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| Summary:  |
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| Proposal: |
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DRAFT CEPT BRIEF ON AGENDA ITEM 1.18

1.18 to consider a primary allocation to the radiolocation service for automotive applications in the 77.5 – 78.0 GHz frequency band in accordance with Resolution 654 (WRC12).

# ISSUE

Resolution 654 (WRC 12) invites ITU-R:

resolves to invite WRC-15

to consider a primary allocation to the radiolocation service in the 77.5-78 GHz frequency band, taking into account the results of ITU-R studies,

and

to conduct, as a matter of urgency, and in time for consideration by WRC‑15, the appropriate technical, operational and regulatory studies, including:

* 1. sharing studies and regulatory solutions to consider a primary allocation to the radiolocation service in the band 77.5-78 GHz, taking into account incumbent services and existing uses of the band;
	2. compatibility studies in the band 77.5-78 GHz with services operating in the adjacent bands 76‑77.5 GHz and 78-81 GHz;
	3. spectrum requirements, operational characteristics and evaluation of ITS safety-related applications that would benefit from global or regional harmonization.

# Preliminary CEPT position

CEPT supports a primary allocation to the radiolocation service to support [automotive] short range radar applications in the frequency band 77.5 to 78.0 GHz in accordance with Resolution 654 (WRC-12) “Allocation of the band 77.5-78 GHz to the radiolocation service to support automotive short-range high-resolution radar operations”.

CEPT is of the opinion that the new allocation needs to be supported by provisions, if needed, to protect the incumbent services.

# Background

There has been significant growth in the use of automotive radar systems, and these systems are expected to become relatively common place within a few years because of general demand for increased road safety. Radars based on the same characteristics, will also likely be used in other applications requiring collision avoidance capabilities.

In order to facilitate the development and deployment of automotive radar systems in Europe, the frequency ranges have been allocated at 24 GHz on a temporary basis due to incompatibilities with existing services, and 79 GHz on a permanent basis.

The 79 GHz band (77-81 GHz) is thus considered to be the long-term operating frequency for SRR within CEPT.

Studies have shown that the use of collision avoidance technology can prevent or lessen the severity of significant number of traffic accidents. In certain parts of the world, automotive radars have successfully operated particularly in the 76-77 GHz band, for many years without mitigation methods or deactivation methods and without increased reports of interference to licensed services.

Portions of 76-81 GHz band are allocated to the radio astronomy service (RAS), amateur and amateur-satellite and radiolocation services (RLS) on a primary or secondary basis and to the space research (space-to-Earth) service on a secondary basis. At these frequencies, radio propagation decreases more rapidly with distance than at lower frequencies and antennas that can narrowly focus transmitted energy are practical and of modest size. While the limited range of such transmissions might appear to be a major disadvantage for many applications, it does allow the reuse of frequencies within very short distances and, thereby enables a higher concentration of transmitters to be located in a geographical area than is possible at lower frequencies. The attenuation of the transmissions, however, varies with the water content of the atmosphere and some other atmospheric factors.

The ITU Council, in adopting Resolution 1318 (Council 2010), stated that ICTs, including intelligent transport systems (ITS), provide mechanisms for vehicular and passenger safety; and invited members of the union to take practical steps to further national and domestic policies, programs and/or educational initiatives in the use of ICTs to improve global road safety.

Status of the CEPT regulatory framework

* In 2001 ECC amended ECC/DEC/(02)01 “.. on the frequency bands to be designated for the co-ordinated introduction of Road Transport and Traffic Telematic Systems” (RTTT) in which the frequency band 76.0 to 77.0 GHz is designated for vehicular radars. This decision is withdrawn in 2012 and replaced by amended ANNEX 5 in ERC Recommendation 70-03 (ANNEX 5: ROAD TRANSPORT AND TRAFFIC TELEMATICS (RTTT))
* (ECC/DEC/(04)03) ECC Decision of 19 March 2004 on the frequency band 77–81 GHz to be designated for the use of Automotive Short Range Radars

## Regulatory status of radiolocation service in the 76-81 GHz band

Currently the 76-77.5 GHz and 78-81 GHz bands are globally allocated to the radiolocation service on a primary basis.

An additional global primary allocation to the radiolocation service in the 77.5-78 GHz band provides a harmonized, contiguous band for collision avoidance related [automotive] short range radar applications in the 76-81 GHz band.

# List of relevant documents

ITU-Recommendations:

ITU-R M.1452-2 – Millimetre wave vehicular collision avoidance radars and radiocommunication systems for intelligent transport system applications.

ITU-Reports:

ITU-R SM.2057 - Studies related to the impact of devices using ultra-wideband technology on radiocommunication services

Further ITU documents:

Updated information/documentation on the ITU-R Preparatory Studies for WRC-15 is available at <http://www.itu.int/ITU-R/go/rcpm-wrc-15-studies>

Annex 29 of Doc. 5B/475: Working document towards a preliminary draft new Report ITU-R M.[AUTOMOTIVE RADARS] “Systems characteristics and compatibility of automotive radars operating in the 77.5-78 GHz band for sharing studies”

Annex 9 of Doc. 5B/475: Working document towards DRAFT CPM text “Chapter 3. Aeronautical, maritime and radiolocation issues. AGENDA ITEM 1.18”

Annex 10 of Doc. 5B/475: “Work plan for WRC-15. AGENDA ITEM 1.18”

Doc. 5/73: New Recommendation ITU-R M.[AUTO] - Systems characteristics of automotive radars operating in the frequency band 76-81 GHz for intelligent transport systems applications

Liaison Statement from WP5A to WP5B (Document 5A/TEMP/56) Information on amateur service systems at 77.5 – 78 GHz

CEPT and/or ECC Documentation (Decisions, Recommendations, Reports):

ECC Report 56, “Compatibility of automotive collision warning short range radar operating at 79 GHz with radiocommunication services”, Stockholm, October 2004.

ERC Recommendation 70-03 (9th October 2012) Annex 5 RTTT (duplicated?)

ETSI standard EN 302 264, Electromagnetic compatibility and Radio spectrum Matters (ERM); Short Range Devices; Road Transport and Traffic Telematics (RTTT); Short Range Radar equipment operating in the 77 GHz to 81 GHz band, 2009, which is under revision (LS from ETSI to WP5A, Document 5A/159-E)

EU Documentation (Directives, Decisions, Recommendations, other), if applicable:

2004/545/EC: Commission Decision of 8 July 2004 on “the harmonisation of radio spectrum in the 79 GHz range for the use of automotive short-range radar equipment in the Community” (notified under document number C(2004) 2591)(Text with EEA relevance), Official Journal L 241, 13/07/2004 P. 0066 – 0067

# Actions to be taken

## Sharing studies:

* to estimate the impact of [automotive]short range radar applications within the RLS in the band 77.5 – 78.0 GHz, which may use parameters provided in the Rec. ITU-R M [AUTO] with regard to the Amateur and Amateur Satellite Services (primary allocation) and Radio Astronomy and Space Research Services (secondary allocation)

## Other studies:

* Consider developing a contribution to ITU-R WP 5B towards CPM text on Agenda Item 1.18 .
* Any limitation to the allocation to the RLS needs to be justified based on sharing studies.

# Relevant information from outside CEPT (examples of these are below)

## European Union (date of proposal)

The band in question is harmonised for automotive short-range radar in the European Union since 2004

## Regional telecommunication organisations:

APT (4-5 December 2013)

APT Members support studies in ITU-R in accordance with Resolution 654 (WRC-12) including sharing studies with services in the band 77.5-78.0 GHz and compatibility studies with services operating in the adjacent bands.

Some APT Members support a primary allocation to the radiolocation service in the 77.5-78.0 GHz frequency band, and realize that the development of automotive radar in 76.0-81.0 GHz band can provide worldwide or regional harmonization for safety and collision avoidance, which, if implemented, will very likely result in reduced traffic fatalities and injuries on the road. Some other APT Members are of the view that the existing services in in the 77.5-78.0 GHz frequency band should be adequately protected from potential interference due to the possible new allocation to the radiolocation service to support automotive short-range high-resolution radar operations, and no constraints are placed on these services.

ATU (date of proposal)

No specific information was given related to the AI 1.18 at the 1st ITU Inter-regional workshop on WRC-15 preparation held in Geneva on 4-5 December 2013.

Arab Group (4-5 December 2013)

Arab Group supports new allocations to the radiolocation service limited for automotive application in the band 77.5 – 78 GHz.

Arab Group also supports the current studies, especially sharing studies, regulatory solutions in the band 77.5-78 GHz in addition to the compatibility studies with other services in the adjacent bands 76-77.5 GHz taking into consideration protection of the existing services in this band.

CITEL (4-5 December 2013)

Preliminary views Brazil/Canada/USA:

Support a primary allocation to the radiolocation service in the frequency band 77.5-78 GHz for automotive radars if ITU-R studies show that:

Sharing is feasible with existing services in the band 77.5-78 GHz and;

Compatibility with and protection of existing services has been demonstrated in the adjacent bands 76-77.5 GHz and 78-81 GHz.

RCC (4-5 December 2013)

The RCC administrations have no objection to primary allocation to the radiolocation service of the 77.5-78.0 GHz frequency band under conditions, defined as a result of compatibility studies and providing the protection of existing services in the band 77.5-78.0 GHz and in the adjacent bands 76-77.5 GHz and 78-81 GHz.

## International organisations

IARU (29 March 2013)

IARU Position

Currently the only primary incumbent services in the band 77.5-78.0 GHz are the amateur and amateur-satellite services. These services also have secondary allocations in the adjacent bands of 76.0-77.5 GHz and 78.0-81.5 GHz. Amateur experimentation in the band is ongoing.

When allocations to services between 71 GHz and 84 GHz were made for the first time at WARC-79, the amateur and amateur-satellite services received a primary and exclusive allocation of 75.5-76.0 GHz and a secondary allocation of 76.0-81.0 GHz. The allocation of 75.5-76.0 GHz was withdrawn at WRC-2000 and as compensation the band 77.5-78.0 GHz was upgraded to primary and No. 5.561A was added, creating a new secondary allocation to the amateur services at 81.0-81.5 GHz.

The IARU acknowledges that there are significant benefits to be gained from worldwide standards for technologies such as automotive radars. However, automotive radars are classic examples of short- range devices (SRDs) for which, in general, allocations are neither essential nor appropriate.

Should a primary allocation to the radiolocation service for automotive applications nonetheless be added to the 77.5 – 78.0 GHz frequency band, the IARU earnestly requests that the primary allocation to the amateur and amateur-satellite services be maintained; or, in the alternative, that a suitable replacement allocation be provided on a primary basis within the band 71 – 84 GHz.

IATA (date of proposal)

ICAO (July 2013)

Position

No impact on aeronautical services has been identified.

IMO (date of proposal)

NATO (date of proposal)

WMO and EUMETNET (25 January 2013)

WMO supports a primary allocation to the radiolocation service in the 77.5-78 GHz frequency band under the assumption that this new allocation to the radiolocation service will facilitate moving automotive applications out of the 24 GHz “passive” frequency band currently used by automotive radars.

## Regional organisations

CRAF (January 2013)

Comments

Radio astronomical observations in the band 77.5 - 78.0 GHz are covered by the footnote 5.149 and have a secondary allocation. The mm-wave regime is already strongly affected by quantum noise in the receivers and radio astronomy utilises wide bandwidths in order to achieve sufficient sensitivities. Increased interference from the proposed allocation will practically isolate the 76-77.5 GHz primary band from the other primary band at 79-94 GHz, reducing achievable sensitivity. In ITU-RWP7D contributions have recently been made detailing studies showing that exclusion zones of ~30 km or more would be needed around observatories to ensure protection of the RAS and that the erection of shielding fences around observatories (a proposed mitigation technique) is unlikely to be practical.

CRAF Position

CRAF supports the protection of existing RAS allocations. No allocations to the radiolocation service should be made unless acceptable sharing criteria with the RAS are established and included in future regulations.

ESA-SFCG (July 2013)

SFCG supports the protection of existing space science service allocations. SFCG further supports a radiolocation allocation in 77.5 - 78 GHz for automotive applications as a means of removing such applications from the 23.6-24 GHz band, however, no new allocations to radiolocation should be made unless acceptable sharing criteria with the affected space science service are developed. Every effort should be made to restrict the use of the potential radiolocation allocation to automotive radars and to adopt technical parameters that would mitigate the effects of those radars on the space science service.

Eurocontrol (date of proposal)