**3GPP TSG-RAN WG4 Meeting # 99-e R4-210XXXX**

**Electronic Meeting, 19th – 27th May 2021**

**Agenda item: 8.5.2, 8.6.2, 8.5.4**

**Source: Ingo Wendler (UIC)**

**Title:** Email discussion summary for [99-e][114]NR\_RAIL\_EU\_900MHz\_NR\_RAIL\_EU\_1900MHz\_UE\_requirements

**Document for:** Information

# Introduction

**Subject 1 UE requirements RMR 900 (AI 8.5.2)**

The inclusion of RMR\_900MHz in 5G NR requires various consideration in the context of spurious emissions to adjacent bands. Apart from the band number allocation various parameters need to be agreed for the use 5G NR. Actually, the WI considers only the use PCL-3 which will be complemented in a later stage by PCL-1 in accordance with ECC Decision 20(02).

The contribution R4-2110956 [2] considers various interference scenarios to adjacent bands B8/n8 and proposes major UE parameters applicable for the RMR 900MHz. The allocated spectrum block of 2x 5.6MHz in accordance to ECC Decision 20(02) [1] and the required CBW of 5MHz will not occupy the entire spectrum of 5.6MHz.

**Subject 2 Channel raster considerations for RMR 900 (AI 8.5.4)**

ECC Decision 20(02) determines that the spectrum block starts at 919.4 MHz while the lowest resource block of the transmission bandwidth may start at 919.6 MHz.

The contribution R4-2111054 [4] considers the impact on guardband and corresponding channel raster aspects.

**Subject 2 UE requirements RMR 1900 (AI 8.6.2)**

The inclusion of RMR\_1900MHz in 5G NR requires various consideration in the context of spurious emissions, blocking characteristics etc. Apart from the band number allocation various parameters are proposed and requires further alignment for the use of 5G NR. Actually, the WI considers only the use PCL-3 which will be complemented in a later stage by PCL-1 in accordance with ECC Decision 20(02).

The contribution R4-2110958 [3] considers the operating bands around RMR 1900MHz which are bands B1/n1 and B3/n3.and proposes the necessary parameters for the UE part.

**Summary**

The use of RMR 900/RMR 1900 have to fulfil ECC Decision 20(02) [1] in an uncoordinated approach. The proposed UE parameters for RMR 900 and RMR 1900 are for discussion and agreement.

# Topic #1: Rail Mobile Radio 900MHz spectrum block

## Companies’ contributions summary - subject relation to other RATs

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2110965[2] | Huawei | **Proposal 1**: adopt the existing UE requirements for RMR 900MHz with specific details below (see below the table). |

## Companies’ contributions summary - subject relation to other RATs

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2111054[4] | Huawei | **Observation 1**: RMR900 downlink allocation from 919.6MHz is not leaving sufficient guardband for NR operation (5MHz channel, 15 kHz and 30 kHz SCS).  **Observation 2**: RMR900 downlink channel edge shall be shifted above 919.6 MHz to allow NR operation with 5MHz channel bandwidth.  **Observation 3**: RMR900 uplink channel edge arrangement shall incorporate NR guardband to allow NR operation with 5MHz channel bandwidth. |

## Open issues summary

### Sub-topic 1-1

Sub-topic description: Proposed RMR 900 parameters

Companies are invited to discuss the proposed parameters applicable for 3GPP TS 3GPP 38.101-1 which are :

- Operating band

- Channel bandwidth

- Channel raster

- Synchronisation raster

- Duplex gap (Tx and Rx frequency separation)

- UE output power

- Reference sensitivity

- Spurious emission for UE co-existence and the proposed bands

### Sub-topic 1-2

Sub-topic description: Align and propose potential solutions in the channel raster context applicable for RMR 900 to achieve sufficient use of the allocated spectrum for RMR 900.

## Companies views’ collection for 1st round

### Open issues

**Sub-topic 1-1**

|  |  |
| --- | --- |
| Company | Comments |
| XXX |  |

**Sub-topic 1-2**

|  |  |
| --- | --- |
| Company | Comments |
| XXX |  |

### CRs/TPs comments collection

*For close-to-finalize WIs and maintenance work, comments collections can be arranged for TPs and CRs. For ongoing WIs, suggest to focus on open issues discussion on 1st round.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| XXX | Company A |
| Company B |
|  |
| YYY | Company A |
| Company B |
|  |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic #1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provides recommendation on CRs/TPs Status update*

*Note: The tdoc decisions shall be provided in Section 3 and this table is optional in case moderators would like to provide additional information.*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

# Topic #2: Rail Mobile Radio 1900MHz spectrum block

## Companies’ contributions summary - subject NR BS specification impact

|  |  |  |
| --- | --- | --- |
| **T-doc number** | **Company** | **Proposals / Observations** |
| R4-2110958[3] | Huawei | Proposal: Agree with the changes listed in this contribution. |

## Open issues summary

### Sub-topic 2-1

Sub-topic description: Proposed RMR 1900 parameters

Companies are invited to discuss the proposed parameters applicable for 3GPP TS 3GPP 38.101-1 which are :

- Operating band

- Channel bandwidth

- Channel raster

- Synchronisation raster

- Reference sensitivity

- Duplex gap (Tx and Rx frequency separation)

- UE output power

- Reference sensitivity

- Spurious emission for UE co-existence and the proposed bands

- In-band blocking characteristics

- Out of band blocking characteristics

- Narrow band blocking characteristics

### Open issues

**Sub-topic 2-1**

|  |  |
| --- | --- |
| Company | Comments |
| XXX |  |

### CRs/TPs comments collection

*Major close to finalize WIs and Rel-15 maintenance, comments collections can be arranged for TPs and CRs. For Rel-16 on-going WIs, suggest to focus on open issues discussion on 1st round.*

|  |  |
| --- | --- |
| **CR/TP number** | **Comments collection** |
| XXX | Company A |
| Company B |
|  |
| YYY | Company A |
| Company B |
|  |

## Summary for 1st round

### Open issues

*Moderator tries to summarize discussion status for 1st round, list all the identified open issues and tentative agreements or candidate options and suggestion for 2nd round i.e. WF assignment.*

|  |  |
| --- | --- |
|  | **Status summary** |
| **Sub-topic#1** | *Tentative agreements:*  *Candidate options:*  *Recommendations for 2nd round:* |

### CRs/TPs

*Moderator tries to summarize discussion status for 1st round and provided recommendation on CRs/TPs Status update suggestion*

|  |  |
| --- | --- |
| **CR/TP number** | **CRs/TPs Status update recommendation** |
| XXX | *Based on 1st round of comments collection, moderator can recommend the next steps such as “agreeable”, “to be revised”* |

## Discussion on 2nd round (if applicable)

*Moderator can provide summary of 2nd round here. Note that recommended decisions on tdocs should be provided in the section titled ”Recommendations for Tdocs”.*

# Recommendations for Tdocs

## 1st round

**New tdocs**

|  |  |  |
| --- | --- | --- |
| **Title** | **Source** | **Comments** |
| WF on … | YYY |  |
| LS on … | ZZZ | To: RAN\_X; Cc: RAN\_Y |
|  |  |  |

**Existing tdocs**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-210xxxx | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

Notes:

1. Please include the summary of recommendations for all tdocs across all sub-topics incl. existing and new tdocs.
2. For the Recommendation column please include one of the following:
   1. CRs/TPs: Agreeable, Revised, Merged, Postponed, Not Pursued
   2. Other documents: Agreeable, Revised, Noted
3. For new LS documents, please include information on To/Cc WGs in the comments column
4. Do not include hyper-links in the documents

## 2nd round

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Tdoc number** | **Title** | **Source** | **Recommendation** | **Comments** |
| R4-210xxxx | CR on … | XXX | Agreeable, Revised, Merged, Postponed, Not Pursued |  |
| R4-210xxxx | WF on … | YYY | Agreeable, Revised, Noted |  |
| R4-210xxxx | LS on … | ZZZ | Agreeable, Revised, Noted |  |
|  |  |  |  |  |

Notes:

1. Please include the summary of recommendations for all tdocs across all sub-topics.
2. For the Recommendation column please include one of the following:
   1. CRs/TPs: Agreeable, Revised, Merged, Postponed, Not Pursued
   2. Other documents: Agreeable, Revised, Noted
3. Do not include hyper-links in the documents

# References

[1] ECC Decision (20)02 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), November 2020

[2] R4-2110956 Introduction of the RMR 900

[3] R4-2110958 Introduction of the RMR 1900

[4] R4-2111054 Discussion on channel raster aspects for RMR 900