

**TSG-RAN Meeting #6  
Nice, France, 13 – 15 December 1999**

**TSGRP#6(99)698**

**Title:** Agreed CRs of category "C" (Modifications) and "F" (Corrections) to TS 25.224

**Source:** TSG-RAN WG1

**Agenda item:** 5.1.3

Spec	CR	Rev	Phase	Subject	Cat	Version-Current	Version-New	Doc
25.224	001	01	R99	Primary and Secondary CCPCH in TDD	F	3.0.0	3.1.0	<a href="#">R1-99i86</a>
25.224	002	-	R99	Measurement procedure of received reference	C	3.0.0	3.1.0	<a href="#">R1-99h08</a>

**NOTE:** The source of this document is TSG-RAN WG1. The source shown on each CR cover sheet is the originating organisation.

<b>CHANGE REQUEST</b>		Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.	
<b>25.224</b>	<b>CR 001r1</b>	Current Version: <b>3.0.0</b>	
GSM (AA.BB) or 3G (AA.BBB) specification number ↑	↑ CR number as allocated by MCC support team		
For submission to: <b>RAN #6</b> <small>list expected approval meeting # here ↑</small>	for approval <input checked="" type="checkbox"/> for information <input type="checkbox"/>	strategic <input type="checkbox"/> non-strategic <input type="checkbox"/>	(for SMG use only)

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:** Siemens AG **Date:** 1999-11-17

**Subject:** Primary and Secondary CCPCH in TDD

**Work item:**

<b>Category:</b>	F Correction <input checked="" type="checkbox"/> A Corresponds to a correction in an earlier release <input type="checkbox"/> B Addition of feature <input type="checkbox"/> C Functional modification of feature <input type="checkbox"/> D Editorial modification <input type="checkbox"/>	<b>Release:</b>	Phase 2 <input type="checkbox"/> Release 96 <input type="checkbox"/> Release 97 <input type="checkbox"/> Release 98 <input type="checkbox"/> Release 99 <input checked="" type="checkbox"/> Release 00 <input type="checkbox"/>
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(only one category shall be marked with an X)

**Reason for change:** Due to recent changes in WG2 (CR25.321-014 and CR25.301-018r1) the transport to physical channel mapping in TDD can be changed in order to facilitate the channel description and harmonize TDD and FDD mapping.

**Clauses affected:** 3, 4.2.2, 4.2.3, 4.4

<b>Other specs affected:</b>	Other 3G core specifications <input type="checkbox"/> Other GSM core specifications <input type="checkbox"/> MS test specifications <input type="checkbox"/> BSS test specifications <input type="checkbox"/> O&M specifications <input type="checkbox"/>	→ List of CRs: 25.221-001r1, 25.223-001r1, 25.225-001r1 → List of CRs: → List of CRs: → List of CRs: → List of CRs:
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**Other comments:**



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## 3 Abbreviations

BCCH	Broadcast Control Channel
BCH	Broadcast Channel
CCTrCH	Coded Composite Transport Channel
DCA	Dynamic Channel Allocation
DPCH	Dedicated Physical Channel
DTX	Discontinuous Transmission
FACH	Forward Access Channel
NRT	Non-Real Time
ODMA	Opportunity Division Multiple Access
ORACH	ODMA Random Access Channel
P-CCPCH	Primary Common Control Physical Channel
PRACH	Physical Random Access Channel
PSCH	Primary Synchronisation Channel
RACH	Random Access Channel
RT	Real Time
RU	Resource Unit
<u>S-CCPCH</u>	<u>Secondary Common Control Physical Channel</u>
SCH	Synchronisation Channel
SSCH	Secondary Synchronisation Channel
STD	Selective Transmit Diversity
TA	Timing Advance
TPC	Transmit Power Control
TSTD	Time Switched Transmit Diversity
TxAA	Transmit Adaptive Antennas
UE	User Equipment
VBR	Variable Bit Rate

## 4.2.2 Uplink Control

### 4.2.2.1 Common Physical Channel

The transmitter power of UE shall be calculated by the following equation:

$$P_{\text{PRACH}} = L_{\text{P\_CCPCH}} + I_{\text{BTS}} + \text{Constant value}$$

where

$P_{\text{PRACH}}$  : Transmitter power level in dBm,

$L_{\text{P\_CCPCH}}$  : Measure representing path loss in dB (reference transmit power is broadcast on BCH),

$I_{\text{BTS}}$  : Interference signal power level at cell's receiver in dBm, which is broadcast on BCH,

Constant value: This value shall be set by higher Layer (operator matter).

### 4.2.2.2 Dedicated Physical Channel

The initial transmission power is decided in a similar manner as PRACH. After the synchronisation between UTRAN and UE is established, the UE transits into open-loop transmitter power control (TPC).

The transmitter power of UE shall be calculated by the following equation:

$$P_{\text{UE}} = \alpha L_{\text{P\_CCPCH}} + (1-\alpha)L_0 + I_{\text{BTS}} + \text{SIR}_{\text{TARGET}} + \text{Constant value}$$

where

$P_{\text{UE}}$  : Transmitter power level in dBm,

$L_{\text{P\_CCPCH}}$  : Measure representing path loss in dB (reference transmit power is broadcast on BCH).

$L_0$  : Long term average of path loss in dB

$I_{\text{BTS}}$  : Interference signal power level at cell's receiver in dBm, which is broadcast on BCH

$\alpha$ :  $\alpha$  is a weighting parameter which represents the quality of path loss measurements.  $\alpha$  may be a function of the time delay between the uplink time slot and the most recent down link PCCPCH time slot containing a physical channel that provides the beacon function, see [8].  $\alpha$  is calculated at the UE. An example for calculating  $\alpha$  as a function of the time delay is given in Annex 1.

$\text{SIR}_{\text{TARGET}}$ : Target SNR in dB. A higher layer outer loop adjusts the target SIR.

Constant value: This value shall be set by higher Layer (operator matter).

## 4.2.3 Downlink Control

### 4.2.3.1 Common Physical Channel

The Primary CCPCH transmit power can be changed based on network determination on a slow basis. The ~~exact~~ reference transmit power of P-CCPCH is signaled on the BCH on a periodic basis.

## 4.4 Synchronisation and Cell Search Procedures

### 4.4.1 Cell Search

During the initial cell search, the UE searches for a cell. It then determines the midamble, the downlink scrambling code and frame synchronisation of that cell. The initial cell search uses the Physical Synchronisation Channel (PSCH) described in [8]. The generation of synchronisation codes is described in [10].

This initial cell search is carried out in three steps:

#### Step 1: Slot synchronisation

During the first step of the initial cell search procedure the UE uses the primary synchronisation code  $c_p$  to acquire slot synchronisation to the strongest cell. Furthermore, frame synchronisation with the uncertainty of 1 out of 2 is obtained in this step. A single matched filter (or any similar device) is used for this purpose, that is matched to the primary synchronisation code which is common to all cells.

#### Step 2: Frame synchronisation and code-group identification

~~The Step 2 is described for the case where PSCH and PCCPCH are in timeslot  $k$  and  $k+8$  with  $k=0\dots6$ .~~

During the second step of the initial cell search procedure, the UE uses the modulated Secondary Synchronisation Codes to find frame synchronisation and identify one out of 32 code groups. Each code group is linked to a specific  $t_{\text{Offset}}$ , thus to a specific frame timing, and is containing 4 specific scrambling codes. Each scrambling code is associated with a specific short and long basic midamble code.

In Cases 2 and 3 it is required to detect the position of the next synchronization slots. To detect the position of the next synchronization slots, the primary synchronization code is correlated with the received signal at offsets of 7 and 8 time slots from the position of the primary code that was detected in Step 1.

Then, the received signal at the positions of the synchronization codes is correlated with the primary synchronization Code  $C_p$  and the secondary synchronization codes  $\{C_0, \dots, C_{15}\}$ . Note that the correlations can be performed coherently over  $M$  time slots, where at each slot a phase correction is provided by the correlation with the primary code. The minimal number of time slots is  $M=1$ , and the performance improves with increasing  $M$ .

#### Step 3: Scrambling code identification

During the third and last step of the initial cell-search procedure, the UE determines the exact basic midamble code and the accompanying scrambling code used by the found cell. They are identified through correlation over the P<sub>-</sub>CCPCH with all four midambles of the code group identified in the second step. Thus the third step is a one out of four decision. This step is taking into account that the P<sub>-</sub>CCPCH containing the BCH is transmitted using the first spreading code ( $a_{Q=16}^{(h=1)}$  in [10]) and using the first midamble  $\mathbf{m}^{(1)}$  (derived from basic midamble code  $\mathbf{m}_p$  in [8]). Thus P<sub>-</sub>CCPCH code and midamble can be immediately derived when knowing scrambling code and basic midamble code.

### 3G CHANGE REQUEST

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**25.224** CR **002**

Current Version: **3.0.0**

3G specification number ↑

↑ CR number as allocated by 3G support team

for submission to TSG **#6**  
*list TSG meeting no. here ↑*

for approval  (only one box should  
for information  be marked with an X)

Form: 3G CR cover sheet, version 1.0 The latest version of this form is available from: ftp://ftp.3gpp.org/Information/3GCRF-xx.tif

**Proposed change affects:**  
*(at least one should be marked with an X)*

USIM

ME

UTRAN

Core Network

**Source:** **PanasonicRAN WG1**

**Date:** **14 Oct., 1999**

**Subject:** **Measurement procedure of received reference power for OL-TPC in TDD**

**3G Work item:**

**Category:**

*(only one category shall be marked with an X)*

- F Correction
- A Corresponds to a correction in a 2G specification
- B Addition of feature
- C Functional modification of feature
- D Editorial modification

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<input type="checkbox"/>

**Reason for change:**

To clarify measurement procedure of received P-CCPCH signal strength used in open loop control scheme

**Clauses affected:** **4.2.2.2 of TS25.224**

**Other specs affected:**

- Other 3G core specifications  → List of CRs:
- Other 2G 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:**



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#### 4.2.2.2 Dedicated Physical Channel

The initial transmission power is decided in a similar manner as PRACH. After the synchronisation between UTRAN and UE is established, the UE transits into open-loop transmitter power control (TPC).

The transmitter power of UE shall be calculated by the following equation:

$$P_{UE} = \alpha L_{P\_CCPCH} + (1-\alpha)L_0 + I_{BTS} + SIR_{TARGET} + \text{Constant value}$$

where

- $P_{UE}$ : Transmitter power level in dBm,
- $L_{P\_CCPCH}$ : Measure representing path loss in dB (reference transmit power is broadcast on BCH).
- $L_0$ : Long term average of path loss in dB
- $I_{BTS}$ : Interference signal power level at cell's receiver in dBm, which is broadcast on BCH
- $\alpha$ :  $\alpha$  is a weighting parameter which represents the quality of path loss measurements.  $\alpha$  may be a function of the time delay between the uplink time slot and the most recent down link P-CCPCH time slot.  $\alpha$  is calculated at the UE. An example for calculating  $\alpha$  as a function of the time delay is given in Annex 1.
- $SIR_{TARGET}$ : Target SNR in dB. A higher layer outer loop adjusts the target SIR.
- Constant value: This value shall be set by higher Layer (operator matter).

If the midamble is used in the evaluation of  $L_{P\_CCPCH}$  and  $L_0$ , and the Tx diversity scheme used for the P-CCPCH involves the transmission of different midambles from the diversity antennas, the received power of the different midambles from the different antennas shall be combined prior to evaluation of these variables.