TSG-RAN Meeting #11 *RP-010020*
Palm Springs, CA, USA, 13 - 16 March 2001

Title: **Agreed CRs (Release '99) to TS 25.302**

Source: **TSG-RAN WG2**

Agenda item: **5.2.3**

Doc-1st-	Status-	Spec	CR	Rev	Phase	Subject	Cat	Version	Versio
R2-010234	agreed	25.302	084	2	R99	Additional physical channel combination for FDD downlink to allow COUNT-C-SFN difference measurement	F	3.7.0	3.8.0
R2-010106	agreed	25.302	087		R99	In & Out of Sync Indications per CCTrCH in TDD	F	3.7.0	3.8.0
R2-010107	agreed	25.302	088		R99	Correction & Clarification to TDD RACH Model and Primitives	F	3.7.0	3.8.0
R2-010217	agreed	25.302	089	1	R99	Alignment of measurements provided by the physical layer	F	3.7.0	3.8.0
R2-010535	agreed	25.302	092	1	R99	Physical channel combinations in TDD	F	3.7.0	3.8.0
R2-010533	agreed	25.302	094		R99	Measurement model clarifications	F	3.7.0	3.8.0
R2-010575	agreed	25.302	095		R99	Removal of DPCCH Gating from Release 99	F	3.7.0	3.8.0
R2-010672	agreed	25.302	096	1	R99	Clarification of simultaneous operation of DRAC and CTCH	F	3.7.0	3.8.0

3GPP TSG-RAN WG2 Meeting #18 ***Tdoc R2-010234***

Edinburgh, UK, 15-19 January 2001

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CHANGE REQUEST

⌘ **25.302** **CR** **084** ⌘ rev **r2** ⌘ Current version: **3.7.0** ⌘

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Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network ☐

Title:	⌘	Additional physical channel combination for FDD downlink to allow COUNT-C-SFN difference measurement
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	***Date:*** ⌘ 09th January 01
Category:	⌘	**F** ***Release:*** ⌘ R99

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Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	The physical channel combination pCCPCH + DPCCH + one or more DPDCH + zero, one, or more PDSCH in DL is missing. It is required in that the UE, that runs a RL in a serving cell, can read the SFN of a neighbouring cell carried on the pCCPCH of that cell. This combination is ~~only~~ required to support timing-maintained hard handover. ~~so that it should be depending on the UE capabilities whether this combination is required or not.~~
Summary of change:	⌘	The addition of the physical channel combination pCCPCH + DPCCH + one or more DPDCH + zero, nore, or more PDSCH in DL as well as the corresponding TrCh combination is proposed.
Consequences if not approved:	⌘	Incomplete description

Clauses affected:	⌘	8.1, 8.2, 8.5
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

8.1 FDD Uplink

The table describes the possible combinations of FDD physical channels that can be supported in the uplink on the same frequency by one UE ~~at any one time.~~simultaneously.

[…]

8.2 FDD Downlink

The table describes the possible combinations of FDD physical channels that can be supported in the downlink on the same frequency by one UE ~~at any one time~~simultaneously.

Table 2: FDD Downlink

	Physical Channel Combination	Transport Channel Combination	Mandatory dependent on UE radio access capabilities	Comment
1	PCCPCH	BCH	Mandatory	
2	SCCPCH	FACH Or PCH Or FACH + PCH	Mandatory	The maximum channel bit rate that can be supported is dependent on the UE radio access capabilities. The PCH is included when the UE needs to receive paging on the SCCPCH. The reception of (FACH + PCH) is to enable the reception of broadcast services on the CTCH, mapped to the FACH.
3	PCCPCH + SCCPCH	BCH + (FACH or PCH or (FACH + PCH))	Mandatory	Simultaneous reception of PCCPCH and SCCPCH is only needed at occurrences when the UE needs to read system information on BCH while being in CELL_FACH state, i.e. continuous reception of both PCCPCH and SCCPCH at the same time is not required. The requirement holds for PCCPCH and SCCPCH sent in different cells or in the same cell. The PCH is included when the UE needs to receive paging on the SCCPCH. The reception of (FACH + PCH) is to enable the reception of broadcast services on the CTCH, mapped to the FACH.
4	SCCPCH + AICH	(FACH or PCH or (FACH + PCH))+ RACH in uplink Or (FACH or PCH or (FACH + PCH))+ CPCH in uplink	Mandatory	The maximum channel bit rate that can be supported is dependent on the UE radio access capabilities. The PCH is included when the UE needs to receive paging on the SCCPCH. The reception of (FACH + PCH) is to enable the reception of broadcast services on the CTCH, mapped to the FACH. This physical channel combination facilitates the preamble portion of the CPCH in the uplink
5	SCCPCH + DPCCH	(FACH or PCH or (FACH + PCH))+ CPCH in uplink	Depending on UE radio access capabilities	This physical channel combination facilitates the message portion of the CPCH in the uplink The PCH is included when the UE needs to receive paging on the SCCPCH. The reception of (FACH + PCH) is to enable the reception of broadcast services on the CTCH, mapped to the FACH.
6	More than one SCCPCH	More than one (FACH or PCH or (FACH + PCH))	Depending on UE radio access capabilities	The PCH is included when the UE needs to receive paging on the SCCPCH. The reception of (FACH + PCH) is to enable the reception of broadcast services on the CTCH, mapped to the FACH.
7	PICH	N/A	Mandatory	
8	DPCCH + DPDCH	One or more DCH coded into a single CCTrCH	Mandatory	The maximum number of DCHs and the maximum channel bit rate are dependent on UE radio access capabilities.

	Physical Channel Combination	Transport Channel Combination	Mandatory dependent on UE radio access capabilities	Comment
9	DPCCH + more than one DPDCH	One or more DCH coded into a single CCTrCH	Depending on UE radio access capabilities	The maximum number of DCHs and the maximum channel bit rate are dependent on UE radio access capabilities.
10	One or more PDSCH + DPCCH + one or more DPDCH	One or more DSCH coded into a single CCTrCH + one or more DCH coded into a single CCTrCH	Depending on UE radio access capabilities	The maximum number of DCHs and the maximum channel bit rate are dependent on UE radio access capabilities.
11	SCCPCH + DPCCH + one or more DPDCH	FACH + one or more DCH coded into a single CCTrCH	Depending on UE radio access capabilities	The maximum number of DCHs and the maximum channel bit rate are dependent on UE radio access capabilities. This combination of physical channels is used for DRAC control of an uplink DCH and for receiving services such as cell broadcast or multicast whilst in connected mode.
12	SCCPCH + one or more PDSCH + DPCCH + one or more DPDCH	FACH + one or more DSCH coded into a single CCTrCH + one or more DCH coded into a single CCTrCH	Depending on UE radio access capabilities	The maximum number of DCHs and the maximum channel bit rate are dependent on UE radio access capabilities. This combination of physical channels is used for simultaneous DSCH and DRAC control of an uplink DCH.
13	One DPCCH + more than one DPDCH	More than one DCH coded into one or more CCTrCH	Depending on UE radio access capabilities	
14	PCCPCH (neighbour cell) + DPCCH + one or more DPDCH + zero, one, or more PDSCH	BCH (neighbour cell) + one or more DCHs + zero, one or more DSCH	Mandatory	This combination is required by a UE ~~running a RL in a serving cell~~ in CELL_DCH state to be able to read the SFN of a neighbouring cell to support timing maintained hard hand over

[…]

8.5 TDD UE Uplink and Downlink Combinations (within 10 ms air frames)

This table describes the possible uplink and downlink physical channel combinations that can be supported by a UE in TDD mode simultaneously.

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CHANGE REQUEST

⌘ **25.302** **CR** **087** ⌘ rev **-** ⌘ Current version: **3.7.0** ⌘

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Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network ☐

Title:	⌘	In & Out of Sync Indications per CCTrCH in TDD
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	***Date:*** ⌘ 2001-01-11
Category:	⌘ **F**	***Release:*** ⌘ R99

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Use one of the following releases:

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R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	In TDD several CCTrCH's may exist simultaneously. It is necessary to indicate in/out of sync status independently for each.
Summary of change:	⌘	Additional CCTrCH ID parameter for CPHY-Sync-IND & CPHY-Out-of-Sync-IND status primitives.
Consequences if not approved:	⌘	Status of individual CCTrCH's are not known.

Clauses affected:	⌘	10.2.1.1 & 10.2.1.2
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

10.2.1 STATUS PRIMITIVES

10.2.1.1 CPHY-Sync-IND

This primitive is used for L1 to indicate to RRC that synchronisation of a certain physical channel has been done in the receiver. In FDD synchronisation is based on reception of the DPCCH, and in TDD synchronisation is based on ~~midamble~~Special Burst, TB reception, and burst quality estimation.

Primitive Type: indication.

Parameters:

- ~~none~~CCTrCH ID (TDD only).

10.2.1.2 CPHY-Out-of-Sync-IND

Primitive sent from L1 to RRC indicating that synchronisation of a previously configured connection has been lost in the receiver. In FDD synchronisation is based on reception of the DPCCH, and in TDD synchronisation is based on ~~midamble~~Special Burst, TB reception, and burst quality estimation.

Primitive Type: indication.

Parameters:

- ~~none~~CCTrCH ID (TDD only).

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CHANGE REQUEST

⌘ **25.302** **CR** **088** ⌘ rev **-** ⌘ Current version: **3.7.0** ⌘

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Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network ☐

Title:	⌘	Correction & Clarification to TDD RACH Model and Primitives
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	***Date:*** ⌘ 2001-01-11
Category:	⌘	**F** ***Release:*** ⌘ R99

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2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	RACH Model and Primitives do not correct reflect TDD aspects.
Summary of change:	⌘	1. RACH model description updated to indicate TDD PRACH bursts do not provide for TFCI transmission and the TDD RACH maintains a single TF within the TFS to avoid the blind detection requirement. 2. Primitives associated with RACH procedure are updated to indicate FDD or TDD specific use. 3. Selected ASC is added to PHY-Data-REQ in the case of RACH transmission. 4. PRACH description ASC Information specifies available signatures/channelisation codes and subchannels.
Consequences if not approved:	⌘	Incorrect and incomplete model, primitives and PRACH description for TDD.

Clauses affected:	⌘	6.1, 10.1, 10.1.1, 10.1.2, 10.1.3, & 10.3.5.5
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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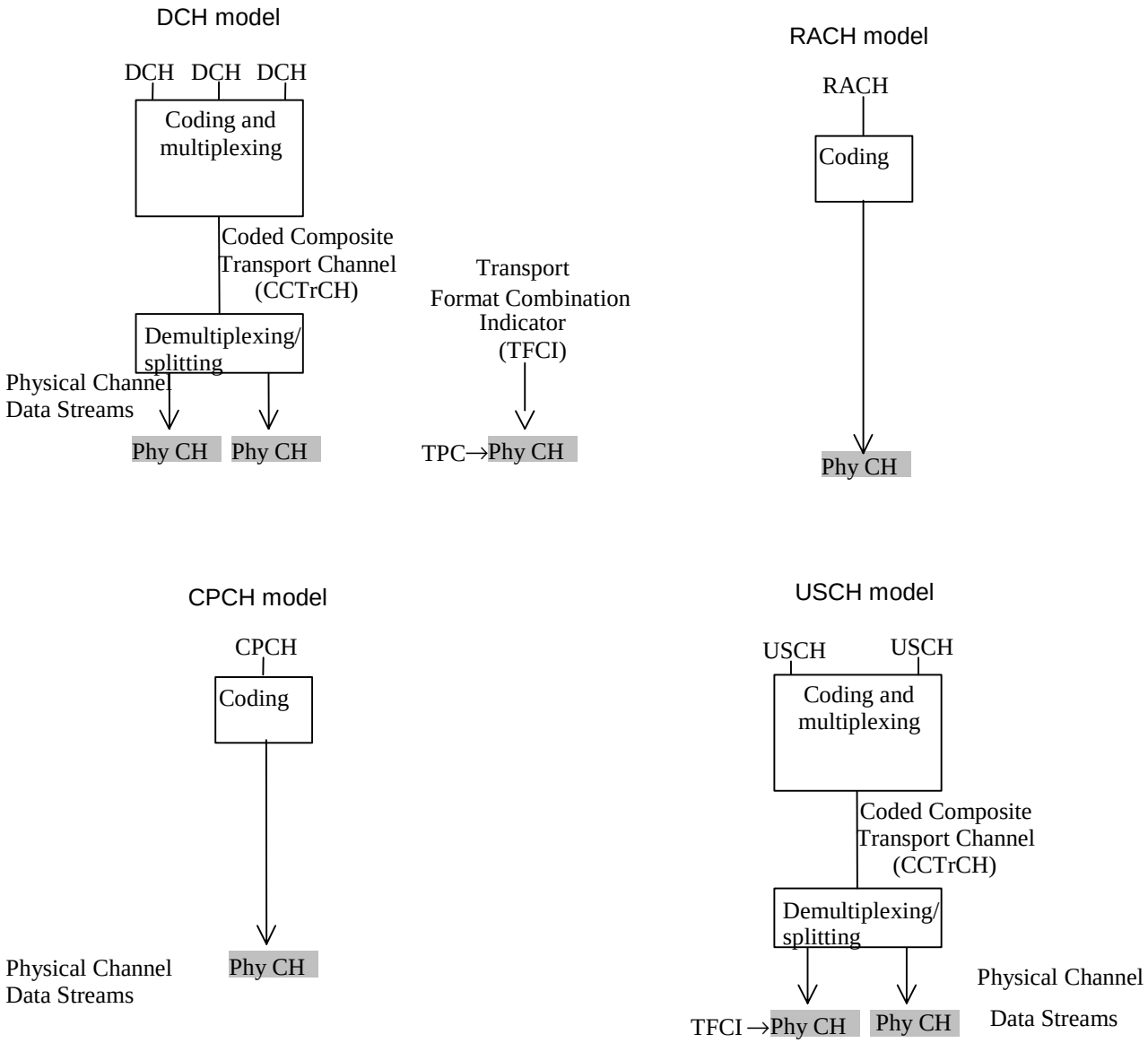
6 Model of physical layer of the UE

6.1 Uplink models

Figure 2 shows models of the UE's physical layer in the uplink for both FDD and TDD mode. It shows the models for DCH, RACH, CPCH (the latter two used in FDD mode only) and USCH (TDD only). Some restriction exist for the use of different types of transport channel at the same time, these restrictions are described in the chapter "UE Simultaneous Physical Channel combinations". More details can be found in [3] and [4].



NOTE 1: CPCH is for FDD only.
NOTE 2: USCH is for TDD only.

Figure 2: Model of the UE's physical layer - uplink

The DCH model shows that one or several DCHs can be processed and multiplexed together by the same coding and multiplexing unit. The detailed functions of the coding and multiplexing unit are not defined in the present document but in [3] and [4]. The single output data stream from the coding and multiplexing unit is denoted *Coded Composite Transport Channel (CCTrCH)*.

The bits on a CCTrCH Data Stream can be mapped on the same Physical Channel and should have the same C/I requirement.

On the downlink, multiple CCTrCH can be used simultaneously with one UE. In the case of FDD, only one fast power control loop is necessary for these different CCtrCH, but the different CCtrCH can have different C/I requirements to provide different QoS on the mapped Transport Channels. In the case of TDD, different power control loops can be applied for different CCTrCH. One physical channel can only have bits coming from the same CCTrCH.

On the uplink and in the case of FDD, only one CCTrCH can be used simultaneously. On the uplink and in the case of TDD, multiple CCTrCH can be used simultaneously.

When multiple CCTrCH are used by one UE, one or several TFCI can be used, but each CCTrCH has only zero or one corresponding TFCI. In the case of FDD, these different words are mapped on the same DPCCH. In the case of TDD, these different TFCI can be mapped on different DPCH.

The data stream of the CCTrCH is fed to a data demultiplexing/splitting unit that demultiplexes/splits the CCTrCH's data stream onto one or several *Physical Channel Data Streams*.

The current configuration of the coding and multiplexing unit is either signalled to, or optionally blindly detected by, the network for each 10 ms frame. If the configuration is signalled, it is represented by the *Transport Format Combination Indicator (TFCI)* bits. Note that the TFCI signalling only consists of pointing out the current transport format combination within the already configured transport format combination set. In the uplink there is only one TFCI representing the current transport formats on all DCHs of one CCTrCH simultaneously. In FDD mode, the physical channel data stream carrying the TFCI is mapped onto the physical channel carrying the power control bits and the pilot. In TDD mode the TFCI is time multiplexed onto the same physical channel(s) as the DCHs. The exact locations and coding of the TFCI are signalled by higher layers.

The DCH and USCH have the possibility to perform Timing Advance in TDD mode.

The model for the RACH case shows that RACH is a common type transport channel in the uplink. RACHs are always mapped one-to-one onto physical channels (PRACHs), i.e. there is no physical layer multiplexing of RACHs. Service multiplexing is handled by the MAC layer. In one cell several RACHs/PRACHs may be configured. If more than one PRACH is configured in a cell, the UE performs PRACH selection as specified in TS 25.331 [4].

In FDD, ~~T~~the RACHs mapped to the PRACHs may all employ the same Transport Format and Transport Format Combination Sets, respectively. It is however also possible that individual RACH Transport Format Sets are applied on each available RACH/PRACH.

In TDD, there is no TFCI transmitted in the burst, and therefore each RACH is configured with a single transport format within it's TFS. The RACHs mapped to the PRACHs may all employ the same Transport Format. It is however also possible that individual RACH Transport Formats are applied on each available RACH/PRACH combination.

The available pairs of RACH and PRACHs and their parameters are indicated in system information. In FDD mode, the various PRACHs are distinguished either by employing different preamble scrambling codes, or by using a common scrambling code but distinct (non-overlapping) partitions of available signatures and available subchannels. In TDD mode, the various PRACHs are distinguished either by employing different timeslots, or by using a common timeslot but distinct (non-overlapping) partitions of available channelisation codes and available subchannels. Examples of RACH/PRACH configurations are given in TR 25.922 [6].

The CPCH, which is another common type transport channel, has a physical layer model as shown in figure2. There is always a single CPCH transport channel mapped to a PCPCH physical channel which implies a one-to-one correspondence between a CPCH TFI and the TFCI conveyed on PCPCH. A CPCH transport channel belongs to a CPCH set which is identified by the application of a common, CPCH set-specific scrambling code for access preamble and collision detection, and multiple PCPCH physical channels. Each PCPCH shall employ a subset of the Transport Format Combinations implied by the Transport Format Set of the CPCH set. A UE can request access to CPCH transport channels of a CPCH set, which is assigned when the service is configured for CPCH transmission.

10.1 Generic names of primitives between layers 1 and 2

The primitives between layer 1 and layer 2 are shown in table 8.

Table 8: Primitives between layer 1 and 2

Generic Name	Parameters
PHY-ACCESS-REQ	transport format subset (NOTE1)
PHY-ACCESS-CNF	Access Information (NOTE1)
PHY-DATA-REQ	TFI, TBS
PHY-DATA-IND	TFI, TBS, CRC result, TD (NOTE2)
PHY-CPCH_STATUS-REQ	transport format subset
PHY-CPCH_STATUS-CNF	transport format subset
PHY-STATUS-IND	Event value

NOTE1: FDD only

NOTE2: TDD only.

10.1.1 PHY-Access-REQ

The PHY-ACCESS-REQ primitive is used to request access to either a RACH or a CPCH transport channel from the physical layer. A PHY-ACCESS primitive is submitted once before the actual data for peer-to-peer communication is passed to the physical layer using the PHY-Data primitive. This primitive is used in FDD only.

Primitive Type: request.

Parameters:

- Transport Format subset.

10.1.2 PHY-Access-CNF

The PHY-ACCESS-CNF primitive is used to confirm that physical layer synchronisation has been established and that the physical layer is ready for data transmission using the PHY-Data primitive. This primitive is used in FDD only.

Primitive Type: confirm.

Parameters:

- access information.

10.1.3 PHY-Data-REQ

The PHY-DATA primitives are used to request SDUs used for communications passed to and from the physical layer. One PHY-DATA primitive is submitted every Transmission Time Interval for each Transport Channel.

Primitive Type: request.

Parameters:

- TFI;
- Transport Block Set;
- FN_{CELL};
- Page indicators (PIs) (PCH only).
- ASC selected for that Transport Block Set (RACH only)

10.3.5.5 PRACH

- Access Slot.
- Preamble scramblingspreading code (FDD only).
- Available Ppreamble signatures (FDD only).
- Spreading factor for data part.
- Power control info:
  - UL target SIR;
  - primary CCPCH DL TX Power;
  - UL interference;
  - power offset (Power ramping) (FDD only).
- Access Service Class Information (PRACH Partitioning)Selection:
  - Available signatures for each ASC (FDD only)preamble signature classification information.
  - Available Channelisation codes for each ASC (TDD only).
  - Available Subchannels for each ASC.
- AICH transmission timing parameter (FDD only).
- Timeslots (TDD only).
- Available Channelisation Codes (TDD only)
- Spreading Factorcodes (TDD only).
- Midamble Typecodes (TDD only).

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CHANGE REQUEST

⌘ **25.302** **CR** **089** ⌘ rev **r1** ⌘ Current version: **3.7.0** ⌘

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Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network ☐

Title:	⌘	Alignment of measurements provided by the physical layer
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	***Date:*** ⌘ 2001-01-16
Category:	⌘	**F** ***Release:*** ⌘ R99

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R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change: ⌘ Alignment with other specifications on UE and UTRAN measurements provided by the physical layer.

Summary of change: ⌘ The following modifications are made in order to align with other specifications:

1. Reference to TS 25.215 and TS 25.225 has been added, to refer to the measurement definitions.
2. Editorial: “LCS” is changed to “UP”, added in ‘Abbreviations’.
3. General: To avoid inconsistent definitions of measurements, field ‘Definition’ has been renamed to ‘Description’. Aligned with TS 25.215 and/or 25.225. Editorial modifications.
4. General for UE measurements: UE UTRA mode capability (FDD or TDD) indicated for mode-specific measurements.
5. General for UTRAN measurements: UTRA mode applicability indicated for mode-specific measurements.
6. CPICH SIR: Replaced by ‘Void’, since measure is not supported in R99.
7. CPICH ISCP: The measurement is not supported as a physical layer measurement according to TS 25.215 and TS 25.225. Therefore, this measurement is removed from TS 25.302.
8. SIR: In FDD, SIR measurement (by UE) is a physical layer internal measurement, and is not reported by UE to UTRAN in any RRC message (TS 25.331). No performance requirements on SIR measurement are specified in TS 25.113. Therefore, this measurement is mandatory for UE in TDD only.
9. Transport channel BLER (UTRAN): Replaced by ‘Void’, since measure is not

		supported in R99. 10. Frequency offset: The measurement is not supported as a physical layer measurement according to TS 25.215 and TS 25.225. Therefore, this measurement is removed from TS 25.302. 11. SIR error: Added that this measurement is applicable for FDD only.
Consequences if not approved:	⌘	Inconsistency between specifications. Measurements not defined for R99 would still exist in the list

Clauses affected:	⌘	3.2, 9.2, 9.2.1, 9.2.2, 9.2.3, 9.2.4, 9.2.5, 9.2.6, 9.2.7, 9.2.8, 9.2.9, 9.2.10, 9.2.11, 9.2.12, 9.2.13, 9.2.14, 9.2.15, 9.2.16, 9.3.1, 9.3.2, 9.3.3, 9.3.4, 9.3.5, 9.3.6, 9.3.7, 9.3.8, 9.3.9, 9.3.10, 9.3.11, 9.3.12, 9.3.13, 9.3.14, 9.3.15, 9.3.16, 9.3.17, 9.3.18		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	
Other comments:	⌘			

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in [3] apply.

3.2 Abbreviations

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

ARQ	Automatic Repeat Request
BCCH	Broadcast Control Channel
BCH	Broadcast Channel
C-	Control-
CC	Call Control
CCC	CPCH Control Command
CCCH	Common Control Channel
CCH	Control Channel
CCTrCH	Coded Composite Transport Channel
CN	Core Network
CRC	Cyclic Redundancy Check
DC	Dedicated Control (SAP)
DCA	Dynamic Channel Allocation
DCCH	Dedicated Control Channel
DCH	Dedicated Channel
DL	Downlink
DRNC	Drift Radio Network Controller
DSCH	Downlink Shared Channel
DTCH	Dedicated Traffic Channel
FACH	Forward Link Access Channel
FAUSCH	Fast Uplink Signaling Channel
FCS	Fame Check Sequence
FDD	Frequency Division Duplex
GC	General Control (SAP)
HO	Handover
ITU	International Telecommunication Union
kbps	kilo-bits per second
L1	Layer 1 (physical layer)
L2	Layer 2 (data link layer)
L3	Layer 3 (network layer)
LAC	Link Access Control
LAI	Location Area Identity
MAC	Medium Access Control
MM	Mobility Management
Nt	Notification (SAP)
PCCH	Paging Control Channel
PCH	Paging Channel
PDU	Protocol Data Unit
PHY	Physical layer
PhyCH	Physical Channels
RACH	Random Access Channel
RLC	Radio Link Control
RNC	Radio Network Controller
RNS	Radio Network Subsystem
RNTI	Radio Network Temporary Identity
RRC	Radio Resource Control

SAP	Service Access Point
SDU	Service Data Unit
SRNC	Serving Radio Network Controller
SRNS	Serving Radio Network Subsystem
TCH	Traffic Channel
TDD	Time Division Duplex
TFCI	Transport Format Combination Indicator
TFI	Transport Format Indicator
TMSI	Temporary Mobile Subscriber Identity
TPC	Transmit Power Control
U-	User-
UE	User Equipment
UL	Uplink
UMTS	Universal Mobile Telecommunications System
UP	UE positioning
URA	UTRAN Registration Area
UTRA	UMTS Terrestrial Radio Access
UTRAN	UMTS Terrestrial Radio Access Network

9.2 UE Measurements

For definitions of the measurements, see [6] and [11].

9.2.1 SFN-CFN observed time difference

This measure is mandatory for ~~the~~ UE.

Measurement	SFN-CFN observed time difference
Source	L1 (UE)
Destination	RRC (RNC) for handover
Reporting Trigger	On-demand, Event-triggered
~~Definition~~Description	~~The 'SFN-CFN observed time difference' indicates the t~~Time difference ~~(in chips for FDD and in frames for TDD) which is measured by the UE~~ between the SFN of the target neighbouring cell and the CFN in the UE.

9.2.2 Observed time difference to GSM cell

This measure is mandatory for ~~the~~ UE ~~if the~~capable of handover to GSM. ~~service is to be supported.~~

Measurement	Observed time difference to GSM cell
Source	L1 (UE)
Destination	RRC (RNC) for maintenance and handover to GSM
Reporting Trigger	On-demand, Event-triggered
~~Definition~~Description	Time difference between a ~~specific~~ UTRA cell and ~~the timing of the~~a GSM cell

9.2.3 CPICH E_c/N_0

This measure is mandatory for ~~the~~ UE with FDD mode capability.

Measurement	CPICH Ec/No
Source	L1(UE)
Destination	RRC (UE, RNC)
Reporting Trigger	Periodic, on demand and event triggered
~~Definition~~Description	The received energy per chip of the CPICH divided by the power density in the frequency band. ~~The Ec/No is identical to RSCP /RSSI.~~

9.2.4 Void~~CPICH SIR~~

~~This measure is not included in release 99.~~

~~Measurement~~	~~CPICH SIR~~
~~Source~~	~~L1 (UE)~~
~~Destination~~	~~RRC (UE, RNC)~~
~~Reporting Trigger~~	~~periodic or event triggered~~
~~Definition~~Description	~~This quantity is a ratio of the CPICH Received Signal Code Power (RSCP) to the Interference Signal Code Power (ISCP).~~

9.2.5 CPICH RSCP

This measure is mandatory for ~~the~~ UE~~.~~ with FDD mode capability.

Measurement	CPICH RSCP
Source	L1(UE)
Destination	RRC (UE, RNC)
Reporting Trigger	periodic or event triggered
~~Definition~~Description	Received sSignal cCode pPower~~, is the received power~~ ofn the CPICH~~. after despreading.~~

9.2.6 P-CCPCH RSCP

This measure is mandatory for ~~the~~ UE with TDD mode capability.

Measurement	P-CCPCH RSCP
Source	L1(UE)
Destination	RRC (UE, RNC)
Reporting Trigger	periodic or event triggered
~~Definition~~Description	Received ~~S~~signal ~~C~~code ~~P~~power of the P-CCPCH ~~is the received power after despreading. This measurement is applicable for TDD cells only.~~

9.2.7 Timeslot ISCP

This measure is mandatory for ~~the~~ UE with TDD mode capability.

Measurement	Timeslot ISCP
Source	L1(UE)
Destination	RRC (UE, RNC)
Reporting Trigger	periodic or event triggered
~~Definition~~Description	Interference Signal Code Power is the interference on the received signal in a specified timeslot. ~~measured on the midamble. This measurement is applicable for TDD only.~~

9.2.8 Void~~CPICH ISCP~~

~~This measure is mandatory for the UE.~~

~~Measurement~~	~~CPICH ISCP~~
~~Source~~	~~L1(UE)~~
~~Destination~~	~~RRC (UE, RNC)~~
~~Reporting Trigger~~	~~Periodic or event triggered~~
~~Definition~~Description	~~Interference on Signal Code Power, is the interference on the received signal after despreading. Thereby only the non-orthogonal part of the interference is included.~~

9.2.9 SIR

This measure is mandatory for ~~the~~ UE with TDD mode capability.~~.~~

Measurement	SIR
Source	L1(UE)
Destination	RRC (UE,RNC)
Reporting Trigger	Periodic, once every power control cycle , event triggered
~~Definition~~Description	Signal to Interference Ratio ~~is defined as (RSCP / ISCP) x (SF/2) for FDD and as (RSCP / ISCP) x SF for TDD. For FDD this is measured on the DPCCH. For TDD this is measured on the DPCH or PDSCH.~~

9.2.10 UTRA carrier RSSI

This measure is mandatory for ~~the~~ UE.

Measurement	UTRA carrier RSSI
Source	L1(UE)
Destination	RRC (RNC)
Reporting Trigger	Periodic, event triggered, on demand
~~Definition~~Description	Received Signal Strength Indicator~~,~~ ~~the~~ the wideband received power within the relevant channel bandwidth. For TDD this is measured in specified timeslots.

9.2.11 GSM carrier RSSI

This measure is mandatory for ~~the~~ UE ~~if the service handover to~~with GSM ~~is to be supported~~capability.

Measurement	GSM carrier RSSI
Source	L1(UE)
Destination	RRC (RNC)
Reporting Trigger	Periodic, event triggered, on demand
~~Definition~~Description	Received Signal Strength Indicator, the wide-band received power within the relevant channel bandwidth. Details are specified in the GSM specification 05.08

9.2.12 Transport channel BLER

This measure is mandatory for ~~the~~ UE.

Measurement	Transport channel BLER (BLock Error Rate)
Source	L1(UE)
Destination	RRC (RNC,UE)
Reporting Trigger	Periodic, on demand
~~Definition~~Description	Estimation of the transport channel block error rate (BLER).

9.2.13 UE transmitted power

This measure is mandatory for ~~the~~ UE.

Measurement	UE transmitted power
Source	L1(UE)
Destination	RRC (UE,RNC)
Reporting Trigger	On-demand, periodic, Event-triggered
~~Definition~~Description	~~RRC (UE): the t~~Total transmitted power on one carrier.~~of the UE measured at the antenna connector. RRC (RNC): indication of Tx power reaching threshold (for example, upper or lower power limits).~~ For TDD this is measured in specified timeslots.

9.2.14 UE Rx-Tx time difference

This measure is mandatory for UE with FDD mode capability.

Measurement	UE Rx-Tx time difference
Source	L1 (UE)
Destination	RRC ~~(~~RNC)
Reporting Trigger	On-demand, periodic, event-triggered
~~Definition~~Description	Time difference between the UE uplink DPCCH/DPDCH frame transmission and the first ~~significant~~ detected path (in time) of the downlink DPCH frame from the measured radio link. Type 1 and Type 2 are defined.~~Measurement shall be made for each cell included in the active set. This measurement is applicable for FDD cells only. (Note: The use for TDD in case of LCS is ffs.)~~

9.2.15 SFN-SFN Observed time difference

~~The SFN-SFN observed time difference at the UE of a group of Node B may be used for location calculation. The applicability of this measure is LCS method dependent. For TDD, t~~This measure is mandatory for ~~the~~ UE.

Measurement	SFN-SFN observed time difference
Source	L1 (UE)
Destination	RRC (RNC)
Reporting Trigger	On-demand, Event-triggered
~~Definition~~Description	Time difference between a specific reference UTRA cell and a target UTRA cell. Type 1 and Type 2 are defined ~~There are two types of this measurement: Type 1 measures by means of the P-CCPCH and type 2 by means of CPICH.~~

9.2.16 UE GPS Timing of Cell Frames for ~~LCS~~UP

This measure is mandatory for UE that has the capability to measure GPS reference time.~~The UE GPS Timing of Cell Frames for LCS is an absolute reference time measurement for the arrival of a specific frame for an identified cell within the active set. This measure is applicable for UEs which support reception of GPS signals for LCS.~~

Measurement	UE GPS Timing of Cell Frames for ~~LCS~~UP
Source	L1 (UE)
Destination	RRC (RNC-~~LCS~~UP)
Reporting Trigger	On-demand, Event-triggered, Periodic
~~Definition~~Description	The timing between UTRA cell and ~~Time of arrival for the beginning of a frame, (identified by its SFN), measured when the first significant multipath of the cell CPICH reaches the UE. This is the absolute time reference measurement in respect to~~ GPS Time Of Week ~~for the arrival of this frame~~.

9.3 UTRAN Measurements

9.3.1 Received total wide band power

Measurement	Received total wide band power
Source	L1 (Node B)
Destination	RRC(RNC)
Reporting Trigger	On-demand, Event-triggered, Periodic
~~Definition~~Description	The received wide band power including noise generated ~~the~~ in the receiver ~~generated noise~~, within the ~~UTRAN uplink channel~~ bandwidth defined by the pulse shaping filter. ~~in an UTRAN access point. In case of receiver diversity the reported value shall be the linear average of the power in the diversity branches. The reference point for the Received total wide band power measurement shall be the antenna connector.~~ For TDD mode, this is measured in specified timeslots.

9.3.2 Transmitted carrier power

Measurement	Transmitted carrier power
Source	L1(Node B)
Destination	RRC (RNC)
Reporting Trigger	On-demand, periodic, Event-triggered
~~Definition~~Description	Transmitted carrier power is the ratio between the total transmitted power on one DL carrier from one UTRAN access point, compared to the maximum power possible to use on that DL carrier at this moment of time. For TDD mode, this is measured in specified timeslots.

9.3.3 Transmitted code power

Measurement	Transmitted code power
Source	L1(Node B)
Destination	RRC (RNC)
Reporting Trigger	On-demand, periodic, Event-triggered
~~Definition~~Description	Transmitted Code Power is the transmitted power on one carrier, one scrambling and one channelisation code. For TDD mode, this is measured in specified timeslots.

9.3.4 Void~~Transport channel BLER~~

~~This measurement is not included in release 99.~~

~~Measurement~~	~~Transport channel BLER (BLock Error Rate)~~
~~Source~~	~~L1(Node B)~~
~~Destination~~	~~RRC (RNC)~~
~~Reporting Trigger~~	~~periodic, event triggered, on demand~~
~~Definition~~Description	~~Estimation of the transport channel block error rate (BLER).~~

9.3.5 Physical channel BER

Measurement	Physical channel BER
Source	L1(Node B)
Destination	RRC (RNC)
Reporting Trigger	On-demand, Event-triggered, periodic
~~Definition~~Description	The Physical channel BER is an estimation of the average bit error rate (BER) on the DPCCH of a Radio Link Set.~~The physical channel BER is measured on the control part after RL combining.~~ ~~Physical channel BER~~This measurement applies to FDD mode only.

9.3.6 Transport channel BER

Measurement	Transport channel BER
Source	L1(Node B)
Destination	RRC (RNC)
Reporting Trigger	On-demand, Event-triggered, periodic
~~Definition~~Description	The transport channel BER is an estimation of the average bit error rate (BER) data part.~~The transport channel BER is measured on the data part after RL combining.~~

9.3.7 RX timing deviation

Measurement	RX timing deviation
Source	L1 (Node B)
Destination	RRC (RNC)
Reporting Trigger	Periodic, event triggered
~~Definition~~Description	The difference of the time of arrival of the UL transmissions in relation to the arrival time of a signal with zero propagation delay. This measurement is applicable for TDD mode ~~cells only.~~

9.3.8 Timeslot ISCP

Measurement	Timeslot ISCP
Source	L1(Node B)
Destination	RRC (RNC)
Reporting Trigger	Periodic or event triggered
~~Definition~~Description	Interference on Signal Code Power, is the interference on the received signal in a specified timeslot ~~measured on the midamble~~. This measurement is applicable is applicable ~~for~~ to TDD ~~cells~~ mode only.

9.3.9 RSCP

Measurement	RSCP
Source	L1(Node B)
Destination	RRC (RNC)
Reporting Trigger	periodic or event triggered
~~Definition~~Description	Received Signal Code Power is the received power on DPCH or PRACH or PUSCH ~~after despreading~~. This measurement is applicable for TDD ~~cells~~ mode only.

9.3.10 Round Trip Time

~~The Round Trip Time (RTT) measurement at a single Node B may provide an estimate of the round trip time of signals between the Node B and the UE and this may be used to calculate a radial distance to the UE within the sector. A group of simultaneous RTT measurements made from a number of Node B or LMU may be used to estimate the location of the UE. The support for this measurement is LCS positioning method dependent.~~

Measurement	Round Trip Time
Source	L1(Node B or LMU)
Destination	RRC (RNC-~~LCS~~UP)
Reporting Trigger	on demand, event triggered
~~Definition~~Description	This is an estimate of the round trip time of signals between the Node B and the UE This measurement is applicable for FDD mode only. ~~The round trip time is measured from the time of transmission of the beginning of a downlink frame to a UE to the time of reception of the beginning of the corresponding uplink frame from the UE.~~

9.3.11 Void ~~Frequency Offset~~

~~The Frequency Offset measures the rate of change (drift) of the Relative Time Difference and may be used to estimate the RTD at the time the UE location measurements are made. The support for this measurement is LCS positioning method dependent.~~

~~Measurement~~	~~Frequency Offset~~
~~Source~~	~~L1(LMU)~~
~~Destination~~	~~RRC (RNC-LCS)~~
~~Reporting Trigger~~	~~On demand, event triggered, periodic~~
~~Definition~~Description	~~The Frequency Offset (FO) measures the rate of change (drift) of the Relative Time Difference of the transmissions of two Node Bs.~~

9.3.12 Acknowledged PRACH preambles

Measurement	Acknowledged PRACH preambles
Source	L1(Node B)
Destination	RRC (RNC)
Reporting Trigger	Periodic, event triggered, On demand
~~Definition~~Description	~~The acknowledged PRACH preambles measurement is defined as the total number of acknowledged PRACH preambles per access frame for each PRACH, where an access frame consists of fifteen access slots from access slot #0 to access slot #14.~~ This measurement indicates ~~is equivalent to~~ the number of positive acquisition indicators transmitted per access frame on each AICH. This measurement is applicable for FDD mode only.

9.3.13 Detected PCPCH access preambles

Measurement	Detected PCPCH Access preambles
Source	L1(Node B)
Destination	RRC (RNC)
Reporting Trigger	Periodic, event triggered, On demand
~~Definition~~Description	This measurement indicates ~~The detected PCPCH access preambles measurement is defined as~~ the total number of detected access preambles per access frame on the PCPCHs belonging to a CPCH set~~, where an access frame consists of fifteen access slots from access slot #0 to access slot #14.~~. This measurement is applicable for FDD mode only.

9.3.14 Acknowledged PCPCH access preambles

Measurement	Acknowledged PCPCH access preambles
Source	L1(Node B)
Destination	RRC (RNC)
Reporting Trigger	Periodic, event triggered, On demand
~~Definition~~Description	~~The acknowledged PCPCH access preambles~~This measurement ~~is defined as~~indicates the total number of acknowledged PCPCH access preambles per access frame on the PCPCHs. , where an access frame consists of fifteen access slots from access slot #0 to access slot #14. ~~This is equivalent to the number of positive acquisition indicators transmitted on the AP-AICH per access frame.~~This measurement is applicable for FDD mode only.

9.3.15 SIR

Measurement	SIR
Source	L1(Node B)
Destination	RRC (RNC)
Reporting Trigger	Periodic, event triggered
~~Definition~~Description	Signal to Interference Ratio,~~Signal to Interference Ratio is defined as (RSCP/ISCP) xSF where:~~ ~~RSCP = Received Signal Code Power, unbiased measurement of the received power on one code.~~ ~~ISCP = Interference Signal Code Power, the interference on the received signal.~~ ~~SF=The used spreading factor.~~ ~~For FDD this is measured on the DPCCH. For TDD this is measured on the DPCH, PRACH or PUSCH.~~

9.3.16 PRACH/PCPCH Propagation Delay

~~The Propagation delay measures the one-way propagation delay as measured during either PRACH or PCPCH access. The propagation delay measurement can be used for DPCH setup, as it allows to minimise the search window, when setting up the uplink DPCH~~.

Measurement	Propagation delay
Source	L1(Node B)
Destination	RRC (RNC)
Reporting Trigger	Event triggered, periodic
~~Definition~~Description	~~The Propagation delay measures t~~The one-way propagation delay as measured during either PRACH or PCPCH access. This measurement is applicable for FDD mode only.

9.3.17 UTRAN GPS Timing of Cell Frames for ~~LCS~~UP

~~The UTRAN GPS Timing of Cell Frames for LCS is an absolute reference time measurement for the arrival of a specific frame for an identified cell within the active set. This measure is applicable for LMUs which support reception of GPS signals for LCS.~~

Measurement	UTRAN GPS Timing of Cell Frames for ~~LCS~~UP
Source	L1 (LMU)
Destination	RRC (RNC-~~LCS~~UP)
Reporting Trigger	On-demand, Event-triggered, Periodic
~~Definition~~Description	~~Time of arrival for the beginning of a frame, (identified by its SFN), measured when the first significant multipath of the cell CPICH reaches the LMU.~~ This is the absolute time reference measurement in respect to GPS Time Of Week for the ~~arrival~~ transmission of ~~this~~ a particular frame.

9.3.18 SIR ERROR

Measurement	SIR ERROR
Source	L1(Node B)
Destination	RRC (RNC)
Reporting Trigger	Periodic, event triggered
~~Definition~~Description	Signal to Interference Ratio Error ~~is defined as SIR – SIR_{target_ave}, where:~~ ~~SIR = the SIR measured by UTRAN.~~ ~~SIR_{target_ave} = the SIR_{target} averaged over the same time period as the SIR used in the SIR ERROR calculation.~~This measurement is applicable for FDD cells only.

3GPP RAN WG2 Meeting #19 **R2-010535**
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CR-Form-v3

CHANGE REQUEST

⌘ **25.302** **CR** **092** ⌘ rev **r1** ⌘ Current version: **3.7.0** ⌘

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

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network ☐

Title:	⌘	Physical channel combinations in TDD
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	***Date:*** ⌘ 20 Feb 2001
Category:	⌘ **F**	***Release:*** ⌘ R99

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	Clarification of possible physical channel configurations
Summary of change:	⌘	- clarify requirement to occassionally read the P-CCPCH of neighbour cells to be able to determine the SFN. - A combination containing DPCH was set as mandatory, because the DPCH will be used by the reference measurment channel during the conformance test. - The single reception of PICH was introduced and set as mandatory. - All combinations with PICH were deleted, because PICH reception is needed in idle mode, CELL_PCH and URA_PCH only - tables 8.5 - 8.7 are removed because they do not provide any additional restrictions or because information is provided elsewhere. Relevant information are moved to 8.3 and 8.4
Consequences if not approved:	⌘	- Important clarification for handover is missing. - clarification on mandatory channels for conformance testing - Possible missunderstanding during reading the channel combinations

Clauses affected:	⌘	8.3, 8.4, 8.5, 8.6, 8.7
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

8.3 TDD Uplink

The table addressesdescribes the possible combinations of TDD physical channels that can be supported in the uplink by one UE simultaneously on the same frequency in any one 10ms frame., where a In TDD a physical channel corresponds to one code, one timeslot, and one frequency. and is mapped to one resource unit (RU). This table addresses combinations of uplink physical channels in the same 10ms frame.

Table 3: TDD Uplink

	Physical Channel Combination	Transport Channel Combination	Mandatory or dependent on UE radio access capabilities	Comment
1	PRACH	RACH	Mandatory	One RACH transport channel maps to one PRACH physical channel.
2	DPCH	One or more DCH coded into a single CCTrCH	Mandatory	The maximum number of DCHs and the maximum channel bit rate are dependent on UE radio access capabilities. This combination is used as reference measurement channel.
2 3	One or more than one DPCH	One or more DCH coded into one or more CCTrCH	Depending on UE radio access capabilities	The maximum number of DCHs and the maximum channel bit rate are dependent on UE radio access capabilities.
3 4	PRACH + one or more DPCH	RACH + one or more DCH coded into one or more CCTrCH	Depending on UE radio access capabilities	One RACH transport channel maps to one PRACH physical channel The maximum number of DCHs and the maximum channel bit rate are dependent on UE radio access capabilities. This combination may be used for shared channel operation only. At least the usage of two timeslots is required.
5 4	One or more PUSCH	One or more USCH coded onto one or more CCTrCH	Depending on UE radio access capabilities	It is assumed here that a USCH transport channel may map to one or more PUSCH physical channels based on system configuration. This combination is used for shared channel operation. USCH requires a control channel (RACH or DCH); however, it is not required to be in the same 10ms frame as the USCH.
6 5	PRACH + one or more PUSCH	RACH + One or more USCH coded on to one or more or more CCTrCH	Depending on UE radio access capabilities	One RACH transport channel maps to one PRACH physical channel. It is assumed here that a USCH transport channel may map to one or more PUSCH physical channels based on system configuration. This combination may be used for shared channel operation only. At least the usage of two timeslots is required.
6 7	One or more PUSCH + one or more DPCH	One or more USCH coded onto one or more CCTrCH + one or more DCH coded into one or more CCTrCH	Depending on UE radio access capabilities	The maximum number of DCHs and the maximum channel bit rate are dependent on UE radio access capabilities. It is assumed here that a USCH transport channel may map to one or more PUSCH physical channels based on system configuration. This combination may be used for shared channel operation.

	Physical Channel Combination	Transport Channel Combination	Mandatory or dependent on UE radio access capabilities	Comment
~~7~~ 8	PRACH + one or more PUSCH + one or more DPCH	RACH + one or more USCH coded onto one or more CCTrCH + one or more DCH coded into one or more CCTrCH	Depending on UE radio access capabilities	~~One RACH transport channel maps to one PRACH physical channel.~~ The maximum number of DCHs and the maximum channel bit rate are dependent on UE radio access capabilities. ~~It is assumed here that a USCH transport channel may map to one or more PUSCH physical channels based on system configuration.~~ This combination may be used for shared channel operation. At least the usage of two timeslots is required.

8.4 TDD Downlink

The table describes the possible combinations of TDD physical channels that can be supported in the downlink by one UE simultaneously on the same frequency in any one 10ms frame, where a TDD physical channel corresponds to one code, one timeslot, and one frequency. and is mapped to one resource unit (RU). This table addresses combinations of downlink physical channels in the same 10ms frame.
Depending on UE radio capabilities UEs may be required to occassionally decode P-CCPCH of its own cell in the following Physical Channel Combinations to maintain open loop power control and/or acquire parameters for RACH access: 4, 6, 7, 8, 9, 10, 11, 12.
Depending on UE radio capabilities UEs may be required to occassionally decode one P-CCPCH of neighbour cells in the following Physical Channel Combinations for handover: 6, 8, 11, 12.

Table 4: TDD Downlink

	Physical Channel Combination	Transport Channel Combination	Mandatory or dependent on UE radio access capabilities	Comment
1	P-CCPCH +and/or One or more S-CCPCH + PICH	BCH and/or PCH and/or one or more FACH	Mandatory	BCH maps to the P-CCPCH in a frame. FACH can map to multiple S-CCPCH in a frame. PCH can map to multiple S-CCPCH in a frame. PICH substitutes one or more paging sub-channels that are mapped on an S-CCPCH assigned for the PCH transport channel.
2	P-CCPCH	BCH	Mandatory	
3	S-CCPCH	FACH or/and PCH	Mandatory	
4	More than one S-CCPCH	one or more FACH+ one ore more PCH	Depending on UE capabilities	
5	PICH	N/A	Mandatory	
62	One Three or more DPCH	One or more DCH coded into one or more CCTrCH	Depending on UE radio access capabilities	The maximum number of DCHs and the maximum channel bit rate are dependent on UE radio access capabilities.
7	One or two DPCH	One or more DCH coded into a single CCTrCH	Mandatory	This combination is used for reference measurement channel.
8	P-CCPCH and/or One or more S-CCPCH + PICH + one or more DPCH	BCH and/or PCH and/or one or more FACH + one or more DCH coded into one or more CCTrCH	Depending on UE radio access capabilities	The number of DCHs and the maximum channel bit rate are dependent on the UE radio access capabilities. This combination is used for shared channel operation only. BCH maps to the P-CCPCH in a frame. FACH can map to multiple S-CCPCH in a frame. PICH substitutes one or more paging sub-channels that are mapped on an S-CCPCH assigned for the PCH transport channel.
94	One or more PDSCH	One or more DSCH coded onto one or more CCTrCH	Depending on UE radio access capabilities	It is assumed here that a DSCH transport channel may map to one or more PDSCH physical channels based on system configuration. DSCH requires a control channel (FACH or DCH).; however, it is not required to be in the same 10ms frame as the DSCH. This combination is used for shared channel operation.

	Physical Channel Combination	Transport Channel Combination	Mandatory or dependent on UE radio access capabilities	Comment
~~5~~10	One or more PDSCH + ~~P-CCPCH and/or~~ one or more S-CCPCH ~~+ PICH~~	~~BCH and/or~~ PCH and/or one or more FACH + one or more DSCH coded onto one or more CCTrCH	Depending on UE radio access capabilities	~~BCH maps to the P-CCPCH in a frame.~~ ~~Each FACH can map to multiple S-CCPCH in a frame.~~ ~~PICH substitutes one or more paging sub-channels that are mapped on an S-CCPCH assigned for the PCH transport channel.~~ ~~It is assumed here that a DSCH transport channel may map to one or more PDSCH physical channels based on system configuration.~~ ~~For the case of DSCH + BCH, DSCH requires a control channel (FACH or DCH); however, it is not required to be in the same 10ms frame as the DSCH.~~ This combination is used for shared channel operation.
11~~6~~	One or more PDSCH + one or more DPCH	One or more DSCH coded onto one or more CCTrCH + one or more DCH coded into one or more CCTrCH	Depending on UE radio access capabilities	The maximum number of DCHs and the maximum channel bit rate are dependent on UE radio access capabilities. ~~It is assumed here that a DSCH transport channel may map to one or more PDSCH physical channels based on system configuration.~~ This combination is used for shared channel operation.

	Physical Channel Combination	Transport Channel Combination	Mandatory or dependent on UE radio access capabilities	Comment
~~7~~12	One or more PDSCH + ~~P-CCPCH and/or~~ one or more S-CCPCH ~~+ PICH~~ + one or more DPCH	~~BCH and/or~~ PCH and/or one or more FACH + one or more DSCH coded onto one or more CCTrCH + one or more DCH coded into one or more CCTrCH	Depending on UE radio access capabilities	~~BCH maps to the P-CCPCH in a frame.~~ ~~Each FACH can map to multiple S-CCPCH in a frame.~~ ~~PICH substitutes one or more paging sub-channels that are mapped on an S-CCPCH assigned for the PCH transport channel.~~ The maximum number of DCHs and the maximum channel bit rate are dependent on UE radio access capabilities. This combination is used for shared channel operation. ~~It is assumed here that a DSCH transport channel may map to one or more PDSCH physical channels based on system configuration.~~

~~8.5 TDD UE Uplink and Downlink Combinations (within 10 ms air frames)~~

~~This table describes the possible uplink and downlink physical channel combinations that can be supported by a UE in TDD mode.~~

~~Table 5: TDD UE Uplink and Downlink Combinations (within 10 ms airframes)~~

	~~DL Physical Channel Combination~~	~~DL Transport Channel Combination~~	~~UL Physical Channel Combination~~	~~UL Transport Channel Combination~~	~~Mandatory or dependent on UE radio access capabilities~~	~~Comment~~
~~1~~	~~P-CCPCH~~		~~PRACH~~	~~RACH~~	~~Mandatory~~	~~One RACH transport channel maps to one PRACH physical channel.~~ ~~P-CCPCH is used for reference power to determine path loss for RACH transmit power calculation.~~
~~2~~	~~P-CCPCH and/or one or more S-CCPCH + PICH~~	~~BCH and/or PCH and/or one or more FACH~~			~~Mandatory~~	~~BCH maps to the P-CCPCH in a frame.~~ ~~FACH or PCH can map to multiple S-CCPCH in a frame.~~
~~3~~	~~P-CCPCH and/or one or more S-CCPCH + PICH~~	~~BCH and/or PCH and/or one or more FACH~~	~~PRACH~~	~~RACH~~	~~Mandatory~~	~~One RACH transport channel maps to one PRACH physical channel~~ ~~BCH maps to the P-CCPCH in a frame.~~ ~~FACH or PCH can map to multiple SCCPCH in a frame.~~ ~~P-CCPCH is used for reference power to determine path loss for RACH transmit power calculation.~~

	DL Physical Channel Combination	DL Transport Channel Combination	UL Physical Channel Combination	UL Transport Channel Combination	Mandatory or dependent on UE radio access capabilities	Comment
4	P-CCPCH and/or one or more S-CCPCH + PICH	BCH and/or PCH and/or one or more FACH	PRACH and one or more DPCH	RACH and one or more DCH coded into one or more CCTrCH	Depending on UE radio access capabilities	The maximum number of DCHs and the maximum channel bit rate are dependent on UE radio access capabilities. BCH maps to P-CCPCH in a frame. FACH or PCH can map to multiple S-CCPCH in a frame. P-CCPCH is used for reference power to determine path loss for RACH and UL- DPCH transmit power calculations.
5	P-CCPCH and/or one or more S-CCPCH + PICH and one or more DPCH	BCH and/or PCH and/or one or more FACH and one or more DCH coded onto one or more CCTrCH	PRACH and one or more DPCH	RACH and one or more DCH coded into one or more CCTrCH	Depending on UE radio access capabilities	The maximum number of DCHs and the maximum channel bit rate are dependent on UE radio access capabilities. See note. BCH maps to P-CCPCH in a frame. FACH or PCH can map to multiple S-CCPCH in a frame. P-CCPCH is used for reference power to determine path loss for RACH and UL- DPCH transmit power calculations.
6	P-CCPCH		One or more DPCH	One or more DCH coded into one or more CCTrCH	Depending on UE radio access capabilities	The maximum number of DCHs and the maximum channel bit rate are dependent on UE radio access capabilities. P-CCPCH is used for reference power to determine path loss for UL- DPCH transmit power calculations.
7	P-CCPCH and one or more DPCH	One or more DCH coded onto one or more CCTrCH	One or more DPCH	One or more DCH coded into one or more CCTrCH	Depending on UE radio access capabilities	The maximum number of DCHs and the maximum channel bit rate are dependent on UE radio access capabilities. P-CCPCH is used for reference power to determine path loss for UL- DPCH transmit power calculations. See note.
NOTE: The requirement for an UL DPCH to exist in every 10 ms frame for DL Power Control, Transmit Diversity, and Joint Pre-distortion is FFS.						

8.6 TDD UE Uplink Timeslot Combinations

This table describes possible uplink physical channels that can be supported by a UE within a specific time slot.

Table 6: TDD UE Uplink Timeslot Combinations

	Physical Channel Combination	Transport Channel Combination	Mandatory or dependent on UE radio access capabilities	Comment
1	PRACH	RACH	Mandatory	Time slots supporting RACH do not support other channel types. One RACH transport channel maps to one PRACH physical channel.
2	One or more DPCH	One or more DCH coded into one or more CCTrCH	Depending on UE radio access capabilities	The maximum number of DCHs and the maximum channel bit rate are dependent on radio access capabilities.
3	One or more PUSCH	One or more USCH coded onto one or more CCTrCH	Depending on UE radio access capabilities	It is assumed here that a USCH transport channel may map to one or more PUSCH physical channels based on system configuration. USCH requires a control channel (RACH/FACH or DCH); however, it is not required to be in the same 10 ms frame as the USCH.
4	One or more PUSCH + one or more DPCH	One or more USCH coded onto one or more CCTrCH + one or more DCH coded into one or more CCTrCH	Depending on UE radio access capabilities	The maximum number of DCHs and the maximum channel bit rate are dependent on UE radio access capabilities. It is assumed here that a USCH transport channel may map to one or more PUSCH physical channels based on system configuration.

8.7 TDD UE Downlink Timeslot Combinations

This table describes possible downlink physical channels that can be supported by a UE within a specific time slot.

Table 7: TDD UE Downlink Timeslot Combinations

	Physical Channel Combination	Transport Channel Combination	Mandatory or dependent on UE radio access capabilities	Comment
1	P-CCPCH and/or one or more S-CCPCH+ PICH	BCH and/or PCH and/or one or more FACH	Mandatory	BCH maps to the P-CCPCH in a frame. FACH can map to multiple S-CCPCH in a frame. PCH can map to multiple S-CCPCH in a frame. PICH substitutes one or more paging sub-channels that are mapped on an S-CCPCH assigned for the PCH transport channel.
2	One or more DPCH	One or more DCH coded into one or more CCTrCH	Depending on UE radio access capabilities	The maximum number of DCHs and the maximum channel bit rate are dependent on radio access capabilities
3	P-CCPCH and/or one or more S-CCPCH+ PICH + one or more DPCH	BCH and/or PCH and/or one or more FACH and one or more DCH coded into one or more CCTrCH	Depending on UE radio access capabilities	The number of DCHs and the maximum channel bit rate are dependent on the UE radio access capabilities. BCH maps to the P-CCPCH in a frame. FACH can map to multiple S-CCPCH in a frame. PICH substitutes one or more paging sub-channels that are mapped on an S-CCPCH assigned for the PCH transport channel.
4	One or more PDSCH	One or more DSCH coded onto one or more CCTrCH	Depending on UE radio access capabilities	It is assumed here that a DSCH transport channel may map to one or more PDSCH physical channels based on system configuration. DSCH requires a control channel (FACH or DCH); however, it is not required to be in the same 10ms frame as the DSCH.
5	P-CCPCH and/or one or more PDSCH + one or more S-CCPCH+ PICH	BCH and/or PCH and/or one or more FACH and one or more DSCH coded onto one or more CCTrCH	Depending on UE radio access capabilities	BCH maps to the P-CCPCH in a frame. Each FACH can map to multiple S-CCPCH in a frame. PICH substitutes one or more paging sub-channels that are mapped on an S-CCPCH assigned for the PCH transport channel. It is assumed here that a DSCH transport channel may map to one or more PDSCH physical channels based on system configuration. For the case of DSCH + BCH, DSCH requires a control channel (FACH or DCH); however, it is not required to be in the same 10ms frame as the DSCH.
6	One or more PDSCH + one or more DPCH	One or more DSCH coded onto one or more CCTrCH + one or more DCH coded into one or more CCTrCH	Depending on UE radio access capabilities	The maximum number of DCHs and the maximum channel bit rate are dependent on UE radio access capabilities. It is assumed here that a DSCH transport channel may map to one or more PDSCH physical channels based on system configuration.
7	One or more PDSCH + P-CCPCH and/or one or more S-CCPCH+ PICH+ one or more DPCH	BCH and/or PCH and/or one or more FACH and one or more DSCH coded onto one or more CCTrCH and one or more DCH coded into one or more CCTrCH	Depending on UE radio access capabilities	BCH maps to the P-CCPCH in a frame. Each FACH can map to multiple S-CCPCH in a frame. PICH substitutes one or more paging sub-channels that are mapped on an S-CCPCH assigned for the PCH transport channel. The maximum number of DCHs and the maximum channel bit rate are dependent on UE radio access capabilities. It is assumed here that a DSCH transport channel may map to one or more PDSCH physical channels based on system configuration.
NOTE: Reference: TS25.221: Physical Channels and Mapping of Transport Channels Onto Physical Channels (TDD).				

3GPP TSG-RAN2 Meeting #19 ***Tdoc R2-010533***
Sophia Antipolis, France, 19th February to 24th February

CR-Form-v3

CHANGE REQUEST

⌘ **25.302** **CR** **094** ⌘ rev **-** ⌘ Current version: **3.7.0** ⌘

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

Title:	⌘	Measurement model clarifications
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	***Date:*** ⌘ 2000-02-23
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	In the measurement model it is unclear how often the event evaluations shall be performed. In case of periodic reporting it is incorrectly stated that the measurement value shall be used for the reporting criteria evaluation. The corresponding clarification for event triggered reporting as defined for periodic reporting regarding that the most recent measurement value shall be used in the event evaluation and reporting is missing.
Summary of change:	⌘	Clarification of measurement model for event triggered reporting what measured value is included in the report, and correction of error for periodical reporting.
Consequences if not approved:	⌘	Relation between measurement model and reporting in 25.331 is unclear

Clauses affected:	⌘	9.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

9 Measurements provided by the physical layer

One of the key services provided by the physical layer is the measurement of various quantities, which are used to trigger or perform a multitude of functions. Both the UE and the UTRAN are required to perform a variety of measurements. The standard will not specify the method to perform these measurements or stipulate that the list of measurements provided in this clause must all be performed. While some of the measurements are critical to the functioning of the network and are mandatory for delivering the basic functionality (e.g., handover measurements, power control measurements), others may be used by the network operators in optimising the network (e.g., radio environment).

Measurements may be made periodically and reported to the upper layers or may be event-triggered (e.g., primary CCPCH becomes better than the previous best primary CCPCH). Another reporting strategy may combine the event triggered and the periodical approach (e.g. falling of link quality below a certain threshold initiates periodical reporting). The measurements are tightly coupled with the service primitives in that the primitives' parameters may constitute some of the measurements.

The list and frequency of measurements, which the physical layer reports to higher layers, is described in this clause. The precision requirements of the measurements are specified in TS 25.103. The detailed definition of the measurements together with the range and mapping is contained in TS 25.215 and TS 25.225.

The measurement quantities measured by the physical layer shall be such that the following principles are applied:

- for handover measurements, the decoding of parameters on the BCCH logical channel of monitored neighbouring cells, should not, in general, be needed for calculating the measurement result. If there is a need to adjust the measurement result with parameters broadcast on the PCCPCH, these parameters shall be provided by the UTRAN in inband measurement control messages. There may be some exceptions to this rule;

EXAMPLE: It may be necessary to decode the SFN of the measured neighbouring cell for time difference measurements.

- in idle mode or in RRC connected mode using common Transport Channels, the UE shall be able to monitor cells for cell reselection, without being required to frequently decode parameters on the BCCH logical channel of the monitored neighbouring cells. The decoding frequency of these parameters, set by the cell reselection algorithm, should be such that UE standby times are not significantly decreased.

9.1 Model of physical layer measurements

This subclause describes a model for how the physical layer measurements are performed. This model applies both to the UE and Node B measurements.

The measurement model for physical layer measurements is represented in the figure 7.

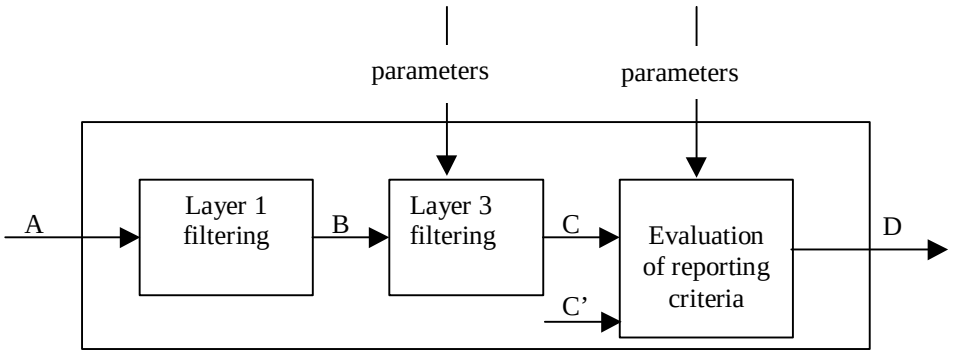

Figure 7: Measurement model

The model is described below:

- **A:** measurements (samples) internal to the physical layer in support to the measurements to be provided to higher layers;

- **Layer 1 filtering:** internal layer 1 filtering of the inputs measured at point A. Exact filtering is implementation dependant. How the measurements are actually executed in the physical layer by an implementation (inputs A and Layer 1 filtering) in not constrained by the standard i.e. the model does not state a specific sampling rate or even if the sampling is periodic or not. What the standard specifies is the performance objective and reporting rate at point B in the model. The performance objectives for the physical layer measurements are specified in [9] and [10];

- **B:** A measurement reported by layer 1 after layer 1 filtering. The reporting rate at point B is defined by the standard and is measurement type specific. It is chosen to be equal to the measurement period over which performance objectives are defined in [9] and [10]. As a consequence, by setting the layer 3 filtering to "no filtering", the performance of the layer 1 implementation can be tested. This means that the physical layer can organise its internal measurements between these reporting at point B to meet the performance requirements;

- **Layer 3 filtering:** Filtering performed on the measurements provided at point B. The Layer 3 filters are standardised and the configuration of the layer 3 filters is provided by RRC signalling (UE measurements) or NBAP signalling (Node B measurements);

- **C:** A measurement after processing in the layer 3 filter. The reporting rate is identical to the reporting rate at point B and is therefore also measurement type specific. Although this is not shown in the figure, one measurement can be used by a multiplicity of evaluation of reporting criteria;

- **Evaluation of reporting criteria:** This checks whether actual measurement reporting is necessary at point D i.e. whether a message need to be sent to higher layers on the radio interface or Iub interface. The evaluation can be based on more than one flow of measurements at reference point C e.g. to compare between different measurements. This is illustrated by input C, C', etc. The UE shall evaluate the reporting criteria at least every time a new measurement result is reported at point C, C´ etc. The reporting criteria are standardised and the configuration is provided by RRC signalling (UE measurements) or NBAP signalling (Node B measurements). Examples are periodic reporting and event based reporting. In case periodical reporting is in use and if the reporting interval is different from the filtering period defined by the layer 3 filter, the last measurement result filtered by the L3 filter shall be ~~is~~ used ~~as the value for reporting criteria evaluation and~~ as the value of the reported result. In case event triggered reporting is in use and the reporting criteria is fulfilled, the last measurement result filtered by the L3 filter shall be used as the value for reporting criteria evaluation and as the value of the reported result. This applies also for any additional measurements that shall be reported as a consequence of the event;

- **D:** a measurement report information (message) sent on the radio or Iub interface.

3GPP TSG-RAN2 Meeting #19 ***R2-010575***
Sophia Antipolis, France, 19-23 February 2001

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CHANGE REQUEST

⌘ **25.302** **CR** **095** ⌘ rev **-** ⌘ Current version: **3.7.0** ⌘

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Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network ☐

Title:	⌘	Removal of DPCCH Gating from R99
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	***Date:*** ⌘ 19 - 02 - 2001
Category:	⌘	**F** ***Release:*** ⌘ R99

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	Align 25.302 to RAN WG1 for R99
Summary of change:	⌘	Removal of DPCCH Gate rate
Consequences if not approved:	⌘	Ambigous specification which could lead to different interpretations for UE manufacturers

Clauses affected:	⌘	10.3.5.6, 10.3.5.8
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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10.3.5.6 Uplink DPDCH+DPCCH

- UL scrambling code.

- ~~DPCCH Gate rate.~~

- DPCCH slot structure (N_{pilot}, N_{TPC}, N_{TFCI}, N_{FBI}).

- Transmission Time offset value.

10.3.5.7 Uplink DPCH

- Timing Advance (TDD only).

- DPCH channelisation code (TDD only).

- Burst Type (TDD only).

- DPCH midamble shift (TDD only).

- Timeslot (TDD only).

- Offset (TDD only).

- Repetition Period (TDD only).

- Repetition length (TDD only).

- TFCI presence (TDD only).

10.3.5.8 Downlink DPCH

- Transmission Time offset value.

- ~~DPCCH Gate rate (FDD only).~~

- DL scrambling code:

  - DL Channelisation code.

- Tx diversity mode:

  - FB mode (FDD only).

- Slot structure ($N_{pilot,}$ N_{TPC}, N_{TFCI}, $N_{FBI,}$, N_{data1}, N_{data2}) (FDD only).

- Special slot structure only for CPCH ($N_{pilot,}$ N_{TPC}, N_{TFCI}, N_{CCC}) (FDD only)

- Burst Type (TDD only).

- DPCH midamble shift (TDD only).

- Timeslot (TDD only).

- Offset (TDD only).

- Repetition period (TDD only).

- Repetition length (TDD only).

- TFCI presence (TDD only).

3GPP TSG-RAN WG2#19
Sofia Antipolis, France, February 19th- 23rd 2000

Tdoc R2-010672

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CHANGE REQUEST

⌘ **25.302** **CR** **096** ⌘ rev **r1** ⌘ Current version: **3.7.0** ⌘

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Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network ☐

Title:	⌘	Clarification of simultaneous operation of DRAC and CTCH
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	***Date:*** ⌘ 2001-02-21
Category:	⌘	**F** ***Release:*** ⌘ R99

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2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	The UE behaviour in case of simultaneous operation of DRAC and CTCH in the same cell has not been specified. This may result in different interpretations and thus in different UE behaviours.
Summary of change:	⌘	A note has been added to indicate how UE with certain capabilities shall listen to DRAC and CTCH info.
Consequences if not approved:	⌘	The lack of specification may result in misinterpretation of the standards, thus putting stronger requirements on UE capabilities than required.

Clauses affected:	⌘	8.2
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

8.2 FDD Downlink

The table describes the possible combinations of FDD physical channels that can be supported in the downlink on the same frequency by one UE at any one time.

Table 2: FDD Downlink

	Physical Channel Combination	Transport Channel Combination	Mandatory dependent on UE radio access capabilities	Comment
1	PCCPCH	BCH	Mandatory	
2	SCCPCH	FACH Or PCH Or FACH + PCH	Mandatory	The maximum channel bit rate that can be supported is dependent on the UE radio access capabilities. The PCH is included when the UE needs to receive paging on the SCCPCH. The reception of (FACH + PCH) is to enable the reception of broadcast services on the CTCH, mapped to the FACH.
3	PCCPCH + SCCPCH	BCH + (FACH or PCH or (FACH + PCH))	Mandatory	Simultaneous reception of PCCPCH and SCCPCH is only needed at occurrences when the UE needs to read system information on BCH while being in CELL_FACH state, i.e. continuous reception of both PCCPCH and SCCPCH at the same time is not required. The requirement holds for PCCPCH and SCCPCH sent in different cells or in the same cell. The PCH is included when the UE needs to receive paging on the SCCPCH. The reception of (FACH + PCH) is to enable the reception of broadcast services on the CTCH, mapped to the FACH.
4	SCCPCH + AICH	(FACH or PCH or (FACH + PCH))+ RACH in uplink Or (FACH or PCH or (FACH + PCH))+ CPCH in uplink	Mandatory	The maximum channel bit rate that can be supported is dependent on the UE radio access capabilities. The PCH is included when the UE needs to receive paging on the SCCPCH. The reception of (FACH + PCH) is to enable the reception of broadcast services on the CTCH, mapped to the FACH. This physical channel combination facilitates the preamble portion of the CPCH in the uplink
5	SCCPCH + DPCCH	(FACH or PCH or (FACH + PCH))+ CPCH in uplink	Depending on UE radio access capabilities	This physical channel combination facilitates the message portion of the CPCH in the uplink The PCH is included when the UE needs to receive paging on the SCCPCH. The reception of (FACH + PCH) is to enable the reception of broadcast services on the CTCH, mapped to the FACH.
6	More than one SCCPCH	More than one (FACH or PCH or (FACH + PCH))	Depending on UE radio access capabilities	The PCH is included when the UE needs to receive paging on the SCCPCH. The reception of (FACH + PCH) is to enable the reception of broadcast services on the CTCH, mapped to the FACH.
7	PICH	N/A	Mandatory	
8	DPCCH + DPDCH	One or more DCH coded into a single CCTrCH	Mandatory	The maximum number of DCHs and the maximum channel bit rate are dependent on UE radio access capabilities.
9	DPCCH + more than one DPDCH	One or more DCH coded into a single CCTrCH	Depending on UE radio access capabilities	The maximum number of DCHs and the maximum channel bit rate are dependent on UE radio access capabilities.

	Physical Channel Combination	Transport Channel Combination	Mandatory dependent on UE radio access capabilities	Comment
10	One or more PDSCH + DPCCH + one or more DPDCH	One or more DSCH coded into a single CCTrCH + one or more DCH coded into a single CCTrCH	Depending on UE radio access capabilities	The maximum number of DCHs and the maximum channel bit rate are dependent on UE radio access capabilities.
11	SCCPCH + DPCCH + one or more DPDCH	FACH + one or more DCH coded into a single CCTrCH	Depending on UE radio access capabilities	The maximum number of DCHs and the maximum channel bit rate are dependent on UE radio access capabilities. This combination of physical channels is used for DRAC control of an uplink DCH and for receiving services such as cell broadcast or multicast whilst in connected mode.NOTE 1
12	SCCPCH + one or more PDSCH + DPCCH + one or more DPDCH	FACH + one or more DSCH coded into a single CCTrCH + one or more DCH coded into a single CCTrCH	Depending on UE radio access capabilities	The maximum number of DCHs and the maximum channel bit rate are dependent on UE radio access capabilities. This combination of physical channels is used for simultaneous DSCH and DRAC control of an uplink DCH.NOTE 1
13	One DPCCH + more than one DPDCH	More than one DCH coded into one or more CCTrCH	Depending on UE radio access capabilities	

NOTE1: When both DRAC and CTCH are configured in one cell, the UTRAN should transmit DRAC info and CTCH info on the same S-CCPCH in order to minimize the number of S-CCPCH to be read by the UE. A UE which supports the simultaneous reception of S-CCPCH and DPCH, shall be capable of switching between different S-CCPCH in order to listen to DRAC info and CTCH info that are not scheduled in the same time intervals. If the UE is ordered to listen to CTCH and DRAC info on different S-CCPCH in the same time interval, it shall listen to DRAC info in priority.