

**Agenda item:**

**Source:** Ericsson

**Title:** CR 25.212-011r2: Connection between TTI and CFN

**Document for:** Decision

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Transport channels within one CCTrCH shall have aligned transmission time instants as illustrated in figure 8 in TS 25.212. Figure 8 is equivalent with the following equation, using the connection frame number CFN (defined in TS 25.402) as reference:

$$CFN_i \bmod F_i = 0.$$

$CFN_i$  denotes the connection frame number of the first radio frame within transmission time interval  $TTI_i$  of transport channel  $i$ . This relation gives a first requirement on the start timing of transport channels that are multiplexed into one CCTrCH.

Due to downlink rate matching rules, the rate matching calculations per TrCH are performed once per transmission time interval for the downlink. This results in the limitation that the transport format combination of one CCTrCH can be changed only each TTI in the downlink. Hence, new TrCHs can only be added into one CCTrCH or reconfigured within the CCTrCH at these time instants.

This can be expressed as:

$CFN_i \bmod F_{\max} = 0$ , where  $F_{\max}$  denotes the maximum number of radio frames within the transmission time intervals of all transport channels which are multiplexed into the same CCTrCH, including the new transport channel  $i$ .

By defining when transport channels may be started, the alignment of the transport channel's TTI timing follows directly.

It is proposed to replace figure 8 with the equation  $CFN_i \bmod F_{\max} = 0$  and to add a reference to TS 25.402 where CFN is defined.

Changes from CR25.212-11 (R1-99i55):

1. The description of the situation when alignment between TTI and CFN is needed has been corrected from “adding a new TrCH into a CCTrCH” to “changing the TFCS of a CCTrCH because a TrCH  $i$  is added to the CCTrCH or reconfigured within the CCTrCH”
2.  $TTI_i/10\text{ms}$  can be expressed by  $F_i$ .
3. The possible start timing for the TTIs of transport channels after they have been added or reconfigured is added by including the equation  $CFN_i \bmod (F_i) = 0$ .

# CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

**25.212 CR 011r2**

Current Version: **3.0.0**

GSM (AA.BB) or 3G (AA.BBB) specification number ↑

↑ CR number as allocated by MCC support team

For submission to: **TSG-RAN #6** for approval   
list expected approval meeting # here ↑ for information

strategic  (for SMG use only)  
non-strategic

Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: <ftp://ftp.3gpp.org/Information/CR-Form-v2.doc>

**Proposed change affects:** (U)SIM  ME  UTRAN / Radio  Core Network   
(at least one should be marked with an X)

**Source:** Ericsson **Date:** 1999-12-02

**Subject:** Connection between TTI and CFN

**Work item:**

**Category:** F Correction  **Release:** Phase 2   
(only one category shall be marked with an X) A Corresponds to a correction in an earlier release  Release 96   
B Addition of feature  Release 97   
C Functional modification of feature  Release 98   
D Editorial modification  Release 99   
Release 00

**Reason for change:** Figure 8 does not specify the exact timing for addition of TrCHs that are multiplexed into one CCTrCH with respect to CFN and TTI.

**Clauses affected:** 2, 4.2.14

**Other specs affected:** Other 3G core specifications  → List of CRs:  
Other GSM core specifications  → List of CRs:  
MS test specifications  → List of CRs:  
BSS test specifications  → List of CRs:  
O&M specifications  → List of CRs:

**Other comments:**



<----- double-click here for help and instructions on how to create a CR.

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# 1 Scope

This specification describes the documents being produced by the 3GPP TSG RAN WG1 and first complete versions expected to be available by end of 1999. This specification describes the characteristics of the Layer 1 multiplexing and channel coding in the FDD mode of UTRA.

The 25.2xx series specifies Um point for the 3G mobile system. This series defines the minimum level of specifications required for basic connections in terms of mutual connectivity and compatibility.

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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.

- [1] 3GPP RAN TS 25.201: "Physical layer – General Description"
- [2] 3GPP RAN TS 25.211: "Transport channels and physical channels (FDD)"
- [3] 3GPP RAN TS 25.213: "Spreading and modulation (FDD)"
- [4] 3GPP RAN TS 25.214: "Physical layer procedures (FDD)"
- [5] 3GPP RAN TS 25.215: "Measurements (FDD)"
- [6] 3GPP RAN TS 25.221: "Transport channels and physical channels (TDD)"
- [7] 3GPP RAN TS 25.222: "Multiplexing and channel coding (TDD)"
- [8] 3GPP RAN TS 25.223: "Spreading and modulation (TDD)"
- [9] 3GPP RAN TS 25.224: "Physical layer procedures (TDD)"
- [10] 3GPP RAN TS 25.225: "Measurements (TDD)"
- [11] 3GPP RAN TS 25.302: "Services Provided by the Physical Layer"
- [12] [3GPP RAN TS 25.402: "Synchronisation in UTRAN, Stage 2"](#)

### 4.2.14 Multiplexing of different transport channels into one CCTrCH, and mapping of one CCTrCH onto physical channels

The following rules shall apply to the different transport channels which are part of the same CCTrCH:

- 1) Transport channels multiplexed into one CCTrCH shall ~~have~~ have co-ordinated timings. ~~in the sense that transport blocks arriving from higher layers on different transport channels of potentially different transmission time intervals shall have aligned transmission~~ When the TFCS of a CCTrCH is changed because a transport channel *i* is added to the CCTrCH or reconfigured within the CCTrCH, the TTI of transport channel *i* may only start in radio frames with CFN fulfilling the relation

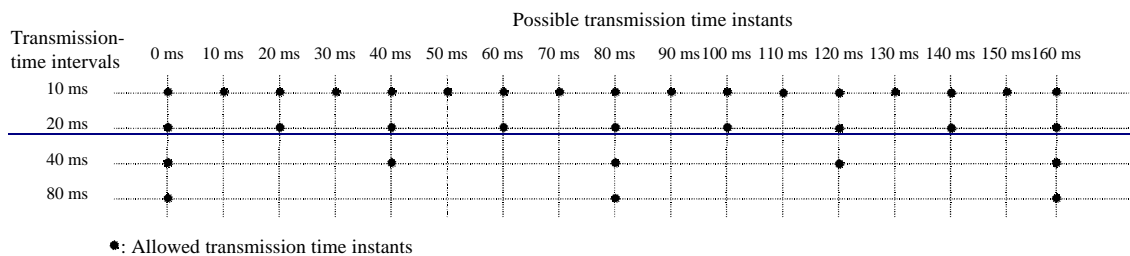
$$CFN_i \bmod F_{\max} = 0,$$

where  $F_{\max}$  denotes the maximum number of radio frames within the transmission time intervals of all transport channels which are multiplexed into the same CCTrCH, including transport channel *i* which is added or reconfigured, and  $CFN_i$  denotes the connection frame number of the first radio frame within the transmission time interval of transport channel *i*.

After addition or reconfiguration of a transport channel *i* within a CCTrCH, the TTI of transport channel *i* may only start in radio frames with CFN fulfilling the relation

$$CFN_i \bmod F_i = 0.$$

time instants as shown in figure 8.



**Figure 8: Possible transmission time instants regarding CCTrCH**

- 2) Only transport channels with the same active set can be mapped onto the same CCTrCH.
- 3) Different CCTrCHs cannot be mapped onto the same PhCH.
- 4) One CCTrCH shall be mapped onto one or several PhCHs. These physical channels shall all have the same SF.
- 5) Dedicated Transport channels and common transport channels cannot be multiplexed into the same CCTrCH
- 6) For the common transport channels, only the FACH and PCH may belong to the same CCTrCH

There are hence two types of CCTrCH

- 1) CCTrCH of dedicated type, corresponding to the result of coding and multiplexing of one or several DCHs.
- 2) CCTrCH of common type, corresponding to the result of the coding and multiplexing of a common channel, RACH in the uplink, DSCH, BCH, or FACH/PCH for the downlink.

#### 4.2.14.1 Allowed CCTrCH combinations for one UE

##### 4.2.14.1.1 Allowed CCTrCH combinations on the uplink

A maximum of one CCTrCH is allowed for one UE on the uplink. It can be either

- 1) one CCTrCH of dedicated type

- 2) one CcTrCH of common type

#### 4.2.14.1.2 Allowed CcTrCH combinations on the downlink

The following CcTrCH combinations for one UE are allowed :

- x CcTrCH of dedicated type + y CcTrCH of common type

The allowed combination of CcTrCHs of dedicated and common type are FFS.

NOTE 1: There is only one DPCCH in the uplink, hence one TPC bits flow on the uplink to control possibly the different DPDCHs on the downlink, part of the same or several CcTrCHs.

NOTE 2: There is only one DPCCH in the downlink, even with multiple CcTrCHs. With multiple CcTrCHs, the DPCCH is transmitted on one of the physical channels of that CcTrCH which has the smallest SF among the multiple CcTrCHs. Thus there is only one TPC command flow and only one TFCI word in downlink even with multiple CcTrCHs.