**3GPP TSG-RAN Meeting #93e *RP-212575***

**Electronic Meeting, September 13-17, 2021**

**Source:** Ericsson, Apple

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

**Agenda item:** 9.2.1

**Document for:** Approval

# Introduction

The RAN-led study item on 6 GHz band for LTE and NR captures the latest status of Regulators decision for the 6 GHz frequency range.

This contribution is relating any update since last RAN#92-e meeting and a corresponding TP to TR 37.980.

# Text proposal

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# 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.

[47] COMMISSION IMPLEMENTING DECISION (EU) 2021/1067, on the harmonised use of radio spectrum in the 5 945-6 425 MHz frequency band for the implementation of wireless access systems including radio local area networks (WAS/RLANs), 17 June 2021.

[48] The National Telecommunications Commission (CONATEL) of Honduras, "Resolution NR 003/21", March 2021, URL: http://www.conatel.gob.hn/doc/Regulacion/resoluciones/2021/NR003-21.pdf

[49] The Superintendencia de Telecomunicaciones (SUTEL), "DECRETO EJECUTIVO N° 42924-MICITT", April 2021, URL: <https://www.imprentanacional.go.cr/pub/2021/04/30/ALCA87_30_04_2021.pdf>

[50] Communications & Information Technology Commission, "Radio Spectrum Allocation and Use Regulation for WLAN Application", June 2021, URL: <https://www.citc.gov.sa/en/new/publicConsultation/Documents/144207-en.pdf>

[51] Communications & Information Technology Commission, "Public Consultation on Spectrum Light Licensing", August 2021, URL: https://www.citc.gov.sa/ar/new/publicConsultation/Documents/EN\_PublicConsultationonLightLicensing-144301.pdf

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##### 4.1.1.3.1d ECC Decision (20)01

The ECC Decision (20)01 [34] harmonized the 5.945-6.425 GHz frequency band for WAS/RLAN use, restricted to:

* Indoor use only for LPI equipment. This LPI equipment could be:
  + LPI Access Point or bridge, power supplied from a wired connection, not battery powered, with an integrated antenna.
  + LPI client connected to a LPI access point or another LPI client. This LPI client could be battery powered or not.
* Indoor and outdoor use for VLP equipment. The VLP device is a portable device, drones are prohibited.

Those equipment shall support an adequate spectrum sharing mechanism.

Moreover, LPI equipment shall comply with the limits captured in Table 4.1.1.3.1d-1 and VLP equipment with limits captured in Table 4.1.1.3.1d-2 [34].

Table 4.1.1.3.1d -1: Low Power Indoor (LPI) WAS/RLAN devices

|  |  |
| --- | --- |
| Parameter | Technical conditions |
| Permissible operation | Restricted for 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 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 not battery powered. |
| Frequency band | 5945-6425MHz |
| 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 compatible 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. | |

Table 4.1.1.3.1d -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 | 5945-6425MHz |
| 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) | -45 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 channels bandwidths below 20 MHz. Narrowband 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: ECC will study the appropriateness of this level of OOBE by 31/12/2024. In absence of the justified evidence, a value of -37 dBm/MHz will be adopted from 01/01/2025. | |

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##### 4.1.1.3.2 European Commission Decision 2021/1067

On June 17th 2021, The European Commission has published in the Official Journal the Commission Decision ([47]) on Wireless Access Systems / Radio Local Area Networks operating in the band 5945-6425 MHz.

The mandated technical conditions are those specified in ECC Decision (20)01 ([34]), as summarized in tables 4.1.1.3.1d-1 and 4.1.1.3.1d-2.

The EC Decision 2021/1067 has clarified further (Article 3) that "*when introducing new applications into the 5 945-6 425 MHz frequency band or into adjacent frequency bands after the entry into force of this Decision, Member States shall not adopt technical and operational conditions applicable to any new application that unduly restrict the continued use of WAS/RLAN in the 5 945-6 425 MHz frequency band in accordance with this Decision”.*

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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.

On 10th June 2021 Saudi Arabia Communications & Information Technology Commission published updated Radio Spectrum Allocation and Use Regulation for WLAN Applications [50], which provides further information on anticipated regulatory parameters for the 5925 – 7125MHz frequency range. The corresponding excerpt with the technical conditions applied to WLAN allocations in 5925 – 7125MHz is presented below.

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency band (MHz) | Environment | Maximum radiated PSD (mW/MHz) | Maximum EIRP (mW) |
| 5925-7125 | Indoor (AP) | 3.125 | 1000 |
| Indoor (CLI) | 3.125 | 150 |
| Outdoor | 0.3125 | 25 |

CITC will identify some WLAN bands for usage under "Light Licensing" regime for e.g. high power WAN use cases, such as fixed links, as further described in [51].

|  |  |  |  |
| --- | --- | --- | --- |
| Frequency band (MHz) | Proposed usage | Proposed technical requirements | Notes |
| 5925-7125 | High Power WLAN  (can be used for fixed links)  Low Power 5G services (NR-U) (mobile) | ETSI EN 303 687  Maximum e.i.r.p.: 30 dBm or 5 dBm/MHz. Maximum channel bandwidth: 320 MHz  3GPP TR38.104 ‘Local Area’ base stations. Maximum channel bandwidth: 100 MHz | This band will also be available for low power indoor WLAN and very low power outdoor WLAN on a licence-exempt basis.  3GPP Band n96 |

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### 4.2.6 Mexico

The Instituto Federal de Telecomunicaciones (IFT) in Mexico has opened a public consultation for the 5925-7125 MHz frequency band with the objectives to establish the technical operating conditions of WAS/RLAN systems that could make use of the of the 5925-7125 MHz frequency band and to increase the harmonization based on international best practices and existing technological advances.

### 4.2.7 Honduras

The National Telecommunications Commission (CONATEL) of Honduras has published Resolution NR 003/21 [48], which updates the National Frequency Allocation Plan (PNAF) to open the use of the 5925-7125MHz frequency range for the license-exempt usage.

### 4.2.8 Costa Rica

The Superintendencia de Telecomunicaciones (SUTEL) in Costa Rica has published its Plan Nacional de Atribución de Frecuencias (PNAF) [49], according to which the 5925-7125MHz frequency range is opened for the license-exempt usage with the following technical conditions:

- maximum EIRP is 30dBm;

- maximum output power of the equipment is 24dBm;

- unlicensed usage is allowed at the following conditions:

- low power indoor applications (LPI) in accordance with the power limits indicated above;

- very low power (VLP) indoors and outdoors with a maximum EIRP of 14 dBm;- LPI applications are restricted to operation inside buildings for RLAN type systems (wireless local area networks) or similar, which use contention protocols to get access to the environment;

- VLP applications are for portable or similar type devices, limited in power, allowing connectivity over short distances.

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## 4.5 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/MHz  10dBm/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 – 6425MHz  6525 – 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) |  |
|  |  |  |  |  |  |
| Costa Rica | LPI (see 4.2.8) | 5925 – 7125MHz | 30dBm (AP)  24dBm (CL) |  |  |
| VLP (see 4.2.8) | 14dBm |  |  |
|  |  |  |  |  |  |  |
| 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 of the VLP mode) |
| Note 1: For the exact conditions of operation, refer to the sub-clause which is mentioned in parenthesis (e.g. for the exact conditions for operating SP in US, refer to sub-clause 4.2.1.) | | | | | | |

<End of changes>