astronomy.

<sup>7</sup> May also include radars used for road speed limit control, the Amateur Radio Service and the Broadcasting Satellite Service (BSS).

Given the mobility within and across EU borders of automotive equipment, a harmonised withdrawal of designation for SRR systems of the 24 GHz band across the EU is essential for this approach to be feasible. A reference date for the termination of placing on the market of SRR devices operating in the temporary band therefore ought to be defined at EU level in the context of their expected market penetration in this band. From this reference date, all *new* SRRs devices would have to use the 77 GHz band (or any other designated permanent band) while the operation of *existing* SRR systems would remain authorised in the temporary band to the end of their operational lifetime.

In order to ensure that this withdrawal will be effective from the set date referred above, and to provide a strong incentive for the automotive sector to develop viable technologies for the permanent frequency range, this band should be available as soon as possible. CEPT is invited therefore to specify the conditions for use of the 77 GHz band (or any other designated band) as soon as possible, but at the latest in parallel with any interim approach.

While any agreed solution must aim to minimise the necessity to refarm other services already operating in the SRR-designated bands, the proposed time schedule on the introduction of SRR should take into account the needs of Administrations possibly concerned by such refarming activities.

### **Regulatory Context**

This mandate is one element of an integrated action aiming at promoting the timely introduction of SRR systems in the European Union in the context of the *eSafety* initiative. If it is decided to designate temporarily the 24 GHz band for SRR systems, other elements that will need to be considered by the European Commission are the following:

- a) Regulatory EU and national measures. Any possible operation of SRR systems at 24 GHz must be linked to halting the introduction on the market of any *additional* equipment operating in this band by a specific date related to an expected penetration threshold. Consideration on how this can be achieved across the EU will include (but not necessarily be limited to) the possibility of a harmonised prohibition of the placing on the market of new SRR systems in the temporary band under the RTT&E Directive.
- b) Harmonised standards. A new harmonised standard for the permanent frequency band would need to be developed as early as possible and with the highest priority. Furthermore, a harmonised standard from ETSI for SRR devices at 24 GHz produced in the context of the R&TTE Directive will only be accepted by the Commission *provided* it is in line with the various elements of the overall approach agreed to in the Radio Spectrum Committee.
- c) A collective commitment by the automotive industry. The commitment would include monitoring of the market penetration of SRR devices in the provisional band. The gathering of monitoring information according to an agreed format would be carried out by ACEA (*European Automobile Manufacturers Association*) in coordination with other automotive associations and presented to the Radio Spectrum Committee annually, or as often as needed. Issues related to the after-sales market may also need to be considered.

- d) A review mechanism. The RSC to undertake a full review of the adopted regulatory approach at some set date, well before the reference date for withdrawal of placing on the market of SRR systems in the temporary band. The RSC may decide to hold such a review at an earlier date, due for instance to a faster-than-expected penetration of SRR systems in the 24 GHz band, or harmful interference that may arise into other services operating in or near the 24 GHz band due to SRR systems.

The above mentioned elements should be prepared in parallel with the execution of this mandate and considered by CEPT when providing its deliverables under this mandate.

### **Order and Schedule**

1. The CEPT is hereby mandated to undertake all relevant work to identify harmonised radio spectrum for the deployment of automotive short-range radar in the EU without undue delay. The radio frequency bands should therefore be chosen according to criteria of equipment cost and of technological maturity. At the same time, a high degree of consideration must be given to the protection of existing radio services in or near the bands to be designated for such short-range radar systems.

Work on the identification of a permanent appropriate band for SRR devices, possibly around 77 GHz, should be undertaken as soon as possible, but at the latest in parallel with any interim approach.

The viability of a time-limited introduction of SRR systems in or near the 24 GHz band should be explored in detail, as this frequency range is considered by the automotive industry as being currently the most appropriate in terms of equipment cost and of technological maturity.

2. More specifically, CEPT is mandated to:

- undertake all necessary technical compatibility studies between automotive SRR systems and other radio services for possible SRR bands;
- designate as a matter of urgency a permanent frequency band(s) for automotive SRR systems, and specify the conditions required for the use of this band;
- consider the designation of a temporary frequency band to enable SRR systems to be introduced in a timely and cost-effective fashion, and specify the conditions required for the use of this band;
- consider the implications of encouraging emissions on a licence-exempt basis in the 23.6-24.0 GHz band, in view of the protection provided by ITU footnote 5.340 to passive services;
- define the threshold market penetration of vehicles equipped with SRR systems operating at or near 24 GHz where interference would be harmful to other existing radio services, and the way this level should be evaluated;
- propose technical and regulatory measures to protect the EESS and FS services from harmful interference by limiting the deployment of automotive SRR systems in the 24 GHz band, and notably by defining a reference date for a programmed mandatory transition of SRR operation to the permanent frequency band in relation to the expected

market penetration of SRR systems at European, national and local level. Other potentially affected services ought also to be considered, in particular Radio Astronomy.

- define the information required to ensure the continued relevance of the technical compatibility identified between SRR systems and other services over the period of operation in the temporary frequency band;

CEPT is expected to summarise the results on the above-mentioned tasks in a report to the Commission.

3. The CEPT is mandated to provide Mandate deliverables according to the following schedule:

<b>Delivery date</b>	<b>Deliverable</b>	<b>Subject</b>
October 2003	First Report from CEPT to the Commission	Description of work undertaken under this Mandate and orientation for future work.
January/March 2004	Draft ECC Decisions on a possible interim and a permanent harmonised frequency band	Validation of draft ECC Decisions for public consultation.
March/July 2004	ECC Decisions	Adoption of the ECC Decisions on the interim solution, if any, and on the permanent harmonised frequency band.
March/July 2004	Final Report from CEPT to the Commission	Description of work undertaken and results achieved under this Mandate

4. The result of this Mandate can be made applicable in the European Community pursuant to Article 4 of the Radio Spectrum Decision<sup>8</sup>.

In implementing this Mandate, the CEPT shall, where relevant, take the utmost account of Community law applicable.

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<sup>8</sup> Decision 676/2002/EC of the European Parliament and of the Council of 7 March 2002 on a regulatory framework for radio spectrum policy in the European Community, OJ L 108 of 24.4.2002, p.1.