**3GPP TSG-RAN WG4 Meeting#112 *DRAFT\_R4-2414434***

**Maastricht, Netherlands, 19 – 23 August 2024**

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| *CR-Form-v12.3* | | | | | | | | |
| **CHANGE REQUEST** | | | | | | | | |
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|  | **38.101-1** | **CR** | **2393** | **rev** | **1** | **Current version:** | **17.14.0** |  |
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| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* | | | | | | | | |
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| ***Proposed change affects:*** | UICC apps |  | ME | **X** | Radio Access Network |  | Core Network |  |

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| ***Title:*** | (NR\_redcap-Core) Correction of the channel raster for RedCap UEs by added entries | | | | | | | | | |
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| ***Source to WG:*** | Ericsson | | | | | | | | | |
| ***Source to TSG:*** | R4 | | | | | | | | | |
|  |  | | | | | | | | | |
| ***Work item code:*** | NR\_redcap-Core | | | | |  | ***Date:*** | | | 2024-08-19 |
|  |  | | | |  | |  | | |  |
| ***Category:*** | **F** |  | | | | | ***Release:*** | | | Rel-17 |
|  | *Use one of the following categories:* ***F*** *(correction)* ***A*** *(mirror corresponding to a change in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)*  Detailed explanations of the above categories can be found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | | | | | | | | *Use one of the following releases: Rel-8 (Release 8) Rel-9 (Release 9) Rel-10 (Release 10) Rel-11 (Release 11) … Rel-17 (Release 17) Rel-18 (Release 18) Rel-19 (Release 19) Rel-20 (Release 20)* | |
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| ***Reason for change:*** | | Correct the channel raster for RedCap by adding intermediary raster entries of 10 kHz granularity for bands with a 100 kHz channel raster defined for the general requirements (clauses without suffix) such that a UE-specific channel bandwidth can always be configured for RedCap UEs within a wider gNB bandwidth for these bands.  This channel raster with its finer 10 kHz granularity is devised such that a RedCap UE is compliant with minimum requirements for any UE specific channel bandwidth and location configurable by *ServingCellConfig* for the DL and UL in accordance with 38.331 just like for bands with an SCS-based channel raster.  For RedCap UEs it must always be possible to configure BWPs and associated UE-specific channel bandwidths smaller than a gNB channel bandwidth greater than 20 MHz. | | | | | | | | |
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| ***Summary of change:*** | | Clause 5.4I (new): Channel arrangement for RedCap  Clause 5.4I.1 (new): the general channel spacing requirements apply.  Clause 5.4I.2 (new): the channel raster in each NR operating band is given by the applicable general NR-ARFCN in Clause 5.4.2.3, and for bands with a 100 kHz channel raster defined for general requirements, additional intermediary NR-ARFCN overlaid with 10 kHz granularity. Hence every 10th of these additional entries coincides with the general NR-ARFCN in Clause 5.4.2.3 (100 kHz granularity).  Clause 5.4I.3 (new): the general synchronisation raster applies while noting that the this raster and the SS positions may not cover all additional raster entries for all channel bandwidths.  Clause 5.4I.4 (new): the general Tx-Rx frequency separation applies.  The changes are consistent with the enhanced channel raster introduced in a later release for all UEs and considered for early implementable from Rel-16.  Isolated impact: this change does not impact the UE conformance tests of RedCap UEs compliant with Rel-17 as specified in the latest version of 38.521-1.  RAN4#112 agreement:    The enhanced channel raster is mandated for Rel-17 RedCap UE from Rel-17 specification version 17.15.0 onwards   * The RedCap UE, which complies with Rel-17 specifications of verion 17.14.0 and before version 17.14.0, may support the legacy channel raster only. | | | | | | | | |
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| ***Consequences if not approved:*** | | Some RedCap UE implementations compliant with Rel-17 may not support a configuration and location of a UE-specific channel bandwidth off the 100 kHz channel raster in bands with this raster granularity.  For RedCap UEs it must always be possible to configure BWPs and associated UE-specific channel bandwidths smaller than the gNB channel bandwidth. | | | | | | | | |
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| ***Clauses affected:*** | | 5.4I, 5.4I.1, 5.4I.2, 5.4I.3, 5.4I.4 (all new) | | | | | | | | |
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|  | | **Y** | **N** |  | | | |  | | |
| ***Other specs*** | |  | **X** | Other core specifications | | | |  | | |
| ***affected:*** | |  | **X** | Test specifications | | | | . | | |
| ***(show related CRs)*** | |  | **X** | O&M Specifications | | | |  | | |
|  | |  | | | | | | | | |
| ***Other comments:*** | |  | | | | | | | | |
|  | |  | | | | | | | | |
| ***This CR's revision history:*** | | r1: RAN4#112 agreement added | | | | | | | | |

*< start of changes*

### 5.4E.3 Synchronization raster for V2X

There is no synchronization raster definition for NR V2X for both licensed bands and unlicensed bands.

## 5.4I Channel arrangement for RedCap

### 5.4I.1 Channel spacing for RedCap

For RedCap UEs, the channel spacing requirements in clause 5.4.1 apply for each operating band.

### 5.4I.2 Channel raster for RedCap

#### 5.4I.2.1 NR-ARFCN and channel raster

For RedCap UEs, the NR-ARFCN and channel raster requirements in clause 5.4.2.1 apply for each operating band.

#### 5.4I.2.2 Channel raster to resource element mapping

For RedCap UEs, the channel raster to resource element mapping requirements in clause 5.4.2.2 apply for each operating band.

#### 5.4I.2.3 Channel raster entries for each operating band

For RedCap UEs, the RF channel positions on the channel raster in each NR operating band are given through the applicable NR-ARFCN in Table 5.4.2.3‑1 and additional intermediary NR-ARFCN with a step size of <2> for operating bands that are included in Table 5.4.2.3-1 with a step size of <20>, using the channel raster to resource element mapping in clause 5.4I.2.2.

For NR operating bands included in Table 5.4.2.3-1 with a step size of <20>, the channel raster for RedCap UEs is defined with ΔFRaster = 2 × ΔFGlobal. In this case every 2nd NR-ARFCN within the operating band are applicable for the channel raster within the operating band and the step size for the channel raster is given as <2>, every 10th of these channel raster entries coincides with entries defined in Table 5.4.2.3-1 for this operating band.

### 5.4I.3 Synchronization raster for RedCap

For RedCap UEs, the synchronization raster requirements in clause 5.4.3 apply for each operating band. The synchronization raster and the corresponding SS block do not cover all possible RF channel bandwidths and locations on the channel raster defined in sub-clause 5.4I.2.

### 5.4I.4 Tx-Rx frequency separation for RedCap

For RedCap UEs, the Tx-Rx frequency separation requirements in clause 5.4.4 apply for each operating band.

## 5.5 Void

*< end of changes >*