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

TSGRP#6(99)688

Title: **Agreed CRs of category "C" (Modifications) and "F" (Corrections) to TS 25.215**

Source: **TSG-RAN WG1**

Agenda item: **5.1.3**

Spec	CR	Rev	Phase	Subject	Cat	Version-Current	Version-New	Doc
25.215	001	3	R99	Clarifications for compressed mode parameters	C	3.0.0	3.1.0	R1-99l42
25.215	004	-	R99	Measurements are done on Primary CPICH	F	3.0.0	3.1.0	R1-99i70
25.215	006	-	R99	Definition of SIR measurement	F	3.0.0	3.1.0	R1-99i72
25.215	009	2	R99	Range and resolution for RF related	F	3.0.0	3.1.0	R1-99l10
25.215	011	-	R99	Removal of Annex A from TS 25.215	F	3.0.0	3.1.0	R1-99i76
25.215	013	-	R99	Definition of Transmitted code power	F	3.0.0	3.1.0	R1-99j22
25.215	014	2	R99	Range and resolution of BLER measurements	F	3.0.0	3.1.0	R1-99l02
25.215	015	2	R99	Range and resolution of BER measurements	F	3.0.0	3.1.0	R1-99l02
25.215	020	-	R99	Correction of SFN-SFN observed time difference	F	3.0.0	3.1.0	R1-99k28
25.215	021	1	R99	CFN-SFN measurement with compressed mode	F	3.0.0	3.1.0	R1-99l03

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

3GPP/SMG Meeting #9
Dresden, Germany, 30 Nov - 03 Dec 1999

Document R1-99L42
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

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25.215	CR	001 rev3	Current Version:	3.0.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

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

Source: Nokia **Date:** 3 Dec 1999

Subject: Clarifications for compressed mode parameters

Work item: Change Request on the corrections/clarifications to the WG1 specifications

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

F	Correction	
A	Corresponds to a correction in an earlier release	
B	Addition of feature	
C	Functional modification of feature	X
D	Editorial modification	

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X
Release 00	

Reason for change: Compressed mode parameter list in 25.215 is incomplete;
compressed mode functionality needed by upper layers is missing

Clauses affected: 6.1.1.1, 6.1.1.2

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:

6 Measurements for UTRA FDD

6.1 UE measurements

6.1.1 Compressed mode

6.1.1.1 Use of compressed mode/dual receiver for monitoring

A UE shall, on upper layers commands, monitor cells on other frequencies (FDD, TDD, GSM). To allow the UE to perform measurements, upper layers shall command that the UE enters in compressed mode, depending on the UE capabilities.

In case of compressed mode decision, UTRAN shall communicate to the UE the parameters of the compressed mode, described in reference [2], 25.212.

A UE with a single receiver shall support downlink compressed mode.

Every UE shall support uplink compressed mode, when monitoring frequencies which are close to the uplink transmission frequency (i.e. frequencies in the TDD or GSM 1800/1900 bands).

All fixed-duplex UE shall support both downlink and uplink compressed mode to allow inter-frequency handover within FDD and inter-mode handover from FDD to TDD.

< WG1's note : the use of uplink compressed mode for single receiver UE when monitoring frequencies outside TDD and GSM 1800/1900 bands is for further study >

UE with dual receivers can perform independent measurements, with the use of a "monitoring branch" receiver, that can operate independently from the UTRA FDD receiver branch. Such UE do not need to support downlink compressed mode.

The UE shall support one single measurement purpose within one compressed mode transmission gap. The measurement purpose of the gap is signalled by upper layers.

The following section provides rules to parametrise the compressed mode.

6.1.1.2 Parameterisation of the compressed mode

In response to a request from upper layers, the UTRAN shall signal to the UE the compressed mode parameters.

The following parameters characterize a transmission gap :

- TGL : Transmission Gap Length is the duration of no transmission, expressed in number of slots ~~(e.g. used for switching frequency, monitoring)~~.
- SFN : The system frame number when the transmission gap starts
- SN : The slot number when the transmission gap starts

With this definition, it is possible to have a flexible position of the transmission gap in the frame, as defined in [2].

The following parameters characterize a compressed mode pattern :

- TGP : Transmission Gap Period is the period of repetition of a set of consecutive frames containing up to 2 transmission gaps (*).
- TGL : As defined above
- TGD : Transmission Gap Distance is the duration of transmission between two consecutive transmission gaps within a transmission gap period, expressed in number of frames. In case there is only one transmission gap in the

transmission gap period, this parameter shall be set to zero.

- PD: Pattern duration is the total time of all TGPs expressed in number of frames.
- SFN : The system frame number when the first transmission gap starts
- UL/DL compressed mode selection: This parameter specifies whether compressed mode is used in UL only, DL only or both UL and DL.
- Compressed mode method: The method for generating the downlink compressed mode gap can be puncturing, reducing the spreading factor or upper layer scheduling and is described in [2].
- Transmit gap position mode: The gap position can be fixed or adjustable. This is defined in [2].
- Downlink frame type: This parameter defines if frame structure type 'A' or 'B' shall be used in downlink compressed mode. This is defined in [2].
- Scrambling code change: This parameter indicates whether the alternative scrambling code is used for compressed mode method 'SF/2'. Alternative scrambling codes are described in [3].
- PCM: Power Control Mode specifies the uplink power ~~control algorithm~~ mode applied during recovery period after each transmission gap in compressed mode. PCM can take 2 values (0 or 1). The different power control modes are described in [4]~~TS 25.214~~.
- PRM: Power Resume Mode selects the uplink power control method to calculate the initial transmit power after the gap. PRM can take two values (0 or 1) and is described in [4].

In a compressed mode pattern, the first transmission gap starts in the first frame of the pattern. The gaps have a fixed position in the frames, and start in the slot position defined in [2].

(*) : Optionally, the set of parameters may contain 2 values TGP1 and TGP2, where TGP1 is used for the 1st and the consecutive odd gap periods and TGP2 is used for the even ones. Note if TGP1=TGP2 this is equivalent to using only one TGP value.

In all cases, upper layers has control of individual UE parameters. The repetition of any pattern can be stopped on upper layers command.

The UE shall support [8] simultaneous compressed mode patterns which can be used for different measurements. Upper layers will ensure that the compressed mode gaps do not overlap and are not scheduled within the same frame. Patterns causing an overlap or too long gaps will not be processed by the UE and interpreted as a faulty message.

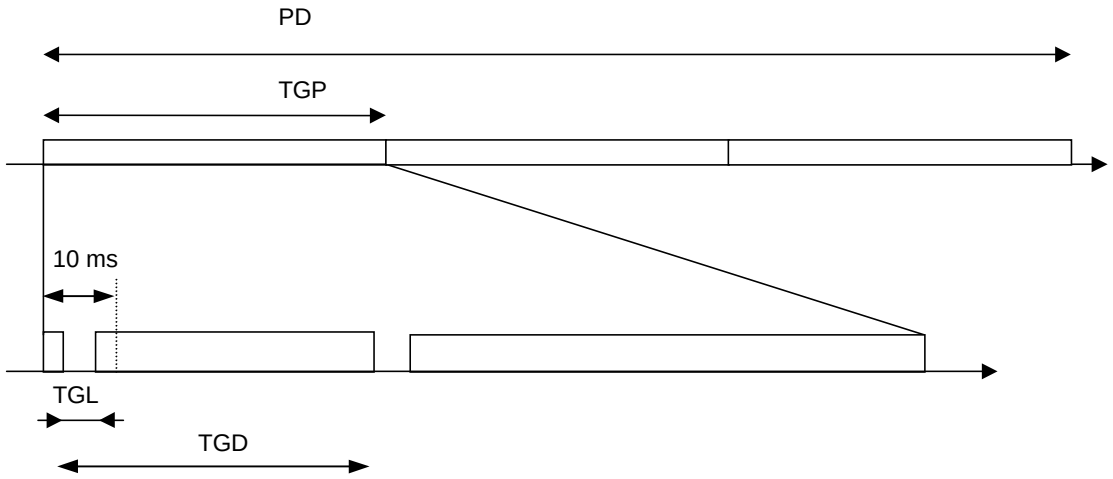

Figure 1 : illustration of compressed mode pattern parameters

6.1.1.3 Parameterisation limitations

In the table below the supported values for the TGL parameter is shown.

Measurements performed on	Supported TGL values
FDD inter-frequency cell	7, 14
TDD cell	4
GSM cell	3, 4, 7, 10, 14

Multi-mode terminals shall support the union of TGL values for the supported modes.

Further limitations on transmission gap position is given in TS 25.212.

Compressed mode patterns for handover monitoring are recommended in "Annex A: Measurements for Handover (Informative)".

A. Annex A: Measurements for Handover (Informative)

A.1 Monitoring of FDD cells on the same frequency

TSG-RAN Working Group 1 meeting #9
Dresden, Germany
November 30 – December 3, 1999

TSGR1#9(99)i70

Agenda item: AH 16

Source: Ericsson

Title: CR 25.215-004: Measurements are done on Primary CPICH

Document for: Decision

In the definition of several UE measurements the term CPICH is used as a name for a physical channel where measurements shall be performed. As there are two types of CPICHs defined in 25.211, e.g. Primary CPICH and Secondary CPICH it is unclear which physical channel that are meant. In this CR it is proposed that CPICH is replaced by Primary CPICH in the definition of UE measurements in 25.215.

3GPP TSG RAN WG1 Meeting #9
Dresden, Germany, Nov 30 – Dec 3, 1999

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25.215	CR	004	Current Version:	3.0.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

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

Source: Ericsson **Date:** 1999-10-25

Subject: Measurements are done on Primary CPICH

Work item:

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

F	Correction	X
A	Corresponds to a correction in an earlier release	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X
Release 00	

Reason for change: In the definition of several UE measurements the term CPICH is used as a name for a physical channel where measurements shall be performed. As there are two types of CPICHs defined in 25.211, e.g. Primary CPICH and Secondary CPICH it is unclear which physical channel that are meant. It is proposed that CPICH is replaced by Primary CPICH in the definition of UE measurements in 25.215.

Clauses affected:
5.1.1 CPICH RSCP
5.1.7 CPICH Ec/No
5.1.12 SFN-SFN observed time difference

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:

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5.1 UE measurement abilities

The structure of the table defining a UE measurement quantity is shown below:

Column field	**Comment**
Definition	Contains the definition of the measurement.
Applicable for	States if a measurement shall be possible to perform in Idle mode and/or Connected mode. For connected mode also information of the possibility to perform the measurement on intra-frequency and/or inter-frequency are given. The following terms are used in the tables: Idle = Shall be possible to perform in idle mode Connected Intra = Shall be possible to perform in connected mode on an intra-frequency Connected Inter = Shall be possible to perform in connected mode on an inter-frequency
Range/mapping	Gives the range and mapping to bits for the measurements quantity.

5.1.1 CPICH RSCP

Definition	Received Signal Code Power, the received power on one code after de-spreading measured on the pilot bits of the Primary CPICH. The reference point for the RSCP is the antenna connector at the UE.
Applicable for	Idle, Connected Intra, Connected Inter
Range/mapping	

5.1.2 RSCP

Definition	Received Signal Code Power, the received power on one code after de-spreading measured on the pilot bits of the DPCCH after RL combination. The reference point for the RSCP is the antenna connector at the UE.
Applicable for	Connected Intra
Range/mapping	

5.1.3 ISCP

Note that it is not a requirement that the ISCP shall be possible to report to higher layers. The ISCP is defined in this section because it is included in the definition of SIR.

Definition	Interference Signal Code Power, the interference on the received signal after de-spreading. Only the non-orthogonal part of the interference is included in the measurement. The reference point for the ISCP is the antenna connector at the UE.

5.1.4 SIR

Definition	Signal to Interference Ratio, defined as the RSCP divided by ISCP. The SIR shall be measured on DPCCH after RL combination. The reference point for the SIR is the antenna connector of the UE.
Applicable for	Connected Intra
Range/mapping	

5.1.5 UTRA carrier RSSI

Definition	Received Signal Strength Indicator, the wide-band received power within the relevant channel bandwidth. Measurement shall be performed on a UTRAN downlink carrier. The reference point for the RSSI is the antenna connector at the UE.
Applicable for	Idle, Connected Intra, Connected Inter
Range/mapping	

5.1.6 GSM carrier RSSI

Definition	Received Signal Strength Indicator, the wide-band received power within the relevant channel bandwidth. Measurement shall be performed on a GSM BCCH carrier. The reference point for the RSSI is the antenna connector at the UE.
Applicable for	Idle, Connected Inter
Range/mapping	According to the definition of RXLEV in GSM 05.08.

5.1.7 CPICH Ec/No

Definition	The received energy per chip divided by the power density in the band. The Ec/No is identical to RSCP/RSSI. Measurement shall be performed on the Primary CPICH. The reference point for Ec/No is the antenna connector at the UE.
Applicable for	Idle, Connected Intra, Connected Inter
Range/mapping	

5.1.8 Transport channel BLER

Definition	Estimation of the transport channel block error rate (BLER). The BLER estimation shall be based on evaluating the CRC on each transport block after RL combination. BLER estimation is only required for transport channels containing CRC. In connected mode the BLER shall be possible to measure on any transport channel. If requested in idle mode it shall be possible to measure the BLER on transport channel PCH.
Applicable for	Idle, Connected Intra
Range/mapping	

5.1.9 Physical channel BER

Definition	The physical channel BER is an estimation of the average bit error rate (BER) before channel decoding of the DPDCH data after RL combination. At most it shall be possible to report a physical channel BER estimate at the end of each TTI for the transferred TrCh's, e.g. for TrCh's with a TTI of x ms a x ms averaged physical channel BER shall be possible to report every x ms.
Applicable for	Connected Intra
Range/mapping	

5.1.10 UE transmitted power

Definition	The total UE transmitted power on one carrier. The reference point for the UE transmitted power shall be the UE antenna connector.
Applicable for	Connected Intra
Range/mapping	

5.1.11 CFN-SFN observed time difference

Definition	The CFN-SFN observed time difference to cell is defined as: OFF×38400+ T_m, where: T_m= T_{RxSFN} - (T_{UETx}-T_0), given in chip units with the range [0, 1, …, 38399] chips T_{UETx} is the time when the UE transmits an uplink DPCCH/DPDCH frame. T_0 is defined in TS 25.211 section 7.1.3. T_{RxSFN} is time at the beginning of the next received neighbouring P-CCPCH frame after the time instant T_{UETx}-T_0in the UE. If the next neighbouring P-CCPCH frame is received exactly at T_{UETx}-T_0 then T_{RxSFN}=T_{UETx}-T_0 (which leads to T_m=0). and OFF=(CFN_{Tx}-SFN) mod 256, given in number of frames with the range [0, 1, …, 255] frames CFN_{Tx} is the connection frame number for the UE transmission of an uplink DPCCH/DPDCH frame at the time T_{UETx}. SFN = the system frame number for the neighbouring P-CCPCH frame received in the UE at the time T_{RxSFN}.
Applicable for	Connected Inter, Connected Intra
Range/mapping	Time difference is given with the resolution of one chip with the range [0, …, 9830399] chips.

5.1.12 SFN-SFN observed time difference

Definition	**Type 1:** The SFN-SFN observed time difference to cell is defined as: OFF×38400+ T_m, where: T_m= T_{RxSFNj} - T_{RxSFNi}, given in chip units with the range [0, 1, …, 38399] chips T_{RxSFNj} is the time at the beginning of a received neighbouring P-CCPCH frame from cell j. T_{RxSFNi} is time at the beginning of the next received neighbouring P-CCPCH frame from cell i after the time instant T_{RxSFNj} in the UE. If the next neighbouring P-CCPCH frame is received exactly at T_{RxSFNj} then T_{RxSFNj}= T_{RxSFNi} (which leads to T_m=0). and OFF=(SFN_j- SFN_i) mod 256, given in number of frames with the range [0, 1, …, 255] frames SFN_j = the system frame number for downlink P-CCPCH frame from cell j in the UE at the time T_{RxSFNj}. SFN_i = the system frame number for the P-CCPCH frame from cell i received in the UE at the time T_{RxSFNi}. **Type 2:** The relative timing difference between cell j and cell i, defined as $T_{CPICHRxj}$ - $T_{CPICHRxi}$, where: $T_{CPICHRxj}$ is the time when the UE receives one Primary CPICH slot from cell j $T_{CPICHRxi}$ is the time when the UE receives the Primary CPICH slot from cell i that is closest in time to the Primary CPICH slot received from cell j
Applicable for	**Type 1:** Idle, Connected Intra **Type 2:** Idle, Connected Intra, Connected Inter
Range/mapping	**Type 1:** Time difference is given with a resolution of one chip with the range [0, …, 9830399] chips. **Type 2:** Time difference is given with a resolution of 0.5 chip with the range [-1279, …, 1280] chips.

5.1.13 UE Rx-Tx time difference

Definition	The difference in time between the UE uplink DPCCH/DPDCH frame transmission and the first significant path, of the downlink DPCH frame from the measured radio link. Measurement shall be made for each cell included in the active set. Note: The definition of "first significant path" needs further elaboration.
Applicable for	Connected Intra
Range/mapping	Always positive.

5.2 UTRAN measurement abilities

The structure of the table defining a UTRAN measurement quantity is shown below:

TSG-RAN Working Group 1 meeting #9
Dresden, Germany
November 30 – December 3, 1999

TSGR1#9(99)i72

Agenda item: AH 16

Source: Ericsson

Title: CR 25.215-006: Definition of SIR measurement

Document for: Decision

In TS 25.215 the SIR measurement is defined as: RSCP/ISCP for both UTRAN and the UE. As the RSCP and ISCP are both powers the SIR will not take the spreading gain into account. The current definition is more or less equal to Ec/No, with the difference that it takes orthogonality into account in the interference estimation.

One drawback with the current definition is that the operating point for the SIR will be highly dependent on the spreading factor (SF) used, as the RSCP is proportional to the chip energy. The SIR will change every time the SF changes and will therefore require a large dynamic range only because the change of SF. Note that this is valid for the donwlink SIR only, as the SF is fixed to 256 for the uplink DPCCH where the SIR is measured. To be consistent the same definition of SIR should apply for the up- and downlink.

To reduce the range for the SIR measurement it is proposed that the SIR shall be proportional the energy per channel coded bit, e.g. add the spreading gain per channel coded bit to the SIR.

The proposed definition of the SIR will then be:

SIR = (RSCP/ISCP)×(SF/2) for the downlink (measured in the UE)

SIR = (RSCP/ISCP)×SF for the uplink (measured by UTRAN)

In TS 25.215 section 5.1.3 the ISCP is defined for UE measurements. In the UTRAN section ISCP is not separately defined. As there is no requirement for the ISCP to be reported separately and the ISCP is only used in the definition of the SIR it is proposed to remove section 5.1.3 and introduce the definition of ISCP together with the definition of SIR, for both the UE and UTRAN. It is also proposed to include the definition of RSCP together with the definition of the SIR.

Together with the proposed change of SIR definition a clarification of the definition of RSCP is proposed.

The RSCP is Received Signal Code Power i.e. the received power on one code and has actually nothing to to with the spreading factors, integration periods etc. Moreover, power has nothing to do with the despreading, although you cannot estimate the power without doing a despreading of the signal if there is interference and noise at the antenna input. Therefore the term de-spreading used in the current definition is somewhat missleading. The same goes for the definition of the ISCP=Interference Signal Code Power, but here we have to be careful to note the ISCP shall only measure the non-orthogonal part of the interference.

It is therefore proposed to modify the definition of RSCP and ISCP by removing the term "after de-spreading" from the current definitions.

Also the abbrevation RL=Radio Link is added in section 3.3.

3GPP TSG RAN WG1 Meeting #9
Dresden, Germany, Nov 30 – Dec 3, 1999

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25.215	CR	006	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	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		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: *(at least one should be marked with an X)*	(U)SIM		ME	X	UTRAN / Radio	X	Core Network	

Source: Ericsson **Date:** 1999-11-15

Subject: Definition of SIR measurement

Work item:

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

F	Correction	X	**Release:**	Phase 2	
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	X
				Release 00	

Reason for change:

In TS 25.215 the SIR measurement is defined as: RSCP/ISCP for both UTRAN and the UE. As the RSCP and ISCP are both powers the SIR will not take the spreading gain into account. The current definition is more or less equal to Ec/No, with the difference that it takes ortogonality into account in the interference estimation. One drawback with the current definition is that the operating point for the SIR will be highly dependent on the spreading factor (SF) used, as the RSCP is proportional to the chip energy. The SIR will change every time the SF changes and will therefore get a large dynamic range only beacuse the change of SF. Note that this is valid for the donwlink SIR only, as the SF is fixed to 256 for the uplink DPCCH where the SIR is measured. To be consistent the same definition of SIR should apply for the up- and downlink.
To reduce the range for the SIR measurement it is proposed that the SIR shall be proportional the energy per channel coded bit instead, e.g. add the spreading gain per channel coded bit to the SIR.

Clauses affected: 3.3 Abbreviations, 5.1.1 CPICH RSCP, 5.1.2 RSCP, 5.1.3 ISCP, 5.1.4 SIR, 5.2.2 SIR

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:

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3 Definitions, symbols and abbreviations

3.1 Definitions

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

<defined term>: <definition>.

3.2 Symbols

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

<symbol> <Explanation>

3.3 Abbreviations

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

BER	Bit Error Rate
BLER	Block Error Rate
Ec/No	Received energy per chip divided by the power density in the band
ISCP	Interference Signal Code Power
RL	Radio Link
RSCP	Received Signal Code Power
RSSI	Received Signal Strength Indicator
SIR	Signal to Interference Ratio

4 Control of UE/UTRAN measurements

In this chapter the general measurement control concept of the higher layers is briefly described to provide an understanding on how L1 measurements are initiated and controlled by higher layers.

L1 provides with the measurement specifications a toolbox of measurement abilities for the UE and the UTRAN. These measurements can be differentiated in different measurement types: intra-frequency, inter-frequency, inter-system, traffic volume, quality and internal measurements (see [14]).
In the L1 measurement specifications the measurements, see chapter 5, are distinguished between measurements in the UE (the messages will be described in the RRC Protocol) and measurements in the UTRAN (the messages will be described in the NBAP and the Frame Protocol).

To initiate a specific measurement the UTRAN transmits a ‘measurement control message’ to the UE including a measurement ID and type, a command (setup, modify, release), the measurement objects and quantity, the reporting quantities, criteria (periodical/event-triggered) and mode (acknowledged/unacknowledged), see [14].
When the reporting criteria is fulfilled the UE shall answer with a ‘measurement report message’ to the UTRAN including the measurement ID and the results.
In idle mode the measurement control message is broadcast in a System Information.

Intra-frequency reporting events, traffic volume reporting events and UE internal measurement reporting events described in [14] define events which trigger the UE to send a report to the UTRAN. This defines a toolbox from which the UTRAN can choose the needed reporting events.

5 Measurement abilities for UTRA FDD

In this chapter the physical layer measurements reported to higher layers (this may also include UE internal measurements not reported over the air-interface) are defined.

5.1 UE measurement abilities

The structure of the table defining a UE measurement quantity is shown below:

Column field	**Comment**
Definition	Contains the definition of the measurement.
Applicable for	States if a measurement shall be possible to perform in Idle mode and/or Connected mode. For connected mode also information of the possibility to perform the measurement on intra-frequency and/or inter-frequency are given. The following terms are used in the tables: Idle = Shall be possible to perform in idle mode Connected Intra = Shall be possible to perform in connected mode on an intra-frequency Connected Inter = Shall be possible to perform in connected mode on an inter-frequency
Range/mapping	Gives the range and mapping to bits for the measurements quantity.

5.1.1 CPICH RSCP

Definition	Received Signal Code Power, the received power on one code ~~after de-spreading~~ measured on the pilot bits of the CPICH. The reference point for the RSCP is the antenna connector at the UE.
Applicable for	Idle, Connected Intra, Connected Inter
Range/mapping	

5.1.2 RSCP

Definition	Received Signal Code Power, the received power on one code ~~after de-spreading~~ measured on the pilot bits of the DPCCH after RL combination. The reference point for the RSCP is the antenna connector at the UE.
Applicable for	Connected Intra
Range/mapping	

~~5.1.3 ISCP~~

~~Note that it is not a requirement that the ISCP shall be possible to report to higher layers. The ISCP is defined in this section because it is included in the definition of SIR.~~

~~Definition~~	~~Interference Signal Code Power, the interference on the received signal after de-spreading. Only the non-orthogonal part of the interference is included in the measurement. The reference point for the ISCP is the antenna connector at the UE.~~

5.1.4 SIR

Definition	Signal to Interference Ratio, defined as: ~~the~~ (RSCP/ISCP)×(SF/2) ~~divided by ISCP~~. The SIR shall be measured on DPCCH after RL combination. The reference point for the SIR is the antenna connector of the UE. where: RSCP = Received Signal Code Power, the received power on one code measured on the pilot bits. ISCP = Interference Signal Code Power, the interference on the received signal measured on the pilot bits. Only the non-orthogonal part of the interference is included in the measurement. SF=The spreading factor used.
Applicable for	Connected Intra
Range/mapping	

5.1.5 UTRA carrier RSSI

Definition	Received Signal Strength Indicator, the wide-band received power within the relevant channel bandwidth. Measurement shall be performed on a UTRAN downlink carrier. The reference point for the RSSI is the antenna connector at the UE.
Applicable for	Idle, Connected Intra, Connected Inter
Range/mapping	

5.1.6 GSM carrier RSSI

Definition	Received Signal Strength Indicator, the wide-band received power within the relevant channel bandwidth. Measurement shall be performed on a GSM BCCH carrier. The reference point for the RSSI is the antenna connector at the UE.
Applicable for	Idle, Connected Inter
Range/mapping	According to the definition of RXLEV in GSM 05.08.

5.1.7 CPICH Ec/No

Definition	The received energy per chip divided by the power density in the band. The Ec/No is identical to RSCP/RSSI. Measurement shall be performed on the CPICH. The reference point for Ec/No is the antenna connector at the UE.
Applicable for	Idle, Connected Intra, Connected Inter
Range/mapping	

5.1.8 Transport channel BLER

Definition	Estimation of the transport channel block error rate (BLER). The BLER estimation shall be based on evaluating the CRC on each transport block after RL combination. BLER estimation is only required for transport channels containing CRC. In connected mode the BLER shall be possible to measure on any transport channel. If requested in idle mode it shall be possible to measure the BLER on transport channel PCH.
Applicable for	Idle, Connected Intra
Range/mapping	

5.1.9 Physical channel BER

Definition	The physical channel BER is an estimation of the average bit error rate (BER) before channel decoding of the DPDCH data after RL combination. At most it shall be possible to report a physical channel BER estimate at the end of each TTI for the transferred TrCh's, e.g. for TrCh's with a TTI of x ms a x ms averaged physical channel BER shall be possible to report every x ms.
Applicable for	Connected Intra
Range/mapping	

5.1.10 UE transmitted power

Definition	The total UE transmitted power on one carrier. The reference point for the UE transmitted power shall be the UE antenna connector.
Applicable for	Connected Intra
Range/mapping	

5.1.11 CFN-SFN observed time difference

Definition	The CFN-SFN observed time difference to cell is defined as: OFF×38400+ T_m, where: T_m= T_{RxSFN} - (T_{UETx}-T_0), given in chip units with the range [0, 1, …, 38399] chips T_{UETx} is the time when the UE transmits an uplink DPCCH/DPDCH frame. T_0 is defined in TS 25.211 section 7.1.3. T_{RxSFN} is time at the beginning of the next received neighbouring P-CCPCH frame after the time instant T_{UETx}-T_0in the UE. If the next neighbouring P-CCPCH frame is received exactly at T_{UETx}-T_0 then T_{RxSFN}=T_{UETx}-T_0 (which leads to T_m=0). and OFF=(CFN_{Tx}-SFN) mod 256, given in number of frames with the range [0, 1, …, 255] frames CFN_{Tx} is the connection frame number for the UE transmission of an uplink DPCCH/DPDCH frame at the time T_{UETx}. SFN = the system frame number for the neighbouring P-CCPCH frame received in the UE at the time T_{RxSFN}.
Applicable for	Connected Inter, Connected Intra
Range/mapping	Time difference is given with the resolution of one chip with the range [0, …, 9830399] chips.

5.1.12 SFN-SFN observed time difference

Definition	**Type 1:** The SFN-SFN observed time difference to cell is defined as: OFF×38400+ T_m, where: T_m= T_{RxSFNj} - T_{RxSFNi}, given in chip units with the range [0, 1, …, 38399] chips T_{RxSFNj} is the time at the beginning of a received neighbouring P-CCPCH frame from cell j. T_{RxSFNi} is time at the beginning of the next received neighbouring P-CCPCH frame from cell i after the time instant T_{RxSFNj} in the UE. If the next neighbouring P-CCPCH frame is received exactly at T_{RxSFNj} then T_{RxSFNj}= T_{RxSFNi} (which leads to T_m=0). and OFF=(SFN_j- SFN_i) mod 256, given in number of frames with the range [0, 1, …, 255] frames SFN_j = the system frame number for downlink P-CCPCH frame from cell j in the UE at the time T_{RxSFNj}. SFN_i = the system frame number for the P-CCPCH frame from cell i received in the UE at the time T_{RxSFNi}. **Type 2:** The relative timing difference between cell j and cell i, defined as $T_{CPICHRxj}$ - $T_{CPICHRxi}$, where: $T_{CPICHRxj}$ is the time when the UE receives one CPICH slot from cell j $T_{CPICHRxi}$ is the time when the UE receives the CPICH slot from cell i that is closest in time to the CPICH slot received from cell j
Applicable for	**Type 1:** Idle, Connected Intra **Type 2:** Idle, Connected Intra, Connected Inter
Range/mapping	**Type 1:** Time difference is given with a resolution of one chip with the range [0, …, 9830399] chips. **Type 2:** Time difference is given with a resolution of 0.5 chip with the range [-1279, …, 1280] chips.

5.1.13 UE Rx-Tx time difference

Definition	The difference in time between the UE uplink DPCCH/DPDCH frame transmission and the first significant path, of the downlink DPCH frame from the measured radio link. Measurement shall be made for each cell included in the active set. Note: The definition of "first significant path" needs further elaboration.
Applicable for	Connected Intra
Range/mapping	Always positive.

5.2 UTRAN measurement abilities

The structure of the table defining a UTRAN measurement quantity is shown below:

Column field	**Comment**
Definition	Contains the definition of the measurement.
Range/mapping	Gives the range and mapping to bits for the measurements quantity.

5.2.1 RSSI

Definition	Received Signal Strength Indicator, the wide-band received power within the UTRAN uplink carrier channel bandwidth in an UTRAN access point. The reference point for the RSSI measurements shall be the antenna connector.
Range/mapping	

5.2.2 SIR

Definition	Signal to Interference Ratio, is defined as: ~~the~~ (RSCP/ISCP)×SF ~~divided by the ISCP~~. Measurement shall be performed on the DPCCH after RL combination in Node B. The reference point for the SIR measurements shall be the antenna connector. where: RSCP = Received Signal Code Power, the received power on one code. ISCP = Interference Signal Code Power, the interference on the received signal. Only the non-orthogonal part of the interference is included in the measurement. SF=The spreading factor used on the DPCCH.
Range/mapping	

TSG-RAN Working Group 1 meeting #9
Dresden, Germany
November 30 – December 3, 1999

TSGR1#9(99)I10

Agenda item: AH 16

Source: Ericsson

Title: CR 25.215-009r02: Range and resolution for RF related measurements

Document for: Decision

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1. Introduction

This is a revised version of Tdoc R1-99k27. The ranges has been adjusted according to an agreement in a measurement drafting session held during the first day of the WG1#9-meeting with represants from Ericsson, Nortel and Siemens. The works was based on the Tdoc R1-99i75 (FDD) and Tdoc R1-99i82 (TDD) also dealing with measurement ranges and resolutions and aimed to harmonise the proposals for FDD and TDD. Together with feasablity for the measurement range also mapping to bits has been considerd. For example, if a measurement is required only a few more values than what could be fitted in a certain number of bits the range was adjusted accordingly. This applies on the measurement UTRA carrier RSSI (UE) and RSSI (UTRAN) which where adjusted to fit into 6 bits. Also the SIR was extended somewhat to fully utilise 6 bits.

The aim of this document is to define ranges for the RF related measurements in TS 25.215.

2. RF related measurements

Measurement	**Range**	**Resolution**	**Comment**
CPICH RSCP	-115 -> -25 dBm	1 dB	Upper limit: To support reasonable dense cell structures without truncating of power measurements. For example a CPICH EIRP of 42dBm and a coupling loss of 82 dB gives a received level of -40dBm. This should be enough for the relevant handover areas. Considering that the CPICH RSCP also can be used in the open loop power control for path loss calculations, higher values can be measured especially close to the base station. A maximum value of –25dBm is specified by WG4 in 25.104 at the UE antenna connector. It is therefore proposed that the CPICH RSCP should be possible to measure up to –25dBm. Lower limit: In an AWGN channel -117dBm is required to read a dedicated channel (according to WG4 simulations). To read the BCCH in a fading channel a couple of dB more is needed, some results indicated around -112dBm. It is proposed that the lower limit is set to -115dBm, 3dB before we can read the BCCH. Resolution: Half of an assumed maximum relative accuracy of 2 dB. Currently a absolute accuracy around +-4dB is discussed within WG4.
PCCPCH RSCP	-115 -> -25 dBm	1 dB	See comments for CPICH RSCP. Same upper limit for PCCPCH RSCP for consitency, although the PCCPCH will not be used for

			the open loop power control.
RSCP	-115 -> -25 dBm	1 dB	See comments for CPICH RSCP.
Ec/No	-24 -> 0 dB	1 dB	Upper limit: As No always is larger than Ec, 0dB will be the upper limit. Lower limit: In IS-95 a range from -20->0 is used. Using a spreading factor of 256 will give a spreading gain of 24dB, therefore a lowest level of –24dB is proposed. Resolution: Half of an assumed maximum relative accuracy of 2 dB. Note that there are no accuracy requirements defined for the Ec/No by WG4 yet.
SIR	-11 -> 20 dB	0.5 dB	Upper limit: Same as for UTRAN. Lower limit: Same as for UTRAN. Resolution: In 25.302 it is stated that the precision shall be less than the minimum DL power control step size, which is 0,5dB. Having the current discussions on measurement accuracies within WG4 in mind where absolute accuracies around +-4dB for power measurements a 0,5dB step for the SIR will be sufficient. Requires exactly 6 bits
UTRA carrier RSSI	-94 -> -32 dBm	1 dB	Upper limit: To support reasonable dense cell structures without truncating of power measurements. The level -32dB should be sufficient. It is 10dB above the maximum CPICH RSCP level. Lower limit: The UE sensitivity was specified using a 9dB noise factor. That gives a noise level in the receiver of -99dBm. To achieve reasonable accuracy a couple of dB above the noise level is needed. The lower limit of the measurement is not critical therefore a lower level of -94dBm is proposed. Resolution: Currently a absolute accuracy around +-4dB is discussed within WG4. Therefore 1dB step should be suffiecient. Note that the upper limit has been changed from –30dB to –32 dBm and the lower from –95 to –94 dBm to align to mapping to 6 bits.
UE transmitted power	-50 -> 33 dBm	1 dB	Upper: +33dBm, maximum transmitted power for UE class 1 Lower: The minimum transmitted power according to section 6.4.3.1 in TS 25.101 is currently –44 dBm but discussions are ongoing to lower that limit to –50dBm. Resolution: Currently an absolute accuracy around +-6dB is discussed within WG4. Therefore 1dB step should be suffiecient.

Table 1 UE measurements

Measurement	**Range**	**Resolution**	**Comment**
RSSI	-105 -> -74 dBm	0.5 dB	Upper limit: More than 30dB above the noise floor should be

			more than sufficient. Note that the upper limit has been changed from –70dB to –74 dBm to align to mapping to 6 bits. Lower limit: Approximately 3 dB above the thermal noise floor (-108dBm over 3,84MHz) allowing for a 3dB noise figure in Node B. As this measurement may be use for load control it is important to measure as low as possible. Resolution: As the uplink RSSI may be used for load control the relative accuracy requirement may be high on this measurement. Therefore a 0,5 dB quantisation step is assumed.
SIR	-11 -> 20 dB	0.5 dB	Upper and lower limit: The working point will something around -3 to 4 dB depending on spreading factor and power difference between DPDCH and DPCCH. The upper limit has propbably som margin to the practical upper SIR limit for normal usage. Resolution: Having the current discussions on measurement accuracies within WG4 in mind where absolute accuracies around +-4dB for power measurements a 0,5dB step for the SIR will be sufficient. Requires exactly 6 bits.
Transmitted carrier power	0 -> 50 dBm	0.5 dB	Upper limit: +50dBm, 20W basestations (43dBm) can be assumed, probably basestations with higher power will be common (like 40W=46dBm). To have som margin an upper limit of 50dBm is proposed. Lower limit: 0 dBm, the minumum power when no dedicated channels are active. A proposal is 0dBm. Resolution: Currently an absolute accuracy between +-3 and +-6 dB is discussed within WG4. Currently nothing has been stated regarding the relative accuracy, which can be estimated to be significantly better. A 0,5dB step is choosen to being able to handle a good relative accuracy.
Transmitted code power	-10 -> 46 dBm	0.5 dB	Upper limit: +46dBm, a couple of dB below the maximum total transmitted power Lower limit: -10 dBm, Assuming a minimum Tx power approx. 30dB below the maximum BTS power (section 6.4.1 in 25.104) using a 1 W basstation will give a lower limit of 0 dBm, to have some margin for future low power base stations –10 dBm is proposed. Resolution: Currently an absolute accuracy between +-3 and +-6 dB is discussed within WG4. Nothing has been stated regarding the relative accuracy which can be estimated to be significantly better. A 0,5dB step is choosen to being able to handle a good relative accuracy.

Table 2 UTRAN measurements

3GPP TSG RAN WG1 Meeting #9
Dresden, Germany, Nov 30 – Dec 3, 1999

Document ????99???
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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

25.215	CR	009r02	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	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		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: *(at least one should be marked with an X)* (U)SIM [ ] ME [X] UTRAN / Radio [X] Core Network [ ]

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

Subject: Range and resolution for RF related measurements

Work item:

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

F	Correction	X
A	Corresponds to a correction in an earlier release	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X
Release 00	

Reason for change: Currently no ranges and resolutions are defined for RF related measurements in TS 25.215. This CR proposes ranges and resolution for RF related measurements in 25.215.

Clauses affected: 5.1 UE measurement abilities, 5.1.1 CPICH RSCP, 5.1.2 RSCP, 5.1.4 SIR, 5.1.5 UTRA carrier RSSI, 5.1.6 GSM carrier RSSI, 5.1.7 CPICH Ec/No, 5.1.10 UE transmitted power, 5.2.1 RSSI, 5.2.2 SIR, 5.2.3 Transmitted carrier power, 5.2.4 Transmitted code power

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:

help.doc

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

5.1 UE measurement abilities

The structure of the table defining a UE measurement quantity is shown below:

Column field	**Comment**
Definition	Contains the definition of the measurement.
Applicable for	States if a measurement shall be possible to perform in Idle mode and/or Connected mode. For connected mode also information of the possibility to perform the measurement on intra-frequency and/or inter-frequency are given. The following terms are used in the tables: Idle = Shall be possible to perform in idle mode Connected Intra = Shall be possible to perform in connected mode on an intra-frequency Connected Inter = Shall be possible to perform in connected mode on an inter-frequency
Range/mapping	Gives the range and mapping to bits for the measurements quantity.

5.1.1 CPICH RSCP

Definition	Received Signal Code Power, the received power on one code after de-spreading measured on the pilot bits of the CPICH. The reference point for the RSCP is the antenna connector at the UE.
Applicable for	Idle, Connected Intra, Connected Inter
Range/mapping	CPICH RSCP is given with a resolution of 1 dB with the range [-115, ..., -25] dBm. CPICH RSCP shall be reported in the unit CPICH_RSCP_LEV where: CPICH_RSCP_LEV_00: CPICH RSCP < –115 dBm CPICH_RSCP_LEV_01: -115 dBm ≤ CPICH RSCP < –114 dBm CPICH_RSCP_LEV_02: -114 dBm ≤ CPICH RSCP < –113 dBm ... CPICH_RSCP_LEV_89: -27 dBm ≤ CPICH RSCP < -26 dBm CPICH_RSCP_LEV_90: -26 dBm ≤ CPICH RSCP < -25 dBm CPICH_RSCP_LEV_91: -25 dBm ≤ CPICH RSCP

5.1.2 RSCP

Definition	Received Signal Code Power, the received power on one code after de-spreading measured on the pilot bits of the DPCCH after RL combination. The reference point for the RSCP is the antenna connector at the UE.
Applicable for	Connected Intra
Range/mapping	RSCP is given with a resolution of 1 dB with the range [-115, ..., -40] dBm. RSCP is given with a resolution of 1 dB with the range [-115, ..., -25] dBm. RSCP shall be reported in the unit RSCP_LEV where: RSCP_LEV_00: RSCP < –115 dBm RSCP_LEV_01: -115 dBm ≤ RSCP < –114 dBm RSCP_LEV_02: -114 dBm ≤ RSCP < –113 dBm ... RSCP_LEV_89: -27 dBm ≤ RSCP < -26 dBm RSCP_LEV_90: -26 dBm ≤ RSCP < -25 dBm RSCP_LEV_91: -25 dBm ≤ RSCP

5.1.3 ISCP

Note that it is not a requirement that the ISCP shall be possible to report to higher layers. The ISCP is defined in this section because it is included in the definition of SIR.

Definition	Interference Signal Code Power, the interference on the received signal after de-spreading. Only the non-orthogonal part of the interference is included in the measurement. The reference point for the ISCP is the antenna connector at the UE.

5.1.4 SIR

Definition	Signal to Interference Ratio, defined as the RSCP divided by ISCP. The SIR shall be measured on DPCCH after RL combination. The reference point for the SIR is the antenna connector of the UE.
Applicable for	Connected Intra
Range/mapping	SIR is given with a resolution of 0.5 dB with the range [-11, ..., 20] dB. SIR shall be reported in the unit UE_SIR where: UE_SIR_00: SIR < –11.0 dB UE_SIR_01: -11.0 dB ≤ SIR < –10.5 dB UE_SIR_02: -10.5 dB ≤ SIR < –10.0 dB ... UE_SIR_61: 19.0 dB ≤ SIR < 19.5 dB UE_SIR_62: 19.5 dB ≤ SIR < 20.0 dB UE_SIR_63: 20.0 dB ≤ SIR

5.1.5 UTRA carrier RSSI

Definition	Received Signal Strength Indicator, the wide-band received power within the relevant channel bandwidth. Measurement shall be performed on a UTRAN downlink carrier. The reference point for the RSSI is the antenna connector at the UE.
Applicable for	Idle, Connected Intra, Connected Inter
Range/mapping	UTRA carrier RSSI is given with a resolution of 1 dB with the range [-94, ..., -32] dBm. UTRA carrier RSSI shall be reported in the unit UTRA_carrier_RSSI_LEV where: UTRA_carrier_RSSI_LEV_00: UTRA carrier RSSI < –94 dBm UTRA_carrier_RSSI_LEV_01: -94 dBm ≤ UTRA carrier RSSI < –93 dBm UTRA_carrier_RSSI_LEV_02: -93 dBm ≤ UTRA carrier RSSI < –92 dBm ... UTRA_carrier_RSSI_LEV_61: -32 dBm ≤ UTRA carrier RSSI < -33 dBm UTRA_carrier_RSSI_LEV_62: -33 dBm ≤ UTRA carrier RSSI < -32 dBm UTRA_carrier_RSSI_LEV_63: -32 dBm ≤ UTRA carrier RSSI

5.1.6 GSM carrier RSSI

Definition	Received Signal Strength Indicator, the wide-band received power within the relevant channel bandwidth. Measurement shall be performed on a GSM BCCH carrier. The reference point for the RSSI is the antenna connector at the UE.
Applicable for	Idle, Connected Inter
Range/mapping	According to the definition of RXLEV in GSM 05.08.

5.1.7 CPICH Ec/No

Definition	The received energy per chip divided by the power density in the band. The Ec/No is identical to RSCP/RSSI. Measurement shall be performed on the CPICH. The reference point for Ec/No is the antenna connector at the UE.
Applicable for	Idle, Connected Intra, Connected Inter
Range/mapping	CPICH Ec/No is given with a resolution of 1 dB with the range [-24, ..., 0] dB. CPICH Ec/No shall be reported in the unit CPICH_Ec/No where: CPICH_Ec/No_00: CPICH Ec/No < –24 dB CPICH_Ec/No_01: -24 dB ≤ CPICH Ec/No < –23 dB CPICH_Ec/No_02: -23 dB ≤ CPICH Ec/No < –22 dB ... CPICH_Ec/No_23: -2 dB ≤ CPICH Ec/No < -1 dB CPICH_Ec/No_24: -1 dB ≤ CPICH Ec/No < 0 dB CPICH_Ec/No_25: 0 dB ≤ CPICH Ec/No

5.1.8 Transport channel BLER

Definition	Estimation of the transport channel block error rate (BLER). The BLER estimation shall be based on evaluating the CRC on each transport block after RL combination. BLER estimation is only required for transport channels containing CRC. In connected mode the BLER shall be possible to measure on any transport channel. If requested in idle mode it shall be possible to measure the BLER on transport channel PCH.
Applicable for	Idle, Connected Intra
Range/mapping	

5.1.9 Physical channel BER

Definition	The physical channel BER is an estimation of the average bit error rate (BER) before channel decoding of the DPDCH data after RL combination. At most it shall be possible to report a physical channel BER estimate at the end of each TTI for the transferred TrCh's, e.g. for TrCh's with a TTI of x ms a x ms averaged physical channel BER shall be possible to report every x ms.
Applicable for	Connected Intra
Range/mapping	

5.1.10 UE transmitted power

Definition	The total UE transmitted power on one carrier. The reference point for the UE transmitted power shall be the UE antenna connector.
Applicable for	Connected Intra
Range/mapping	UE transmitted power is given with a resolution of 1 dB with the range [-50, ..., 33] dBm. UE transmitted power shall be reported in the unit UE_TX_POWER where: UE_TX_POWER_021: -50 dBm ≤ UE transmitted power < –49 dBm UE_TX_POWER_022: -49 dBm ≤ UE transmitted power < –48 dBm UE_TX_POWER_023: -48 dBm ≤ UE transmitted power < –47 dBm ... UE_TX_POWER_102 31 dBm ≤ UE transmitted power < 32 dBm UE_TX_POWER_103: 32 dBm ≤ UE transmitted power < 33 dBm UE_TX_POWER_104: 33 dBm ≤ UE transmitted power < 34 dBm

5.1.11 CFN-SFN observed time difference

Definition	The CFN-SFN observed time difference to cell is defined as: OFF×38400+ T_m, where: T_m= T_{RxSFN} - (T_{UETx}-T_0), given in chip units with the range [0, 1, …, 38399] chips T_{UETx} is the time when the UE transmits an uplink DPCCH/DPDCH frame. T_0 is defined in TS 25.211 section 7.1.3. T_{RxSFN} is time at the beginning of the next received neighbouring P-CCPCH frame after the time instant T_{UETx}-T_0in the UE. If the next neighbouring P-CCPCH frame is received exactly at T_{UETx}-T_0 then T_{RxSFN}=T_{UETx}-T_0 (which leads to T_m=0). and OFF=(CFN_{Tx}-SFN) mod 256, given in number of frames with the range [0, 1, …, 255] frames CFN_{Tx} is the connection frame number for the UE transmission of an uplink DPCCH/DPDCH frame at the time T_{UETx}. SFN = the system frame number for the neighbouring P-CCPCH frame received in the UE at the time T_{RxSFN}.
Applicable for	Connected Inter, Connected Intra
Range/mapping	Time difference is given with the resolution of one chip with the range [0, …, 9830399] chips.

5.1.12 SFN-SFN observed time difference

Definition	**Type 1:** The SFN-SFN observed time difference to cell is defined as: OFF×38400+ T_m, where: T_m= T_{RxSFNj} - T_{RxSFNi}, given in chip units with the range [0, 1, …, 38399] chips T_{RxSFNj} is the time at the beginning of a received neighbouring P-CCPCH frame from cell j. T_{RxSFNi} is time at the beginning of the next received neighbouring P-CCPCH frame from cell i after the time instant T_{RxSFNj} in the UE. If the next neighbouring P-CCPCH frame is received exactly at T_{RxSFNj} then T_{RxSFNj}= T_{RxSFNi} (which leads to T_m=0). and OFF=(SFN_j- SFN_i) mod 256, given in number of frames with the range [0, 1, …, 255] frames SFN_j = the system frame number for downlink P-CCPCH frame from cell j in the UE at the time T_{RxSFNj}. SFN_i = the system frame number for the P-CCPCH frame from cell i received in the UE at the time T_{RxSFNi}. **Type 2:** The relative timing difference between cell j and cell i, defined as $T_{CPICHRxj}$ - $T_{CPICHRxi}$, where: $T_{CPICHRxj}$ is the time when the UE receives one CPICH slot from cell j $T_{CPICHRxi}$ is the time when the UE receives the CPICH slot from cell i that is closest in time to the CPICH slot received from cell j
Applicable for	**Type 1:** Idle, Connected Intra **Type 2:** Idle, Connected Intra, Connected Inter
Range/mapping	**Type 1:** Time difference is given with a resolution of one chip with the range [0, …, 9830399] chips. **Type 2:** Time difference is given with a resolution of 0.5 chip with the range [-1279, …, 1280] chips.

5.1.13 UE Rx-Tx time difference

Definition	The difference in time between the UE uplink DPCCH/DPDCH frame transmission and the first significant path, of the downlink DPCH frame from the measured radio link. Measurement shall be made for each cell included in the active set. Note: The definition of "first significant path" needs further elaboration.
Applicable for	Connected Intra
Range/mapping	Always positive.

5.1.14 PCCPCH RSCP

Definition	Received Signal Code Power, the received power on one code measured on the PCCPCH from a TDD cell. The reference point for the RSCP is the antenna connector at the UE. Note: The RSCP can either be measured on the data part or the midamble of a burst, since there is no power difference between these two parts. However, in order to have a common reference, measurement on the midamble is assumed.
Applicable for	Idle, Connected Inter
Range/mapping	PCCPCH RSCP is given with a resolution of 1 dB with the range [-115, ..., -25] dBm. PCCPCH RSCP shall be reported in the unit PCCPCH_RSCP_LEV where: PCCPCH_RSCP_LEV_00: PCCPCH RSCP < –115 dBm PCCPCH_RSCP_LEV_01: -115 dBm ≤ PCCPCH RSCP < –114 dBm PCCPCH_RSCP_LEV_02: -114 dBm ≤ PCCPCH RSCP < –113 dBm ... PCCPCH_RSCP_LEV_89: -27 dBm ≤ PCCPCH RSCP < -26 dBm PCCPCH_RSCP_LEV_90: -26 dBm ≤ PCCPCH RSCP < -25 dBm PCCPCH_RSCP_LEV_91: -25 dBm ≤ PCCPCH RSCP

5.2 UTRAN measurement abilities

The structure of the table defining a UTRAN measurement quantity is shown below:

Column field	**Comment**
Definition	Contains the definition of the measurement.
Range/mapping	Gives the range and mapping to bits for the measurements quantity.

5.2.1 RSSI

Definition	Received Signal Strength Indicator, the wide-band received power within the UTRAN uplink carrier channel bandwidth in an UTRAN access point. The reference point for the RSSI measurements shall be the antenna connector.
Range/mapping	RSSI is given with a resolution of 0.5 dB with the range [-105, ..., -74] dBm. RSSI shall be reported in the unit RSSI_LEV where: RSSI_LEV_00: RSSI < –105.0 dBm RSSI_LEV_01: -105.0 dBm ≤ RSSI < –104.5 dBm RSSI_LEV_02: -104.5 dBm ≤ RSSI < –104.0 dBm ... RSSI_LEV_61: -73.0 dBm ≤ RSSI < -73.5 dBm RSSI_LEV_62: -73.5 dBm ≤ RSSI < -74.0 dBm RSSI_LEV_63: -74.0 dBm ≤ RSSI

5.2.2 SIR

Definition	Signal to Interference Ratio, is defined as the RSCP divided by the ISCP. Measurement shall be performed on the DPCCH after RL combination in Node B. The reference point for the SIR measurements shall be the antenna connector.
Range/mapping	SIR is given with a resolution of 0.5 dB with the range [-11, ..., 20] dB. SIR shall be reported in the unit UTRAN_SIR where: UTRAN_SIR_00: SIR < –11.0 dB UTRAN_SIR_01: -11.0 dB ≤ SIR < –10.5 dB UTRAN_SIR_02: -10.5 dB ≤ SIR < –10.0 dB ... UTRAN_SIR_61: 19.0 dB ≤ SIR < 19.5 dB UTRAN_SIR_62: 19.5 dB ≤ SIR < 20.0 dB UTRAN_SIR_63: 20.0 dB ≤ SIR

5.2.3 Transmitted carrier power

Definition	Transmitted carrier power, is the total transmitted power on one carrier from one UTRAN access point. Measurement shall be possible on any carrier transmitted from the UTRAN access point. The reference point for the total transmitted power measurement shall be the antenna connector. In case of Tx diversity the total transmitted power for each branch shall be measured.
Range/mapping	Transmitted carrier power is given with a resolution of 0.5 dB with the range [0, ..., 50] dBm Transmitted carrier power shall be reported in the unit UTRAN_TX_POWER where: UTRAN_TX_POWER_016: 0.0 dBm ≤ Transmitted carrier power < 0.5 dBm UTRAN_TX_POWER_017: 0.5 dBm ≤ Transmitted carrier power < 1.0 dBm UTRAN_TX_POWER_018: 1.0 dBm ≤ Transmitted carrier power < 1.5 dBm ... UTRAN_TX_POWER_114 49.0 dBm ≤ Transmitted carrier power < 49.5 dBm UTRAN_TX_POWER_115: 49.5 dBm ≤ Transmitted carrier power < 50.0 dBm UTRAN_TX_POWER_116: 50.0 dBm ≤ Transmitted carrier power < 50.5 dBm

5.2.4 Transmitted code power

Definition	Transmitted code power, is the transmitted power on one carrier, one scrambling code and one channelisation code. Measurement shall be possible on any channelisation code transmitted from the UTRAN access point. The reference point for the transmitted code power measurement shall be the antenna connector. In case of Tx diversity the transmitted code power for each branch shall be measured.
Range/mapping	Transmitted code power is given with a resolution of 0.5 dB with the range [-10, ..., 46] dBm. Transmitted code power shall be reported in the unit UTRAN_CODE_POWER where: UTRAN_CODE_POWER_010: -10.0 dBm ≤ Transmitted code power < -9.5 dBm UTRAN_CODE_POWER_011: -9.5 dBm ≤ Transmitted code power < -9.0 dBm UTRAN_CODE_POWER_012: -9.0 dBm ≤ Transmitted code power < -8.5 dBm ... UTRAN_CODE_POWER_120 45.0 dBm ≤ Transmitted code power < 45.5 dBm UTRAN_CODE_POWER_121: 45.5 dBm ≤ Transmitted code power < 46.0 dBm UTRAN_CODE_POWER_122: 46.0 dBm ≤ Transmitted code power < 46.5 dBm

TSG-RAN Working Group 1 meeting #9
Dresden, Germany
November 30 – December 3, 1999

TSGR1#9(99)i76

Agenda item: AH 16

Source: Ericsson

Title: CR 25.215-011: Removal of Annex A from TS 25.215

Document for: Decision

At the WG2#8 meeting, a contribution was presented (R2-99f47) that proposes to move Annex A from 25.215 into 25.922 – RRM strategies. That contribution was approved by WG2. Therefore it is proposed that Annex A in 25.215 is removed.

3GPP TSG RAN WG1 Meeting #9
Dresden, Germany, Nov 30 – Dec 3, 1999

Document ????99???
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

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25.215	CR	011	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	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		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: *(at least one should be marked with an X)*	(U)SIM		ME	X	UTRAN / Radio	X	Core Network	

Source: Ericsson **Date:** 1999-11-15

Subject: Removal of Annex A from TS 25.215

Work item:

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

F	Correction	X	**Release:**	Phase 2	
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	X
				Release 00	

Reason for change: At the WG2#8 meeting, a contribution was presented (R2-99f47) that proposes to move Annex A from 25.215 into 25.922 – RRM strategies. That contribution was approved by WG2. Therefore it is proposed that Annex A in 25.215 is removed.

Clauses affected: A. Annex A

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:


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A. Annex A: Measurements for Handover (Informative)

A.1 Monitoring of FDD cells on the same frequency

During the measurement process of cells on the same frequencies, the UE shall find the necessary synchronisation to the cells to measure using the primary and secondary synchronisation channels and also the knowledge of the possible scrambling codes in use by the neighbouring cells.

A.2 Monitoring cells on different frequencies

A.2.1 Monitoring of FDD cells on a different frequency

Upper layers may ask FDD UE to perform preparation of inter frequency handover to FDD. In such case, the UTRAN signals to the UE the handover monitoring set, and if needed, the compressed mode parameters used to make the needed measurements. Setting of the compressed mode parameters defined in section 6.1.1.2 for the preparation of handover from UTRA FDD to UTRA FDD is indicated in the following section. The compressed mode for IFHO preparation from UTRA FDD to UTRA FDD has two different modes. One is "selection mode". The UE must identify the cell during this mode. The other is "reselection mode". The UE measures signal strength by the scrambling code already known. Selection mode / reselection mode parameter sets are described in section A.2.1.1 / A.2.1.2 respectively.

Measurements to be performed by the physical layer is defined in section 6.

A.2.1.1 Setting of the compressed mode parameters for selection mode

During the transmission gaps, the UE shall perform measurements so as to be able to report to the UTRAN the frame timing, the scrambling code and the Ec/Io of Primary CCPCH of up FDD cells in the handover monitoring set.

When compressed mode is used for cell acquisition at each target FDD frequency, the parameters of compressed mode pattern are fixed to be :

	TGL	TGD	TGP1	TGP2	PD
Pattern1	7	24/15	4	20	M
Pattern2	7	24/15	4	140	M
Pattern3	7	2	4	Not Used	M
Pattern4	7	2	4	20	M
Pattern5	7	2	4	140	M
Pattern6	14	3	6	18	M
Pattern7	14	3	6	138	M

<Note2: The frequency switching time required for UE is assumed to be 666us (equal to the slot duration) which includes implementation margin. This assumption means UE will consume 1slot of TGL for frequency switching (go and return) time.>

A.2.1.2 Setting of the compressed mode parameters for reselection mode

This parameter sets are used for UE which already know the downlink scrambling code. UTRAN indicate which pattern will be used by UE. According to the result during reselection mode, If needed, UTRAN will indicate the transition back to the selection mode.

	TGL	TGD	TGP1	TGP2	PD
Pattern8	7	0	72	Not Used	M
Pattern9	7	0	144	Not Used	M

A.2.2 Monitoring of TDD cells

Upper layers may ask dual mode FDD/TDD UE to perform preparation of inter-frequency handover to TDD. In such case, the UTRAN signals to the UE the handover monitoring set, and if needed, the compressed mode parameters used to make the needed measurements. Setting of the compressed mode parameters defined in 6.1.1.2 for the preparation of handover from UTRA FDD to UTRA TDD is indicated in the following section. Measurements to be performed by the physical layer are defined in section 5.

A.2.2.1 Setting of the compressed mode parameters

When compressed mode is used for cell acquisition at each target TDD frequency, the parameters of compressed mode pattern are fixed to be:

TGL	TGD	TGP	PD

A.2.2.2 Setting of compressed mode parameters with prior timing information between FDD serving cell and TDD target cells

When UTRAN or UE have this prior timing information, the compressed mode shall be scheduled by upper layers with the intention that SCH on the specific TDD basestation can be decoded at the UE during the transmission gap.

TGL	SFN	SN
4	(calculated by UTRAN)	(calculated by UTRAN)

A.2.3 Monitoring of GSM cells

Upper layers may ask dual mode FDD/GSM UE to perform preparation of inter-frequency handover to GSM. In such case, the UTRAN signals to the UE the handover monitoring set, and if needed, the compressed mode parameters used to make the needed measurements.

The involved measurements are GSM BCCH power measurements (Section A.2.3.1), initial GSM SCH or FCCH acquisition (Section A.2.3.2), acquisition/tracking of GSM SCH or FCCH when timing information between UTRA serving cells and the target GSM cell is available (Section A.2.3.3), and BSIC reconfirmation (Section A.2.3.4).

A.2.3.1 Setting of compressed mode parameters for Power measurements

When compressed mode is used for GSM BCCH power measurements, the parameters of compressed mode pattern are fixed to be :

Pattern No.	TGL	TGD	TGP	PD
1	3	0	8	128

Pattern 1 allows measuring all the adjacent cell signal levels even with the maximum of 32 frequencies, if two measurements are done during each transmission gap. The pattern can be repeated by sending the measurement request again, if more measurement data is desired.

In order to fulfil the expected GSM power measurements requirement, the UE can get effective measurements samples during a time window of length Tmeas, equal to the transmission gap length reduced by an implementation margin of [2*500 µs + 200 µs], which includes the maximum allowed delay for a UE's synthesizer to switch from one FDD frequency to one GSM frequency and switch back to FDD frequency, plus some additional implementation margin.

A.2.3.2 Setting of compressed mode parameters for first SCH decoding without prior knowledge of timing information

The setting of the compressed mode parameters is described in this section when used for first SCH decoding of one cell when there is no knowledge about the relative timing between the current FDD cells and the neighbouring GSM cell.

On upper layers command, UE shall pre-synchronise to the each of GSM cells in the handover monitoring set and decode their BSIC, see GSM 05 series.

When compressed mode is used to perform initial FCCH/SCH acquisition, the compressed mode pattern belongs to the list of patterns in table .

In order to fulfill the expected GSM SCH speed requirement, the UE can get effective measurements samples during a time window of length Tmeas, equal to the transmission gap length reduced by an implementation margin of [2*500 µs + 200 µs], that includes the maximum allowed delay for a UE's synthesizer to switch from one FDD frequency to one GSM frequency and switch back to FDD frequency, plus some additional implementation margin.

	TGL	TGD	TGP	PD parallel search / serial search
Pattern 1	7	0	2	40/64
Pattern 2	7	0	3	39/63
Pattern 3	7	2	9	63/252
Pattern 4	7	3	12	99/123
Pattern 5	14	0	2	12/26
Pattern 6	14	2	6	24/48
Pattern 7	14	2	8	34/58
Pattern 8	14	2	12	60/84
Pattern 9	10	12	48	108/828
Pattern 10	10	0	48	240/1440

Table . List of compressed mode patterns used for initial GSM FCCH/SCH acquisition without timing information

The pattern duration for the parallel search (time until a GSM FCCH or SCH burst is found) and for the serial search (time until a FCCH burst is found) is given.

The patterns 5…8 should mainly be used in such cases where the present signal level suddenly drops and very little time to execute the handover is available. Patterns 1…4 are significantly more optimal from the point of view of the transmission power control than the other ones, while patterns 5…8 consume less slots for the measurements on the average.

Patterns 1…4 may use any pattern described in specification 25.212 chapter 4.4.3.1. Patterns 5…10 must use the double frame method.

The patterns 9 and 10 are optimised for least consumption of slots for the measurements on the average using the parallel search. The patterns 9 and 10 achieve about the same or half the speed of the synchronisation to GSM from GSM.

Each pattern corresponds to a different compromise between speed of GSM SCH search and rate of use of compressed frames. On upper layers command, the repetition of the selected pattern can be stopped and/or replaced by one of the other listed patterns. Upper layers may also decide to alternate the use of different patterns periods.

Depending on the UE's capabilities, the search procedure may be sequential (tracking of FCCH burst before decoding of the first SCH) or parallel (parallel tracking of FCCH and SCH bursts). The latter solution achieves SCH decoding faster than the first one, thus decreasing the needed number of repeated patterns.

Once the UE has completed the search it signals the UTRAN with FCCH found or SCH found, both with the timing of the associated SCH burst, or with FCCH/SCH not found (see GSM 05 series).

In case of FCCH found, the UTRAN can continue the current pattern until also SCH is found or stop it and schedule a single, properly aligned gap for SCH search as described in A.2.3.3.

Whenever UE receives a new neighbour cell with a sufficiently high power level (see GSM 05 series), it shall perform a new SCH search procedure.

When a compressed mode pattern is available, then it is up to the UE to trigger this search procedure with the available transmission gaps. In this case, no specific signalling is needed between the UE and the UTRAN.

When a compressed mode pattern is not available, the UE shall initiate the search procedure by sending a "request new cell search" message to the UTRAN. Based on the UE's capabilities for serial or parallel search as described above, the UTRAN then determines a suitable compressed mode pattern and signals this to the UE. The upper layers can delay the onset of this pattern depending on the timing priority the Network Operator has set for new BSIC identification.

A.2.3.3 Setting of compressed mode parameters for first SCH decoding with prior timing information between UTRAN serving cells and GSM target cells

UTRAN or UE may have some prior knowledge of timing difference between some FDD cells in UE's active set and some GSM cells in the handover monitoring set. When this information is acquired by the UE (e.g. after initial FCCH/SCH detection) and on upper layers command, the UE shall report it to the upper layers for verification of UTRAN's information, and feedback of this information from UTRAN to the other UE.

When UTRAN or UE have this prior timing information, the compressed mode shall be scheduled by upper layers with the intention that SCH (or FCCH if needed) on a specific GSM band can be decoded at the UE during the transmission gap.

The transmission gap parameters used for GSM FCCH/SCH tracking with prior timing information are :

TGL	SFN	SN
4	(calculated by UTRAN)	(calculated by UTRAN)

In addition to normal compressed mode parameters, UTRAN signals the following information to the UE :

- The GSM carrier for which the particular compressed frame is intended (BS ID, carrier no, etc.)

Once the UE has completed the search, it signals the UTRAN with the timing of the associated SCH burst or with SCH not found.

A.2.3.4 Setting of compressed mode parameters for SCH decoding for BSIC reconfirmation and procedure at the UE

In this paragraph it is assumed that the UE has successfully decoded one SCH burst of a given neighbouring GSM cell during the call.

When a compressed mode pattern is available, then it is up to the UE to trigger and perform the BSIC reconfirmation procedure with the available transmission gaps. In this case, no specific signalling is needed between the UE and the UTRAN for BSIC reconfirmation procedure.

When no compressed mode pattern is available then it is up to the UE to trigger and perform the BSIC reconfirmation procedure. In that case, UE indicates to the upper layers the schedule of the SCH burst of that cell, and the size of the necessary transmission gap necessary to capture one SCH burst. The Network Operator decides the target time for BSIC reconfirmation and the upper layers uses this and the schedule indicated by the UE to determine the appropriate compressed mode parameters.

The compressed mode parameters shall be one of those described in section 8.2.3.3.

A.2.3.5 Parametrisation of the compressed mode for handover preparation to GSM

Whereas section A.2.3.2 described the compressed mode parametrisation for the initial synchronisation tracking or reconfirmation for one cell and the compressed mode parameters for power measurement for one of multiple cells, there is a need to define the global compressed mode parameters when considering the monitoring of all GSM cells.

TSG-RAN Working Group 1 meeting #9
Dresden, Germany
November 30 – December 3, 1999

TSGR1#9(99)j22

Agenda item: AH 16

Source: Ericsson

Title: CR 25.215-013: Definition of Transmitted code power

Document for: Decision

Currently the Transmitted code power is defined as being possible to perform on any channelisation code, which implies that the measurement shall be possible on downlink common and dedicated channels. The RNC controls the power of the common channels and the common channels are not separately power controlled (using the inner loop pwc). Therefore there is no reason to measure the Transmitted code power on common channels. It is proposed that the Transmitted code power measurement shall be possible on dedicated channels only, e.g. downlink DPCH.

On the downlink DPCH the different fields (Data, TFCI, TPC, Pilot) can be transmitted with different power levels. In the definition of the UTRAN measurement Transmitted code power is not clear which fields of the DPCH that shall be reflected by the measurement.

As the power offsets between the different fields of the DPCH are known by the RNC and as the DPCCH part is transmitted even during DTX it is more convenient to define the Transmitted code power on the pilot bits for the DPCH. Also the received power (RSCP) measurement in the UE is defined on the pilot bits. This CR will clarify the definition of the Transmitted code power in 25.215.

3GPP TSG RAN WG1 Meeting #9
Dresden, Germany, Nov 30 – Dec 3, 1999

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25.215	CR	013	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	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		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 [X] UTRAN / Radio [X] Core Network [ ]
(at least one should be marked with an X)

Source: Ericsson **Date:** 1999-11-23

Subject: Definition of Transmitted code power

Work item:

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

F	Correction	X
A	Corresponds to a correction in an earlier release	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X
Release 00	

Reason for change: Currently the Transmitted code power measurement in TS 25.215 is defined on any channelisation code. The measurement of transmitted code power is only needed on the DPCH. On the downlink DPCH the different fields can be transmitted with different power levels. The definition of the measurement Transmitted code power is not clear on which fields of the DPCH that shall be reflected by the measurement. This CR will clarify the definition of the Transmitted code power in 25.215.

Clauses affected: 5.2.4 Transmitted code power

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:


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5.2.1 RSSI

Definition	Received Signal Strength Indicator, the wide-band received power within the UTRAN uplink carrier channel bandwidth in an UTRAN access point. The reference point for the RSSI measurements shall be the antenna connector.
Range/mapping	

5.2.2 SIR

Definition	Signal to Interference Ratio, is defined as the RSCP divided by the ISCP. Measurement shall be performed on the DPCCH after RL combination in Node B. The reference point for the SIR measurements shall be the antenna connector.
Range/mapping	

5.2.3 Transmitted carrier power

Definition	Transmitted carrier power, is the total transmitted power on one carrier from one UTRAN access point. Measurement shall be possible on any carrier transmitted from the UTRAN access point. The reference point for the total transmitted power measurement shall be the antenna connector. In case of Tx diversity the total transmitted power for each branch shall be measured.
Range/mapping	

5.2.4 Transmitted code power

Definition	Transmitted code power, is the transmitted power on ~~one carrier, one scrambling code and~~ one channelisation code on one given scrambling code on one given carrier. Measurement shall be possible on any DPCH~~channelisation code~~ transmitted from the UTRAN access point and shall reflect the power on the pilot bits of the DPCH. The reference point for the transmitted code power measurement shall be the antenna connector. In case of Tx diversity the transmitted code power for each branch shall be measured.
Range/mapping	

5.2.5 Transport channel BLER

Definition	Estimation of the transport channel block error rate (BLER). The BLER estimation shall be based on evaluating the CRC on each transport block. Measurement shall be possible to perform on any transport channel after RL combination in Node B. BLER estimation is only required for transport channels containing CRC.
Range/mapping	

5.2.6 Physical channel BER

Definition	The physical channel BER is an estimation of the average bit error rate (BER) before channel decoding of the DPDCH data after RL combination in Node B. It shall be possible to report a physical channel BER estimate at the end of each TTI for the transferred TrCh's, e.g. for TrCh's with a TTI of x ms a x ms averaged physical channel BER shall be possible to report every x ms.
Range/mapping	

TSG-RAN Working Group 1 meeting #9
Dresden, Germany
November 30 – December 3, 1999

TSGR1#9(99)l02

Agenda item: AH 16

Source: Ericsson

Title: CR 25.215-014r02, 015r02:
Range and resolution of BER/BLER measurements

Document for: Decision

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1. Introduction

Note that this is a revised version of R1-99k29. The value range together with the mapping for Transport channel BLER and Physical channel BER has been revised accoring to discussions in a drafting group and harmonisation between FDD and TDD.

The range for the proposed maping of Physical channel BER:

BER_dB=Log10(Physical channel BER), with value range [-4.03 - 0] in step of 0.065 for Physical channel BER>0
A separate value also will be allocated to represent Physical channel BER = 0.

The proposed range and resolution can be mapped to 6 bits (64 values) and covers a range from 10^{-4} to 1.

In the table below the quantisation step is shown around BER 1%, 10% and 20%

BER (%)
26,0
22,4
19,3
...
12,3
10,6
9,1
...
1,30
1,12
0,97

2. Proposal

The attached CRs (CR 014r02 CR 015r02) proposes the range and resolution above for Physical channel BER and Transport channel BLER both for UTRAN and the UE.

3GPP TSG RAN WG1 Meeting #9
Dresden, Germany, Nov 30 – Dec 3, 1999

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25.215	CR	014r02	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	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		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 [X] UTRAN / Radio [X] Core Network [ ]
(at least one should be marked with an X)

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

Subject: Range and resolution of BLER measurements

Work item:

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

F	Correction	X	**Release:**	Phase 2	
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	X
				Release 00	

Reason for change: Currently there is no range and resolution specified for the Transport channel BLER measurements in TS 25.215.

Clauses affected:
5.1.8 Transport channel BLER
5.2.5 Transport channel BLER

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:

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5.1.8 Transport channel BLER

Definition	Estimation of the transport channel block error rate (BLER). The BLER estimation shall be based on evaluating the CRC on each transport block after RL combination. BLER estimation is only required for transport channels containing CRC. In connected mode the BLER shall be possible to measure on any transport channel. If requested in idle mode it shall be possible to measure the BLER on transport channel PCH.
Applicable for	Idle, Connected Intra
Range/mapping	The Transport channel BLER shall be reported for 0 ≤ Transport channel BLER ≤ 1 in the unit BLER_dB where: BLER_dB_00: Transport channel BLER = 0 BLER_dB_01: -∞ < Log10(Transport channel BLER) < -4.03 BLER_dB_02: -4.03 ≤ Log10(Transport channel BLER) < -3.965 BLER_dB_03: -3.965 ≤ Log10(Transport channel BLER) < -3.9 ... BLER_dB_61: -0.195 ≤ Log10(Transport channel BLER) < -0.13 BLER_dB_62: -0.13 ≤ Log10(Transport channel BLER) < -0.065 BLER_dB_63: -0.065 ≤ Log10(Transport channel BLER) ≤ 0

5.1.9 Physical channel BER

Definition	The physical channel BER is an estimation of the average bit error rate (BER) before channel decoding of the DPDCH data after RL combination. At most it shall be possible to report a physical channel BER estimate at the end of each TTI for the transferred TrCh's, e.g. for TrCh's with a TTI of x ms a x ms averaged physical channel BER shall be possible to report every x ms.
Applicable for	Connected Intra
Range/mapping	

5.1.10 UE transmitted power

Definition	The total UE transmitted power on one carrier. The reference point for the UE transmitted power shall be the UE antenna connector.
Applicable for	Connected Intra
Range/mapping	

5.1.11 CFN-SFN observed time difference

Definition	The CFN-SFN observed time difference to cell is defined as: OFF×38400+ T_m, where: T_m= T_{RxSFN} - (T_{UETx}-T_0), given in chip units with the range [0, 1, …, 38399] chips T_{UETx} is the time when the UE transmits an uplink DPCCH/DPDCH frame. T_0 is defined in TS 25.211 section 7.1.3. T_{RxSFN} is time at the beginning of the next received neighbouring P-CCPCH frame after the time instant T_{UETx}-T_0in the UE. If the next neighbouring P-CCPCH frame is received exactly at T_{UETx}-T_0 then T_{RxSFN}=T_{UETx}-T_0 (which leads to T_m=0). and OFF=(CFN_{Tx}-SFN) mod 256, given in number of frames with the range [0, 1, …, 255] frames CFN_{Tx} is the connection frame number for the UE transmission of an uplink DPCCH/DPDCH frame at the time T_{UETx}. SFN = the system frame number for the neighbouring P-CCPCH frame received in the UE at the time T_{RxSFN}.
Applicable for	Connected Inter, Connected Intra
Range/mapping	Time difference is given with the resolution of one chip with the range [0, …, 9830399] chips.

5.1.12 SFN-SFN observed time difference

Definition	**Type 1:** The SFN-SFN observed time difference to cell is defined as: OFF×38400+ T_m, where: T_m= T_{RxSFNj} - T_{RxSFNi}, given in chip units with the range [0, 1, …, 38399] chips T_{RxSFNj} is the time at the beginning of a received neighbouring P-CCPCH frame from cell j. T_{RxSFNi} is time at the beginning of the next received neighbouring P-CCPCH frame from cell i after the time instant T_{RxSFNj} in the UE. If the next neighbouring P-CCPCH frame is received exactly at T_{RxSFNj} then T_{RxSFNj}= T_{RxSFNi} (which leads to T_m=0). and OFF=(SFN_j- SFN_i) mod 256, given in number of frames with the range [0, 1, …, 255] frames SFN_j = the system frame number for downlink P-CCPCH frame from cell j in the UE at the time T_{RxSFNj}. SFN_i = the system frame number for the P-CCPCH frame from cell i received in the UE at the time T_{RxSFNi}. **Type 2:** The relative timing difference between cell j and cell i, defined as $T_{CPICHRxj}$ - $T_{CPICHRxi}$, where: $T_{CPICHRxj}$ is the time when the UE receives one CPICH slot from cell j $T_{CPICHRxi}$ is the time when the UE receives the CPICH slot from cell i that is closest in time to the CPICH slot received from cell j
Applicable for	**Type 1:** Idle, Connected Intra **Type 2:** Idle, Connected Intra, Connected Inter
Range/mapping	**Type 1:** Time difference is given with a resolution of one chip with the range [0, …, 9830399] chips. **Type 2:** Time difference is given with a resolution of 0.5 chip with the range [-1279, …, 1280] chips.

5.1.13 UE Rx-Tx time difference

Definition	The difference in time between the UE uplink DPCCH/DPDCH frame transmission and the first significant path, of the downlink DPCH frame from the measured radio link. Measurement shall be made for each cell included in the active set. Note: The definition of "first significant path" needs further elaboration.
Applicable for	Connected Intra
Range/mapping	Always positive.

5.2 UTRAN measurement abilities

The structure of the table defining a UTRAN measurement quantity is shown below:

Column field	**Comment**
Definition	Contains the definition of the measurement.
Range/mapping	Gives the range and mapping to bits for the measurements quantity.

5.2.1 RSSI

Definition	Received Signal Strength Indicator, the wide-band received power within the UTRAN uplink carrier channel bandwidth in an UTRAN access point. The reference point for the RSSI measurements shall be the antenna connector.
Range/mapping	

5.2.2 SIR

Definition	Signal to Interference Ratio, is defined as the RSCP divided by the ISCP. Measurement shall be performed on the DPCCH after RL combination in Node B. The reference point for the SIR measurements shall be the antenna connector.
Range/mapping	

5.2.3 Transmitted carrier power

Definition	Transmitted carrier power, is the total transmitted power on one carrier from one UTRAN access point. Measurement shall be possible on any carrier transmitted from the UTRAN access point. The reference point for the total transmitted power measurement shall be the antenna connector. In case of Tx diversity the total transmitted power for each branch shall be measured.
Range/mapping	

5.2.4 Transmitted code power

Definition	Transmitted code power, is the transmitted power on one carrier, one scrambling code and one channelisation code. Measurement shall be possible on any channelisation code transmitted from the UTRAN access point. The reference point for the transmitted code power measurement shall be the antenna connector. In case of Tx diversity the transmitted code power for each branch shall be measured.
Range/mapping	

5.2.5 Transport channel BLER

Definition	Estimation of the transport channel block error rate (BLER). The BLER estimation shall be based on evaluating the CRC on each transport block. Measurement shall be possible to perform on any transport channel after RL combination in Node B. BLER estimation is only required for transport channels containing CRC.
Range/mapping	The Transport channel BLER shall be reported for $0 \leq$ Transport channel BLER ≤ 1 in the unit BLER_dB where: BLER_dB_00: Transport channel BLER = 0 BLER_dB_01: $-\infty <$ Log10(Transport channel BLER) < -4.03 BLER_dB_02: $-4.03 \leq$ Log10(Transport channel BLER) < -3.965 BLER_dB_03: $-3.965 \leq$ Log10(Transport channel BLER) < -3.9 ... BLER_dB_61: $-0.195 \leq$ Log10(Transport channel BLER) < -0.13 BLER_dB_62: $-0.13 \leq$ Log10(Transport channel BLER) < -0.065 BLER_dB_63: $-0.065 \leq$ Log10(Transport channel BLER) ≤ 0

3GPP TSG RAN WG1 Meeting #9
Dresden, Germany, Nov 30 – Dec 3, 1999

Document ????99???
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

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25.215	CR	015r02	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	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		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: *(at least one should be marked with an X)* (U)SIM [ ] ME [X] UTRAN / Radio [X] Core Network [ ]

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

Subject: Range and resolution of BER measurements

Work item:

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

F	Correction	X
A	Corresponds to a correction in an earlier release	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X
Release 00	

Reason for change: Currently there is no range and resolution specified for the Physical channel BER measurements in TS 25.215.

Clauses affected: 5.1.9 Physical channel BER
5.2.6 Physical channel BER

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:


help.doc

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

5.1.9 Physical channel BER

Definition	The physical channel BER is an estimation of the average bit error rate (BER) before channel decoding of the DPDCH data after RL combination. At most it shall be possible to report a physical channel BER estimate at the end of each TTI for the transferred TrCh's, e.g. for TrCh's with a TTI of x ms a x ms averaged physical channel BER shall be possible to report every x ms.
Applicable for	Connected Intra
Range/mapping	The Physical channel BER shall be reported for 0 ≤ Physical channel BER ≤ 1 in the unit BER_dB where: BER_dB_00: Physical channel BER = 0 BER_dB_01: -∞ < Log10(Physical channel BER) < -4.03 BER_dB_02: -4.03 ≤ Log10(Physical channel BER) < -3.965 BER_dB_03: -3.965 ≤ Log10(Physical channel BER) < -3.9 ... BER_dB_61: -0.195 ≤ Log10(Physical channel BER) < -0.13 BER_dB_62: -0.13 ≤ Log10(Physical channel BER) < -0.065 BER_dB_63: -0.065 ≤ Log10(Physical channel BER) ≤ 0

5.1.10 UE transmitted power

Definition	The total UE transmitted power on one carrier. The reference point for the UE transmitted power shall be the UE antenna connector.
Applicable for	Connected Intra
Range/mapping	

5.1.11 CFN-SFN observed time difference

Definition	The CFN-SFN observed time difference to cell is defined as: OFF×38400+ T_m, where: T_m= T_{RxSFN} - (T_{UETx}-T_0), given in chip units with the range [0, 1, …, 38399] chips T_{UETx} is the time when the UE transmits an uplink DPCCH/DPDCH frame. T_0 is defined in TS 25.211 section 7.1.3. T_{RxSFN} is time at the beginning of the next received neighbouring P-CCPCH frame after the time instant T_{UETx}-T_0in the UE. If the next neighbouring P-CCPCH frame is received exactly at T_{UETx}-T_0 then T_{RxSFN}=T_{UETx}-T_0 (which leads to T_m=0). and OFF=(CFN_{Tx}-SFN) mod 256, given in number of frames with the range [0, 1, …, 255] frames CFN_{Tx} is the connection frame number for the UE transmission of an uplink DPCCH/DPDCH frame at the time T_{UETx}. SFN = the system frame number for the neighbouring P-CCPCH frame received in the UE at the time T_{RxSFN}.
Applicable for	Connected Inter, Connected Intra
Range/mapping	Time difference is given with the resolution of one chip with the range [0, …, 9830399] chips.

5.1.12 SFN-SFN observed time difference

Definition	**Type 1:** The SFN-SFN observed time difference to cell is defined as: OFF×38400+ T_m, where: T_m= T_{RxSFNj} - T_{RxSFNi}, given in chip units with the range [0, 1, …, 38399] chips T_{RxSFNj} is the time at the beginning of a received neighbouring P-CCPCH frame from cell j. T_{RxSFNi} is time at the beginning of the next received neighbouring P-CCPCH frame from cell i after the time instant T_{RxSFNj} in the UE. If the next neighbouring P-CCPCH frame is received exactly at T_{RxSFNj} then T_{RxSFNj}= T_{RxSFNi} (which leads to T_m=0). and OFF=(SFN_j- SFN_i) mod 256, given in number of frames with the range [0, 1, …, 255] frames SFN_j = the system frame number for downlink P-CCPCH frame from cell j in the UE at the time T_{RxSFNj}. SFN_i = the system frame number for the P-CCPCH frame from cell i received in the UE at the time T_{RxSFNi}. **Type 2:** The relative timing difference between cell j and cell i, defined as $T_{CPICHRxj}$ - $T_{CPICHRxi}$, where: $T_{CPICHRxj}$ is the time when the UE receives one CPICH slot from cell j $T_{CPICHRxi}$ is the time when the UE receives the CPICH slot from cell i that is closest in time to the CPICH slot received from cell j
Applicable for	**Type 1:** Idle, Connected Intra **Type 2:** Idle, Connected Intra, Connected Inter
Range/mapping	**Type 1:** Time difference is given with a resolution of one chip with the range [0, …, 9830399] chips. **Type 2:** Time difference is given with a resolution of 0.5 chip with the range [-1279, …, 1280] chips.

5.1.13 UE Rx-Tx time difference

Definition	The difference in time between the UE uplink DPCCH/DPDCH frame transmission and the first significant path, of the downlink DPCH frame from the measured radio link. Measurement shall be made for each cell included in the active set. Note: The definition of "first significant path" needs further elaboration.
Applicable for	Connected Intra
Range/mapping	Always positive.

5.2 UTRAN measurement abilities

The structure of the table defining a UTRAN measurement quantity is shown below:

Column field	**Comment**
Definition	Contains the definition of the measurement.
Range/mapping	Gives the range and mapping to bits for the measurements quantity.

5.2.1 RSSI

Definition	Received Signal Strength Indicator, the wide-band received power within the UTRAN uplink carrier channel bandwidth in an UTRAN access point. The reference point for the RSSI measurements shall be the antenna connector.
Range/mapping	

5.2.2 SIR

Definition	Signal to Interference Ratio, is defined as the RSCP divided by the ISCP. Measurement shall be performed on the DPCCH after RL combination in Node B. The reference point for the SIR measurements shall be the antenna connector.
Range/mapping	

5.2.3 Transmitted carrier power

Definition	Transmitted carrier power, is the total transmitted power on one carrier from one UTRAN access point. Measurement shall be possible on any carrier transmitted from the UTRAN access point. The reference point for the total transmitted power measurement shall be the antenna connector. In case of Tx diversity the total transmitted power for each branch shall be measured.
Range/mapping	

5.2.4 Transmitted code power

Definition	Transmitted code power, is the transmitted power on one carrier, one scrambling code and one channelisation code. Measurement shall be possible on any channelisation code transmitted from the UTRAN access point. The reference point for the transmitted code power measurement shall be the antenna connector. In case of Tx diversity the transmitted code power for each branch shall be measured.
Range/mapping	

5.2.5 Transport channel BLER

Definition	Estimation of the transport channel block error rate (BLER). The BLER estimation shall be based on evaluating the CRC on each transport block. Measurement shall be possible to perform on any transport channel after RL combination in Node B. BLER estimation is only required for transport channels containing CRC.
Range/mapping	

5.2.6 Physical channel BER

Definition	The physical channel BER is an estimation of the average bit error rate (BER) before channel decoding of the DPDCH data after RL combination in Node B. It shall be possible to report a physical channel BER estimate at the end of each TTI for the transferred TrCh's, e.g. for TrCh's with a TTI of x ms a x ms averaged physical channel BER shall be possible to report every x ms.
Range/mapping	The Physical channel BER shall be reported for $0 \leq$ Physical channel BER ≤ 1 in the unit BER_dB where: BER_dB_00: Physical channel BER = 0 BER_dB_01: $-\infty <$ Log10(Physical channel BER) < -4.03 BER_dB_02: $-4.03 \leq$ Log10(Physical channel BER) < -3.965 BER_dB_03: $-3.965 \leq$ Log10(Physical channel BER) < -3.9 ... BER_dB_61: $-0.195 \leq$ Log10(Physical channel BER) < -0.13 BER_dB_62: $-0.13 \leq$ Log10(Physical channel BER) < -0.065 BER_dB_63: $-0.065 \leq$ Log10(Physical channel BER) ≤ 0

TSG-RAN Working Group 1 meeting #9
Dresden, Germany
November 30 – December 3, 1999

TSGR1#9(99)k28

Agenda item: AH 16

Source: Ericsson

Title: CR 25.215-020: Correction of SFN-SFN observed time difference

Document for: Decision

The definition of Tm in the measurement “SFN-SFN observed time difference” in TS 25.215 has the wrong sign. This CR corrects that.

3GPP TSG RAN WG1 Meeting #9
Dresden, Germany, Nov 30 – Dec 3, 1999

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or for SMG, use the format P-99-xxx

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25.215	CR	020	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	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		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: *(at least one should be marked with an X)*	(U)SIM		ME	X	UTRAN / Radio	X	Core Network	

Source: Ericsson **Date:** 1999-12-01

Subject: Correction of SFN-SFN observed time difference

Work item:

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

F	Correction	X	**Release:**	Phase 2	
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	X
				Release 00	

Reason for change: The definition of Tm in the measurement SFN-SFN observed time difference in TS 25.215 has the wrong sign. This CR corrects that.

Clauses affected: 5.1.12 SFN-SFN observed time difference

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:

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5.1.11 CFN-SFN observed time difference

Definition	The CFN-SFN observed time difference to cell is defined as: OFF×38400+ T_m, where: T_m= T_{RxSFN} - (T_{UETx}-T_0), given in chip units with the range [0, 1, …, 38399] chips T_{UETx} is the time when the UE transmits an uplink DPCCH/DPDCH frame. T_0 is defined in TS 25.211 section 7.1.3. T_{RxSFN} is time at the beginning of the next received neighbouring P-CCPCH frame after the time instant T_{UETx}-T_0in the UE. If the next neighbouring P-CCPCH frame is received exactly at T_{UETx}-T_0 then T_{RxSFN}=T_{UETx}-T_0 (which leads to T_m=0). and OFF=(CFN_{Tx}-SFN) mod 256, given in number of frames with the range [0, 1, …, 255] frames CFN_{Tx} is the connection frame number for the UE transmission of an uplink DPCCH/DPDCH frame at the time T_{UETx}. SFN = the system frame number for the neighbouring P-CCPCH frame received in the UE at the time T_{RxSFN}.
Applicable for	Connected Inter, Connected Intra
Range/mapping	Time difference is given with the resolution of one chip with the range [0, …, 9830399] chips.

5.1.12 SFN-SFN observed time difference

Definition	**Type 1:** The SFN-SFN observed time difference to cell is defined as: OFF×38400+ T_m, where: T_m= T_{RxSFNj} - T_{RxSFNi}, given in chip units with the range [0, 1, …, 38399] chips T_{RxSFNj} is the time at the beginning of a received neighbouring P-CCPCH frame from cell j. T_{RxSFNi} is time at the beginning of the next received neighbouring P-CCPCH frame from cell i after the time instant T_{RxSFNj} in the UE. If the next neighbouring P-CCPCH frame is received exactly at T_{RxSFNj} then T_{RxSFNj}= T_{RxSFNi} (which leads to T_m=0). and OFF=(SFN_j- SFN_i) mod 256, given in number of frames with the range [0, 1, …, 255] frames SFN_j = the system frame number for downlink P-CCPCH frame from cell j in the UE at the time T_{RxSFNj}. SFN_i = the system frame number for the P-CCPCH frame from cell i received in the UE at the time T_{RxSFNi}. **Type 2:** The relative timing difference between cell j and cell i, defined as $T_{CPICHRxj}$ - $T_{CPICHRxi}$, where: $T_{CPICHRxj}$ is the time when the UE receives one CPICH slot from cell j $T_{CPICHRxi}$ is the time when the UE receives the CPICH slot from cell i that is closest in time to the CPICH slot received from cell j
Applicable for	**Type 1:** Idle, Connected Intra **Type 2:** Idle, Connected Intra, Connected Inter
Range/mapping	**Type 1:** Time difference is given with a resolution of one chip with the range [0, …, 9830399] chips. **Type 2:** Time difference is given with a resolution of 0.5 chip with the range [-1279, …, 1280] chips.

3GPP TSG RAN WG1#9 **Tdoc R1-(99)l03**
Dresden, Germany
November 30th - December 3rd, 1999 **Meeting No. 9**
Agenda Item: Ad Hoc 16 / Plenary

Source: Nokia, Ericsson

Clarifications for CFN-SFN observed time difference measurement in UTRA FDD

1. Introduction.

This is a revision of R1-99k77.

This contribution proposes to clarify the CFN-SFN measurement in connection with the compressed mode.

2. Background

The UE performs CFN-SFN timing measurements with compressed mode, the SFN number from the measured carriers can not be decoded. This means that the range for this measurements basically is limited to the timing difference of the scrambling codes, the possible frame offset (OFF parameters in the measurement) is not actually measured.

3. Conclusions

The attached CR-021r01 is recommended to be to included in 25.215 for clarifying the SFN-CFN measurement issue in order to avoid misunderstanding of this reported value when provided with compressed mode.

3GPP TSG RAN WG1 Meeting #9
Dresden Germany, Nov. 30-Dec. 3 1999

***Document* R1-99l01**
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

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25.215	CR	021r01	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	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		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: *(at least one should be marked with an X)* (U)SIM [ ] ME [X] UTRAN / Radio [X] Core Network [ ]

Source: Nokia, Ericsson **Date:** 29.11.1999

Subject: CFN-SFN measurement with compressed mode

Work item:

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

F	Correction	X	**Release:**	Phase 2	
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	X
				Release 00	

Reason for change: For the CFN-SFN measurement, the range reported is not available with compressed mode.

Clauses affected: 5.1.11CFN-SFN observed time difference

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:


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

5.1.11 CFN-SFN observed time difference

Definition	The CFN-SFN observed time difference to cell is defined as: OFF×38400+ T_m, where: T_m= T_{RxSFN} - (T_{UETx}-T_0), given in chip units with the range [0, 1, …, 38399] chips T_{UETx} is the time when the UE transmits an uplink DPCCH/DPDCH frame. T_0 is defined in TS 25.211 section 7.1.3. T_{RxSFN} is time at the beginning of the next received neighbouring P-CCPCH frame after the time instant T_{UETx}-T_0 in the UE. If the next neighbouring P-CCPCH frame is received exactly at T_{UETx}-T_0 then T_{RxSFN}=T_{UETx}-T_0 (which leads to T_m=0). And OFF=(CFN_{Tx}-SFN) mod 256, given in number of frames with the range [0, 1, …, 255] frames CFN_{Tx} is the connection frame number for the UE transmission of an uplink DPCCH/DPDCH frame at the time T_{UETx}. SFN = the system frame number for the neighbouring P-CCPCH frame received in the UE at the time T_{RxSFN}. In case the inter-frequency measurement is done with compressed mode, the value for the parameter OFF is always reported to be 0. In case that the SFN measurement indicator indicates that the UE does not need to read cell SFN of the target neighbour cell, the value of the parameter OFF is always be set to 0. *Note: In Compressed mode it is not required to read cell SFN of the target neighbour cell.*
Applicable for	Connected Inter, Connected Intra
Range/mapping	Time difference is given with the resolution of one chip with the range [0, …, 9830399] chips.