# TSG-RAN Meeting #12
# Stockholm, Sweden, 12-15, June, 2001

***RP-010337***

**Title:** **Agreed CRs (R99 and Rel-4 Category A) to TS 25.223**

**Source:** **TSG-RAN WG1**

**Agenda item:** **8.1.3**

| No. | Spec | CR | Rev | R1 T-doc | Subject | Releas | Cat | W / I Code | V_old | V_new |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 25.223 | 018 | - | R1-01-0451 | Addition to the abbreviation list and definition of a constant | R99 | F | TEI | 3.5.0 | 3.6.0 |
| 2 | 25.223 | 019 | - | R1-01-0629 | Addition to the abbreviation list and definition of a constant | REL-4 | A | TEI4 | 4.0.0. | 4.1.0 |

**3GPP TSG RAN Meeting #12**
**Stockholm, Sweden, 12-15, June, 2001**

***R1-01-0451***

*CR-Form-v3*

# CHANGE REQUEST

⌘ **25.223** **CR** **018** ⌘ rev **-** ⌘ 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 **X** Radio Access Network ☐ Core Network ☐

| | | |
|---|---|---|
| ***Title:*** | ⌘ | Addition to the abbreviation list and definition of a constant. |
| ***Source:*** | ⌘ | TSG RAN WG1 |
| ***Work item code:*** | ⌘ | TEI |
| ***Date:*** | ⌘ | May 9, 2001 |
| ***Category:*** | ⌘ | **F** |
| ***Release:*** | ⌘ | R99 |

*Use one 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 one 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:*** | ⌘ | Acronyms and constants are used but not defined |
| ***Summary of change:*** | ⌘ | Additions to the Abbreviation list. |
| ***Consequences if not approved:*** | ⌘ | Incomplete abbreviation list. |

| | | |
|---|---|---|
| ***Clauses affected:*** | ⌘ | 3.2, 5.2.1 |
| ***Other specs affected:*** | ⌘ | ☐ Other core specifications ⌘<br>☐ Test specifications<br>☐ O&M Specifications |
| ***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.

## 3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply:

| | |
|---|---|
| CCTrCH | Coded Composite Transport Channel |
| DPCH | Dedicated Physical Channel |
| CDMA | Code Division Multiple Access |
| FDD | Frequency Division Duplex |
| OVSF | Orthogonal Variable Spreading Factor |
| P-CCPCH | Primary Common Control Physical Channel |
| PN | Pseudo Noise |
| PRACH | Physical Random Access Channel |
| PSC | Primary Synchronisation Code |
| QPSK | Quadrature Phase Shift Keying |
| RACH | Random Access Channel |
| SCH | Synchronisation Channel |
| SF | Spreading Factor |
| SFN | System Frame Number |
| TDD | Time Division Duplex |
| TFC | Transport Format Combination |
| UL | Uplink |
| UE | User Equipment |

# 4 General

In the following, a separation between the data modulation and the spreading modulation has been made. The data modulation is defined in clause 5 and the spreading modulation in clause 6.

**Table 1: Basic modulation parameters**

| | | |
|---|---|---|
| Chip rate | same as FDD basic chiprate: 3.84 Mchip/s | Low chiprate: 1.28 Mchip/s |
| Data modulation | QPSK | QPSK |
| Spreading characteristics | Orthogonal Q chips/symbol, where Q = $2^p$, 0 <= p <= 4 | Orthogonal Q chips/symbol, where Q = $2^p$, 0 <= p <= 4 |

# 5 Data modulation

## 5.1 Symbol rate

The symbol duration $T_S$ depends on the spreading factor Q and the chip duration $T_C$: $T_s = Q \times T_c$, where $T_c = \frac{1}{chiprate}$.

## 5.2 Mapping of bits onto signal point constellation

### 5.2.1 Mapping for burst type 1 and 2

The data modulation is performed to the bits from the output of the physical channel mapping procedure in [8] and combines always 2 consecutive binary bits to a complex valued data symbol. Each user burst has two data carrying parts, termed data blocks:

$$\underline{\mathbf{d}}^{(k,i)} = (\underline{d}_1^{(k,i)}, \underline{d}_2^{(k,i)}, ..., \underline{d}_{N_k}^{(k,i)})^T \quad i = 1, 2; k = 1, ..., K. \tag{1}$$

K is the number of users, max K =16. $N_k$ is the number of symbols per data field for the user k. This number is linked to the spreading factor $Q_k$ as described in table 1 of [7].

Data block $\underline{\mathbf{d}}^{(k,1)}$ is transmitted before the midamble and data block $\underline{\mathbf{d}}^{(k,2)}$ after the midamble. Each of the $N_k$ data symbols $\underline{d}_n^{(k,i)}$; i=1, 2; k=1,...,K; n=1,...,$N_k$; of equation 1 has the symbol duration $T_s^{(k)}=Q_k.T_c$ as already given.

The data modulation is QPSK, thus the data symbols $\underline{d}_n^{(k,i)}$ are generated from two consecutive data bits from the output of the physical channel mapping procedure in [8]:

$$b_{l,n}^{(k,i)} \in \{0,1\} \qquad l = 1,2;\ k = 1,\ldots K;\ n = 1,\ldots,N_k;\ i = 1,2 \tag{2}$$

using the following mapping to complex symbols:

| consecutive binary bit pattern | complex symbol |
|---|---|
| $b_{1,n}^{(k,i)}$ $b_{2n}^{(k,i)}$ | $\underline{d}_n^{(k,i)}$ |
| 00 | +j |
| 01 | +1 |
| 10 | -1 |
| 11 | -j |

The mapping corresponds to a QPSK modulation of the interleaved and encoded data bits $b_{l,n}^{(k,i)}$ of equation 2.

**3GPP TSG RAN Meeting #12**
**Stockholm, Sweden, 12-15, June, 2001**

***R1-01-0629***

*CR-Form-v3*

# CHANGE REQUEST

⌘ **25.223** **CR** **019** ⌘ rev **-** ⌘ Current version: **4.0.0** ⌘

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| | | |
|---|---|---|
| ***Title:*** | ⌘ | Addition to the abbreviation list and definition of a constant. |
| ***Source:*** | ⌘ | TSG RAN WG1 |
| ***Work item code:*** | ⌘ | TEI4 |
| ***Date:*** | ⌘ | May 22, 2001 |
| ***Category:*** | ⌘ | **A** |
| ***Release:*** | ⌘ | REL-4 |

*Use one of the following categories:*
***F*** *(essential correction)*
***A*** *(corresponds to a correction in an earlier release)*
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