ECC Decision (20)01

On the harmonised use of the frequency band 5945-6425 MHz for Wireless Access Systems including Radio Local Area Networks (WAS/RLAN)[1]

approved 20 November 2020

amended 8 November 2024

[1] Comparable technical specifications to those given in this ECC Decision are given in EC Decision 2021/1067 [13]. EU Member States and, if so approved by the EEA Joint Committee, Iceland, Liechtenstein and Norway are obliged to implement the EC Decision.

EXPLANATORY MEMORANDUM

1 INTRODUCTION

This CEPT/ECC Decision addresses the designation of the frequency band 5945-6425 MHz for the implementation of Wireless Access Systems including Radio Local Area Networks (WAS/RLAN). This frequency band has been allocated to the mobile service, the fixed service and the fixed-satellite service on a primary basis in all three regions by ITU-R Radio Regulations.

Wireless Access Systems are broadband radio systems which can be deployed either inside or outside buildings, usually in geographically limited areas. Broadband RLAN, a subset of WAS, are the major type of equipment deployed today and are predominantly used inside buildings. Typical WAS/RLAN include public and private applications offered in homes, schools, hospitals, hotels, conference centres, railway stations, airports, shopping centres, etc. These types of applications may thus be considered to fall into the ITU-R categories nomadic wireless access (NWA) or mobile wireless access (MWA) [10]. They are typically intended for connections between traditional business products such as PC, laptops, workstations, servers, printers and other networking equipment as well as digital consumer electronic equipment in the wireless home network environment. RLAN thus remove the need for physical connection of the above devices. RLAN utilise low power levels because of the short distance nature of inside building operation. Most of the existing RLAN and similar broadband data transmission systems are currently operating in the ISM frequency bands. In order to ensure high reliability and higher data transfer rates RLAN, however, require a more predictable sharing environment. Therefore, other frequency bands have been identified which are more suitable than the ISM bands for these kinds of services. More detailed information regarding broadband RLAN applications which are used worldwide can be found in Recommendation ITU-R M.1450 [5].

2 BACKGROUND

The results of detailed compatibility and sharing studies within CEPT taking into account the existing radio services can be found in ECC Report 302 [4] and ECC Report 316 [6] and in complementary studies performed in parallel with the public consultation on this ECC Decision in order to further assess the in-band Power Spectral Density (PSD) for VLP devices and out-of-band emission limits below 5935 MHz for LPI and VLP devices. This technical assessment were also the basis for the response to the EC Mandate on 6 GHz WAS/RLAN in CEPT Report 73 (2019) [7] and CEPT Report 75 [8]. As a consequence of these studies, the following use cases and related conditions were identified for use by WAS/RLAN in the bands 5945-6425 MHz:

- Low power indoor (LPI) use, maximum mean[2] 200 mW e.i.r.p., with no outdoor use allowed;
- Very low power (VLP) portable use, maximum mean[1] 25 mW e.i.r.p., that may both operate indoor and outdoor.

The e.i.r.p. requirements assumed generic WAS/RLAN systems. Those systems can be described by two common configurations: centralised systems, where multiple devices are connecting to an access point (AP), and non-centralised systems, where multiple devices communicate directly in a small area on an ad-hoc basis.

Consideration of use cases with powers higher than those described in this Decision including for outdoor use would require further investigations.

LPI use is intended to be permanently in buildings, in aircraft or in trains. The outdoor use of the frequency band is restricted to the VLP usage because of the protection requirements of other radio services. The VLP outdoor use is intended to cover short range applications for small area direct communications. VLP devices can operate in the frequency band 5945-6425 MHz throughout CEPT taking into account operations of Urban Rail Intelligent Transport Systems (ITS). This approach is based on the conclusions contained in CEPT Report 73 and further elaborated on in CEPT Report 75 [8].

ECC Report 355 [11] further studied OOB emissions from Very Low Power (VLP) WAS/RLAN devices operating in the band 5945-6425 MHz to protect CBTC systems that operate in the band 5915-5935 MHz, in order to advise whether a relaxation of the -45 dBm/MHz is possible. Based on the results of the different

[2] The "mean e.i.r.p." refers to the e.i.r.p. during the transmission burst, which corresponds to the highest power, if power control is implemented.

studies, CEPT decided to relax the VLP WAS/RLAN OOB emission levels to -37 dBm/MHz, given that VLP devices shall first attempt to select a frequency block above 6105 MHz when initiating a communication session. Alternatively, where no such mechanism is implemented, then a maximum mean e.i.r.p. density for out-of-band emissions of -45 dBm/MHz below 5935 MHz applies.

ETSI has published a System Reference Document TR 103 524 [2] and ETSI EN 303 687 [9].

As there are concerns regarding the protection of national implementations of the fixed service, especially regarding the short-term protection criterion, national administrations should support an effective enforcement of the indoor restriction for LPI in order to maintain an adequate protection of the fixed service.

Finally, this ECC Decision may be reviewed in order to address the results of the relevant activities, where considered appropriate, to enhance its implementation status in CEPT.

3 REQUIREMENT FOR AN ECC DECISION

The allocation or designation of frequency bands for use by a radio service or system under specified conditions in CEPT member countries is laid down by law, regulation or administrative action. ECC Decisions are required to deal with the licence related matters and for the carriage and use of equipment throughout Europe. The harmonisation on a European basis would support the Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity [1]. A commitment by CEPT member countries to implement an ECC Decision will provide a clear indication that the required frequency bands will be made available on time and on a European-wide basis.

ECC DECISION OF 20 NOVEMBER 2020 ON THE HARMONISED USE OF THE FREQUENCY BAND 5945-6425 MHZ FOR WIRELESS ACCESS SYSTEMS INCLUDING RADIO LOCAL AREA NETWORKS (WAS/RLAN) (ECC DECISION (20)01), AMENDED 8 NOVEMBER 2024

"The European Conference of Postal and Telecommunications Administrations,

considering

a) that there is a need to harmonise additional spectrum for the implementation of Wireless Access Systems including Radio Local Area Networks (WAS/RLAN);

b) that the frequency band 5945-6425 MHz has been allocated to the mobile service, the fixed service (FS), and the fixed-satellite service (FSS) on a primary basis in ITU Region 1 and in the European Common Allocation Table (ECA) [12];

c) that the frequency band 6650.0-6675.2 MHz is covered by RR footnote 5.149, which urges administrations "to take all practicable steps to protect the radio astronomy service (RAS) from harmful interference" and that the appropriate measures to protect the RAS stations may be defined on a site-by-site basis at national level;

d) that ECC Decision (08)01 [3] harmonises the use of the frequency bands 5875-5935 MHz for safety-related Intelligent Transport Systems (ITS);

e) that compatibility studies in ECC Report 302 [4] and ECC Report 316 [6] have shown that sharing between WAS/RLAN and FSS earth stations and terrestrial FS deployments in the band 5945-6425 MHz is feasible under certain conditions;

f) that there is no out-of-band emissions (OOBE) limit included in this ECC Decision, to protect adjacent incumbents operating above 6425 MHz, as the same incumbents will be operating co-channel with WAS/RLAN below 6425 MHz;

g) that the conditions provided in Table 1 of this Decision also apply to WAS/RLAN used inside trains and aircraft; train operators, manufacturers and train owners should consult the relevant national or regional railway regulatory bodies before installing and using WAS/RLAN on board trains;

h) that national administrations should support an effective enforcement of the indoor restriction for LPI in order to maintain an adequate protection of the fixed service;

i) that VLP devices using the frequency band below 6105 MHz use a Transmit Power Control (TPC) mechanism or adhere to a maximum mean e.i.r.p. density for out-of-band emissions of -45 dBm/MHz below 5935 MHz;

j) that in EU/EFTA countries the radio equipment that is under the scope of this Decision shall comply with the RE Directive. Conformity with the essential requirements of the RE Directive may be demonstrated by compliance with the applicable harmonised European standard(s) or by using the other conformity assessment procedures set out in the RE Directive [1];

DECIDES

1. that the purpose of this ECC Decision is to:
   - harmonise the use of the frequency band 5945-6425 MHz for WAS/RLAN use, restricted to indoor use and no fixed outdoor WAS/RLAN use;
   - allow free circulation and use of WAS/RLAN equipment for indoor and outdoor use under certain conditions (see Annex 1);
2. that WAS/RLAN devices shall comply with the technical conditions described in Annex 1;
3. that CEPT administrations shall:

- designate the frequency band 5945-6425 MHz for the use by WAS/RLAN equipment on a non-exclusive, non-interference and non-protected basis;

- allow free circulation and use of Very Low Power (VLP) portable equipment, which may also operate outdoor (in accordance with Annex 1), and Low Power Indoor (LPI) equipment (in accordance with Annex 1);

- exempt WAS/RLAN equipment in accordance with the technical details in Annex 1 from individual licensing;

4. that this Decision enters into force on 8 November 2024;

5. that the preferred date for implementation of this Decision shall be 8 May 2025;

6. that CEPT administrations shall communicate the national measures implementing this Decision to the ECC Chair and the Office when this ECC Decision is nationally implemented."

Note:

Please check the Office documentation database https://docdb.cept.org/ for the up to date position on the implementation of this and other ECC Decisions.

ANNEX 1: TECHNICAL CONDITIONS

A1.1 LOW POWER INDOOR (LPI) DEVICES

Table 1: Low Power Indoor (LPI) WAS/RLAN devices

Parameter	Technical conditions
Permissible operation	Restricted to indoor use only (including trains where metal coated windows (note 1) are fitted and aircraft) Outdoor use (including in road vehicles) is not permitted.
Category of device	An LPI access point or bridge that is supplied power from a wired connection, has an integrated antenna (note 3) and is not battery powered. An LPI client device is a device that is connected to an LPI access point or another LPI client device and may or may not be battery powered.
Frequency band	5945-6425 MHz
Channel access and occupation rules	An adequate spectrum sharing mechanism shall be implemented.
Maximum mean e.i.r.p. for in-band emissions (note 2)	23 dBm
Maximum mean e.i.r.p. density for in-band emissions (note 2)	10 dBm/MHz
Maximum mean e.i.r.p. density for out-of-band emissions below 5935 MHz (note 2)	-22 dBm/MHz

Note 1: Or similar structures made of material with comparable attenuation characteristics.

Note 2: The "mean e.i.r.p." refers to the e.i.r.p. during the transmission burst, which corresponds to the highest power, if power control is implemented.

Note 3: Or a distributed antenna system installed inside a train or an aircraft.

A1.2 VERY LOW POWER (VLP) WAS/RLAN DEVICES

VLP WAS/RLAN devices shall comply with the harmonised technical conditions listed in Table 2.

Table 2: Very Low Power (VLP) WAS/RLAN devices

Parameter	Technical conditions
Permissible operation	Indoors and outdoors Use on drones is prohibited
Category of device	The VLP device is a portable device
Frequency band	5945-6425 MHz
Channel access and occupation rules	An adequate spectrum sharing mechanism shall be implemented.
Maximum mean e.i.r.p. for in-band emissions (note 1)	14 dBm
Maximum mean e.i.r.p. density for in-band emissions (note 1)	1 dBm/MHz
Narrowband usage maximum mean e.i.r.p. density for in-band emissions (note 1) (note 2)	10 dBm/MHz
Maximum mean e.i.r.p. density for out-of-band emissions below 5935 MHz (note 1)	-37 dBm/MHz (note 3)

Note 1: The "mean e.i.r.p." refers to the e.i.r.p. during the transmission burst, which corresponds to the highest power, if power control is implemented.

Note 2: Narrowband (NB) devices are devices that operate in channel bandwidths below 20 MHz. NB devices also require a frequency hopping mechanism based on at least 15 hop channels to operate at a PSD value above 1 dBm/MHz.

Note 3: VLP devices shall first attempt to select a frequency block above 6105 MHz when initiating a communication session. Alternatively, where no such mechanism is implemented, then a maximum mean e.i.r.p. density for out-of-band emissions of -45 dBm/MHz below 5935 MHz applies.

ANNEX 2: LIST OF REFERENCES

[1] Directive 2014/53/EU: “Directive 2014/53/EU of the European Parliament and of the Council of 16 April 2014 on the harmonisation of the laws of the Member States relating to the making available on the market of radio equipment and repealing Directive 1999/5/EC”

[2] ETSI TR 103 524 V1.1.1 (2018-10) “System Reference document (SRdoc); Wireless access systems including radio local area networks (WAS/RLANs) in the band 5 925 MHz to 6 725 MHz”

[3] ECC Decision (08)01: “Harmonised use of Safety-Related Intelligent Transport Systems (ITS) in the 5875-5935 MHz frequency band”, approved March 2008 and latest amendment March 2020

[4] ECC Report 302: “Sharing and compatibility studies related to Wireless Access Systems including Radio Local Area Networks (WAS/RLAN) in the frequency band 5925-6425 MHz”, approved May 2019

[5] Recommendation ITU-R M.1450-5: “Characteristics of broadband radio local area networks”

[6] ECC Report 316: “Sharing studies assessing short-term interference from Wireless Access Systems including Radio Local Area Networks (WAS/RLAN) into Fixed Service in the frequency band 5925-6425 MHz”, approved May 2020

[7] CEPT Report 073: “Report from CEPT to the European Commission in response to the Mandate to study feasibility and identify harmonised technical conditions for Wireless Access Systems including Radio Local Area Networks in the 5925-6425 MHz band for the provision of wireless broadband services; Report A: Assessment and study of compatibility and coexistence scenarios for WAS/RLANs in the band 5925-6425 MHz”, approved March 2020

[8] CEPT Report 075: “Report from CEPT to the European Commission in response to the Mandate to study to study feasibility and identify harmonised technical conditions for Wireless Access Systems including Radio Local Area Networks in the 5925-6425 MHz band for the provision of wireless broadband services; Report B: Harmonised technical parameters for WAS/RLANs operating on a coexistence basis with appropriate mitigation techniques and/or operational compatibility/coexistence conditions, operating on the basis of a general authorisation”, approved November 2020

[9] ETSI EN 303 687: “6 GHz RLAN Harmonised Standard for access to radio spectrum”

[10] Prototype of the integrated Database ITU Terms and Definitions is an online database” (here)

[11] ECC Report 355: “Measurement-based compatibility studies assessing interference from Very Low Power (VLP) Wireless Access Systems including Radio Local Area Networks (WAS/RLAN) operating in 5945-6425 MHz to Communication Based Train Control (CBTC) systems operating in 5915-5935 MHz”, approved May 2024

[12] ERC Report 025: "The European Table of Frequency Allocations and Applications in the frequency range 8.3 kHz to 3000 GHz (ECA Table)", approved June 1994 and latest amended October 2021, latest editorial update March 2024

[13] Decision (EU) 2021/1067: “Commission Implementing Decision (EU) 2021/1067 of 17 June 2021 on the harmonised use of radio spectrum in the 5945-6425 MHz frequency band for the implementation of wireless access systems including radio local area networks (WAS/RLANs)”