TSG-RAN Meeting #7 **_RP-000035_**
Madrid, Spain, 13 – 15 March 2000

Title: **Agreed CRs to TS 25.302**

Source: **TSG-RAN WG2**

Agenda item: **6.3.3**

Doc-1st-	Spec	CR	Rev	Subject	Cat	Version	Versio
R2-000273	25.302	032	2	Revision of CPCH model	C	3.3.0	3.4.0
R2-000190	25.302	033	1	Error Correction Coding for FACH	B	3.3.0	3.4.0
R2-000648	25.302	034	3	Revision of compressed mode	C	3.3.0	3.4.0
R2-000246	25.302	036		TrBLK size	D	3.3.0	3.4.0
R2-000346	25.302	037		PDSCH multi-code	F	3.3.0	3.4.0
R2-000532	25.302	038	1	Primitives for CPCH Abnormal Situation	B	3.3.0	3.4.0
R2-000399	25.302	039		Physical channel BER	F	3.3.0	3.4.0
R2-000439	25.302	041		Editorial modification on AMR trblk size	F	3.3.0	3.4.0
R2-000501	25.302	042	1	Corrections and clarifications on L1 and	F	3.3.0	3.4.0
R2-000528	25.302	043	1	Transport Block Transmission	F	3.3.0	3.4.0
R2-000516	25.302	044		Clarification to layer 1 model regarding	D	3.3.0	3.4.0
R2-000569	25.302	045		Removal of SCH and SCCH	F	3.3.0	3.4.0
R2-000593	25.302	046		Replacement of Time of Arrival	D	3.3.0	3.4.0
R2-000655	25.302	047	1	Incorporation of Measurement filtering	F	3.3.0	3.4.0
R2-000644	25.302	048		Separation of physical channel BER	C	3.3.0	3.4.0

3GPP TSG-RAN Meeting #7
Madrid, Spain, 13 - 15 March 2000

Document R2-000273
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.

25.302 CR 032r2 Current Version: 3.3.0

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

For submission to: TSG-RAN #7	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: TSG-RAN WG2 **Date:** 2000-01-21

Subject: Revision of CPCH model

Work item:

Category:				**Release:**		
	F	Correction			Phase 2	
	A	Corresponds to a correction in an earlier release			Release 96	
(only one category	B	Addition of feature			Release 97	
shall be marked	C	Functional modification of feature	X		Release 98	
with an X)	D	Editorial modification			Release 99	X
					Release 00	

Reason for change: A revised model for CPCH incorporating CPCH status monitoring, Versatile Channel Assignment Method (VCAM), and UE Channel Selection (UCS) has been agreed. CPCH procedure is therefore required to be changed.

Clauses affected: 6.1, 6.3, 10.1, 10.1.1 through 10.1.7, 10.2.2.11, 10.3.2 through 10.3.5, 10.3.5.1 through 10.3.5.17

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:

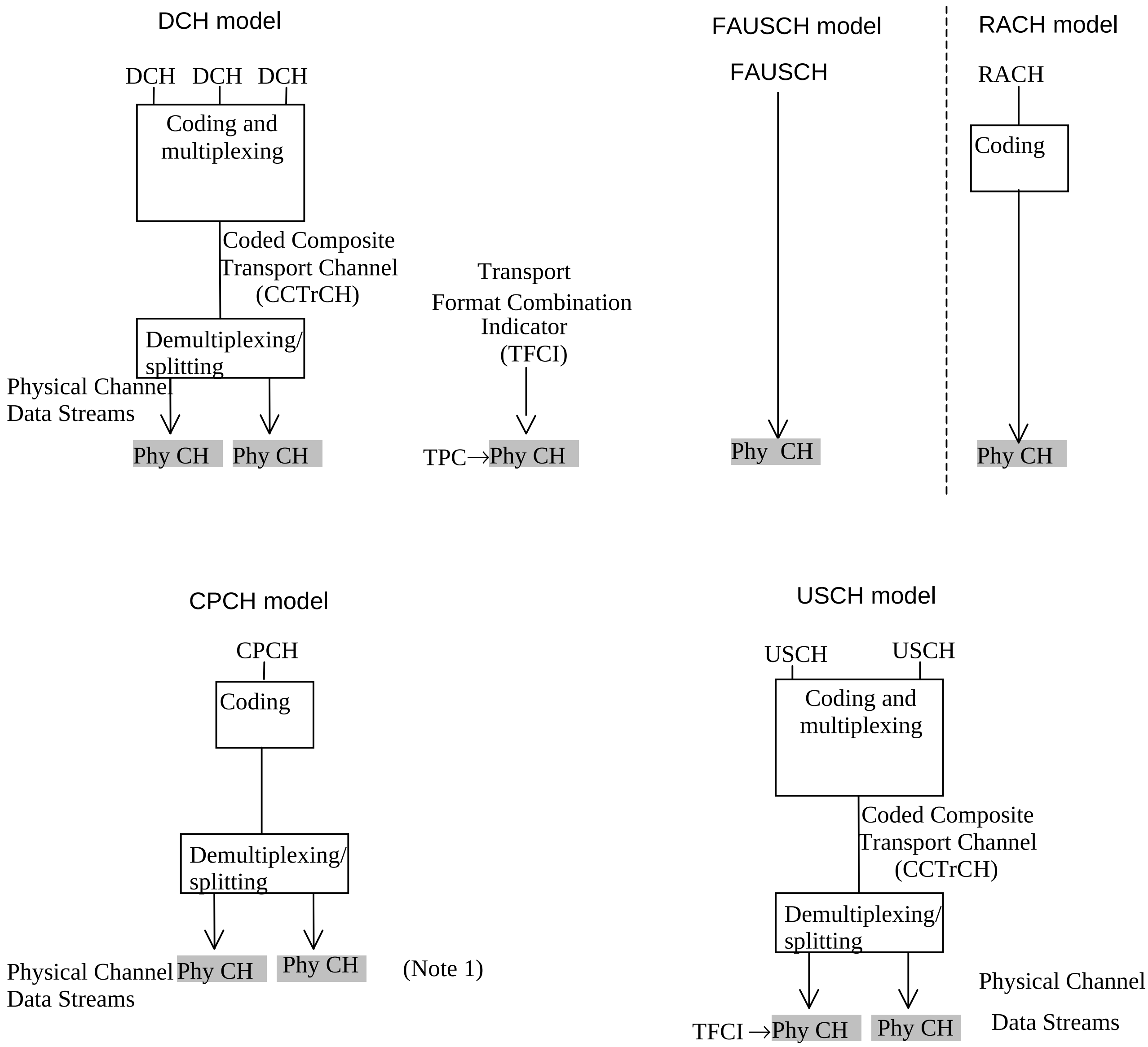

help.doc

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

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 ~~two models:~~ the models for DCH, ~~model and~~ RACH, ~~model~~ FAUSCH, 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: Only the data part of the CPCH can be mapped on multiple physical channels (in case of multi-code PCPCH)
Note 2: FAUSCH and CPCH are for FDD only.
Note 3: USCH is for TDD only.

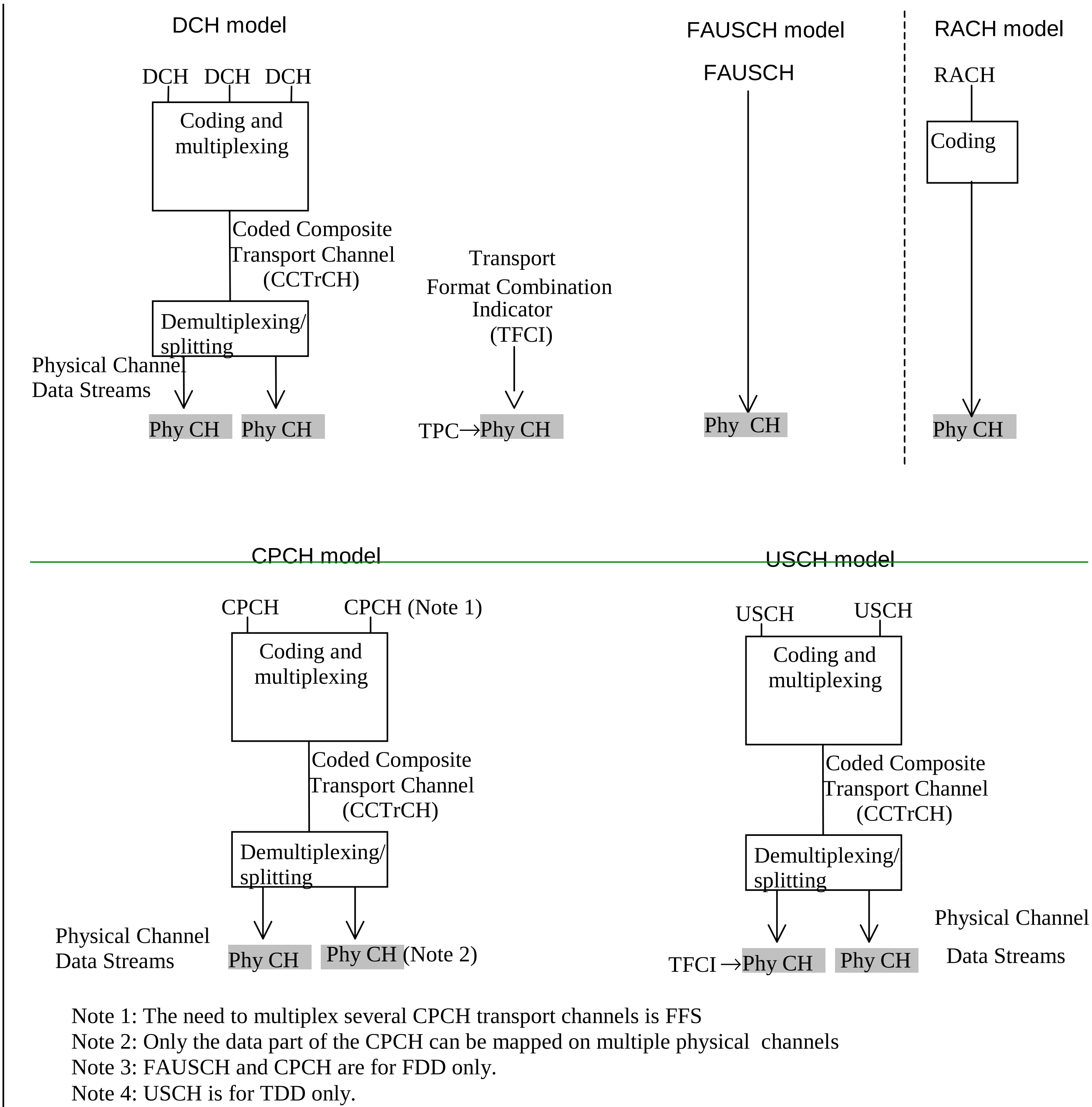


Figure 2: Model of the UE's physical layer – uplink

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 this 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.

For the FAUSCH, there is no coding, since the FAUSCH is only used for the transmission of a reservation request by sending an up-link signalling code (USC) at the time-offset allocated for the specific UE during the 10 ms frame. Due to the fixed time-offset allotted to a specific UE, the FAUSCH is a dedicated control channel.

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, i.e. there is no physical layer multiplexing of RACH. Service multiplexing is handled by the MAC layer.

The CPCH, which is another common type transport channel, has a physical layer model as shown in ~~the above ~~F~~f~~igure 2. 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. Demultiplexing/splitting applies to multicode PCPCH physical channels. 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.

6.2 Downlink models

Figure 3 and Figure 4 show the model of the UE's physical layer for the downlink in FDD and TDD mode, respectively. Note that there is a different model for each transport channel type.

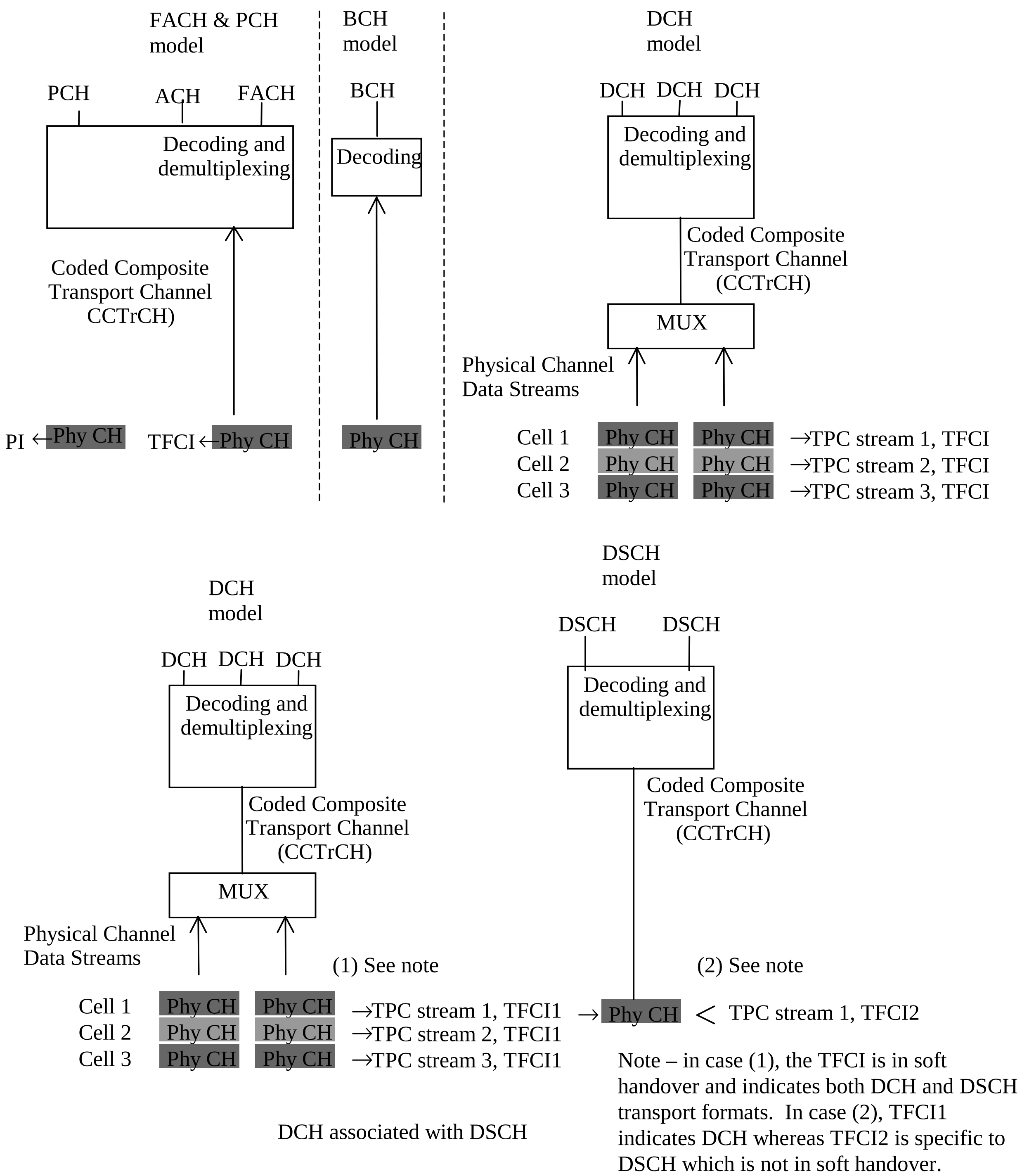


Figure 3: Model of the UE's physical layer – downlink FDD mode

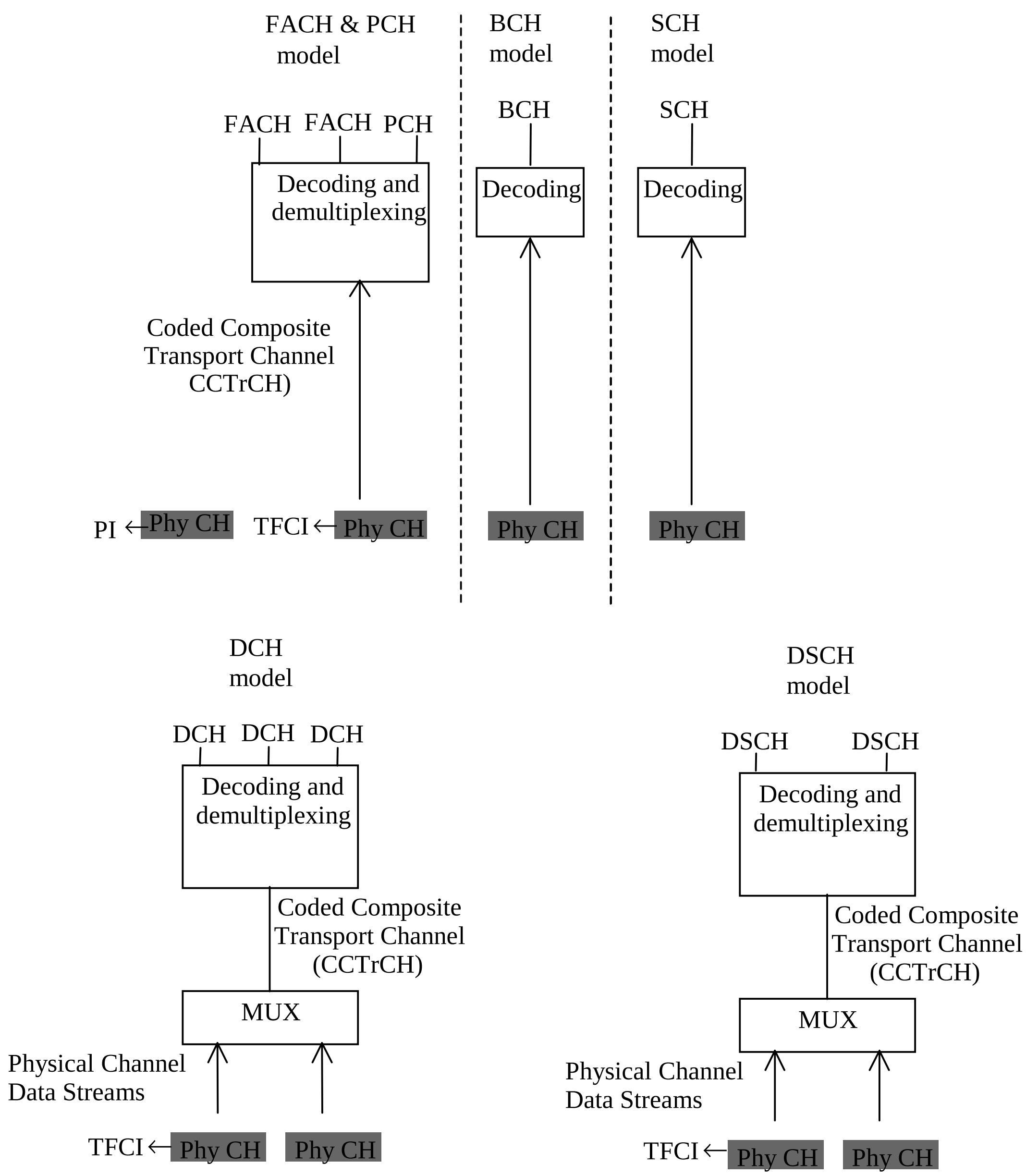


Figure 4: Model of the UE's physical layer – downlink TDD mode

For the DCH case, the mapping between DCHs and physical channel data streams works in the same way as for the uplink. Note however, that the number of DCHs, the coding and multiplexing etc. may be different in uplink and downlink.

In the FDD mode, the differences are mainly due to the soft and softer handover. Further, the pilot, TPC bits and TFCI are time multiplexed onto the same physical channel(s) as the DCHs. Further, the definition of physical channel data stream is somewhat different from the uplink. 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.

Note that it is logically one and the same physical data stream in the active set of cells, even though physically there is one stream for each cell. The same processing and multiplexing is done in each cell. The only difference between the cells is the actual codes, and these codes correspond to the same spreading factor.

The physical channels carrying the same physical channel data stream are combined in the UE receiver, excluding the pilot, and in some cases the TPC bits. TPC bits received on certain physical channels may be combined provided that UTRAN has informed the UE that the TPC information on these channels is identical.

A PCH and one or several FACH can be encoded and multiplexed together forming a CCTrCH. Similarly as in the DCH model there is one TFCI for each CCTrCH for indication of the transport formats used on each PCH and FACH. The PCH is associated with a separate physical channel carrying page indicators (PIs) which are used to trigger UE reception of the physical channel that carries PCH. A FACH or a PCH can also be individually mapped onto a separate physical channel. The BCH is always mapped onto one physical channel without any multiplexing with other transport channels.

In the TDD mode there is the SCH in addition (not shown in Figure 4).

6.3 Relay link Model

The Relay link applies to the TDD mode only.

Figure 4 illustrates the model of the UE's physical layer for the TDD mode.

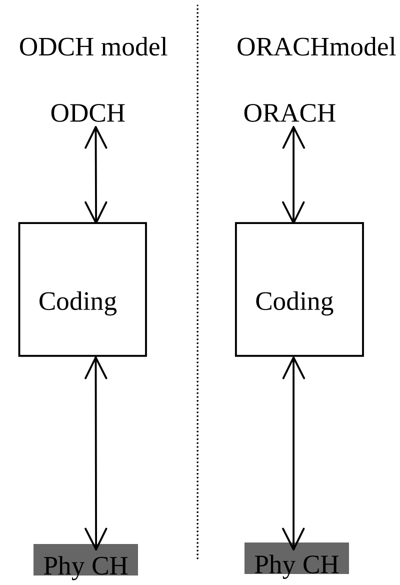


Figure 5: Model of the UE's physical laye–r - relay link TDD mode.

The ORACH is a channel used within UE's to transmit and receive probing messages, and also to transmit and receive small packets of information. The ODCH is used to transmit larger amounts of data over a number of hops between UE's.

10 Primitives of the physical layer

The Physical layer interacts with other entities as illustrated in Figure 1. The interactions with the MAC layer and the RRC layer are shown in terms of primitives where the primitives represent the logical exchange of information and control between the physical layer and higher layers. They do not specify or constrain implementations. The (adjacent) layers connect to each other through Service Access Points (SAPs). Primitives, therefore, are the conveyers of the information exchange and control through SAPs.

Three types of primitives are used for this document, as follows.

- **REQUEST:**

  This type is used when a higher layer is requesting a service from a lower layer

- **INDICATION:**

  This type is used by a lower layer providing a service to notify its higher layer of activities concerning that higher layer

- **CONFIRM:**

This type is used by a lower layer providing the requested service to confirm to the higher layer that the activity has been completed.

The primitives defined below are for local communications between MAC and L1, as well as RRC and L1 in the same protocol stack.

For the physical layer two sets of primitives are defined

* **Primitives between layer 1 and 2:**

PHY - Generic name - Type: Parameters

* **Primitives between layer 1 and the RRC entity:**

CPHY - Generic name - Type: Parameters.

NOTE: This is a logical description of the primitives and does not cover addressing aspects (e.g. Transport Channel ID, Physical Channel ID, start frame number or disconnect frame number).

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

NOTE: 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.

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 synchronis~~z~~ation has been established and that the physical layer is ready for data transmission using the PHY-Data primitive.

Primitive Type: confirm.

Parameters:

- Access information

10.1.3~~1~~ 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} ~~FN_{CELL}~~
- Page indicators (PIs) (PCH only)

10.1.4~~2~~ PHY- Data-IND

The PHY-DATA primitives are used to indicate SDUs used for Layer 2 passed to and from the physical layer. One PHY-DATA primitive is submitted every Transmission Time Interval for each Transport Channel.

Primitive Type: indicate

Parameters:

- TFI
- Transport Block Set
- CRC check result
- TD (RX Timing Deviation measurement) (optional, TDD only)

10.1.5 PHY-CPCH_Status-REQ

The PHY-CPCH_STATUS-REQ primitive is used by MAC to request CPCH status information which is broadcast on CSICH. The parameter Transport Format subset allows to restrict the CPCH status information request to a limited number of CPCH channels of the given CPCH set.

Primitive Type: Request

Parameters:

- Transport Format subset

10.1.6 PHY-CPCH_Status-CNF

The PHY-CPCH_STATUS-CNF primitive is used by L1 to indicate CPCH status information which is broadcast on CSICH. Status information is represented in terms of a Transport format subset which is permitted to be employed by the UE.

Primitive Type: Confirm

Parameters:

- Transport Format subset

10.1.~~3~~7 PHY-Status-IND

The PHY-STATUS primitive can be used by the layer 1 to notify higher layers of an event that has occurred.

Primitive Type: indication

Parameters:

- Event value

10.2 Generic names of primitives between layers 1 and 3

The status primitives between layer 1 and 3 are shown in Table 9.

Table 9: Status primitives between layer 1 and 3

Generic Name	Parameters
CPHY-Sync-IND	none
CPHY-Out-of-Sync-IND	none
CPHY-Measurement-REQ	Measurement parameters
CPHY-Measurement-IND	Measurement parameters
CPHY-ERROR-IND	Error Code

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 reception.

Primitive Type: indication

Parameters:

- none

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 reception.

Primitive Type: indication

Parameters:

- none

10.2.1.3 CPHY-Measurement-REQ

The Request primitive is used for RRC to configure L1 measurements.

Primitive Type: request

Parameters:

- transmission power threshold
- Refer to section 9 for measurement parameters

10.2.1.4 CPHY-Measurement-IND

The Indication primitive is used to report the measurement results

Primitive Type: indication

Parameters:

- Refer to Section 9 for measurement parameters

10.2.1.5 CPHY-ERROR-IND

The CPHY-ERROR primitive is used to indicate to the management entity that an error has occurred as a result of a physical layer fault.

Primitive Type: indication

Parameters:

- Error Code

10.2.2 CONTROL PRIMITIVES

The control primitives between layer 1 and 3 are shown in Table 10

Table 10: Control primitives between layer 1 and 3

Generic Name	Parameters
CPHY-TrCH-Config-REQ	Transport channel description,
CPHY-TrCH-Config-CNF	
CPHY-TrCH_Release-REQ	
CPHY-TrCH_Release-CNF	
CPHY-RL-Setup-REQ	Physical channel description
CPHY-RL-Setup-CNF	none
CPHY-RL-Release-REQ	none
CPHY-RL-Release-CNF	none
CPHY-RL-Modify-REQ	Physical channel description
CPHY-RL-Modify-CNF	none
CPHY-Commit-REQ	Activation Time

10.2.2.1 CPHY-TrCH-Config-REQ

This primitive is used for setting up and configuring a transport channel, and also to modify an existing transport channel.

Primitive Type: request

Parameters:

- Transport channel description

10.2.2.2 CPHY-TrCH-Config-CNF

This primitive is used for confirming the setting up and configuring a transport channel, and also modifying an existing transport channel.

Primitive Type: confirm

Parameters:

- none

10.2.2.3 CPHY-TrCH-Release-REQ

This primitive is used for releasing a transport channel.

Primitive Type: request

Parameters:

- none

10.2.2.4 CPHY-TrCH-Release-CNF

This primitive is used for confirming the releasing a transport channel.

Primitive Type: confirm

Parameters:

- none

10.2.2.5 CPHY-RL-Setup-REQ

The Request primitive is sent from RRC to L1 for establishment of a Radio link to a certain UE.

Primitive Type: request

Parameters:

Physical channel description

10.2.2.6 CPHY-RL-Setup-CNF

The Confirm primitive is returned from L1 to RRC when the Radio link is established. In case L1 is unable to execute the request, this is indicated in the confirm primitive.

Primitive Type: confirm

Parameters:

- none

10.2.2.7 CPHY-RL-Release-REQ

The Request primitive is sent from RRC to L1 for release of a Radio link to a certain UE.

Primitive Type: request

Parameters:

- none

10.2.2.8 CPHY-RL-Release-CNF

The Confirm primitive is returned from L1 to RRC when the radio link is released.

Primitive Type: confirm

Parameters:

- none

10.2.2.9 CPHY-Modify-REQ

The Request primitive is sent from RRC to L1 for modification of a Radio link to a certain UE.

Primitive Type: request

Parameters:

- Physical channel description

10.2.2.10 CPHY-RL-Modify-CNF

The Confirm primitive is returned from L1 to RRC when the radio link is modified. In case L1 is unable to execute the request, this is indicated in the confirm primitive.

Primitive Type: confirm

Parameters:

- none

10.2.2.11 CPHY-Commit-REQ

This primitive is sent from RRC to L1 to synchronise UE and NW for the physical channel modification.

Primitive Type: request

Parameters:

- Activation time

10.3 Parameter definition

10.3.1 Error code

- Hardware failure

10.3.2 Event value

- Maximum transmission power has been reached
- Allowable transmission power has been reached
- —Average transmission power is below allowable transmission power
- Loss of DL DPCCH
- Emergency stop of CPCH transmission

10.3.3 Access Information

- Ready for RACH data transmission (in case of FDD mode: when Ack on AICH has been received)

The following values of this parameter apply to FDD only:

- NACK on AICH or AP-AICH has been received
- Timeout, no response on AICH or AP-AICH has been received while maximum number of access preamble transmissions has been performed
- Ready for CPCH data transmission (CD or CD/CA information received on CD-ICH or CD/CA-ICH, respectively)
- Mismatch of CD-ICH or CD/CA-ICH signatures
- No response on CD-ICH or CD/CA-ICH received
- Timeout, no CD/CA-ICH received

10.3.4 Transport Format Subset

- A subset of the Transport Format set of a Transport Channel

10.3.~~3~~5 Physical channel description

10.3.~~3~~5.1 Primary SCH

- Tx diversity mode

10.3.~~3~~5.2 Secondary SCH

- Tx diversity mode

10.3.~~3~~5.3 Primary CCPCH

- Frequency info
- DL scrambling code
- Tx diversity mode
- Timeslot (TDD only)
- Burst type (TDD only)
- Offset (TDD only)
- Repetition period (TDD only)
- Repetition length (TDD only)

10.3.~~3~~5.4 Secondary CCPCH

- DL scrambling code
- Channelisation code
- Tx diversity mode
- Timeslot (TDD only)

- Burst type (TDD only)
- Midamble shift (TDD only)
- Offset (TDD only)
- Repetition period (TDD only)
- Repetition length (TDD only)
- TFCI presence (TDD only)

10.3.5~~3~~.5 PRACH

NOTE: The PRACH can also be used to map the FAUSCH Transport Channel

- Access Slot
- Preamble spreading code (FDD only)
- Preamble signature (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 Selection
  - Preamble signature classification information
- AICH transmission timing parameter (FDD only)
- Timeslots (TDD only)
- Spreading codes (TDD only)
- Midamble codes (TDD only)

10.3.5~~3~~.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~~3~~.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~~3~~.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 ($N_{pilo,}$ N_{TPC}, N_{TFCI}, $N_{FBI,}$, N_{data1}, N_{data2}) (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)

10.3.5~~3~~.9 PCPCH (Physical Common Packet Channel)

- ~~—~~CPCH Set ID to which this PCPCH belongs
- Parameters related to the AP preamble~~.~~
  - ~~UE~~ Access Preamble (AP) scrambling code
  - Available AP signatures/subchannels for access request
- Parameters related to the CD preamble
  - ~~UL~~ CD preamble scrambling code
  - Available CD signatures/subchannels
- Parameters related to PCPCH message part
  - PCPCH ~~UL~~ scrambling code
  - PCPCH ~~UL~~ multirate c~~C~~hannelisation code
  - ~~DPCCH DL Channelisation code~~
  - Data rate (spreading factor)
  - N_frames_max: Maximum ~~packet~~ length of CPCH message in radio frames

- ~~Signature set: set of preamble signatures for AP to access this CPCH~~

10.3.5~~3~~.10 PICH

- Scrambling code
- Channelisation code
- Timeslot (TDD only)
- Burst Type (TDD only)
- Midamble shift (TDD only)
- Offset (TDD only)
- Repetition period (TDD only)
- Repetition length (TDD only)

10.3.5~~3~~.11 AICH

- Scrambling code
- Channelisation code
- Tx diversity mode

NOTE: T~~t~~he value for the parameters needs to be consistent with the corresponding PRACH.

10.3.5.12 AP-AICH

- CPCH Set ID
- Scrambling code
- Channelisation code
- Tx diversity mode

10.3.5.13 CD-ICH

- CPCH Set ID
- Scrambling code
- Channelisation code
- Tx diversity mode

NOTE: This physical channel is used in conjunction with PCPCH when UE Channel Selection is active.

10.3.5.14 CD/CA-ICH

- CPCH Set ID
- Scrambling code
- Channelisation code

- Tx diversity mode

NOTE: This physical channel is used in conjunction with PCPCH when Channel Assignment is active.

10.3.5.15 CSICH

- CPCH Set ID
- Scrambling code
- Channelisation code
- Tx diversity mode

NOTE: T~~t~~he values for the parameters need to be consistent with the AP-AICH which is time-multiplexed with this CSICH

10.3.5~~3~~.16~~2~~ PDSCH

- Scrambling code
- Channelisation code
- Tx diversity mode
  - FB mode (FDD only)
- DL channelisation code (TDD only)
- Burst Type (TDD only)
- PDSCH 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~~3~~.17~~3~~ PUSCH

- PUSCH channelisation code
- Burst Type (TDD only)
- PUSCH midamble shift (TDD only)
- Timeslot (TDD only)
- Offset (TDD only)
- Repetition period (TDD only)
- Repetition length (TDD only)
- TFCI presence (TDD only)
- Timing Advance (TDD only)

3GPP TSG-RAN Meeting #7
Madrid, Spain, 13 - 15 March 2000

Document ***R2-000190***
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.

25.302 CR 033r1 Current Version: 3.3.0

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

For submission to:	TSG-RAN #7	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: TSG-RAN WG2 **Date:** 2000-01-17

Subject: Error Correction Coding for FACH

Work item:

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

F	Correction		**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature	X		Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: Alignment with decision in RAN WG1 to add the option of no coding and turbo coding for the FACH (cf LS in Tdoc R2-000026).

Clauses affected: 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:

help.doc

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

Annex A (normative): Description of Transport Formats

The following table describes the characterisation of a Transport Format.

Table A.1: Characterisation of Transport Format

		Attribute values	**BCH**	**PCH**	**FACH**	**RACH**
Dynamic part	Transport Block Size	1 to 5000 1 bit granularity	246	1 to 5000 1 bit granularity	1 to 5000 1 bit granularity	1 to 5000 1 bit granularit
	Transport Block Set Size	1 to 200000 1 bit granularity	246	1 to 200000 1 bit granularity	1 to 200000 1 bit granularity	1 to 200000 1 bit granularit
	Transmission Time Interval (option for TDD only)	10, 20 ms, 40 and 80 ms				
Semi-static part	Transmission Time Interval (FDD, option for TDD NRT bearers)	10, 20 ms, 40 and 80 ms	20ms	10ms for FDD, 10ms, 20ms, 40ms and 80ms for TDD	10, 20 ms, 40 and 80 ms	10ms and 20m FDD, 10ms for TDD
	Type of channel coding	No coding Turbo coding Convolutional coding	Convolutional coding	Convolutional coding	No coding, Turbo coding Convolutional coding	Convolutional coding
	code rates	1/2, 1/3	1/2	1/2	1/2, 1/3	1/2
	CRC size	0, 8, 12, 16, 24	16	0, 8, 12, 16, 24	0, 8, 12, 16, 24	0, 8, 12, 16, 24
	Resulting ratio after static rate matching	0.5 to 4				

		Attribute values	CPCH	DCH	DSCH	USCH
Dynamic part	Transport Block Size	1 to 5000 1 bit granularity	1 to 5000 1 bit granularity	1 to 5000 1 bit granularity	1 to 5000 1 bit granularity	1 to 5000 1 bit granularity
	Transport Block Set Size	1 to 200000 1 bit granularity	1 to 200000 1 bit granularity	1 to 200000 1 bit granularity	1 to 200000 1 bit granularity	1 to 200000 1 bit granularity
	Transmission Time Interval (option for TDD only)	10, 20 ms, 40 and 80 ms		10, 20 ms, 40 and 80 ms	10, 20 ms, 40 and 80 ms	10, 20 ms, 40 and 80 ms
Semi-static part	Transmission Time Interval (FDD, option for TDD NRT bearers)	10, 20 ms, 40 and 80 ms		10, 20 ms, 40 and 80 ms	10, 20 ms, 40 and 80 ms	10, 20 ms, 40 and 80 ms
	Type of channel coding	No coding Turbo coding Convolutional coding	No coding Turbo coding Convolutional coding	No coding Turbo coding Convolutional coding	No coding Turbo coding Convolutional coding	No coding Turbo coding Convolutional coding
	code rates (in case of convolutional coding)	1/2, 1/3	1/2, 1/3	1/2, 1/3	1/2, 1/3	1/2, 1/3
	CRC size	0, 8, 12, 16, 24		0, 8, 12, 16, 24	0, 8, 12, 16, 24	0, 8, 12, 16, 24
	Resulting ratio after static rate matching	0.5 to 4				

NOTE 1: The maximum size of the Transport Block has been chosen so as to avoid any need for segmentation in the physical layer into sub-blocks (segmentation should be avoided in the physical layer).

NOTE 2: Code rate is fixed to 1/3 in case of Turbo coding.

NOTE 3: All channels using the same resources as the BCH (i.e. the same timeslot and code, e.g. in a multiframe pattern) have to use different Transport Formats than the BCH to allow the identification of the BCH channel by physical layer parameters. Due to the differing parameters, decoding of other transport channels than BCH will result in an erroneous CRC.

3GPP TSG RAN WG2 Meeting #11
Torino, Italy, 28 Feb-03 March 2000

Document ***R2-000648***

CHANGE REQUEST

25.302 CR 034r3 Current Version: 3.3.0

For submission to: TSG-RAN #7	for approval	X	strategic	
	for information		non-strategic	

Proposed change affects: (U)SIM [ ] ME [X] UTRAN / Radio [X] Core Network [ ]

Source:	TSG-RAN WG2	**Date:**	2nd Mar. 2000
Subject:	Revision of compressed mode description		
Work item:			

Category:				**Release:**		
	F	Correction			Phase 2	
(only one category shall be marked with an X)	A	Corresponds to a correction in an earlier release			Release 96	
	B	Addition of feature			Release 97	
	C	Functional modification of feature	X		Release 98	
	D	Editorial modification			Release 99	X
					Release 00	

Reason for change: This CR removes overlapping parts of information from 25.302, which are described in RAN WG1 specifications. Two parameters TGPSI and TGMP are added and the handling of overlapping gaps is specified.

Clauses affected: 2, 7.3

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:

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

[1] 3G TS 23.110: "UMTS Access Stratum; Services and Functions"

[2] 3G TS 25.301: "Radio Interface Protocol Architecture"

[3] 3G TS 25.212: "Multiplexing and channel coding (FDD)"

[4] 3G TS 25.222: "Multiplexing and channel coding (TDD)"

[5] 3G TS 25.224: "Physical Layer Procedures (TDD)"

[6] 3G TS 25.215: "Physical Layer – Measurements (FDD)"

[7] 3G TS 25.213: "Spreading and modulation (FDD)"

[8] 3G TS 25.214: "Physical layer procedures (FDD)"

7.3 Compressed Mode

Compressed Mode is defined as the mechanism whereby certain idle periods are created in radio frames so that the UE can perform measurements during these periods (more details can be found in [3]).

Compressed Mode is obtained by layer 2 using transport channels provided by the layer 1 as follows:

- Compressed Mode is controlled by the RRC layer, which configures the layer 2 and the physical layer
- The number of occurrences of compressed frames is controlled by RRC, and can be modified by RRC signalling
- ~~The compression of frames can be either cyclic (typically for circuit services) in a compressed mode pattern (defined below) or a-periodic (typically for NRT services)~~
- It is under the responsibility of the layer 2 if necessary and if possible to either buffer some layer 2 PDUs (typically at the RLC layer for NRT services) or to rate adapt the data flow (similarly to GSM) so that there is no loss of data because of compressed mode. This will be service dependent and controlled by the RRC layer.

For measurements in compressed mode, a transmission gap pattern sequence is defined. A transmission gap pattern sequence consists of alternating transmission gap patterns 1 and 2, and each of these patterns in turn consists of one or two transmission gaps. The transmission gap pattern structure, position and repetition are defined with physical channel parameters described in [3]. In addition, the UTRAN configures compressed mode pattern sequences with the the following parameters:

- TGMP: Transmission Gap pattern sequence Measurement Purpose: This parameter defines the purpose this transmission gap pattern sequence is intended for. The following values are used: 'TDD measurement', 'FDD measurement', 'GSM measurement', 'Other'.
- TGPSI: Transmission Gap Pattern Sequence Identifier selects the compressed mode pattern sequence for which the parameters are to be set. The range of TGPSI is [1 to <MaxTGPS>].

~~The following parameters characterise a transmission gap :~~

- ~~TGL : Transmission Gap Length is the duration of no transmission, expressed in number of slots.~~
- ~~CFN : The connection 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.~~

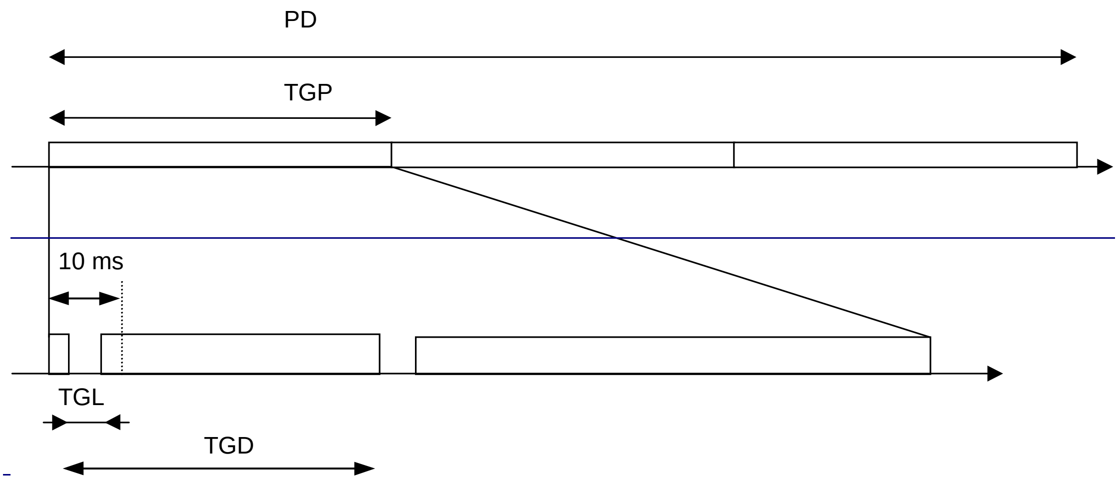
~~The following parameters characterise a compressed mode pattern (illustrated in Figure 7) :~~

- ~~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.~~
- ~~CFN : The connection frame number when the first transmission gap starts~~
- ~~PCM: Power Control Mode specifies the uplink power control algorithm 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 TS 25.214.~~

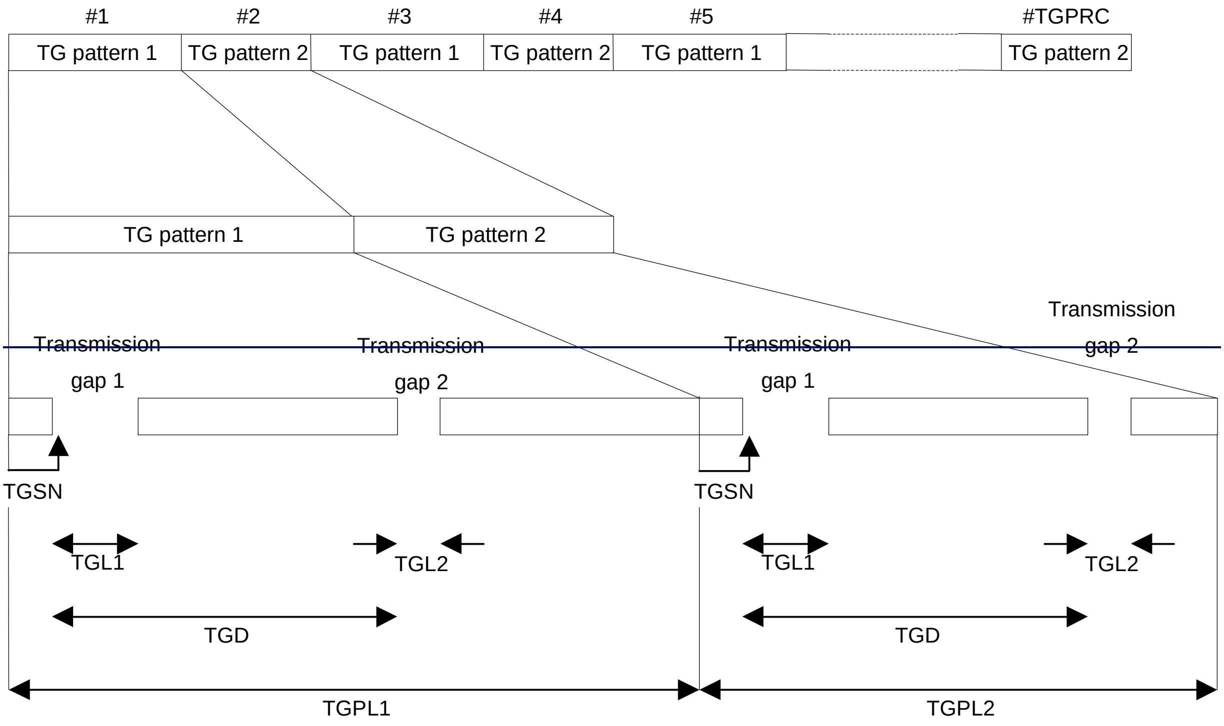
The UE shall support <MaxTGPS> simultaneous compressed mode pattern sequences which can be used for different measurements. When using simultaneous pattern sequences, it is the responsibility of the NW to ensure that the compressed mode gaps do not overlap and are not scheduled to overlap the same frame. Gaps exceeding the maximum gap length shall not be processed by the UE and shall interpreted as a faulty message. If the UE detects overlapping gaps, it shall process the gap from the pattern sequence having the lowest~~r~~ TGPSI.

~~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 [3]. The length of the transmission gap has certain limitations defined in [3] and [6].~~

~~NOTE(*): 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.~~



~~**Figure 7: Illustration of compressed mode pattern parameters.**~~



~~**Figure 7: Illustration of compressed mode pattern parameters.**~~

3GPP TSG-RAN Meeting #7
Madrid, Spain, 13 - 15 March 2000

Document R2-000246
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.

25.302	**CR**	**036**	Current Version:	3.3.0

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

For submission to:	TSG-RAN #7	for approval	X	strategic		(for SMG
list expected approval meeting # here ↑		for information		non-strategic		use only)

Form: CR cover sheet, version 2 for 3GPP and SMG   The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc

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

(U)SIM	ME	UTRAN / Radio	Core Network
		X	

Source: TSG-RAN WG2   **Date:** 17th Jan 2000

Subject: TrBLK size

Work item:

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	
D	Editorial modification	X

Release:

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

Reason for change: Based on the CR168rev1 on TS25.331, transport block size=0 is added.

Clauses affected: 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:

help.doc

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

Annex A (normative): Description of Transport Formats

The following table describes the characterisation of a Transport Format.

Table A.1: Characterisation of Transport Format

		Attribute values	BCH	PCH	FACH	RACH
Dynamic part	Transport Block Size	0~~1~~ to 5000 1 bit granularity	246	1 to 5000 1 bit granularity	0~~1~~ to 5000 1 bit granularity	0~~1~~ to 5000 1 bit granularity
	Transport Block Set Size	0~~1~~ to 200000 1 bit granularity	246	1 to 200000 1 bit granularity	0~~1~~ to 200000 1 bit granularity	0~~1~~ to 200000 1 bit granularity
	Transmission Time Interval (option for TDD only)	10, 20 ms, 40 and 80 ms				
Semi-static part	Transmission Time Interval (FDD, option for TDD NRT bearers)	10, 20 ms, 40 and 80 ms	20ms	10ms for FDD, 10ms, 20ms, 40ms and 80ms for TDD	10, 20 ms, 40 and 80 ms	10ms and 20ms fo FDD, 10ms for TDD
	Type of channel coding	Turbo Convolutional coding	Convolutional	Convolutional	Convolutional	Convolutional
	code rates	1/2, 1/3	1/2	1/2	1/2	1/2
	CRC size	0, 8, 12, 16, 24	16	0, 8, 12, 16, 24	0, 8, 12, 16, 24	0, 8, 12, 16, 24
	Resulting ratio after static rate matching	0.5 to 4				

		Attribute values	CPCH	DCH	DSCH	USCH
Dynamic part	Transport Block Size	0~~1~~ to 5000 1 bit granularity	0~~1~~ to 5000 1 bit granularity	~~1~~ 0 to 5000 1 bit granularity	0~~1~~ to 5000 1 bit granularity	0~~1~~ to 5000 1 bit granularity
	Transport Block Set Size	0~~1~~ to 200000 1 bit granularity	0~~1~~ to 200000 1 bit granularity	0~~1~~ to 200000 1 bit granularity	0~~1~~ to 200000 1 bit granularity	0~~1~~ to 200000 1 bit granularity
	Transmission Time Interval (option for TDD only)	10, 20 ms, 40 and 80 ms		10, 20 ms, 40 and 80 ms	10, 20 ms, 40 and 80 ms	10, 20 ms, 40 and 80 ms
Semi-static part	Transmission Time Interval (FDD, option for TDD NRT bearers)	10, 20 ms, 40 and 80 ms		10, 20 ms, 40 and 80 ms	10, 20 ms, 40 and 80 ms	10, 20 ms, 40 and 80 ms
	Type of channel coding	No coding Turbo coding Convolutional coding	No coding Turbo coding Convolutional coding	No coding Turbo coding Convolutional coding	No coding Turbo coding Convolutional coding	No coding Turbo coding Convolutional coding
	code rates (in case of convolutional coding)	1/2, 1/3	1/2, 1/3	1/2, 1/3	1/2, 1/3	1/2, 1/3
	CRC size	0, 8, 12, 16, 24		0, 8, 12, 16, 24	0, 8, 12, 16, 24	0, 8, 12, 16, 24
	Resulting ratio after static rate matching	0.5 to 4				

NOTE 1: The maximum size of the Transport Block has been chosen so as to avoid any need for segmentation in the physical layer into sub-blocks (segmentation should be avoided in the physical layer).

NOTE 2: Code rate is fixed to 1/3 in case of Turbo coding.

NOTE 3: All channels using the same resources as the BCH (i.e. the same timeslot and code, e.g. in a multiframe pattern) have to use different Transport Formats than the BCH to allow the identification of the BCH channel by physical layer parameters. Due to the differing parameters, decoding of other transport channels than BCH will result in an erroneous CRC.

3GPP TSG-RAN Meeting #7
Madrid, Spain; 13-15 Mar 2000

***Document* R2-000346**

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.

25.302	**CR**	**037**	Current Version:	3.3.0

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

For submission to:	TSG-RAN #7	for approval	X	strategic	*(for SMG*
list expected approval meeting # here ↑		for information		non-strategic	*use only)*

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from:* ftp://ftp.3gpp.org/Information/CR-Form-v2.doc

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

Source:	TSG-RAN WG2	**Date:**	28 Feb 2000
Subject:	PDSCH multi-code		
Work item:			

Category:	F	Correction	X	**Release:**	Phase 2	
	A	Corresponds to a correction in an earlier release			Release 96	
(only one category	B	Addition of feature			Release 97	
shall be marked	C	Functional modification of feature			Release 98	
with an X)	D	Editorial modification			Release 99	X
					Release 00	

Reason for change:	Current specification is not in line with 25.211 which states that multiple PDSCH codes may be directed toward a single user in a single frame.
Clauses affected:	6.2

Other specs affected:	Other 3G core specifications	X	→ List of CRs:	25.331, 25.433, 25.435
	Other GSM core specifications		→ List of CRs:	
	MS test specifications		→ List of CRs:	
			→ List of CRs:	
	O&M specifications		→ List of CRs:	

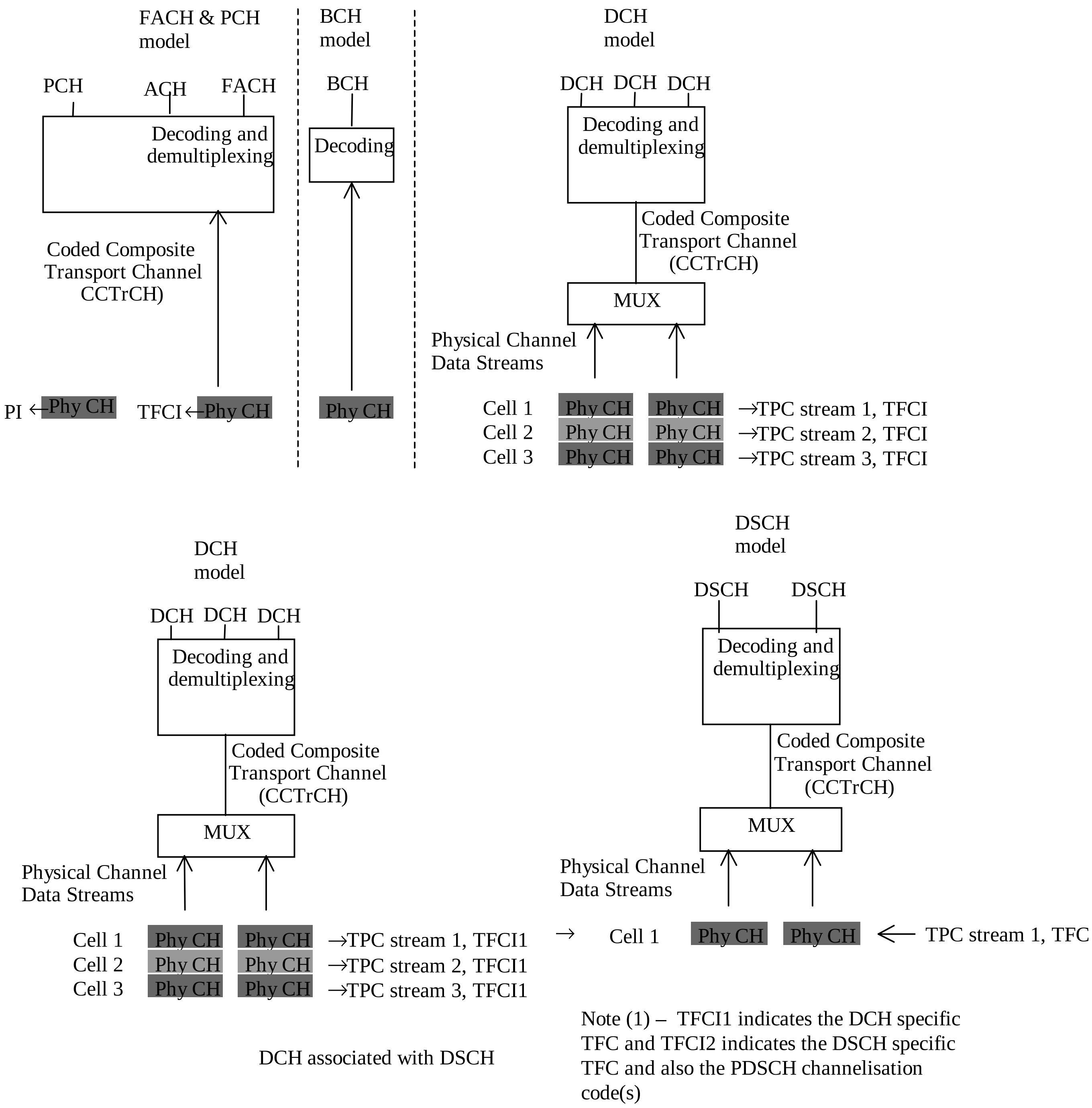
Other comments:	

help.doc

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

6.2 Downlink models

Figure 3 and Figure 4 show the model of the UE's physical layer for the downlink in FDD and TDD mode, respectively. Note that there is a different model for each transport channel type.



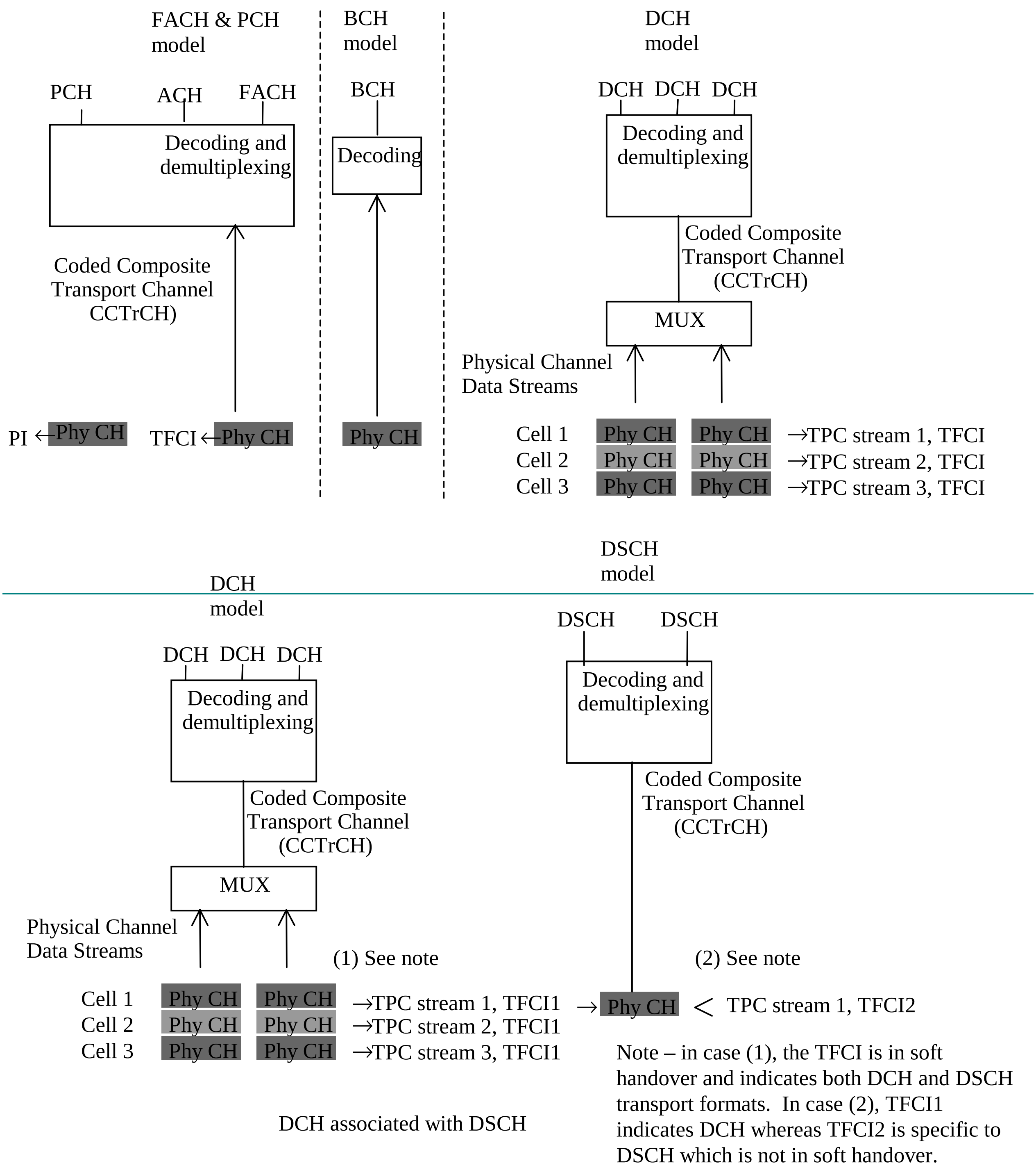


Figure 3: Model of the UE's physical layer – downlink FDD mode

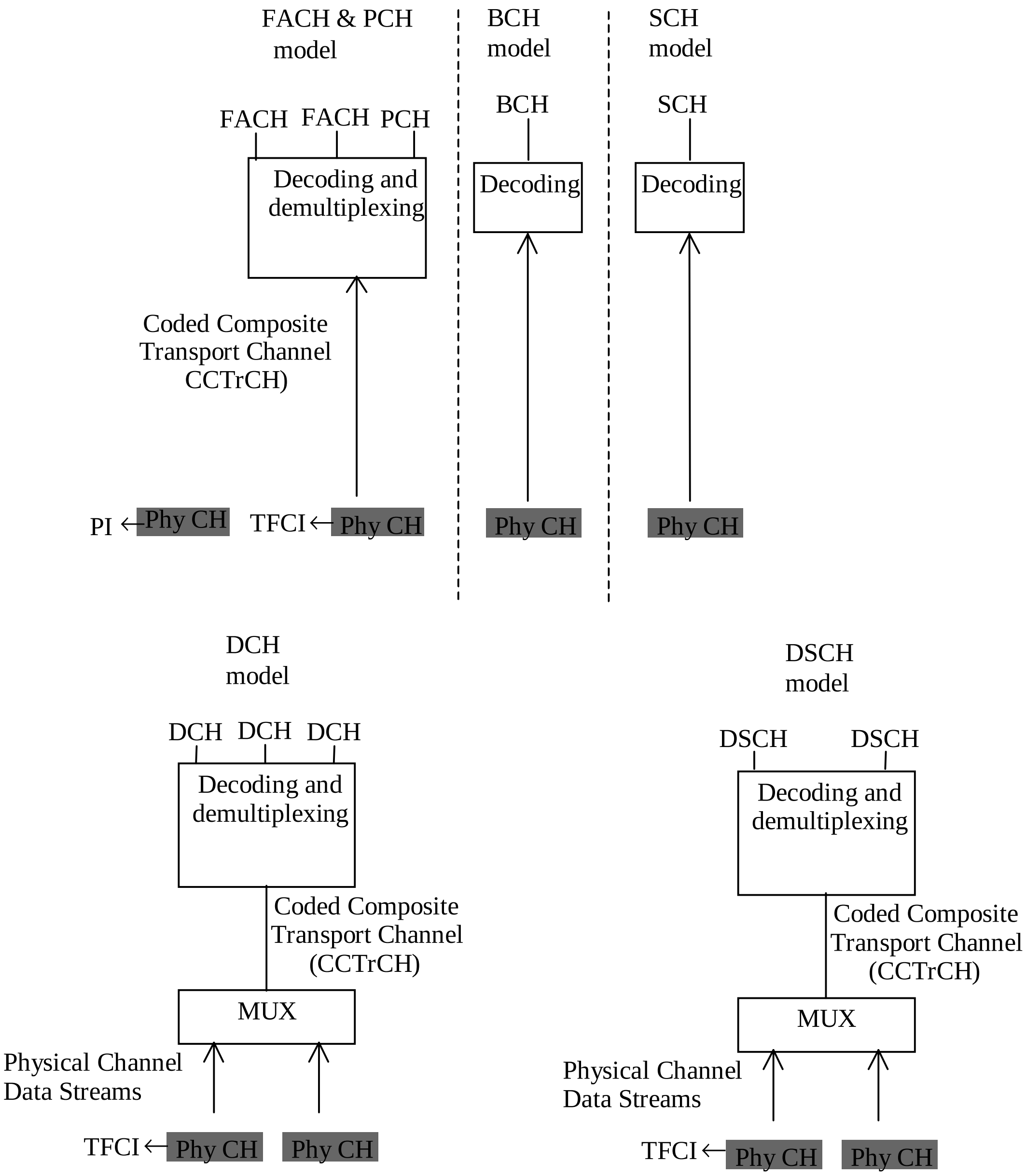


Figure 4: Model of the UE's physical layer – downlink TDD mode

For the DCH case, the mapping between DCHs and physical channel data streams works in the same way as for the uplink. Note however, that the number of DCHs, the coding and multiplexing etc. may be different in uplink and downlink.

In the FDD mode, the differences are mainly due to the soft and softer handover. Further, the pilot, TPC bits and TFCI are time multiplexed onto the same physical channel(s) as the DCHs. Further, the definition of physical channel data stream is somewhat different from the uplink. 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.

Note that it is logically one and the same physical data stream in the active set of cells, even though physically there is one stream for each cell. The same processing and multiplexing is done in each cell. The only difference between the cells is the actual codes, and these codes correspond to the same spreading factor.

The physical channels carrying the same physical channel data stream are combined in the UE receiver, excluding the pilot, and in some cases the TPC bits. TPC bits received on certain physical channels may be combined provided that UTRAN has informed the UE that the TPC information on these channels is identical.

A PCH and one or several FACH can be encoded and multiplexed together forming a CCTrCH. Similarly as in the DCH model there is one TFCI for each CCTrCH for indication of the transport formats used on each PCH and FACH. The PCH is associated with a separate physical channel carrying page indicators (PIs) which are used to trigger UE reception of the physical channel that carries PCH. A FACH or a PCH can also be individually mapped onto a separate physical channel. The BCH is always mapped onto one physical channel without any multiplexing with other transport channels.

In the TDD mode there is the SCH in addition (not shown in Figure 4).

3GPP RAN WG2 #11
Torino, Italy, 28 February - 03 March 2000

Document R2-000532
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.

25.302	**CR**	**038r1**	Current Version:	3.3.0

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

For submission to:	TSG-RAN #7	for approval	X	strategic		(for SMG
list expected approval meeting # here ↑		for information		non-strategic		use only)

Form: CR cover sheet, version 2 for 3GPP and SMG The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc

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

Source: TSG-RAN WG2 **Date:** 28th Feb 2000

Subject: Primitives for CPCH Abnormal Situation Handling

Work item:

Category:	F	Correction		**Release:**	Phase 2	
	A	Corresponds to a correction in an earlier release			Release 96	
(only one category	B	Addition of feature	X		Release 97	
Shall be marked	C	Functional modification of feature			Release 98	
With an X)	D	Editorial modification			Release 99	X
					Release 00	

Reason for change: To support CPCH abnormal situation handling such as emergency stop and start of message indication, some Control Primitives should be added to 25.302.

Clauses affected: 10.1, 10.2

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:

help.doc

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

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-DATA-REQ	TFI, TBS
PHY-DATA-IND	TFI, TBS, CRC result, TD (NOTE)
PHY-STATUS-IND	Event value

NOTE: TDD only

10.1.1 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)

10.1.2 PHY- Data-IND

The PHY-DATA primitives are used to indicate SDUs used for Layer 2 passed to and from the physical layer. One PHY-DATA primitive is submitted every Transmission Time Interval for each Transport Channel.

Primitive Type: indicate

Parameters:

- TFI
- Transport Block Set
- CRC check result
- TD (RX Timing Deviation measurement) (optional, TDD only)

10.1.3 PHY-Status-IND

The PHY-S~~TATUS~~ tatus -IND primitive can be used by the layer 1 to notify higher layers of an event that has occurred.

Primitive Type: indication

Parameters:

- Event value
  - CPCH Emergency stop was received
  - CPCH Start of Message Indicator was not received
  - L1 hardware failure has occurred

10.2 Generic names of primitives between layers 1 and 3

The status primitives between layer 1 and 3 are shown in Table 9.

Table 9: Status primitives between layer 1 and 3

Generic Name	Parameters
CPHY-Sync-IND	none
CPHY-Out-of-Sync-IND	none
CPHY-Measurement-REQ	Measurement parameters
CPHY-Measurement-IND	Measurement parameters
CPHY-ERROR-IND	Error Code

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 reception.

Primitive Type: indication

Parameters:

- none

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 reception.

Primitive Type: indication

Parameters:

- none

10.2.1.3 CPHY-Measurement-REQ

The Request primitive is used for RRC to configure L1 measurements.

Primitive Type: request

Parameters:

- transmission power threshold
- Refer to section 9 for measurement parameters

10.2.1.4 CPHY-Measurement-IND

The Indication primitive is used to report the measurement results

Primitive Type: indication

Parameters:

- Refer to Section 9 for measurement parameters

10.2.1.5 CPHY-ERROR-IND

The CPHY-ERROR primitive is used to indicate to the management entity that an error has occurred as a result of a physical layer fault.

Primitive Type: indication

Parameters:

- Error Code

10.2.2 CONTROL PRIMITIVES

The control primitives between layer 1 and 3 are shown in Table 10

Table 10: Control primitives between layer 1 and 3

Generic Name	Parameters
CPHY-TrCH-Config-REQ	Transport channel description,
CPHY-TrCH-Config-CNF	
CPHY-TrCH_Release-REQ	
CPHY-TrCH_Release-CNF	
CPHY-RL-Setup-REQ	Physical channel description
CPHY-RL-Setup-CNF	none
CPHY-RL-Release-REQ	none
CPHY-RL-Release-CNF	none
CPHY-RL-Modify-REQ	Physical channel description
CPHY-RL-Modify-CNF	none
CPHY-Commit-REQ	Activation Time
CPHY-CPCH-Estop-IND	none
CPHY-CPCH-Estop-Resp	none
CPHY-CPCH-Estop-REQ	none
CPHY-CPCH-Estop-CNF	none

10.2.2.1 CPHY-TrCH-Config-REQ

This primitive is used for setting up and configuring a transport channel, and also to modify an existing transport channel.

Primitive Type: request

Parameters:

- Transport channel description

10.2.2.2 CPHY-TrCH-Config-CNF

This primitive is used for confirming the setting up and configuring a transport channel, and also modifying an existing transport channel.

Primitive Type: confirm

Parameters:

- none

10.2.2.3 CPHY-TrCH-Release-REQ

This primitive is used for releasing a transport channel.

Primitive Type: request

Parameters:

- none

10.2.2.4 CPHY-TrCH-Release-CNF

This primitive is used for confirming the releasing a transport channel.

Primitive Type: confirm

Parameters:

- none

10.2.2.5 CPHY-RL-Setup-REQ

The Request primitive is sent from RRC to L1 for establishment of a Radio link to a certain UE.

Primitive Type: request

Parameters:

Physical channel description

10.2.2.6 CPHY-RL-Setup-CNF

The Confirm primitive is returned from L1 to RRC when the Radio link is established. In case L1 is unable to execute the request, this is indicated in the confirm primitive.

Primitive Type: confirm

Parameters:

- none

10.2.2.7 CPHY-RL-Release-REQ

The Request primitive is sent from RRC to L1 for release of a Radio link to a certain UE.

Primitive Type: request

Parameters:

- none

10.2.2.8 CPHY-RL-Release-CNF

The Confirm primitive is returned from L1 to RRC when the radio link is released.

Primitive Type: confirm

Parameters:

- none

10.2.2.9 CPHY-Modify-REQ

The Request primitive is sent from RRC to L1 for modification of a Radio link to a certain UE.

Primitive Type: request

Parameters:

- Physical channel description

10.2.2.10 CPHY-RL-Modify-CNF

The Confirm primitive is returned from L1 to RRC when the radio link is modified. In case L1 is unable to execute the request, this is indicated in the confirm primitive.

Primitive Type: confirm

Parameters:

- none

10.2.2.11 CPHY-Commit-REQ

This primitive is sent from RRC to L1 to synchronise UE and NW for the physical channel modification.

Primitive Type: request

Parameters:

- Activation time

10.2.2.12 CPHY-CPCH-Estop-IND

The CPHY-CPCH-Estop-IND primitive is used by L1 to notify RRC of a CPCH emergency stop event has occurred.

Primitive Type: indication

Parameters:

- none

10.2.2.13 CPHY-CPCH-Estop-Resp

This primitive is sent from UE RRC to L1 for emergency stop of the CPCH transmission. After receiving this primitive, UE L1 stopping its transmission on the related CPCH.

Primitive Type: response

Parameters:

- none

10.2.2.14 CPHY-CPCH-Estop-REQ

This primitive is sent from RRC to L1 for CPCH Emergency Stop. This primitive is sent for triggering of a CPCH emergency stop. After receiving this primitive, Node B L1 sends CPCH Estop Command to UE. This CPCH Estop Command is a specific bit pattern on the currently unused DL DPCH field.

Primitive Type: request

Parameters:

- none

10.2.2.15 CPHY-CPCH-Estop-CNF

This primitive is sent from Node B L1 to RRC for confirming the emergency stop of the CPCH

Primitive Type: confirm

Parameters:

- none

3GPP TSG RAN WG2 meeting #11
Turin, Italy, 28th Feb. – 3rd Mar. 2000

Document R2-000399

CHANGE REQUEST

25.302	**CR**	**039**	Current Version: 3.3.0

For submission to: TSG-RAN#7	for approval	X	strategic	
	For information		non-strategic	

Proposed change affects: (U)SIM [ ] ME [X] UTRAN / Radio [X] Core Network [ ]

Source:	TSG-RAN WG2	**Date:**	24.02.2000
Subject:	Physical channel BER		
Work item:			

Category:				**Release:**		
	F	Correction	X		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: It was decided in the RAN RRM ad hoc (9.-11.2., Turin), that the UE physical channel BER measurement was not going to be used for downlink outer loop power control. No other purposes for usage have been presented. Therefore, it is proposed to remove this measurement from 25.302.

Clauses affected:

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:

9.1 UE Measurements

9.1.1 CFN-SFN observed time difference

This measure is mandatory for the UE.

Measurement	CFN-SFN observed time difference
Source	L1 (UE)
Destination	RRC (RNC) for handover
Reporting Trigger	On-demand, Event-triggered
Definition	The ‘CFN-SFN observed time difference’ indicates the time difference which is measured by the UE between CFN in the UE and the SFN of the target neighbouring cell. This measurement is applicable to FDD cells only.

9.1.2 Observed time difference to GSM cell

This measure is mandatory for the UE if the 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	Time difference between a specific UTRA and the timing of the GSM cell.

9.1.3 CPICH E_c/N_0

This measure is mandatory for the UE.

Measurement	CPICH Ec/No
Source	L1(UE)
Destination	RRC (UE, RNC),
Reporting Trigger	Periodic, on demand and event triggered
Definition	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.

9.1.4 CPICH SIR

This measure is mandatory for the UE.

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

9.1.5 CPICH RSCP

This measure is mandatory for the UE.

Measurement	CPICH RSCP
Source	L1(UE)
Destination	RRC (UE, RNC)
Reporting Trigger	periodic or event triggered
Definition	Received Signal Code Power, is the received power on the CPICH after despreading.

9.1.6 P-CCPCH RSCP

This measure is mandatory for the UE.

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

9.1.7 Timeslot ISCP

This measure is mandatory for the UE.

Measurement	Timeslot ISCP
Source	L1(UE)
Destination	RRC (UE, RNC)
Reporting Trigger	periodic or event triggered
Definition	Interference Signal Code Power is the interference on the received signal after despreading. Only the non-orthogonal part of the interference is included. This measurement is applicable for TDD only. It is measured in specified timeslots.

9.1.8 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	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.

9.1.9 SIR

This measure is mandatory for the UE.

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

9.1.10 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	Received Signal Strength Indicator, the wideband received power within the channel bandwidth. For TDD this is measured in specified timeslots.

9.1.11 GSM carrier RSSI

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

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

9.1.12 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	Estimation of the transport channel block error rate (BLER).

~~9.1.13 Physical channel BER~~

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

~~Measurement~~	~~Physical channel BER~~
~~Source~~	~~L1(UE)~~
~~Destination~~	~~RRC(UE,RNC)~~
~~Reporting Trigger~~	~~On-demand, Event-triggered~~
~~Definition~~	~~The estimate of the physical channel BER of the data part before channel decoding.~~

9.1.14 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	RRC (UE): the total transmitted power 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.

9.1.15 UE Rx-Tx time difference

Measurement	UE Rx-Tx time difference
Source	L1 (UE)
Destination	RRC (RNC)
Reporting Trigger	On-demand, periodic, event-triggered
Definition	Time difference 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. This measurement is applicable for FDD cells only. (Note: The use for TDD in case of LCS is ffs.)

9.1.16 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, 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	Time difference between a specific reference UTRA cell and a target UTRA cell. There are two types of this measurement: Type 1 measures by means of the P-CCPCH and type 2 by means of CPICH.

3GPP TSG-RAN Meeting #7
Madrid, Spain, 13 - 15 March 2000

Document **R2-000439**

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.

25.302 CR 041 Current Version: 3.3.0

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

For submission to:	TSG-RAN #7	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 [ ] UTRAN / Radio [X] Core Network [ ]
(at least one should be marked with an X)

Source: TSG-RAN WG2 **Date:** 28th Feb 2000

Subject: Editorial modification on AMR trblk size

Work item:

Category:
(only one category Shall be marked With an X)

F	Correction	X	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	

Release: (see table above)

Reason for change: Transport block size was modified to reflect the changes made in RAN WG1.

Clauses affected: Annex B

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.

Annex B (informative): Example of Transport format attributes for AMR speech codec

The support for the AMR speech codec is exemplified below. On the radio interface, one Transport Channel is established per class of bits i.e. DCH A for class A, DCH B for class B and DCH C for class C. Each DCH has a different transport format combination set which corresponds to the necessary protection for the corresponding class of bits as well as the size of these class of bits for the various AMR codec modes.

With this principle, the AMR codec mode which is used during a given TTI can be deduced from the format of the transport channels DCH A, DCH B and DCH C for that particular TTI.

Note that a similar principle can also be applied for other source codecs e.g. other speech codecs or video codecs.

An example of transport channel description for each class of bits is given below:

	Attribute	**Value**		
		Class A	**Class B**	**Class C**
Dynamic part	Transport Block Size	81 65 75 61 ~~55~~58 55 49 42 39	103 99 84 87 ~~79~~76 63 54 ~~56~~53 0	60 40 0 0 0 0 0 0 0
	Transport Block Set Size	Same as the transport block sizes		
Semi-static part	Transmission Time Interval	20 ms		
	Type of channel coding	Convolutional coding		
	code rates	1/2, 1/3 + class-specific rate matching	None, 1/2, 1/3 + class-specific rate matching	None, 1/2 , 1/3 + class-specific rate matching
	CRC size	8	0	0
	Resulting ratio after static rate matching	0.5 to 4(with no coding the rate matching ratio needs to be >1)		

3GPP TSG-RAN Meeting #11
Turin, Italy 28th February - 3rd March

Document ***R2-000501***
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.

25.302 **CR** **042r1** Current Version: 3.3.0

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

For submission to: TSG-RAN #7
list expected approval meeting # here ↑

for approval	X	strategic		*(for SMG use only)*
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 [ ] UTRAN / Radio [X] Core Network [ ]
(at least one should be marked with an X)

Source: TSG-RAN WG2   **Date:** 18th Feb 2000

Subject: Corrections and clarifications on L1 and L2 functionality descriptions

Work item:

Category:

F	Correction	X	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	

(only one category Shall be marked With an X)   **Release:**

Reason for change:
Clarification on descriptions of L1 interactions with L2 retransmission functionality
Addition of dynamic rate matching functionality on the uplink for TDD
Corrections on types of transport channel descriptions
PCH TTI is corrected in accordance with WG1 specifications for TDD.

Clauses affected: 5.3, 7.1.12, 7.2, 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:

help.doc

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

5.3 L1 interactions with L2 retransmission functionality

Provided that the RLC PDUs are mapped one-to-one onto the Transport Blocks, Error indication may be provided by L1 to L2. For that purpose, the L1 CRC can be used for individual error indication of each RLC PDU. The L1 CRC will then serve multiple purposes:

- Error indication for uplink macro diversity selection combining (L1)
- ~~Frame e~~Error indication for each erroneous Transport Block~~speech services~~ in transparent and unacknowledged mode RLC
- Quality indication
- Error indication for ~~L2 retransmissions~~ each erroneous Transport Block in acknowledged mode RLC

~~As a conclusion, L1 needs to give an error indication to L2 for each erroneous Transport Block delivered.~~

7.1.12 Rate matching

Two levels of rate matching are defined on the radio interface:

- A static rate matching per Transport Channel. The static rate matching is part of the semi-static attributes of the Transport Channel
- A dynamic rate matching per CCTrCH. The dynamic rate matching adjusts the size of the physical layer data payload to the physical channel as requested by RRC.

The static rate matching and the dynamic rate matching to be applied by the physical layer are indicated by RRC to the physical layer.

In FDD RRC is also responsible for configuring the physical layer on whether:

- Blind Rate Detection or TFCI is used
- Dynamic rate matching is applied or not on the downlink

7.2 Types of Transport Channels

A general classification of transport channels is into two groups:

- common channels and
- dedicated channels (where the UEs can be unambiguously identified by the physical channel, i.e. code and frequency)

Common transport channel types are:

1. Random Access Channel(s) (RACH) characterised by:
   - existence in uplink only,
   - limited data field.
   - collision risk,
   - open loop power control,
2. ODMA Random Access Channel(s) (ORACH) characterised by:
   - used in TDD mode only
   - existence in relay-link

- collision risk,
- open loop power control,
- no timing advance control

3. Forward Access Channel(s) (FACH) characterised by:
   - existence in downlink only,
   - possibility to use beam forming,
   - possibility to use slow power control,
   - possibility to change rate fast (each 10ms),
   - lack of fast power control and
4. Broadcast Channel (BCH) characterised by:
   - existence in downlink only,
   - low fixed bit rate and
   - requirement to be broadcast in the entire coverage area of the cell.
5. Paging Channel (PCH) characterised by:
   - existence in downlink only,
   - association with a physical layer signal, the Page Indicator, to support efficient sleep mode procedures and
   - requirement to be broadcast in the entire coverage area of the cell.
6. Synchronisation channel (SCH) characterised by:
   - existence in TDD and downlink only
   - low fixed bit rate
   - requirement to be broadcast in the entire coverage area of the cell
7. Downlink Shared Channel(s) (DSCH) characterised by:
   - existence in downlink only,
   - possibility to use beamforming,
   - possibility to use slow power control,
   - possibility to use fast power control, when associated with dedicated channel(s)
   - possibility to be broadcast in the entire cell
   - always associated with another channel (DCH or FACH (TDD)) .
8. CPCH Channel characterised by:
   - existence in FDD only,
   - existence in uplink only,
   - fast power control on the message part,
   - possibility to use beam forming,
   - possibility to change rate fast,
   - collision detection,

- open loop power estimate for pre-amble power ramp-up
- ~~possibility to use timing advance~~

9. Uplink Shared channel (USCH) characterised by:
   - used in TDD only
   - existence in uplink only,
   - possibility to use beam forming,
   - possibility to use power control,
   - possibility to change rate fast
   - possibility to use Uplink Synchronisation
   - possibility to use Timing advance

Dedicated transport channel types are:

1. Dedicated Channel (DCH) characterised by:
   - existing in uplink or downlink
   - possibility to use beam forming,
   - possibility to change rate fast (each 10ms),
   - fast power control
   - possibility to use timing advance in uplink (TDD only)
   - possibility to use Uplink Synchronisation
2. Fast Uplink Signalling Channel (FAUSCH) to allocate, in conjunction with FACH, dedicated channels; the FAUSCH is characterised by:
   - existing in uplink only,
   - inherent addressing of a UE by a unique time-offset (indicating to a UE when to send an uplink signalling code, USC) related to the beginning of the 10 ms frame,
   - allowing for a UE to notify (by sending an USC) a request for a DCH, the allocation of which is messaged via the FACH. No further information is conveyed via the FAUSCH,

NOTE: applicability for TDD mode is FFS

3. ODMA Dedicated Channel (ODCH) characterised by:
   - used in TDD mode only,
   - possibility to use beam forming,
   - possibility to change rate fast (each 10ms),
   - closed loop power control,
   - closed loop timing advance control

To each transport channel (except for the FAUSCH, since it only conveys a reservation request),, there is an associated Transport Format (for transport channels with a fixed or slow changing rate) or an associated Transport Format Set (for transport channels with fast changing rate).

Annex A (normative):
Description of Transport Formats

The following table describes the characterisation of a Transport Format.

Table A.1: Characterisation of Transport Format

		Attribute values	BCH	PCH	FACH	RACH
Dynamic part	Transport Block Size	1 to 5000 1 bit granularity	246	1 to 5000 1 bit granularity	1 to 5000 1 bit granularity	1 to 5000 1 bit granularity
	Transport Block Set Size	1 to 200000 1 bit granularity	246	1 to 200000 1 bit granularity	1 to 200000 1 bit granularity	1 to 200000 1 bit granularity
	Transmission Time Interval (option for TDD only)	10, 20 ms, 40 and 80 ms				
Semi-static part	Transmission Time Interval (FDD, option for TDD NRT bearers)	10, 20 ms, 40 and 80 ms	20ms	10ms for FDD, ~~10ms,~~ 20ms~~,~~ ~~40ms and 80ms~~ for TDD	10, 20 ms, 40 and 80 ms	10ms and 20ms fo FDD, 10ms for TDD
	Type of channel coding	Turbo Convolutional coding	Convolutional	Convolutional	Convolutional	Convolutional
	code rates	1/2, 1/3	1/2	1/2	1/2	1/2
	CRC size	0, 8, 12, 16, 24	16	0, 8, 12, 16, 24	0, 8, 12, 16, 24	0, 8, 12, 16, 24
	Resulting ratio after static rate matching	0.5 to 4				

		Attribute values	CPCH	DCH	DSCH	USCH
Dynamic part	Transport Block Size	1 to 5000 1 bit granularity	1 to 5000 1 bit granularity	1 to 5000 1 bit granularity	1 to 5000 1 bit granularity	1 to 5000 1 bit granularity
	Transport Block Set Size	1 to 200000 1 bit granularity	1 to 200000 1 bit granularity	1 to 200000 1 bit granularity	1 to 200000 1 bit granularity	1 to 200000 1 bit granularity
	Transmission Time Interval (option for TDD only)	10, 20 ms, 40 and 80 ms		10, 20 ms, 40 and 80 ms	10, 20 ms, 40 and 80 ms	10, 20 ms, 40 and 80 ms
Semi-static part	Transmission Time Interval (FDD, option for TDD NRT bearers)	10, 20 ms, 40 and 80 ms		10, 20 ms, 40 and 80 ms	10, 20 ms, 40 and 80 ms	10, 20 ms, 40 and 80 ms
	Type of channel coding	No coding Turbo coding Convolutional coding	No coding Turbo coding Convolutional coding	No coding Turbo coding Convolutional coding	No coding Turbo coding Convolutional coding	No coding Turbo coding Convolutional coding
	code rates (in case of convolutional coding)	1/2, 1/3	1/2, 1/3	1/2, 1/3	1/2, 1/3	1/2, 1/3
	CRC size	0, 8, 12, 16, 24		0, 8, 12, 16, 24	0, 8, 12, 16, 24	0, 8, 12, 16, 24
	Resulting ratio after static rate matching	0.5 to 4				

NOTE 1: The maximum size of the Transport Block has been chosen so as to avoid any need for segmentation in the physical layer into sub-blocks (segmentation should be avoided in the physical layer).

NOTE 2: Code rate is fixed to 1/3 in case of Turbo coding.

NOTE 3: All channels using the same resources as the BCH (i.e. the same timeslot and code, e.g. in a multiframe pattern) have to use different Transport Formats than the BCH to allow the identification of the BCH channel by physical layer parameters. Due to the differing parameters, decoding of other transport channels than BCH will result in an erroneous CRC.

3GPP RAN WG2#11 | ***Document R2-000528***

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

Turin, Italy, Feb. 28 – March 3, 2000

CHANGE REQUEST

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

25.302	**CR**	**043r1**	Current Version:	3.3.0

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

For submission to:	TSG-RAN #7	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: TSG-RAN WG2 **Date:** 2000-03-02

Subject: Transport block transmission

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: This contribution proposes a specification of transport block transmission and bit transmission sequence for Sec. 11 "Radio frame transmission" which is presently empty.

Clauses affected: 11

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.

11 Transport block ~~Radio Frame~~ transmission

Data exchange between MAC and the physical layer, is defined in terms of Transport Block Sets (TBS). On a Transport Channel, one Transport Block Set can be transmitted for every Transmission Time Interval. A TBS consists of one or several Transport Blocks which shall be numbered 1,…, *m*,… ,*M* and is delivered in the order of the index *m*.

A Transport Block is identical with a MAC PDU. A Transport Block (MAC PDU) is a bit string ordered from first to last, where the first and last bits are numbered 1 and *A*, respectively, where *A* is the number of bits of the Transport Block.

The bits of the *m*th Transport Block in a TBS, are denoted as a_{im1}, …, a_{imA} for a Transport Channel identified by an index *i* (cf. TS 25.212 and TS 25.222).

~~11.1 Downlink Frame format~~

~~11.2 Uplink Frame format~~

~~11.3 Order of bit transmission~~

3GPP RAN WG2 Meeting #11
Turin, Italy, 28 FEB- 03 MAR 2000

***Document* R2-000516**
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.

25.302 CR 044 Current Version: 3.3.0

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

For submission to: TSG-RAN#7	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: TSG-RAN WG2 **Date:** 02 March 2000

Subject: Clarification to layer 1 model regarding transport blocks received by UE with CRC failure

Work item: N/A

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

			Release:	
F	Correction		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	X	Release 99	X
			Release 00	

Reason for change: At RAN WG2#11 a liaison was received from TSG T WG1 regarding the UE layer 1 model. TSG T WG1 has defined a UE test loop function (TS 34.109) that is modelled as being at the top of layer 2. In order conduct performance tests on the UE it is necessary to be able to 'loop back' at the transport channel (MAC and RLC in transparent mode) and it is necessary that transport blocks are looped back regardless of the CRC check result on the received transport block. To be consistent with loop back function modelled as being in layer 2 then the layer 1 model contained in 302 must state that transport blocks are passed up to layer 2 regardless of the CRC check result. This is already stated in 302, but an editorial modification is proposed to clarify the sentence

Clauses affected: 5.3

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.

5.3 L1 interactions with L2 retransmission functionality

Provided that the RLC PDUs are mapped one-to-one onto the Transport Blocks, Error indication may be provided by L1 to L2. For that purpose, the L1 CRC can be used for individual error indication of each RLC PDU. The L1 CRC will then serve multiple purposes:

- Error indication for uplink macro diversity selection combining (L1)
- Frame error indication for speech services
- Quality indication
- Error indication for L2 retransmissions

~~As a conclusion, L1 needs to give an error indication to L2 for each erroneous Transport Block delivered.~~Regardless of the result of the CRC check, all Transport Blocks are delivered to L2 along with the associated error indications.

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 two models: DCH model and RACH model. 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].

3GPP TSG-RAN WG2 #11 | ***Document* R2-000569**

Turin, 28th February - 3rd March

3G CHANGE REQUEST

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

25.302	**CR**	**045**	Current Version:	3.3.0

3G specification number ↑ *↑ CR number as allocated by 3G support team*

For submission to	TSG-RAN#7	for approval	X	*(only one box should*
list TSG meeting no. here ↑		for information		*be marked with an X)*

Proposed change affects: *(at least one should be marked with an X)*	USIM		ME		UTRAN	X	Core Network	

Source:	TSG-RAN WG2	**Date:**	01/03/2000
Subject:	Removal of SCH and SCCH		
3G Work item:			

Category:			
	F	Correction	X
	A	Corresponds to a correction in a 2G specification	
(only one category	B	Addition of feature	
shall be marked	C	Functional modification of feature	
with an X)	D	Editorial modification	

Reason for change:	Due to performance reasons synchronisation case 3 is removed from WG1 specifications and SCH and SCCH became obsolete.
Clauses affected:	3.2, 6.2, 7.2, 8.4, 8.5, 8.7

Other specs affected:				
	Other 3G core specifications	X	→ List of CRs:	CR034 on 25.301, CR031 on 25.322, CR040 on 25.321, CR268 on 25.331
	Other 2G core specifications		→ List of CRs:	
	MS test specifications		→ List of CRs:	
	BSS test specifications		→ List of CRs:	
	O&M specifications		→ List of CRs:	

Other comments:	

help.doc

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

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
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)
OCCCH	ODMA Common Control Channel
ODCCH	ODMA Dedicated Control Channel
ODCH	ODMA Dedicated Channel
ODMA	Opportunity Driven Multiple Access
ORACH	ODMA Random Access Channel
ODTCH	ODMA Dedicated Traffic Channel
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
~~SCCH~~	~~Synchronisation Control Channel~~
~~SCH~~	~~Synchronisation Channel~~
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
UE_R	User Equipment with ODMA relay operation enabled
UL	Uplink
UMTS	Universal Mobile Telecommunications System
URA	UTRAN Registration Area
UTRA	UMTS Terrestrial Radio Access
UTRAN	UMTS Terrestrial Radio Access Network

6.2 Downlink models

Figure 3 and Figure 4 show the model of the UE's physical layer for the downlink in FDD and TDD mode, respectively. Note that there is a different model for each transport channel type.

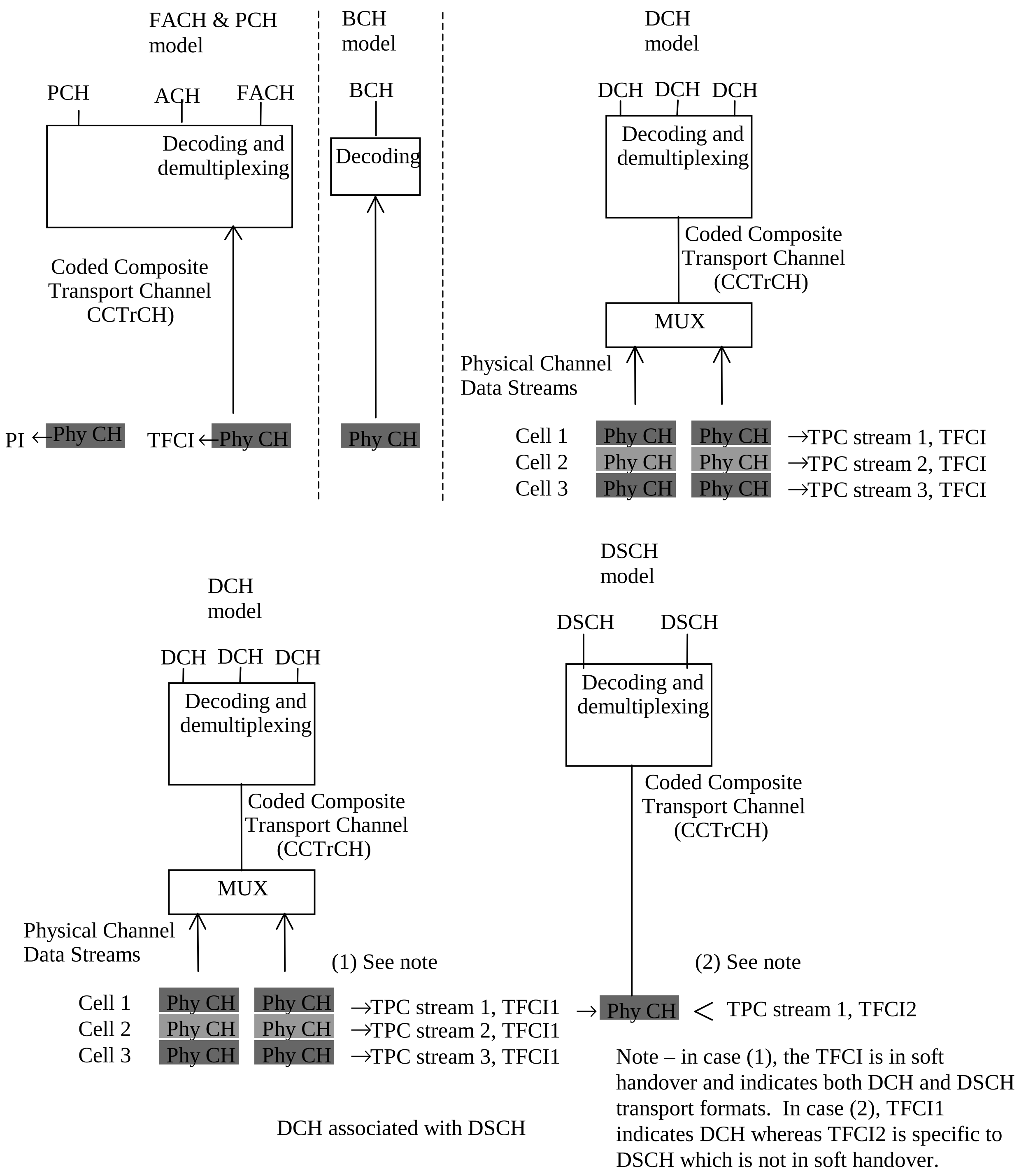
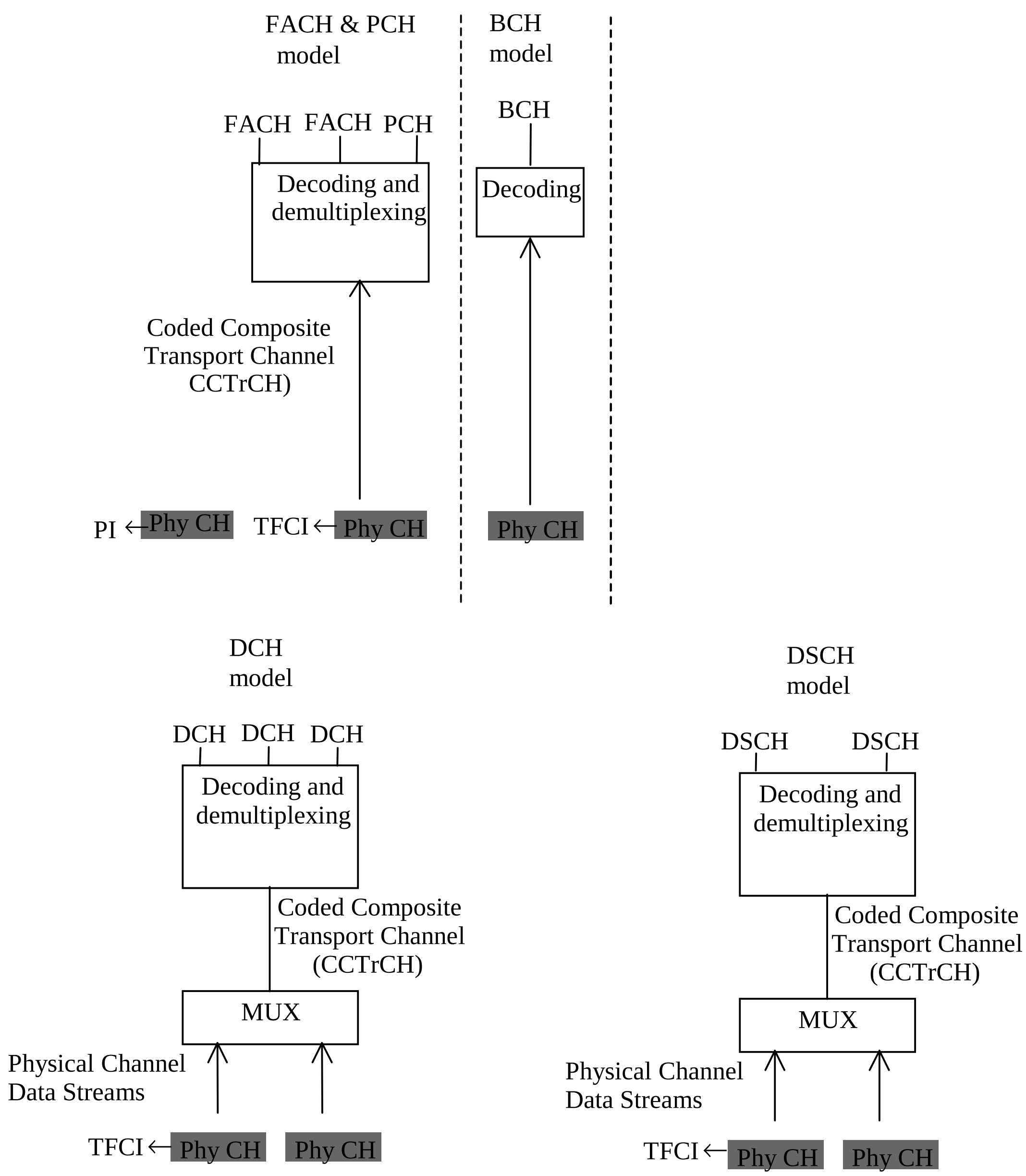


Figure 3: Model of the UE's physical layer – downlink FDD mode


FACH & PCH
model
BCH
model
FACH
FACH
PCH
BCH
Decoding and
demultiplexing
Decoding
Coded Composite
Transport Channel
CCTrCH)
PI
Phy CH
TFCI
Phy CH
Phy CH
DCH
model
DSCH
model
DCH
DCH
DCH
DSCH
DSCH
Decoding and
demultiplexing
Decoding and
demultiplexing
Coded Composite
Transport Channel
(CCTrCH)
Coded Composite
Transport Channel
(CCTrCH)
MUX
MUX
Physical Channel
Data Streams
Physical Channel
Data Streams
TFCI
Phy CH
Phy CH
TFCI
Phy CH
Phy CH

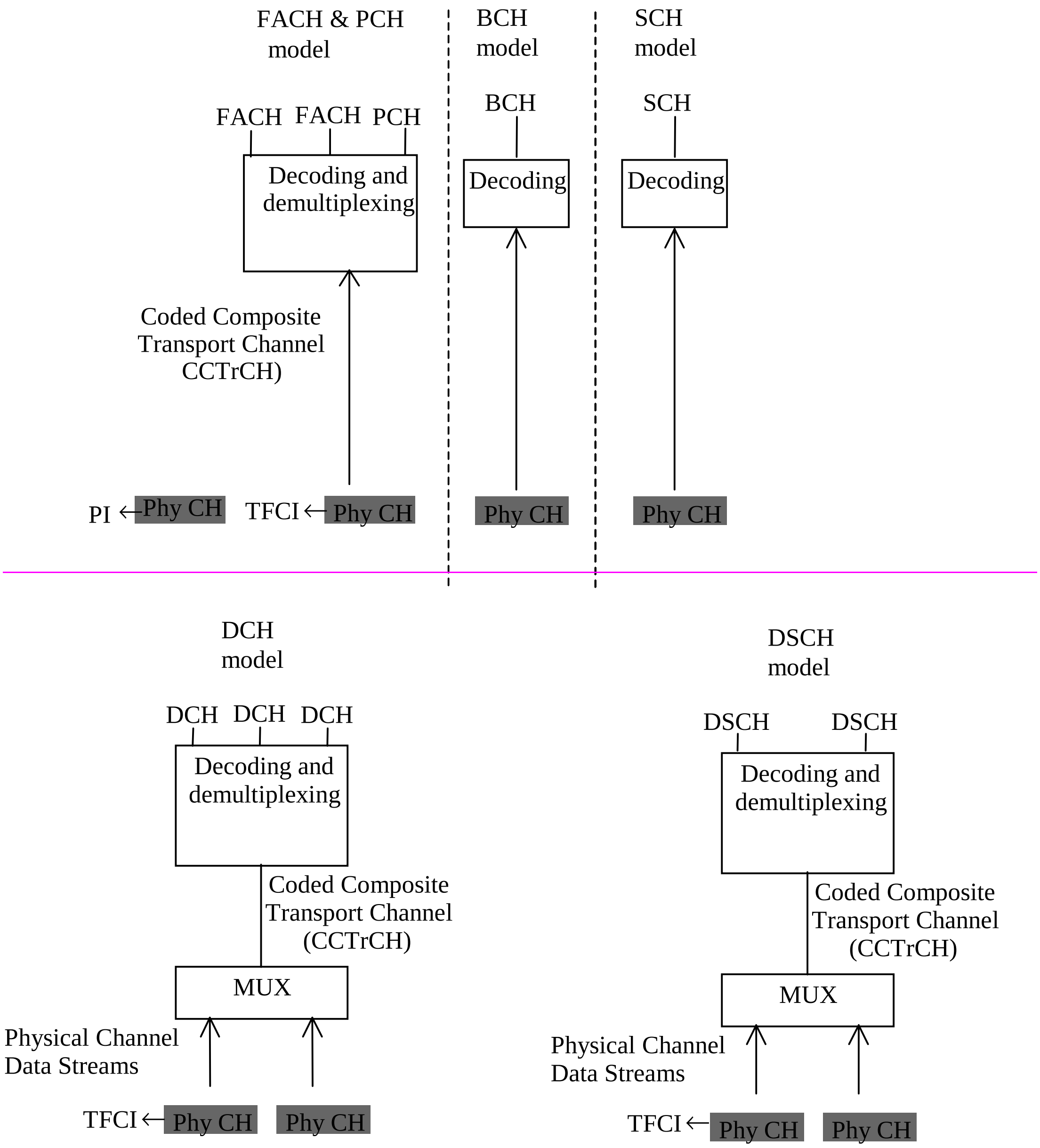


Figure 4: Model of the UE's physical layer – downlink TDD mode

For the DCH case, the mapping between DCHs and physical channel data streams works in the same way as for the uplink. Note however, that the number of DCHs, the coding and multiplexing etc. may be different in uplink and downlink.

In the FDD mode, the differences are mainly due to the soft and softer handover. Further, the pilot, TPC bits and TFCI are time multiplexed onto the same physical channel(s) as the DCHs. Further, the definition of physical channel data stream is somewhat different from the uplink. 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.

Note that it is logically one and the same physical data stream in the active set of cells, even though physically there is one stream for each cell. The same processing and multiplexing is done in each cell. The only difference between the cells is the actual codes, and these codes correspond to the same spreading factor.

The physical channels carrying the same physical channel data stream are combined in the UE receiver, excluding the pilot, and in some cases the TPC bits. TPC bits received on certain physical channels may be combined provided that UTRAN has informed the UE that the TPC information on these channels is identical.

A PCH and one or several FACH can be encoded and multiplexed together forming a CCTrCH. Similarly as in the DCH model there is one TFCI for each CCTrCH for indication of the transport formats used on each PCH and FACH. The PCH is associated with a separate physical channel carrying page indicators (PIs) which are used to trigger UE reception of the physical channel that carries PCH. A FACH or a PCH can also be individually mapped onto a separate physical channel. The BCH is always mapped onto one physical channel without any multiplexing with other transport channels.

~~In the TDD mode there is the SCH in addition (not shown in Figure 4).~~

7.2 Types of Transport Channels

A general classification of transport channels is into two groups:

- common channels and
- dedicated channels (where the UEs can be unambiguously identified by the physical channel, i.e. code and frequency)

Common transport channel types are:

1. Random Access Channel(s) (RACH) characterised by:
   - existence in uplink only,
   - limited data field.
   - collision risk,
   - open loop power control,
2. ODMA Random Access Channel(s) (ORACH) characterised by:
   - used in TDD mode only
   - existence in relay-link
   - collision risk,
   - open loop power control,
   - no timing advance control
3. Forward Access Channel(s) (FACH) characterised by:
   - existence in downlink only,
   - possibility to use beam forming,
   - possibility to use slow power control,
   - possibility to change rate fast (each 10ms),
   - lack of fast power control and
4. Broadcast Channel (BCH) characterised by:
   - existence in downlink only,
   - low fixed bit rate and
   - requirement to be broadcast in the entire coverage area of the cell.
5. Paging Channel (PCH) characterised by:
   - existence in downlink only,
   - association with a physical layer signal, the Page Indicator, to support efficient sleep mode procedures and
   - requirement to be broadcast in the entire coverage area of the cell.

~~6. Synchronisation channel (SCH) characterised by:~~

- ~~existence in TDD and downlink only~~
- ~~low fixed bit rate~~
- ~~requirement to be broadcast in the entire coverage area of the cell~~

~~7~~6. Downlink Shared Channel(s) (DSCH) characterised by:

- existence in downlink only,
- possibility to use beamforming,
- possibility to use slow power control,
- possibility to use fast power control, when associated with dedicated channel(s)
- possibility to be broadcast in the entire cell
- always associated with another channel (DCH).

~~8~~7. CPCH Channel characterised by:

- existence in FDD only,
- existence in uplink only,
- fast power control on the message part,
- possibility to use beam forming,
- possibility to change rate fast,
- collision detection,
- open loop power estimate for pre-amble power ramp-up
- possibility to use timing advance

~~9~~8. Uplink Shared channel (USCH) characterised by:

- used in TDD only
- existence in uplink only,
- possibility to use beam forming,
- possibility to use power control,
- possibility to change rate fast
- possibility to use Uplink Synchronisation

Dedicated transport channel types are:

1. Dedicated Channel (DCH) characterised by:
   - existing in uplink or downlink
   - possibility to use beam forming,
   - possibility to change rate fast (each 10ms),
   - fast power control
   - possibility to use timing advance (TDD only)
   - possibility to use Uplink Synchronisation

2. Fast Uplink Signalling Channel (FAUSCH) to allocate, in conjunction with FACH, dedicated channels; the FAUSCH is characterised by:

   - existing in uplink only,

   - inherent addressing of a UE by a unique time-offset (indicating to a UE when to send an uplink signalling code, USC) related to the beginning of the 10 ms frame,

   - allowing for a UE to notify (by sending an USC) a request for a DCH, the allocation of which is messaged via the FACH. No further information is conveyed via the FAUSCH,

NOTE: applicability for TDD mode is FFS

3. ODMA Dedicated Channel (ODCH) characterised by:

   - used in TDD mode only,

   - possibility to use beam forming,

   - possibility to change rate fast (each 10ms),

   - closed loop power control,

   - closed loop timing advance control

To each transport channel (except for the FAUSCH, since it only conveys a reservation request),, there is an associated Transport Format (for transport channels with a fixed or slow changing rate) or an associated Transport Format Set (for transport channels with fast changing rate).

8.4 TDD Downlink

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

Table 4: TDD Downlink

	Physical Channel Combination	Transport Channel Combination	Baseline Capability or Service dependent	Comment
~~1~~	~~One or two PSCH~~	~~SCH~~	~~Baseline~~	~~SCH can map to one or two PSCH in a frame depending on the synchronisation case as defined in 25.221 (see note 1)~~
~~2~~1	P-CCPCH and/or One or more S-CCPCH + PICH	BCH and/or PCH and/or one or more FACH	Baseline	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.
~~3~~2	One or more DPCH	One or more DCH coded into one or more CCTrCH	Service dependent	The maximum number of DCHs and the maximum channel bit rate are dependent on UE Service Capability
~~4~~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 + one or more DCH coded into one or more CCTrCH	Service dependent	The number of DCHs and the maximum channel bit rate are dependent on the UE Service Capability. 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.
~~5~~4	One or more PDSCH	One or more DSCH coded onto one or more CCTrCH	Service dependent	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.
~~6~~5	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	Service dependent	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.
~~7~~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	Service dependent	The maximum number of DCHs and the maximum channel bit rate are dependent on UE Service Capability It is assumed here that a DSCH transport channel may map to one or more PDSCH physical channels based on system configuration.
~~8~~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 + one or more DSCH coded onto one or more CCTrCH + one or more DCH coded into one or more CCTrCH	Service dependent	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 Service Capability It is assumed here that a DSCH transport channel may map to one or more PDSCH physical channels based on system configuration.

NOTE 1: Reference: TS25.221: Physical Channels and Mapping of Transport Channels Onto Physical Channels (TDD).

~~NOTE 2: The PSCH synchronisation channel can co-exist with all listed combinations~~

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	Baseline Capability or Service Dependent	Comment
1	P-CCPCH		PRACH	RACH	Baseline	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			Baseline	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	Baseline	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.
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	Service Dependent	The maximum number of DCHs and the maximum channel bit rate are dependent on UE Service Capability. 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.

	DL Physical Channel Combination	DL Transport Channel Combination	UL Physical Channel Combination	UL Transport Channel Combination	Baseline Capability or Service Dependent	Comment
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	Service dependent	The maximum number of DCHs and the maximum channel bit rate are dependent on UE Service Capability. See Note 1. 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	Service dependent	The maximum number of DCHs and the maximum channel bit rate are dependent on UE Service Capability. 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	Service dependent	The maximum number of DCHs and the maximum channel bit rate are dependent on UE Service Capability. P-CCPCH is used for reference power to determine path loss for UL- DPCH transmit power calculations. See Note 1.

NOTE 1: 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.

~~NOTE 2: The PSCH synchronisation channel can co-exist with all listed combinations~~

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	Baseline Capability or Service dependent	Comment
~~1~~	~~One PSCH~~	~~SCH~~	~~Baseline~~	~~SCH can map to one or two PSCH in a frame depending on the synchronisation case as defined in 25.221 (see note 1)~~
~~2~~1	P-CCPCH and/or one or more S-CCPCH+ PICH	BCH and/or PCH and/or one or more FACH	Baseline	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.
~~3~~2	One or more DPCH	One or more DCH coded into one or more CCTrCH	Service dependant	The maximum number of DCHs and the maximum channel bit rate are dependent on UE Service Capability
~~4~~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	Service dependent	The number of DCHs and the maximum channel bit rate are dependent on the UE Service Capability. 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.
~~5~~4	One or more PDSCH	One or more DSCH coded onto one or more CCTrCH	Service dependent	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.
~~6~~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	Service dependant	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.
~~7~~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	Service dependent	The maximum number of DCHs and the maximum channel bit rate are dependent on UE Service Capability It is assumed here that a DSCH transport channel may map to one or more PDSCH physical channels based on system configuration.

	Physical Channel Combination	Transport Channel Combination	Baseline Capability or Service dependent	Comment
~~8~~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	Service dependent	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 Service Capability It is assumed here that a DSCH transport channel may map to one or more PDSCH physical channels based on system configuration.

NOTE 1: Reference: TS25.221: Physical Channels and Mapping of Transport Channels Onto Physical Channels (TDD).

~~NOTE 2: The PSCH synchronisation channel can co-exist with all listed combinations~~

3GPP RAN WG 2 Meeting #11
Turin, Italy, 28 Feb. - 03 Mar. 2000

Document ***R2-000593***

CHANGE REQUEST

25.302 CR 046 Current Version: 3.3.0

For submission to:	TSG-RAN#7	for approval	X	strategic	
		for information		non-strategic	

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

Source:	TSG-RAN WG2	**Date:**	02/03/2000
Subject:	Replacement of Time of Arrival Measurement by RTT		
Work item:			

Category:				**Release:**		
	F	Correction			Phase 2	
	A	Corresponds to a correction in an earlier release			Release 96	
(only one category	B	Addition of feature			Release 97	
shall be marked	C	Functional modification of feature			Release 98	
with an X)	D	Editorial modification	X		Release 99	X
					Release 00	

Reason for change: The time of arrival (ToA) name is used extensively in RAN3 specifications to reference a measurement, which is different from the ToA defined in 25.302. For this reason, it is proposed to rename the ToA in 25.302 with a different name "Round Trip Time (RTT)"

Clauses affected:

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:

9.2 UTRAN Measurements

9.2.1 RSSI

Measurement	RSSI
Source	L1 (Node B)
Destination	RRC(RNC)
Reporting Trigger	On-demand, Event-triggered, Periodic
Definition	**Received Signal Strength Indicator, the wide-band received power within the UTRAN UL channel bandwidth at a UTRAN access point.** For TDD this is measured in specified timeslots.

9.2.2 Transmitted carrier power

Measurement	Transmitted carrier power
Source	L1(Node-B)
Destination	RRC(RNC)
Reporting Trigger	On-demand, periodic, Event-triggered
Definition	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 this is measured in specified timeslots.

9.2.3 Transmitted code power

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

9.2.4 Transport channel BLER

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

9.2.5 Physical channel BER

Measurement	Physical channel BER
Source	L1(Node-B)
Destination	RRC(RNC)
Reporting Trigger	On-demand, Event-triggered, periodic
Definition	There are two types of this measurement. Type 1 calculates the physical channel BER on the data part before channel decoding and after RL combining. Type 2 calculates the physical channel BER on the control part after RL combining.

9.2.6 RX timing deviation

Measurement	RX timing deviation
Source	L1 (Node B)
Destination	RRC (RNC)
Reporting Trigger	Periodic, event triggered
Definition	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 cells only.

9.2.7 Timeslot ISCP

Measurement	Timeslot ISCP
Source	L1(Node B)
Destination	RRC (RNC)
Reporting Trigger	periodic or event triggered
Definition	Interference on Signal Code Power, is the interference after despreading in specified timeslots. Only the non-orthogonal part of the interference is included. This measurement is applicable for TDD cells only.

9.2.8 RSCP

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

9.2.9 ~~Time of Arrival~~Round trip time

The ~~Time of Arrival~~ Round Trip Time (~~TOA~~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 ~~TOA~~ 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	~~Time of arrival~~Round trip time
Source	L1(Node-B or LMU)
Destination	RRC (RNC-LCS)
Reporting Trigger	on demand, event triggered
Definition	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.~~The time of arrival of the uplink transmissions in relation to a specific timing reference.~~

9.2.10 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	The Frequency Offset (FO) measures the rate of change (drift) of the Relative Time Difference of the transmissions of two Node-Bs.

3GPP TSG RAN WG2 #11
Turin, Italy, 28 Feb-3 Mar, 2000

***Document* R2-000655**
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.

25.302	**CR**	**047r1**	Current Version:	3.3.0

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

For submission to: TSG-RAN#7	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: TSG-RAN WG2 **Date:** 2000-03-02

Subject: Incorporation of Measurement filtering model

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: Filtering is discussed both in WG1, WG4 and WG2. In order to have a common understanding on how L3 configuration of filtering and filtering in L1 a model should be present within the 3GPP specifications.

Clauses affected: New section 9.1 is inserted

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.

TS 25.302 V3.3.0 (2000-01)

9.1 Model of physical layer measurements

This section 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 below:

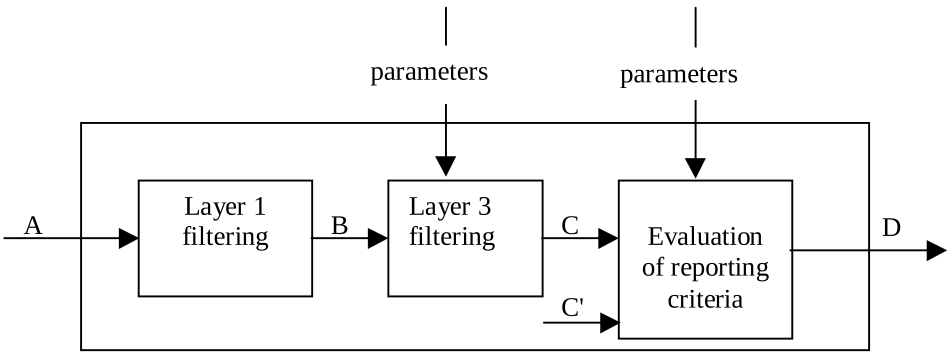


Figure 1 Measurement model

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 is specified in [ref to R4 spec].
- **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 [ref to R4 spec]. 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 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.
- **D**: a measurement report information (message) sent on the radio or Iub interface.

***** Next modified section *****

3GPP RAN WG 2 Meeting #11
Turin, Italy, 28 Feb. - 03 Mar. 2000

Document R2-000644

CHANGE REQUEST

25.302	**CR**	**048**	Current Version:	3.3.0

For submission to:	TSG-RAN#7	for approval	X	strategic	
		for information		non-strategic	

Proposed change affects:	(U)SIM		ME	X	UTRAN / Radio	X	Core Network	

Source:	TSG-RAN WG2
Date:	2nd Mar. 2000
Subject:	Separation of physical channel BER
Work item:	

Category:				**Release:**		
	F	Correction			Phase 2	
	A	Corresponds to a correction in an earlier release			Release 96	
(only one category shall be marked with an X)	B	Addition of feature			Release 97	
	C	Functional modification of feature	X		Release 98	
	D	Editorial modification			Release 99	X
					Release 00	

Reason for change:

RAN1 has defined the reference point for physical channel BER and separated it into two measurements

- Transport channel BER, which is measured on DPDCH after RL combination. The measurement is done from the data considering only non-punctured bits at the input of the channel decoder in Node B. This measurement used to be called "Physical channel BER, type 1".
- Physical channel BER, which is measured on DPCCH after RL combination. This measurement used to be called "Physical channel BER, type 2".

The reason for the change into Transport channel BER, is to reduce the complexity of the BER measurement on DPDCH. The corresponding change is updated to 25.302.

Clauses affected:

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:

9.2 UTRAN Measurements

9.2.1 RSSI

Measurement	RSSI
Source	L1 (Node B)
Destination	RRC(RNC)
Reporting Trigger	On-demand, Event-triggered, Periodic
Definition	**Received Signal Strength Indicator, the wide-band received power within the UTRAN UL channel bandwidth at a UTRAN access point.** For TDD this is measured in specified timeslots.

9.2.2 Transmitted carrier power

Measurement	Transmitted carrier power
Source	L1(Node-B)
Destination	RRC(RNC)
Reporting Trigger	On-demand, periodic, Event-triggered
Definition	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 this is measured in specified timeslots.

9.2.3 Transmitted code power

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

9.2.4 Transport channel BLER

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

9.2.5 Physical channel BER

Measurement	Physical channel BER
Source	L1(Node-B)
Destination	RRC(RNC)
Reporting Trigger	On-demand, Event-triggered, periodic
Definition	~~There are two types of this measurement. Type 1 calculates T~~The physical channel BER is measured ~~on the data part before channel decoding and after RL combining. Type 2 calculates the physical channel BER~~ on the control part after RL combining.

9.2.x Transport channel BER

Measurement	Transport channel BER
Source	L1(Node-B)
Destination	RRC(RNC)
Reporting Trigger	On-demand, Event-triggered, periodic
Definition	The transport channel BER is measured on the data part after RL combining.

9.2.6 RX timing deviation

Measurement	RX timing deviation
Source	L1 (Node B)
Destination	RRC (RNC)
Reporting Trigger	Periodic, event triggered
Definition	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 cells only.

9.2.7 Timeslot ISCP

Measurement	Timeslot ISCP
Source	L1(Node B)
Destination	RRC (RNC)
Reporting Trigger	periodic or event triggered
Definition	Interference on Signal Code Power, is the interference after despreading in specified timeslots. Only the non-orthogonal part of the interference is included. This measurement is applicable for TDD cells only.

9.2.8 RSCP

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

9.2.9 Time of Arrival

The Time of Arrival (TOA) 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 TOA 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	Time of arrival
Source	L1(Node-B or LMU)
Destination	RRC (RNC-LCS)
Reporting Trigger	on demand, event triggered
Definition	The time of arrival of the uplink transmissions in relation to a specific timing reference.

9.2.10 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	The Frequency Offset (FO) measures the rate of change (drift) of the Relative Time Difference of the transmissions of two Node-Bs.