



**EUROPEAN COMMISSION**

Communications Networks Content & Technology Directorate-General

Electronic Communications Networks & Services

**Radio Spectrum Policy**

Brussels, 9 October 2017

DG CONNECT/B4

**RSCOM17-40**

**PUBLIC DOCUMENT**

## **RADIO SPECTRUM COMMITTEE**

### **Working Document**

**Subject: Commission paper on a draft Mandate to CEPT on RLAN in the 6 GHz band (5925-6725 MHz)**

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## Introduction

Pursuant to Article 6 of the Radio Spectrum Policy Programme (RSPP)<sup>1</sup>, the Commission shall, in cooperation with Member States, assess the justification and feasibility of extending the allocations of unlicensed spectrum for wireless access systems, including radio local area networks.

Taking into account the outcome of the Mandate submitted to CEPT by the Commission in 2013 to study and identify harmonised compatibility and sharing conditions for Wireless Access Systems including Radio Local Networks in the bands 5350-5470 MHz and 5725-5925 MHz ('WAS/RLAN extension bands') bands for the provision of wireless broadband services, it is not possible for the Commission to proceed further in the RSC with a harmonisation measure on RLAN in the bands 5350-5470 MHz and 5725-5925 MHz.

Noting recent developments, there is now a potential way forward by examining the possibilities of making available additional spectrum in the 6 GHz band (5925-6725 MHz) for WAS/RLAN on a shared basis.

Member States are invited to give their views during the meeting and if necessary to provide any written comments on the attached draft of the Mandate to CEPT on RLAN in 6 GHz band by 6<sup>th</sup> November 2017.

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<sup>1</sup> Decision 243/2012/EU of 14 March 2012, OJ L 81 of 21.3.2012

**DRAFT MANDATE TO CEPT**  
**TO STUDY AND IDENTIFY HARMONISED COMPATIBILITY AND SHARING CONDITIONS FOR**  
**WIRELESS ACCESS SYSTEMS INCLUDING RADIO LOCAL AREA NETWORKS**  
**IN THE BAND 5925-6725 MHz FOR THE PROVISION OF WIRELESS BROADBAND SERVICES**

**1. PURPOSE**

The objective of the mandate is to study and identify harmonised compatibility and sharing conditions for a sustainable and efficient use on a shared basis of the frequency band 5925-6725 MHz for wireless access systems including radio local area networks (WAS/RLANs). Based on the results of the necessary coexistence studies, the operational sharing conditions for WAS/RLANs should enable the coexistence with other systems in these and adjacent frequency bands.

**2. BACKGROUND**

Regarding the frequency band 5925-6725 MHz, the European Common Allocations Table (ECA Table)<sup>2</sup> includes a primary allocation to the Fixed Service, the Fixed-Satellite Service (Earth-to-Space) and the Earth Exploration-Satellite (passive) Service. According to the ECA Table, radio applications in this band include Satellite Earth Stations on board Vessels (within the sub-band 5925-6425 MHz), Fixed Satellite Service Earth Stations, Fixed Service systems (point-to-point), Passive Sensors (satellite), Radiodetermination and UWB.

A considerable amount of RLAN devices currently in use are still operated in the 2.4 GHz band (2400-2483.5 MHz) where, based on the Commission Implementing Decision (EU) 2017/1483 amending Decision 2006/771/EC on short-range devices, 83.5 MHz of spectrum is available on a non-exclusive, non-interference and non-protected basis to a large number of short-range devices because the overwhelming majority of commercially available access points have until recently been capable of operating only there.

Commission Decision 2007/90/EC amending Decision 2005/513/EC harmonises the use of radio spectrum in the 5 GHz band (5150-5350 MHz and 5470-5725 MHz) for the implementation of wireless access systems including radio local area networks (WAS/RLANs). The use of the 5 GHz band for the operation of WAS/RLAN systems is subject to general authorisation only.

The existing regulatory framework for WAS/RLAN systems using the 2.4 GHz and 5 GHz bands has led to a rapid take-up of Wi-Fi based wireless broadband usage which is based on the availability in the internal market of a nearly-globally harmonised spectrum resource that fosters large economies of scale for equipment manufacturers. The low spectrum access barrier has led to a large-scale deployment of interoperable Wi-Fi-capable devices and access points. In addition to the private use of Wi-Fi, wireless broadband access through publicly accessible Wi-Fi access points is now recognised as important connectivity infrastructure that is largely complementary to mobile internet services provided by mobile network operators.

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<sup>2</sup> ERC Report 25 available at <http://www.erodocdb.dk/Docs/doc98/official/pdf/ERCREP025.PDF>, EFIS database at [www.efis.dk](http://www.efis.dk)

The European Union promotes free Wi-Fi connectivity for citizens and visitors in public spaces everywhere in Europe through the WiFi4EU scheme<sup>3</sup>. The budget of the WiFi4EU scheme is EUR 120 million for the period 2017-2019. The scheme supports the installation of state-of-the-art Wi-Fi equipment in the centres of community life. The WiFi4EU scheme is funding the equipment and installation costs (internet access points) and is open to local public authorities.

While there is already 455 MHz in the 5 GHz band harmonised for WAS/RLAN, there is also evidence that practically all new smart phones and tablets now have dual-band Wi-Fi connectivity (2.4 GHz and 5 GHz). Moreover, large-scale public Wi-Fi networks are today a significant driver of 5 GHz band use, especially where outdoor coverage is being provided<sup>4</sup>. In this respect, making available additional spectrum resources on a shared basis without re-farming existing usage would provide additional socioeconomic benefits under the condition that spectrum sharing with incumbent services is feasible.

Therefore, in order to identify additional spectrum resources for WAS/RLAN on a shared basis, the Commission submitted a Mandate<sup>5</sup> to CEPT in 2013 to study and identify harmonised compatibility and sharing conditions for WAS/RLAN in the 5 GHz extension bands 5350-5470 MHz and 5725-5925 MHz. CEPT Report<sup>6</sup> 64 of November 2016 in response to the Mandate concludes that considering the results of the studies performed under tasks of the Mandate it is not possible to specify any appropriate mitigation techniques and/or operational compatibility and sharing conditions that would allow WAS/RLANs to be operated in the bands 5350-5470 MHz and 5725-5925 MHz while ensuring relevant protection of incumbent services in these bands.

The outcome of the Mandate submitted to CEPT in 2013 does not allow the Commission to proceed with a harmonisation measure on RLAN in the bands 5350-5470 MHz and 5725-5925 MHz. Noting recent developments there is now a potential way forward by examining the possibility of making available additional spectrum in the 6 GHz band (5925-6725 MHz) for WAS/RLAN on a shared basis with various radio applications currently using the 6 GHz band.

### **3. JUSTIFICATION**

Pursuant to Article 4(2) of the Radio Spectrum Decision<sup>7</sup>, the Commission may issue mandates to the CEPT for the development of technical implementing measures with a view to ensuring harmonised conditions for the availability and efficient use of radio spectrum necessary for the functioning of the internal market. Such mandates shall set the tasks to be performed and their timetable.

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<sup>3</sup> <https://ec.europa.eu/digital-single-market/en/policies/wifi4eu-free-wi-fi-europeans>

<sup>4</sup> See WIK/Aegis Study "Study on impact of traffic off-loading and related technological trends on the demand for wireless broadband spectrum", 2013 (SMART 2012/0015), current use of the 5 GHz band. Study report is available on <https://publications.europa.eu/en/publication-detail/-/publication/128656f0-dfb9-40f3-a175-87a090ec3e84>

<sup>5</sup> document RSCOM13-32rev3 at <https://ec.europa.eu/digital-single-market/en/news/radio-spectrum-cept-mandates-0>

<sup>6</sup> <http://www.erodocdb.dk/Docs/doc98/official/pdf/CEPTREP064.PDF>

<sup>7</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, OJL 108 of 24.4.2002

Pursuant to Article 6 of the Radio Spectrum Policy Programme (RSPP)<sup>8</sup>, the Commission shall, in cooperation with Member States, assess the justification and feasibility of extending the allocations of unlicensed spectrum for wireless access systems, including radio local area networks. In addition, Article 3(c) of the RSPP requires Member States, in cooperation with the Commission, to take all steps necessary to ensure that sufficient spectrum for coverage and capacity purposes is available for achieving the target for all citizens to have access to broadband speeds of not less than 30 Mbps by 2020. In order to meet future broadband connectivity needs, the Commission proposes that by 2025 all schools, transport hubs and main providers of public services as well as digitally intensive enterprises should have access to internet connections with download/upload speeds of 1 Gigabit of data per second<sup>9</sup>. In addition, all European households, rural or urban, should have access to networks offering a download speed of at least 100 Mbps, which can be upgraded to 1 Gigabit.

In view of the above broadband connectivity objectives as part of the Digital Single Market Strategy and Digital Agenda for Europe and considering the steadily increasing amount of data traffic delivered through fixed broadband networks, the Commission considers WAS/RLAN frequency bands as essential spectrum resource for the provision of internet-based services. It is therefore necessary to ensure that sufficient spectrum resources are available on a harmonised basis to support a long-term future for new generations of WAS/RLAN technologies that will provide increasing data capacity and speed.

The Study on Wi-Fi Spectrum Needs<sup>10</sup> commissioned by Wi-Fi Alliance in 2017 has concluded that the ever growing number and diversity of Wi-Fi devices along with increased connection speeds and data traffic volumes will exceed the capacity of spectrum currently available in the 5 GHz band by 2020. Between 500 MHz and 1 GHz of additional spectrum in various world regions may be needed to support expected growth in Wi-Fi by 2020. Additional spectrum identified for Wi-Fi should be sufficiently contiguous to support 80 MHz and 160 MHz wide channels which are required to support a growing number of applications which need a large bandwidth to achieve Gigabit speeds.

Designating an uninterrupted block of spectrum in the 6 GHz band (5925-6725 MHz) for WAS/RLANs would result in up to 800 MHz of newly available spectrum in the range at 6 GHz, and may also result in an increase of possibly available 80 MHz and 160 MHz channels. Realising a sharing opportunity for WAS/RLAN to operate on a shared basis in an uninterrupted band from 5925 MHz to 6725 MHz would therefore ensure that sufficient spectrum capacity for private and public Wi-Fi deployments will be available throughout the internal market.

The Commission focuses on the 6 GHz band as a promising alternative to 5 GHz where spectrum currently available for RLAN cannot be extended given the outcome of the previous Mandate (2013). The 6 GHz band (5925-6725 MHz) is immediately adjacent to 5 GHz and therefore it should be technologically compatible with existing Wi-Fi equipment

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<sup>8</sup> Decision 243/2012/EU of 14 March 2012, OJ L 81 of 21.3.2012

<sup>9</sup> See the Communication Connectivity for a Competitive Digital Single Market - Towards a European Gigabit Society (COM(2016) 587 final)

<sup>10</sup> <https://www.wi-fi.org/news-events/newsroom/additional-unlicensed-spectrum-needed-to-deliver-future-wi-fi-connectivity>

using the 5 GHz band according to initial views given by the industry. The 6 GHz band should also contain sufficient uninterrupted spectrum to accommodate 80 MHz and 160 MHz channels. Moreover, the Commission assumes that the development of compatibility and sharing conditions for RLAN in the 6 GHz band (5925-6725 MHz) should be less problematic than for RLAN in the previously proposed extension bands at 5 GHz (5350-5470 MHz and 5725-5925 MHz) mainly in regard to a different composition of the incumbent use of the band.

However, such an opportunity can only be realised if appropriate coexistence between WAS/RLAN and radio applications for which the band 5925-6725 MHz is already assigned or designated is duly safeguarded. It will therefore be necessary to carry out the appropriate technical studies and identify suitable sharing conditions to fully safeguard the operation of all radio applications currently using the band 5925-6725 MHz as well as the bands adjacent to this band.

Taking into account the current activity in the United States<sup>11</sup> to examine the possibility of license-exempt use by RLAN of the bands 5925-6425 MHz and 6425-6725 MHz, there should be a scope for worldwide harmonisation of additional spectrum for WAS/RLAN that would strengthen the economies of scale for manufacturers of RLAN equipment.

#### **4. TASK ORDER AND SCHEDULE**

The objective of this Mandate is to (1) study and identify harmonised compatibility and sharing scenarios for WAS/RLANs to operate on a shared basis in an uninterrupted band from 5925 MHz to 6725 MHz; to (2) develop appropriate compatibility and sharing conditions for a maximum number of 80 MHz channels in the band to ensure a long-term spectrum access resource for WAS/RLANs to operate on the basis of the general authorisation.

The CEPT is thereby mandated to carry out the following tasks:

##### **Task 1 – Identification of compatibility and sharing scenarios**

To study and identify harmonised compatibility and sharing scenarios for WAS/RLANs in the 5925-6725 MHz band, on the basis of the latest generation of WAS/RLAN equipment (v. 2.1.1.)<sup>12</sup> and to define relevant protection parameters and conditions for a maximum number of 80 MHz channels in the band in close cooperation with all concerned stakeholders in order to facilitate coexistence between RLAN systems and other existing usage in various Member States in and adjacent to the band 5925-6725 MHz. To assess the impact, if any, of the future use of WAS/RLAN systems in the band 5925-6725 MHz on short-range devices operating in the band 5000-7000 MHz according to the parameters harmonised in Decision (EU) 2017/1483 amending Decision 2006/771/EC.

For each compatibility and sharing scenario, the risk of interference, the deployment assumptions of all applications and the operational footprint of the actual use of incumbent services/applications should be identified.

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<sup>11</sup> [https://apps.fcc.gov/edocs\\_public/attachmatch/DOC-345789A1.pdf](https://apps.fcc.gov/edocs_public/attachmatch/DOC-345789A1.pdf)

<sup>12</sup> [http://www.etsi.org/deliver/etsi\\_en/301800\\_301899/301893/02.01.01\\_60/en\\_301893v020101p.pdf](http://www.etsi.org/deliver/etsi_en/301800_301899/301893/02.01.01_60/en_301893v020101p.pdf)

In addition, it should be assessed whether and how coexistence can be ensured between the future WAS/RLAN usage and other potential uses of the 6 GHz band (5925-6725 MHz) that could be considered on a shared basis.

## **Task 2 – Development of compatibility and sharing conditions**

Taking into account the expected development of WAS/RLAN technology and of the relevant standards until 2020, in particular the use of larger channel bandwidths, as well as the outcome of Task 1, appropriate mitigation techniques and/or operational compatibility and sharing conditions should be developed in close cooperation with all concerned stakeholders.

In the light of experience, the compatibility and sharing conditions should in particular identify the technical parameters that would be needed to ensure in the internal market consistent harmonised conditions and requirements for WAS/RLANs operating on a shared basis across the entire 6 GHz band (5925-6725 MHz).

In order to enable WAS/RLANs to operate on the basis of a general authorisation only, these harmonised conditions and requirements should be implementable by means of harmonised standards and foster economies of scale, in particular taking into account existing sharing technologies and mitigation approaches which are currently applied for existing WAS/RLAN equipment. The regulatory and enforcement context of general authorisation should be taken into consideration. The compatibility and sharing conditions should also define the coexistence criteria that must be respected by any other potential future use of the 6 GHz band (5925-6725 MHz) to prevent interference with WAS/RLAN usage in this band.

With a view to achieving a scope for worldwide harmonisation of additional spectrum for WAS/RLAN that would strengthen the economies of scale for manufacturers of RLAN equipment and thereby benefit all end-users, the work carried out under Task (2) of the Mandate should take into account developments in other ITU Regions, in particular the current activity in the United States aimed at assessing the possibility of license-exempt use by RLAN of the bands 5925-6425 MHz and 6425-6725 MHz. By November 2018 the CEPT will organise a public stakeholder workshop on RLAN in the 6 GHz band whose purpose will be to examine the international developments in the band, e.g. the situation in the United States and other countries.

In the work carried out under the Mandate, the overall policy objectives of the RSPP, such as effective and efficient spectrum use and the support for specific Union policies shall be given utmost consideration. In implementing this Mandate, the CEPT shall, whenever relevant, take utmost account of EU law applicable and support the principles of service and technological neutrality, non-discrimination and proportionality insofar as technically possible.

CEPT is also requested to collaborate actively with all concerned stakeholders and the European Telecommunications Standardisation Institute (ETSI) which develops harmonised standards for conformity under Directive 1999/5/EC.

CEPT should provide deliverables according to the following schedule:

<b>Delivery date</b>	<b>Deliverable</b>	<b>Subject</b>
July 2018	Interim Report from CEPT to the Commission	Description of work undertaken and interim results under tasks (1) and (2) of this Mandate
November 2018	Final Draft Report from CEPT to the Commission	Description of work undertaken and final results under tasks (1) and (2) of this Mandate including the results of the public stakeholder workshop on RLAN in the 6 GHz band
March 2019	Final Report from CEPT to the Commission taking into account the outcome of the public consultation	Description of work undertaken and final results under this Mandate taking into account the results of the public consultation

In addition, CEPT is requested to report on the progress of its work pursuant to this Mandate to all meetings of the Radio Spectrum Committee taking place during the course of the Mandate.

The Commission, with the assistance of the Radio Spectrum Committee and pursuant to the Radio Spectrum Decision, may consider applying the results of this mandate in the EU, pursuant to Article 4 of the Radio Spectrum Decision.