

CHANGE REQUEST

TS25.222 CR 054 rev 1 Current version: 3.5.0

For **HELP** on using this form, see bottom of this page or look at the pop-up text over the symbols.

Proposed change affects: (U)SIM ME/UE Radio Access Network Core Network

Title:	Corrections & Clarifications for TS25.222		
Source:	Siemens AG		
Work item code:		Date:	22.2.2001
Category:	F	Release:	R99
Use <u>one</u> of the following categories: F (essential correction) A (corresponds to a correction 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.		Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) REL-4 (Release 4) REL-5 (Release 5)	

Reason for change:	Some information on SF selection in the RM section is missing and following recent discussions the TPC coding section should be moved from TS25.222 to TS25.221 to be in line with the corresponding FDD specifications.
Summary of change:	?? Clarifies that SF selection in DL is fixed (1 or 16) ?? Clarifies the order of physical channel numbers in 4.2.11 ?? Removes TPC coding section to TS25.221
Consequences if not approved:	Inconsistent description & specifications

Clauses affected:	2; 4.2.7.1; 4.2.11; 4.3.3	
Other specs affected:	<input checked="" type="checkbox"/> Other core specifications <input type="checkbox"/> Test specifications <input type="checkbox"/> O&M Specifications	CR221-041
Other comments:		

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

- 1) Fill out the above form. The symbols above marked contain pop-up help information about the field that they are closest to.
- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under <ftp://www.3gpp.org/specs/> For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.
- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

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 TS 25.202: "UE capabilities".
- [2] 3GPP TS 25.211: "Transport channels and physical channels (FDD)".
- [3] 3GPP TS 25.212: "Multiplexing and channel coding (FDD)".
- [4] 3GPP TS 25.213: "Spreading and modulation (FDD)".
- [5] 3GPP TS 25.214: "Physical layer procedures (FDD)".
- [6] 3GPP TS 25.215: "Physical layer – Measurements (FDD)".
- [7] 3GPP TS 25.221: "Transport channels and physical channels (TDD)".
- [9] 3GPP TS 25.223: "Spreading and modulation (TDD)".
- [10] 3GPP TS 25.224: "Physical layer procedures (TDD)".
- [11] 3GPP TS 25.225: "Measurements".
- [12] ~~3GPP TS S2.01: "Radio Interface Protocol Architecture"~~ [3GPP TS25.331: "RRC Protocol Specification"](#).

4.2.7.1 Determination of rate matching parameters

The following relations, defined for all TFC j , are used when calculating the rate matching pattern:

$$Z_{0,j} = 0$$

$$Z_{i,j} = \frac{\sum_{m=1}^I RM_m \cdot N_{m,j} \cdot N_{data,j}}{\sum_{m=1}^I RM_m \cdot N_{m,j}} \text{ for all } i = 1 \dots I \quad (1)$$

$$N_{i,j} = Z_{i,j} \cdot Z_{i-1,j} \cdot N_{i-1,j} \text{ for all } i = 1 \dots I$$

Puncturing can be used to minimise the required transmission capacity. The maximum amount of puncturing that can be applied is 1-PL, PL is signalled from higher layers. The possible values for N_{data} depend on the number of physical channels P_{max} , allocated to the respective CCTrCH, and on their characteristics (spreading factor, length of midamble and TFCI, usage of TPC and multiframe structure), which is given in [7].

Denote the number of data bits in each physical channel by $U_{p,Sp}$, where p refers to the sequence number $1 \leq p \leq P_{max}$ of this physical channel as detailed in section 4.2.11 in the allocation message, and the second index Sp indicates the spreading factor with the possible values $\{16, 8, 4, 2, 1\}$, respectively. For each physical channel an individual minimum spreading factor Sp_{min} is transmitted by means of the higher layers. There are two options to determine the number N_{data} from the number of possible physical channels and the minimum spreading factor. The option is signalled by means of the higher layers.

If the UE shall increase the spreading factor autonomously Then, for N_{data} one of the following values in ascending order can be chosen:

~~$$\{U_{1,16}, \dots, U_{1,Sp_{min}}, U_{1,Sp_{min}}, U_{2,16}, \dots, U_{1,Sp_{min}}, U_{2,Sp_{min}}, \dots, U_{1,Sp_{min}}, U_{2,Sp_{min}}, \dots, U_{P_{max},16}, \dots, U_{1,Sp_{min}}, U_{2,Sp_{min}}, \dots, U_{P_{max},Sp_{max}}, \dots\}$$~~

$$\{U_{1,Sp_{min}}, U_{1,Sp_{min}}, U_{2,Sp_{min}}, U_{1,Sp_{min}}, U_{2,Sp_{min}}, \dots, U_{P_{max},Sp_{max}}, \dots\}$$

Optionally, if indicated by higher layers for the UL If the UE shall vary only use the minimum spreading factor autonomously, so that for N_{data} is one of the following values in ascending order can be chosen:

~~$$\{U_{1,Sp_{min}}, U_{1,Sp_{min}}, U_{2,Sp_{min}}, U_{1,Sp_{min}}, U_{2,Sp_{min}}, \dots, U_{P_{max},Sp_{max}}, \dots\}$$~~

$$\{U_{1,16}, \dots, U_{1,Sp_{min}}, U_{1,Sp_{min}}, U_{2,16}, \dots, U_{1,Sp_{min}}, U_{2,Sp_{min}}, \dots, U_{P_{max},16}, \dots, U_{1,Sp_{min}}, U_{2,Sp_{min}}, \dots, U_{P_{max},Sp_{max}}, \dots\}$$

$N_{data,j}$ for the transport format combination j is determined by executing the following algorithm:

$$SET1 = \{ N_{data} \text{ such that } \min_{1 \leq y \leq I} \{ RM_y \cdot N_{data} \cdot PL \cdot \sum_{x=1}^I RM_x \cdot N_{x,j} \} \text{ is non negative} \}$$

$$N_{data,j} = \min SET1$$

The number of bits to be repeated or punctured, $N_{i,j}$, within one radio frame for each TrCH i is calculated with the relations given at the beginning of this subclause for all possible transport format combinations j and selected every radio frame.

If $N_{i,j} = 0$ then the output data of the rate matching is the same as the input data and the rate matching algorithm of subclause 4.2.7.3 does not need to be executed.

Otherwise, the rate matching pattern is calculated with the algorithm described in subclause 4.2.7.3. For this algorithm the parameters e_{ini} , e_{plus} , e_{minus} , and X_i are needed, which are calculated according to the equations in subclauses 4.2.7.1.1 and 4.2.7.1.2.

4.2.8 TrCH multiplexing

Every 10 ms, one radio frame from each TrCH is delivered to the TrCH multiplexing. These radio frames are serially multiplexed into a coded composite transport channel (CCTrCH).

The bits input to the TrCH multiplexing are denoted by $f_{i,1}, f_{i,2}, f_{i,3}, \dots, f_{i,V_i}$, where i is the TrCH [id](#) number and V_i is the number of bits in the radio frame of TrCH i . The number of TrCHs is denoted by I . The bits output from TrCH multiplexing are denoted by $s_1, s_2, s_3, \dots, s_S$, where S is the number of bits, i.e. $S = \sum_i V_i$. The TrCH multiplexing is defined by the following relations:

$$s_k = f_{1,k} \quad k = 1, 2, \dots, V_1$$

$$s_k = f_{2,(k-V_1)} \quad k = V_1+1, V_1+2, \dots, V_1+V_2$$

$$s_k = f_{3,(k-(V_1+V_2))} \quad k = (V_1+V_2)+1, (V_1+V_2)+2, \dots, (V_1+V_2)+V_3$$

□

$$s_k = f_{I,(k-(V_1+V_2+\dots+V_{I-1}))} \quad k = (V_1+V_2+\dots+V_{I-1})+1, (V_1+V_2+\dots+V_{I-1})+2, \dots, (V_1+V_2+\dots+V_{I-1})+V_I$$

4.2.11 Physical channel mapping

The PhCH for both uplink and downlink is defined in [6]. The bits after physical channel mapping are denoted by $W_{p,1}, W_{p,2}, \dots, W_{p,U_p}$, where p is the PhCH number corresponding to the sequence number 1? p ? P_{max} of this physical channel as detailed below, and U_p is the number of bits in one radio frame for the respective PhCH. The bits $W_{p,k}$ are mapped to the PhCHs so that the bits for each PhCH are transmitted over the air in ascending order with respect to k .

The physical channel sequence number p are to be allocated by the physical layer in ascending order of the timeslots in which they appear. If more than one physical channel appears in a timeslot, they shall be allocated the sequence number in order of the timeslot first and then of their channelisation codes. The channelisation codes shall be ordered in ascending order of the spreading Factor (Q) and then channelisation index (k), as shown in [9].

The mapping of the bits $v_{(t),1}, v_{(t),2}, \dots, v_{(t),U_{(t)}}$ is performed like block interleaving, writing the bits into columns, but a PhCH with an odd number is filled in forward order, were as a PhCH with an even number is filled in reverse order.

The mapping scheme, as described in the following subclause, shall be applied individually for each timeslot t used in the current frame. Therefore, the bits $v_{t,1}, v_{t,2}, \dots, v_{t,U_t}$ are assigned to the bits of the physical channels

$W_{t,1,1\dots U_{t1}}, W_{t,2,1\dots U_{t2}}, \dots, W_{t,P_t,1\dots U_{tP_t}}$ in each timeslot.

In uplink there are at most two codes allocated ($P \leq 2$). If there is only one code, the same mapping as for downlink is applied. Denote SF1 and SF2 the spreading factors used for code 1 and 2, respectively. For the number of consecutive bits to assign per code bs_k the following rule is applied:

if

SF1 \geq SF2 then $bs_1 = 1$; $bs_2 = SF1/SF2$;

else

SF2 $>$ SF1 then $bs_1 = SF2/SF1$; $bs_2 = 1$;

end if

In the downlink case bs_p is 1 for all physical channels.

4.3.3 Coding of Transmit Power Control (TPC)

The TPC command is an identifier sent in uplink transmission only, to instruct the NodeB whether Tx power has to be increased or decreased. The length of the TPC command is one symbol. The coding of the TPC command is shown in table 11.

Table 11: Coding of the TPC

TPC	TPC-Bits	Meaning
'Down'	00	Decrease Tx Power
'Up'	11	Increase Tx Power