**3GPP TSG-RAN Meeting #92e *RP-211515***

**Electronic Meeting, June 14-18, 2021**

**Source:** Ericsson, Apple Inc.

**Title:** TP to TR 37.890 – Latest updates

**Agenda item:** 9.6.1

**Document for:** Approval

# Introduction

# Text proposal

<Start of changes>

# 2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non‑specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2] RP-172804: “Feasibility Study on 6 GHz for LTE and NR”, Ericsson, Verizon Wireless, Qualcomm Incorporated.

[3] ITU-R Radio Regulations, Articles, Edition 2016;

[4] FCC ONLINE TABLE OF FREQUENCY ALLOCATIONS, 47 C.F.R. § 2.106, December 13, 2017;

[5] FCC 17-104, Notice of Inquiry, “Expanding Flexible Use in Mid-Band Spectrum Between 3.7 and 24 GHz”;

[6] Comments of IEEE 802, in GN Docket No. 17-183;

[7] APPLE INC., BROADCOM LIMITED,,CISCO SYSTEMS, INC., FACEBOOK, INC., GOOGLE LLC, HEWLETT PACKARD ENTERPRISE, INTEL CORPORATION,MEDIATEK INC., MICROSOFT CORPORATION, and QUALCOMM INCORPORATED, in GN Docket No. 17-183;

[8] Reply Comments of the Wireless Internet Service Providers Association, in GN Docket No. 17-183;

[9] Comments of Ericsson, in GN Docket No. 17-183;

[10] Comments of T-Mobile USA, in GN Docket No. 17-183;

[11] Comments of Verizon, in GN Docket No. 17-183;

[12] Reply Comments of the Satellite Industry Association, in GN Docket No. 17-183;

[13] Reply Comments of the Fixed Wireless Communications Coalition, in GN Docket No. 17-183;

[14] Comments of Dynamic Spectrum Alliance, in GN Docket No. 17-183;

[15] Comments of the National Spectrum Management Association, in GN Docket No. 17-183;

[16] Comments of CTIA, in GN Docket No. 17-183;

[17] Reply Comments of Cisco Systems, Inc., in GN Docket No. 17-183;

[18] Reply Comments of WI-FI Alliance, in GN Docket No. 17-183;

[19] PART 15 - Radio Frequency Devices, Title 47 of electronic Code of Federal Regulations;

[20] The European Table of Frequency Allocations and applications in the frequency range 8.3 kHz and 3000 GHz (ECA Table), October 2017;

[21] RSCOM17-53rev1- Mandate to CEPT to study and identify harmonised compatibility and sharing conditions for wireless access systems including radio local area networks in the band 5925-6425 MHz for the provision of wireless broadband services.

[22] ETSI TR 103 524 System Reference document (SRdoc), “Wireless Access Systems including Radio Local Area Networks (WAS/RLANs) in the band 5 925 MHz to 6 725 MHz”, v1.1.1, October 2018

[23] CEPT/ERC/REC 74-01: “Unwanted Emissions in the Spurious Domain”;

[24] 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, May 2019.

[25] FCC Notice of Proposed Rulemaking. FCC 18-147. October 24, 2018

[26] ETSI TR 103 612, "IMT cellular networks; Mobile/Fixed Communication Network (MFCN) in the frequency range 6 425 - 7 125 MHz", v1.1.1, December 2019

[27] ETSI TR 103 631, "Wireless Access Systems including Radio Local Area Networks (WAS/RLANs) in the band 6 725 MHz to 7 125 MHz", v1.1.1, March 2019

[28] 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”

[29] CCSA-TC5-WG8-2019-003 Project Proposal on the feasibility study of IMT system using 5925-7125MHz frequency band, [http://www.ccsa.org.cn/tc/meeting.php?meeting\_id=6243#](http://www.ccsa.org.cn/tc/meeting.php?meeting_id=6243)

[30] World Radiocommunication Conference 2019 (WRC-19) Provisional Final Acts, ITU-R <https://www.itu.int/dms_pub/itu-r/opb/act/R-ACT-WRC.13-2019-PDF-E.pdf>

[31] Report and order and further notice of proposed rulemaking, FCC 20-51

[32] 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”, 21 May 2020

[33] CEPT Report 075, “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. , November 2020

[34] ECC Decision (20)01; “On the harmonised use of the frequency bands 5945 to 6425 MHz for the implementation of Wireless Access Systems including Radio Local Area Networks (WAS/RLAN)”, November 2020

[35] ETSI TR 103 524, "System Reference document (SRDoc); Wireless access systems including radio local area networks (WAS/RLANs) in the band 5925 MHz to 6725 MHz"

[36] EN 303 687, “"6 GHz RLAN Harmonised Standard for access to radio spectrum", Draft

[37] doc 2.1\_LS to 3GPP TSG RAN – ENG (18th meeting of the RCC Commission on Spectrum and Satellite Orbits), [to be updated]

[38] CEPT Report 073, “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 on 6 March 2020 by ECC.

[39] Korea’s Ministry of Science and ICT, "Technical standards for radio equipment for radio stations", URL: <https://www.law.go.kr/admRulLsInfoP.do?admRulSeq=2100000196974>

[40] Ofcom, "Improving spectrum access for Wi-Fi; Spectrum use in the 5 GHz and 6 GHz bands", July 2020, URL: <https://www.ofcom.org.uk/__data/assets/pdf_file/0036/198927/6ghz-statement.pdf>

[41] Communications & Information Technology Commission, "Spectrum Outlook for Commercial and Innovative Use 2021- 2023", January 2021, URL: https://www.citc.gov.sa/ar/new/publicConsultation/Documents/Spectrum%20Outlook%20for%20Commercial%20and%20Innovative%20(2021-2023).pdf

[42] Innovation, Science and Economic Development Canada, "Decision on the Technical and Policy Framework for Licence-Exempt Use in the 6 GHz Band", May 2021, URL: <https://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf11698.html>

[43] National Telecommunications Agency (ANATEL), "ACT NO. 1306", February 2021, URL: <https://sei.anatel.gov.br/sei/modulos/pesquisa/md_pesq_documento_consulta_externa.php?eEP-wqk1skrd8hSlk5Z3rN4EVg9uLJqrLYJw_9INcO7uvjUt3vSOwT_4Z5fukj9yIzPErY4KWH5cpE9W_9hcTZkCG-vLPIdpXyuhgMG-L9M-uBLoSdAAXO0clb3SIt1i>

[44] Ministerio de Transportes y Comunicaciones, "Resolución Ministerial N° 373-2021-MTC/01", April 2021, URL: https://cdn.www.gob.pe/uploads/document/file/1861732/Resolución%20Ministerial%20nro%20373-2021-MTC/01.pdf

[45] MINISTERIO DE TRANSPORTES Y TELECOMUNICACIONES; SUBSECRETARÍA DE TELECOMUNICACIONES, "RESOLUCIÓN 1985 EXENTA", October 2020, URL: https://www.bcn.cl/leychile/navegar?idNorma=1109333&idParte=9841504&idVersion=&r\_c=6

[46] RP-210957, Liaison statement to 3GPP TSG RAN on inclusion of the frequency band 6425-7125 MHz in 3GPP specification for 5G-NR/IMT-2020 systems, Regional Commonwealth in the filed of Communications.

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## 3.3 Abbreviations

For the purposes of the present document, the abbreviations given in 3GPP TR 21.905 [1] and the following apply. An abbreviation defined in the present document takes precedence over the definition of the same abbreviation, if any, in 3GPP TR 21.905 [1].

AP Access Point

BAS Broadcast Auxiliary Service

CARS Cable Television Relay Service

CBTC Communication-based Train Control systems

CEPT European Conference of Postal and Telecommunications

CL Client device

DA2GC Direct Air-to-Ground Communications

EC European Commission

ECC European Electronic Communications Committee

EESS Earth Exploration-Satellite Service

eLAA enhanced LAA

ERC European Radio-communication Commitee

ESV Earth Stations on Vessel

FCC Federal Communication Commission

FDP Fractional Degradation in Performance

FM Frequency Management – ECC Working Group

FS Fixed Service

FSS Fixed Satellite Service

IMT International Mobile Telecommunications

ITS Intelligent Transport System

LAA Licensed Assisted Access

LPI Low Power Indoor

LPR Level Probing Radar

LTTS Local TV Transmission Service

MBR Maritime Broadband Radio Links

MCL Maximum Coupling Loss

NOI Notice of Inquiry

NPRM Notice of Proposed Rule Making

NR New Radio

NR-U NR Unlicensed

PMSE Programme-Making and Special Events

RLAN Radio Local Area Network

RR Radio Regulation

SDARS Sirius Satellite Radio Service

SE Spectrum Engineering – ECC Working Group

SP Standard Power

SRD Short Range Device

TLPR Tank Level Probing Radar

UNII Unlicensed National Information Infrastructure

UWB Ultra Wideband

VLBI Very Long Baseline Interferometry (Radio Astronomy)

VLP Very Low Power

WAS Wireless Access System

WIA Wireless Industrial Applications

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### 4.1.2 Regional Commonwealth in the field of Communications (RCC) countries

The RCC Commission on Spectrum and Satellite Orbits approved their position on Agenda Item 1.2 of WRC-23 supporting the usage of IMT systems in the 6425-7125 MHz frequency range taking into account the conditions ensuring the compatibility of these systems with other radio systems using this frequency range [37].

In a recent communication [46], the RCC Commission on RFS and SO confirmed that the frequency range 6425-7125 MHz is allocated in RCC countries to mobile service as primary basis and under this service 5G-NR/IMT-2020 systems will be licensed.

The work on regulatory requirements is under progress.

Note: The list of RCC members could be consulted at [RCC website](https://en.rcc.org.ru/regional-commonwealth-in-the-field-of-communications/regional-commonwealth-in-the-field-of-communications/rcc-participants/).

### 4.1.3 UK

On 24th July 2020, UK Ofcom has decided to make the lower 6 GHz band (5925-6425 MHz) available for the license exempt RLANs for indoor use with a maximum EIRP of 250mW and outdoor use with a maximum EIRP of 25mW, with the maximum mean EIRP density of 12.6mW/MHz in any 1 MHz band [40].

Equipment must not form part of a fixed outdoors installation when operating in 5925- 6425MHz. Aeronautical mobile use is not permitted. The Low Power Indoor apparatus may only be used within a building, onboard an aircraft or in any other enclosed space with attenuation characteristics at least as strong as those of either a building or an aircraft. ‘Onboard aircraft’ means the use of radio links for communications purposes inside an aircraft. Airborne use of the relevant equipment will be permitted within an aircraft only to establish a connection with a station or apparatus within the same aircraft.

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### 4.1.4 Saudi Arabia

On 28th January 2021, Saudi Arabia Communications & Information Technology Commission announced its intention to allocate the entire 5925 – 7125 MHz band for license-exempt [41]. Nevertheless, given that segments of the band are considered for a possible IMT identification in Region 1, CITC will consult with relevant stakeholders before finalizing the decision

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### 4.2.2 Canada

On 21st May 2021, Innovation, Science and Economic Development (ISED) department of Canada published "Decision on the Technical and Policy Framework for Licence-Exempt Use in the 6 GHz Band" [42] with the following key aspects:

- D1: ISED will allow licence-exempt RLAN use in the 5925-7125 MHz band;

- D3: Standard-power RLANs under the control of an AFC system will be permitted to operate on a licence-exempt basis in the 5925-6875 MHz frequency range:

- standard-power devices would be subject to a maximum permitted EIRP of 36 dBm per channel;

- a maximum permitted power spectral density of 23 dBm/MHz and that standard-power RLAN operation would only be permitted on specific frequency channels, with EIRP dictated by the AFC system;

- to address coexistence with fixed-satellite services (FSS), ISED sought comments to limit the standard-power RLAN’s maximum EIRP to 125 mW per channel at elevation angles above 30 degrees over the horizon.

- D4: Low-power indoor-only RLANs will be permitted to operate on a licence-exempt basis across the 5925-7125 MHz band with the use of a contention-based protocol (e.g. listen-before-talk):

- subject to a maximum permitted EIRP of 30 dBm per channel; and

- a maximum permitted power spectral density of 5 dBm/MHz.

- D5: Indoor and outdoor very low-power RLAN devices will be permitted to operate on a licence-exempt basis across the 5925-7125 MHz band with the use of a contention-based protocol (e.g. listen-before- talk):

- subject to a maximum permitted EIRP of 14 dBm per channel; and

- a maximum permitted power spectral density of -8 dBm/MHz.

- D6-D7: ISED will adopt an AFC system that is practical, consistent with the Canadian public interest and harmonized with the U.S. to the maximum extent possible. Canadian AFC rules will include a requirement to protect licensed fixed service systems and radioastronomy sites.

### 4.2.3 Brazil

On 26th February 2021, Brazilian National Telecommunications Agency approved Act 1306 [43] that lists the technical requirements for Broadband Wireless Access System for Local Area Networks operating 5.925 – 7.125 GHz band with the following key points:

- For indoor access points and subordinate access points, they must meet the following conditions:

- Average power is limited to a maximum of 30 dBm EIRP.

- Average power spectral density is limited to a maximum of 5 dBm / MHz EIRP.

- The equipment must be used in an indoor environment only.

- For client equipment operating under the control of an indoor access point, they must meet the following conditions:

- Average power is limited to a maximum of 24 dBm EIRP.

- Average power spectral density is limited to a maximum of -1 dBm / MHz EIRP.

- The equipment must be used in an indoor environment only.

- For very low power devices, the following conditions must be met:

- Average power is limited to a maximum of 17 dBm EIRP.

- Average power spectral density is limited to a maximum of -5 dBm / MHz EIRP.

- The RMS value for spurious emissions of any emission outside the range of 5.925 - 7.125 MHz must be limited to maximum spectral power density of EIRP of -27 dBm/MHz.

- The spectral power density must meet the following emission mask:

- Attenuation of 20 dB, with a distance of 1 MHz bandwidth from the channel.

- Attenuation of 28 dB, with a distance of one channel spacing, from the centre of the channel, and

- Attenuation of 40 dB, with a distance of 1.5 channel spacing, from the centre of the channel

All equipments must only use an antenna permanently integrated into the structure of the equipment.

It is mandatory to use a media access sharing system on these equipment.

### 4.2.4 Peru

On 30th April 2021, Peruvian Ministry of Transport and Communication has released a new resolution [44], which in particular updates regulatory parameters for the 6GHz band as presented below:

- Frequency range 5925-7125MHz is assigned for the license-exempt operation;

- For the indoor operation, the access point is allowed to transmit at maximum EIRP of 30dBm with the spectral density of 5dBm/MHz; and the client equipment maximum EIRP is 24dBm and the maximum spectral density is -1dBm/MHz;

- Access points cannot be weatherproof;

- Access points may have only built-in antennas and it is prohibited to provide the ability to connect other external antennas;

- Access points cannot be battery operated;

- Access points cannot operate on oil extraction platforms, automobiles, trains, ships and aircraft, with the exception of large passenger aircraft (only at 5925 - 6425 MHz) operating at more than 10,000 feet;

- Operation and/or communication with drones is not allowed.

### 4.2.5 Chile

On 22th October 2020, Ministry of Transport and Communication of Chile published Resolution 1985 according to which low power access equipment, also referred to as AP, may operate in the frequency band 5925-7125 MHz under exclusive use for indoor environment and the following transmission power requirements:

- maximum EIRP of 30dBm;

- maximum spectral density of 5dBm/MHz.

- low-power AP equipment may only have integrated antennas, which cannot be removable or replaceable, nor may they have connectors that allow the connection of additional external antennas;

- likewise, they should not be able to operate with internal batteries or have spaces for their installation

User terminal devices that are associated with low power AP equipment must operate at the following power levels:

- maximum EIRP of 24dBm;

- maximum spectral density of -1dBm/MHz.

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## 4.x Regulatory parameters comparative for license-exempt

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Region | Country | Permissible operation(Note 1) | Frequency range | Maximum mean EIRP for in-band emissions | Maximum mean EIRP density for in-band emissions | Maximum mean EIRP density for out-of-band emissions |
| Region 1 | EU/CEPT | LPI (see 4.1.1) | 5945 – 6425MHz | 23dBm | 10dBm/MHz | -22 dBm/MHz (below 5935MHz) |
| VLP (see 4.1.1) | 14dBm | 1dBm/MHz10dBm/MHz (for the narrowband usage) | -45 dBm/MHz(below 5935MHz);  |
|  |  |  |  |  |  |
| UK | LPI (see 4.1.3) | 5925 – 6425MHz | 24dBm | 11dBm/MHz | In accordance with directive 2014/53/EC |
| VLP (see 4.1.3) | 14dBm |  |  |
|  |  |  |  |  |  |  |
| Region 2 | US | SP (see 4.2.1) | 5925 – 6425MHz6525 – 6875MHz | 36dBm (AP)30dBm (CL) | 23dBm/MHz (AP)17dBm/MHz (CL) | -27 dBm/MHz(outside operational range) |
| LPI (see 4.2.1) | 5925 – 7125MHz | 30dBm (AP)24dBm (CL) | 5 dBm/MHz (AP)-1 dBm/MHz (CL) |
|  |  |  |  |  |  |
| Canada | SP (see 4.2.2) | 5925-6875 MHz | 36dBm | 23dBm/MHz |  |
| LPI (see 4.2.2) | 5925-7125 MHz | 30dBm | 5 dBm/MHz |  |
| VLP (see 4.2.2) | 14dBm | -8dBm/MHz |  |
|  |  |  |  |  |  |
| Brazil | LPI (see 4.2.3) | 5925 – 7125MHz | 30dBm (AP)24dBm (CL) | 5dBm/MHz (AP)-1dBm/MHz (CL) | -27 dBm/MHz (outside operational range) |
| VLP (see 4.2.3) | 17 dBm | -5 dBm/MHz |
|  |  |  |  |  |  |
| Peru | LPI (see 4.2.4) | 5925 – 7125MHz | 30dBm (AP)24dBm (CL) | 5dBm/MHz (AP)-1dBm/MHz (CL) |  |
|  |  |  |  |  |  |
| Chile | LPI (see 4.2.5) | 5925 – 7125MHz | 30dBm (AP)24dBm (CL) | 5dBm/MHz (AP)-1dBm/MHz (CL) |  |
|  |  |  |  |  |  |  |
| Region 3 | South Korea | LPI (see 4.3.2) | 5925 – 7125MHz | 24dBm | 2dBm/MHz | -27 dBm/MHz (outside operational range) |
| VLP (see 4.3.2) | 5925 – 6425MHz | 14dBm | 1dBm/MHz | -34 dBm/MHz (outside operational range) |
| Note 1: For the exact conditions of operation, refer to the sub-clause mentioned in (). |

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