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| **Radiocommunication Study Groups** |  |
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| **9 June 2022** |
| **English only** |
| Annex 14 to Working Party 5A Chairman’s Report | |
| working document towards a preliminary draft new recommendation ITU-R M.[RSTT\_FRQ] | |
| Harmonization of spectrum for existing and future Railway Radiocommunication Systems between Train and Trackside (RSTT)  within the frequency bands allocated to the mobile service | |

Scope

This Recommendation provides frequency ranges to facilitate harmonization of frequency bands within the existing Mobile Service allocations for existing and future railway radiocommunication systems between train and tracksides (RSTT) on global or regional basis.

Keywords

Railway Radiocommunication Systems between Train and Trackside (RSTT), Train, Trackside, frequency ranges, frequency bands, harmonization

Abbreviations and Glossary

APT Asia-Pacific Telecommunity

ASMG Arab Spectrum Management Group

ATU African Telecommunications Union

CEPT European Conference of Postal and Telecommunications Administrations

RCC Regional Commonwealth in the field of Communications

RSTT Railway Radiocommunication Systems between Train and Trackside

Harmonized frequency range: In the context of this Recommendation, a range of frequencies harmonized globally or regionally over which relevant radio equipment is envisaged to be capable of operating in specific frequency bands/conditions; however, the actual use may be limited according to national and regional conditions and requirements.

Railway radiocommunication systems between train and trackside: Radiocommunication systems providing improved railway traffic control, passenger safety and improved security for train operations

Related ITU Recommendations and Reports

1 Report ITU-R [M.2418](https://www.itu.int/pub/R-REP-M.2418) – *Description of Railway Radiocommunication Systems between Train and Trackside*

2 Report [ITU-R M.2442](http://www.itu.int/dms_pub/itu-r/opb/rep/R-REP-M.2442-2019-MSW-E.docx) – *Current and future usage of railway radiocommunication systems between train and trackside*

3 [Recommendation ITU-R SM.1896](https://www.itu.int/rec/R-REC-SM.1896/en) – *Frequency ranges for global or regional harmonization of short-range devices*

The ITU Radiocommunication Assembly,

considering

*a)* that railway transportation contributes to global economic and social development, especially for developing countries;

*b)* that the main categories of applications of RSTT are Train Radio, Train Positioning Information, Train Remote and Train Surveillance;

*c)* that many administrations wish to facilitate RSTT interoperability, in particular for cross-border operations, effective use of spectrum resources and for minimizing the risk of interference;

*d)* that information and radiocommunication technologies in railway radiocommunication systems between train and trackside provide improved railway traffic control, passenger safety and improved security for train operations, and benefit from using frequency bands allocated to mobile service on primary basis;

*e)* that the deployment of RSTT requires significant infrastructure investment and would benefit from a stable radio spectrum regulatory environment;

*f)*  that international standards and harmonized spectrum facilitate deployment of RSTT based on readily available cost-effective technologies that would help to provide economies-of-scale for the railway industry;

*g)* that in general, spectrum harmonization of Train Radio application of RSTT may have priority over other RSTT applications, because Train Radio application requires high reliability and quality of services for the safety for train operations;

*h)* that some national and international railway organizations and standards bodies have begun investigating and developing specifications for new technologies for railway radiocommunication systems;

*i)* that implementation of future RSTT needs to take into account the development of railway industry and relevant standards;

*j)* that the evolving safety related applications of railway transportation may require more spectrum;

*k)* that there may be a need to integrate different technologies in order to facilitate various functions, for instance dispatching commands, operating control and data transmission, into railway train and trackside systems to also meet the needs of a high-speed railway environment,

recognizing

*a)* that Report ITU-R M.2418 provides the architecture, applications, technologies and operational scenarios of Railway Radiocommunication Systems between Train and Trackside (RSTT) for all types of trains (e.g. high-speed trains, passenger trains, freight trains, and metro trains);

*b)* that Report ITU‑R M.2442 provides technical and operational characteristics and the spectrum usage of current and future Railway radiocommunication Systems between Train and Trackside (RSTT) as well as countries’ specific frequency bands used for RSTT;

*c)* that Recommendation ITU-R SM.1896 contains Frequency ranges for global or regional harmonization of short-range devices,

noting

*a)* that spectrum planning for RSTT is performed at the national level, taking into account the need for interoperability and benefits of neighbouring administrations using harmonized frequency bands;

*b)* that cooperation among all involved parties (administrations and railway organisations), will facilitate spectrum harmonization for RSTT;

*c)* that the growth and evolution of the railway transportation systems may require administrations to follow the development of applicable standards to ensure coexistence with other applications operated in the same band and/or in the adjacent bands;

*d)* that some railway systems have been operating in many countries for many years using various frequency bands not necessarily listed in Annex 1, and that these frequency bands will continue to be used for RSTT in the future and require ongoing support;

*e)* that the provisions of RR Nos. **1.59** and **4.10** do not apply for railway radiocommunication systems,

recommends

1that administrations should consider using the frequency ranges (or parts thereof), as listed in the Annexes, within the bands allocated to the mobile service on primary basis, in order to achieve regional or global spectrum harmonization for RSTT;

2that administrations should make all necessary efforts to ensure cross border coexistence between RSTT and other systems operating in the mobile service as well as between RSTT and stations of other services.

ANNEX 1

Global

Note: This Annex will be updated according to material received to the next meetings, if any.

ANNEX 2

Region 1

Table A2-1

Frequency ranges harmonized or considered for harmonization for RSTT in Region 1

|  |  |  |  |
| --- | --- | --- | --- |
|  | Region 1 | | |
| Applications | Frequency ranges within the existing mobile service allocations under consideration or proposed for harmonization by sub-Regional groups | Harmonized frequency ranges within the existing mobile service allocations in Region 1 |
| Train Radio | ATU:  138-170 MHz, 406.1-430 MHz, 440-470 MHz; 873‑880 MHz / 918‑925 MHz | 876-880 MHz / 921-925 MHz |
| ASMG:  876-880 MHz / 921-925 MHz |
| CEPT[[1]](#footnote-1),[[2]](#footnote-2):  874.4-880 MHz / 919.4-925 MHz,  1900-1910 MHz |
| RCC[[3]](#footnote-3):  138–174 MHz;  406.2–430 MHz /440–470 MHz; 876-880 MHz / 921‑925 MHz |
| Train Positioning | CEPT2:  [0.984-7.484 MHz]\*  27.09-27.10 MHz | See Note 1 |
| Train Remote | RCC3: 138-174 MHz; 406.2-430 MHz / 440‑470 MHz; 876-880 MHz / 921-925 MHz | See Note 1 |
| Train Surveillance | See Note 1 | See Note 1 |
| Note 1: No Frequency ranges within the existing mobile service allocations for this RSTT application are harmonized at this time. | | |

[\*Editor’s note : The highlighted frequency range is not fully allocated to the mobile service in Region 1 and needs clarification or updated information.]

ANNEX 3

Region 2

Table A3-1

Frequency ranges harmonized or considered for harmonization for RSTT in Region 2

|  |  |  |  |
| --- | --- | --- | --- |
|  | Region 2 | | |
| Application | Frequency ranges within the existing mobile service allocations considered for harmonization | Harmonized frequency ranges within the existing mobile service allocations in Region 2 |
| Train Radio |  |  |
| Train Positioning |  |  |
| Train Remote |  |  |
| Train Surveillance |  |  |

ANNEX 4

Region 3

Table A4-1

Frequency ranges harmonized or considered for harmonization for RSTT in Region 3

|  |  |  |
| --- | --- | --- |
|  | Region 3 | |
| Application | Frequency ranges within the existing mobile service allocations under consideration for regional harmonization | Harmonized frequency ranges within the existing mobile service allocations in Region 3 |
| Train Radio | VHF Band: 70-74.8 MHz, 75.2-88 MHz, 142-144 MHz, 146-149.9 MHz, 150.05-156.4875 MHz, 156.5625-156.7625 MHz, 156.8375‑161.9625 MHz, 161.9875-162.0125 MHz, 162.0375‑174 MHz | See Note X. |
| UHF Band: 335.4-399.9 MHz, 406.1-430 MHz, 440‑470 MHz, 703‑748 MHz, 758-803 MHz, 873-915 MHz, 918-960 MHz, 1 770‑1 880 MHz, 1 965-1 975 MHz, 2 155‑2 165 MHz |
| SHF Band: 43.5-45.5 GHz, 92-94 GHz, 94.1-100 GHz, 102-109.5 GHz |
| Train Positioning | 1 708 kHz, [3.951-4.516 MHz]\*, 27.09-27.10 MHz, 718‑728 MHz, 773-783 MHz, 910.1-914.1MHz, 1.5 GHz, 2.4 GHz | See Note X. |
| Train Remote | Under study | See Note X. |
| Train Surveillance | 703-748 MHz, 758-803 MHz, 18.86-18.92 GHz, 19.20-19.26 GHz, 43.5-43.7 GHz, 57-66 GHz, 92‑94 GHz. 94.1-100GHz, 102-109.5GHz | See Note X. |

*Note X: No Frequency ranges* within the existing mobile service allocations *for this RSTT application are harmonized at this time.*

Methodologies for achieving regional spectrum harmonization for RSTT in Region 3 are provided in the attachment to this Annex.

*\*[Editor’s note: This frequency range is not fully allocated to the mobile service in Region 3* *and needs further clarification or updated information.]*

*[Editor’s note: The highlighted single frequencies need to be clarified and the exact frequency ranges need to be provided, as appropriate.]*

Attachment to Annex 4

Methodologies of harmonizing frequencies for RSTT in Region 3

The following text shows the methodology used in Region 3 to identify frequencies for regional harmonization for RSTT employing the “logical OR approach”.

For example, according to the materials provided by some administrations within Region 3 in Report ITU-R M.2442, spectrum usage for RSTT in 300-500 MHz within Region 3 are shown below. A wide frequency range can be calculated with logical OR from each frequency bands. Finally, the frequency range is filtered and separated with the condition of existing mobile-service allocations as seen in the figure below.

With this “logical OR approach”, each frequency could be involved in harmonized frequency ranges and each administration would use those frequency ranges or part of thereof for RSTT on their national needs, spectrum requirements, policy objectives, and operating environments.



(1)Logical OR from each frequency

(2)Within existing mobile-service allocations

Harmonized frequency ranges

1. In accordance to the ECC Decision (20)02 on the harmonised use of the paired frequency bands 874.4‑880.0 MHz and 919.4-925.0 MHz and of the unpaired frequency band 1900-1910 MHz for Railway Mobile Radio (RMR). [↑](#footnote-ref-1)
2. CEPT is of the view that regional and global harmonization can only be achieved if there is overlapping spectrum in the related harmonization measures of the regional groups or their sub-regional entities. [↑](#footnote-ref-2)
3. This is a frequency tuning range and will be limited to use by these systems according to national and regional constraints, conditions and requirements. [↑](#footnote-ref-3)