TSG-RAN Meeting #9
Hawaii, US, 20 - 22 September 2000

TSGRP#9(00)0384

Title: **Agreed CRs to TS 25.427**

Source: **TSG-RAN WG3**

Agenda item: **5.3.3**

Tdoc_Num	Specification	CR_Num	Revision_Num	CR_Subject	CR_Category	WG_Status	Cur_Ver_Num	New_Ver_Num
R3-001935	25.427	026	1	Timing Deviation and Timing Adjustment Synchronisation	F	agreed	3.3.0	3.4.0
R3-001941	25.427	028	1	Reserved TFI bits	F	agreed	3.3.0	3.4.0
R3-001940	25.427	029	1	Transport connection synchronisation	F	agreed	3.3.0	3.4.0
R3-002038	25.427	031		DSCH Corrections	F	agreed	3.3.0	3.4.0
R3-002188	25.427	032	1	BER at Uplink DTX for TDD	F	agreed	3.3.0	3.4.0
R3-002252	25.427	033	1	Node B knowledge of timing advance	F	agreed	3.3.0	3.4.0
R3-002248	25.427	034	1	CRCI octet when number of TBs is equal to zero	F	agreed	3.3.0	3.4.0
R3-002365	25.427	035	3	Editorial modification of 25.427	F	agreed	3.3.0	3.4.0

Document ***R3-001935***
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

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TS 25.427 **CR** **026r1** 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:	RAN#9	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: R-WG3 **Date:** July 2000

Subject: Co-ordination of Timing deviation measurement and Timing advance

Work item:

Category:				**Release:**	
	F	Correction	X	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: The current method to make the application of timing advance deterministic is not adequate and can not be tied to timing deviation measurements

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:

6.3.3.7 Rx Timing Deviation

6.3.3.7.1 Payload structure

Figure below shows the structure of the payload when the control frame is used for the Rx timing deviation.

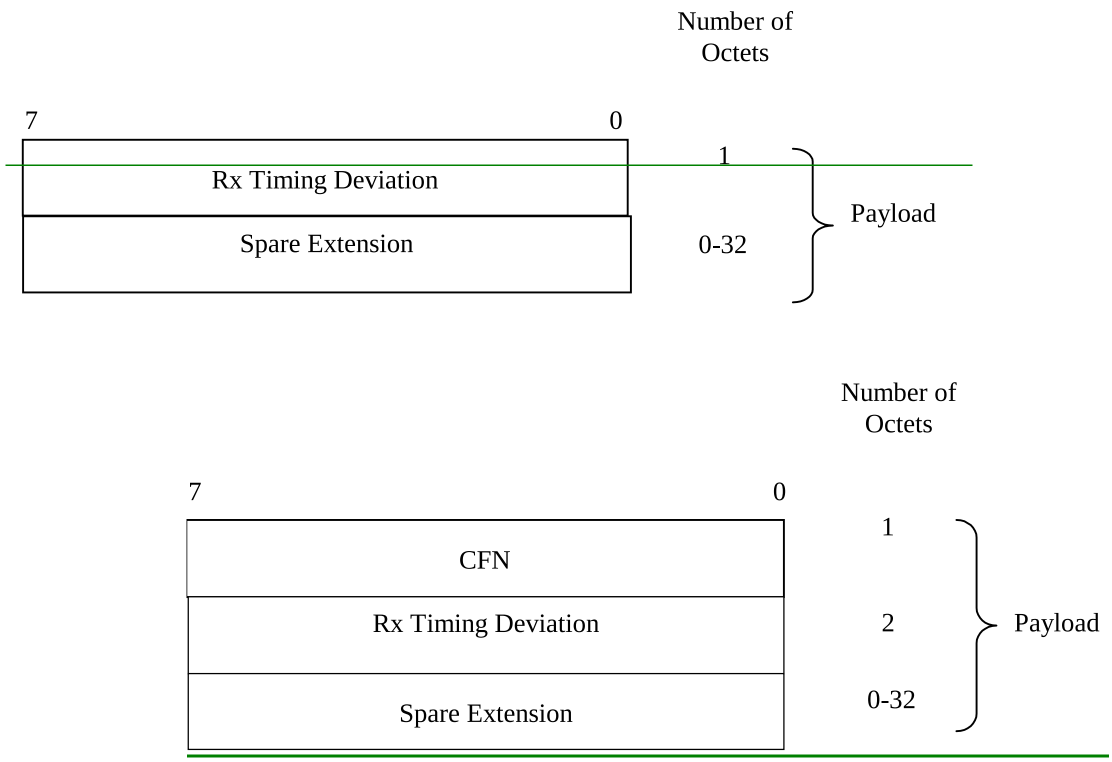

Figure 20: Structure of the payload for Rx timing deviation control frame

6.3.3.7.2 Rx Timing Deviation

Description: Measured Rx Timing deviation as a basis for timing advance.

Value range: {-256, ..,+256 }chips.

{N*4 –256}chips ≤ RxTiming Deviation < {(N+1)*4 –256} chips

With N = 0,1, .. , 127

Granularity: 4 chips.

Field length: 7 bits.

6.3.3.7.3 Spare Extension

The Spare Extension is described in subclause 6.3.3.1.4.

6.3.3.7.4 CFN

The CFN value in the control frame is the CFN when the RX timing deviation was measured. It is coded as in subclause 6.2.4.3.

TSG-RAN Working Group 3 Meeting #14
Helsinki, Finland, 3rd – 7th July 2000

Document ***R3-001941***
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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25.427	**CR**	**028 R1**	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 #9	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: R-WG3 **Date:** July 2000

Subject: Reserved TFI bits.

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: The maximum number of TFIs has been restricted to 32. TFI IE occupies one octet, although TFI could be identified with 5 bits or in many cases with less than 5 bits. This CR proposes that the three most significant bits are set to spare.

Clauses affected: 6.2.2., 6.2.3, 6.2.4.4

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:

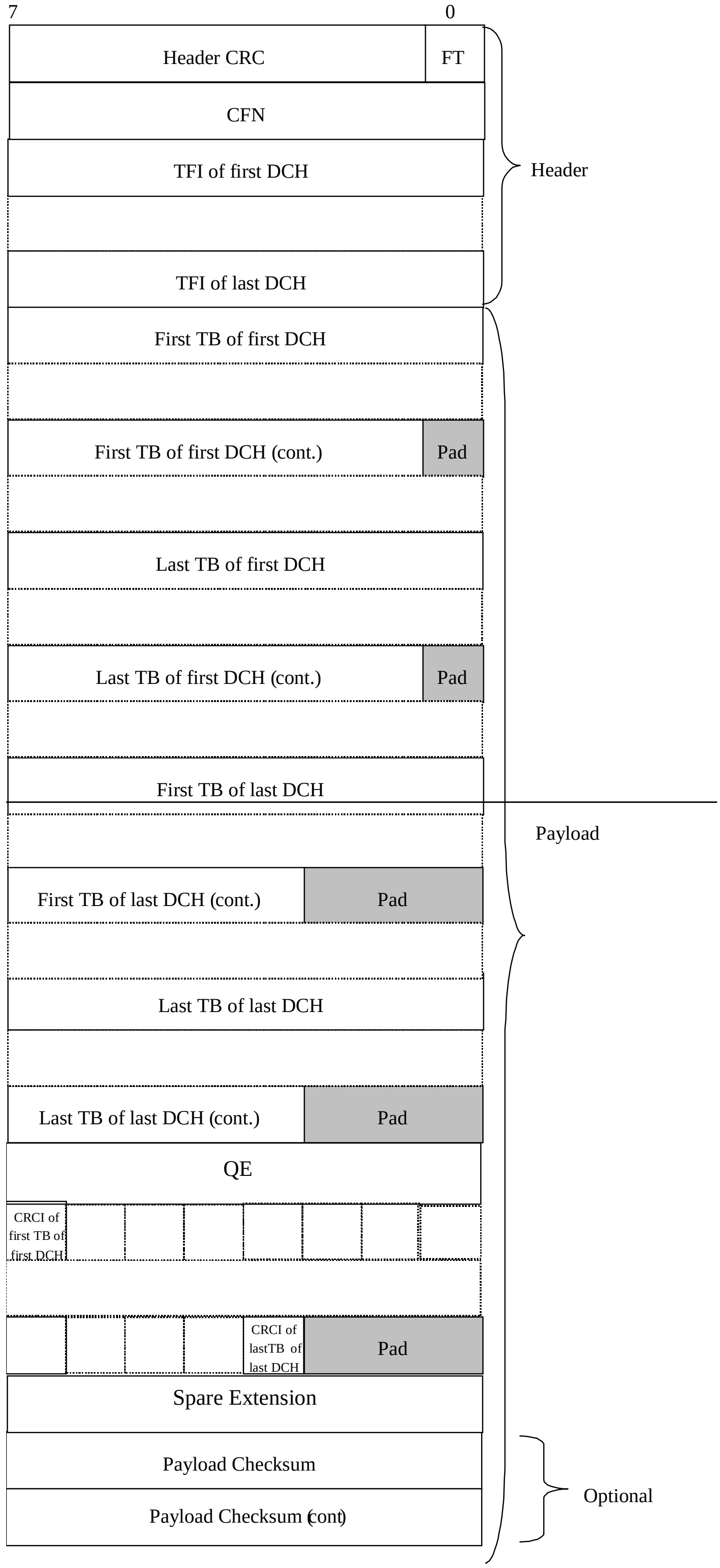
Other comments:

help.doc

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

6.2.2 Uplink data frame

The structure of the UL data frame is shown below.


7
0
Header CRC
FT
CFN
TFI of first DCH
TFI of last DCH
Header
First TB of first DCH
First TB of first DCH (cont.)
Pad
Last TB of first DCH
Last TB of first DCH (cont.)
Pad
First TB of last DCH
Payload
First TB of last DCH (cont.)
Pad
Last TB of last DCH
Last TB of last DCH (cont.)
Pad
QE
CRCI of first TB of first DCH
CRCI of lastTB of last DCH
Pad
Spare Extension
Payload Checksum
Payload Checksum (cont)
Optional

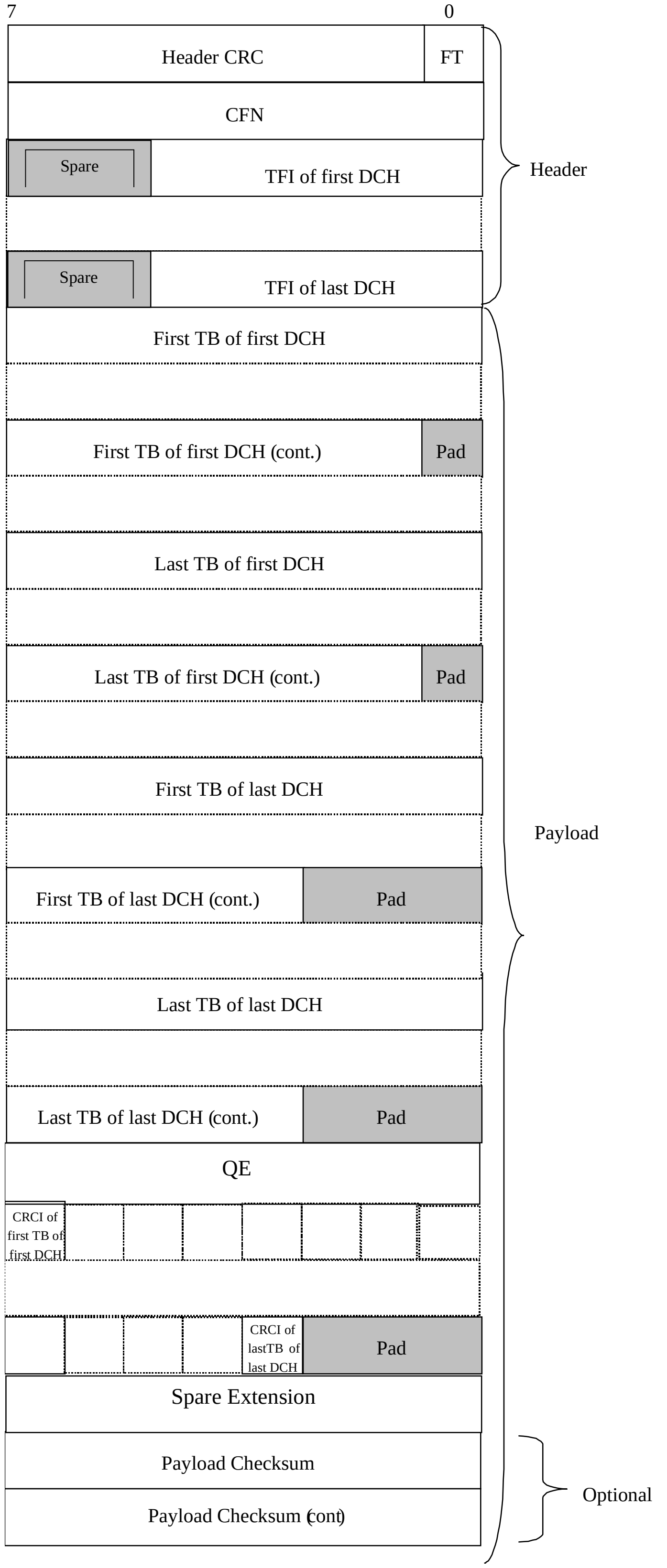


Figure 11: Uplink data frame structure

For the description of the fields see subclause 6.2.4.

There are as many TFI fields as number of DCH multiplexed in the same transport connection.

The DCHs in the frame structure are ordered from the lower DCH id ('first DCH') to the higher DCH id ('last DCH').

The size and the number of TBs for each DCH is defined by the correspondent TFI.

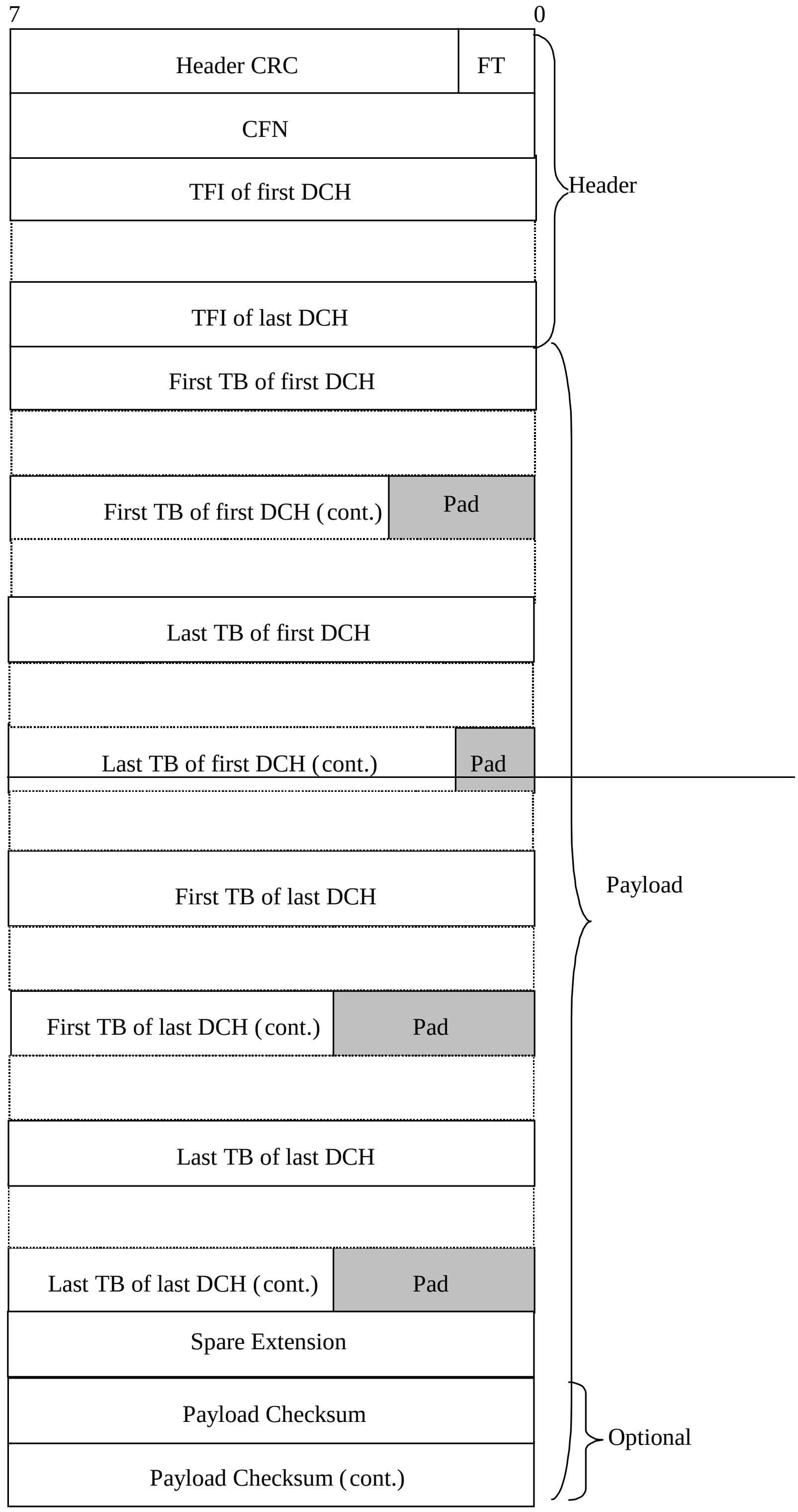
If the TB does not fill an integer number of bytes, then bit padding is used as shown in the figure in order to have the octet aligned structure (ex: a TB of 21 bits requires 3 bits of padding).

There is a CRCI for each TB included in the frame. If the CRC indicators of one data frame do not fill an integer number of bytes, then bit padding is used as shown in the figure in order to have the octet aligned structure.

The payload CRC is optional, i.e. the whole 2 bytes field may or may not be present in the frame structure (this is defined at the setup of the transport connection).

6.2.3 Downlink data frame

The structure of the DL data frame is shown below.


7
0
Header CRC
FT
CFN
TFI of first DCH
TFI of last DCH
Header
First TB of first DCH
First TB of first DCH (cont.)
Pad
Last TB of first DCH
Last TB of first DCH (cont.)
Pad
First TB of last DCH
Payload
First TB of last DCH (cont.)
Pad
Last TB of last DCH
Last TB of last DCH (cont.)
Pad
Spare Extension
Payload Checksum
Payload Checksum (cont.)
Optional

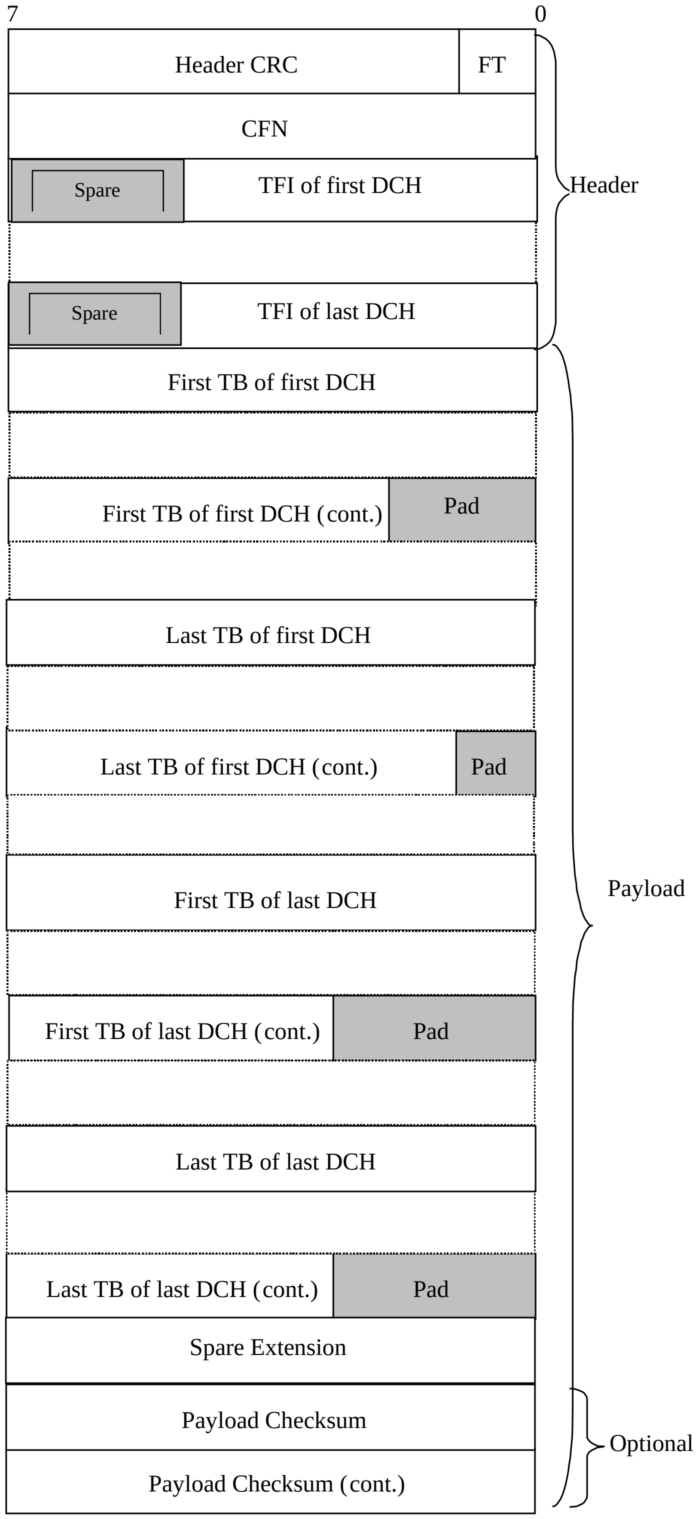


Figure 12: Downlink data frame structure

For the description of the fields see subclause 6.2.4.

There are as many TFI fields as number of DCH multiplexed in the same transport connection.

The DCHs in the frame structure are ordered from the lower DCH id ('first DCH') to the higher DCH id ('last DCH').

The size and the number of TBs for each DCH is defined by the correspondent TFI.

If the TB does not fill an integer number of bytes, then bit padding is used as shown in the figure in order to have the octet aligned structure (ex: a TB of 21 bits requires 3 bits of padding).

The payload CRC is optional, i.e. the whole 2 bytes field may or may not be present in the frame structure (this is defined at the setup of the transport connection).

6.2.4.4 Transport Format Indicator (TFI)

Description: TFI is the local number of the transport format used for the transmission time interval.For information about what the transport format includes see TS 25.302 reference [3].

Value range: {0-~~255~~31}.

Field length: ~~8~~ 5 bits.

3GPP TSG-RA WG3 Meeting #14
Helsinki, Finland, 3rd-7th July 2000

Document R3-001940

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

CHANGE REQUEST

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25.427	**CR**	**029 R1**	Current Version:	v.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#9	for approval		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		UTRAN / Radio	X	Core Network	

Source: R-WG3 **Date:** July 2000

Subject: Transport connection synchronisation

Work item:

Category:				**Release:**		
	F	Correction	X		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:

Currently, 25.427 requires receipt of at least one data frame on a transport connection with a positive TOA before the transport connection shall be considered synchronised. However, when the transport channel is established even frames with a negative TOA are handled as long as the negative TOA does not lead to frame arrival after LTOA.

We think this difference in behaviour is strange: also in the synchronisation case we see no reason why a frame received with a negative TOA but before the LTOA, should not be handled: i.e. lead to a synchronised transport connection and possibly be transmitted on the radio interface.

This contribution proposes to align the two cases.

Clauses affected: 5.1.2.

Other specs affected:			
	Other 3G core specifications		→ List of CRs:
	Other GSM core specifications		→ List of CRs:
	MS test specifications		→ List of CRs:
	BSS test specifications		→ List of CRs:
	O&M specifications		→ List of CRs:

Other comments:

help.doc

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

5.1.2 Downlink

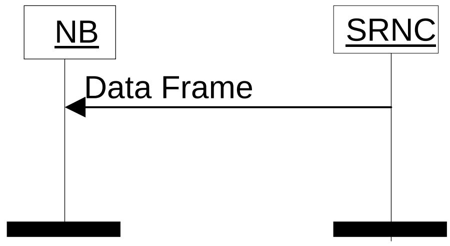

Figure 2: Downlink data transfer

The Node B shall only consider a transport connection synchronised after it has received at least one data frame on this transport connection before LTOA~~with a positive TOA~~ [4].

The Node B shall consider the DL user plane for a certain RL synchronised if all transport connections established for carrying DL data frames for this RL can be considered synchronised.

Only when the DL user plane is considered synchronised, the Node B shall transmit on the [FDD - DL DPDCH][TDD – DPCH].

When the DL user plane is considered synchronised and the Node B does not receive a valid FP frame in a TTI, it assumes that there is no data to be transmitted in that TTI for this transport channel.

If the node B is aware of a TFI value corresponding to zero bits for this transport channel, this TFI is assumed. If the TFS contains both a TFI corresponding to “TB length equal to 0 bits” and a TFI corresponding to “number of TB equal to 0”, the node-B shall assume the TFI corresponding to “number of TB equal to 0”.When combining the TFI’s of the different transport channels, a valid TFCI might result and in this case data shall be transmitted on Uu.

If the node B is not aware of a TFI value corresponding to zero bits for this transport channel or if combining the TFI corresponding to zero bits with other TFI’s, results in an unknown TFI combination, the handling as described in the following paragraph shall be applied.

At each frame, the Node B shall build the TFCI value of each CCTrCH, according to the TFI of the DCH data frames multiplexed on this CCTrCH and scheduled for that frame. [FDD - In case the Node receives an unknown combination of DCH data frames, it shall transmit only the DPCCH without TFCI bits.] [TDD - In case the Node receives an unknown combination of DCH data frames, it shall apply DTX, i.e. suspend transmission on the corresponding DPCHs.]

3GPP/SMG Meeting #15
Berlin, Germany, 21-25 August 2000

***Document* R3-002038**
e.g. for 3GPP use the format TP-99xxx
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CHANGE REQUEST

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25.427	**CR**	**31r0**	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 #9
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:
(at least one should be marked with an X)

(U)SIM	ME	UTRAN / Radio	Core Network
		X	

Source: R-WG3

Date: 2000-08-08

Subject: DSCH corrections

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: Align the length of TFCI field 2 in 6.3.3.8.2 with the definition in RRC.

Clauses affected: 6.3.3.8

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.

6.3.3.6.5 Spare Extension

The Spare Extension is described in subclause 6.3.3.1.4.

6.3.3.7 Rx Timing Deviation

6.3.3.7.1 Payload structure

Figure below shows the structure of the payload when the control frame is used for the Rx timing deviation.

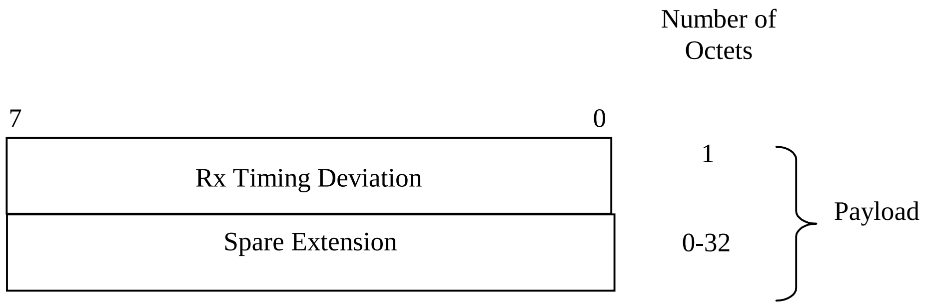

Figure 20: Structure of the payload for Rx timing deviation control frame

6.3.3.7.2 Rx Timing Deviation

Description: Measured Rx Timing deviation as a basis for timing advance.

Value range: {-256, ..,+256 }chips.

{N*4 –256}chips ≤ RxTiming Deviation < {(N+1)*4 –256} chips

With N = 0,1, .. , 127

Granularity: 4 chips.

Field length: 7 bits.

6.3.3.7.3 Spare Extension

The Spare Extension is described in subclause 6.3.3.1.4.

6.3.3.8 [FDD - DSCH TFCI signalling]

6.3.3.8.1 Payload structure

The figure below shows the structure of the payload when the control frame is used for signalling TFCI (field 2) bits. The TFCI (field 2) bits are used by the node B to create the TFCI word(s) for transmission on the DPCCH. A transport bearer of any DCH directed to this same user may be employed for transport over the Iub / Iur.

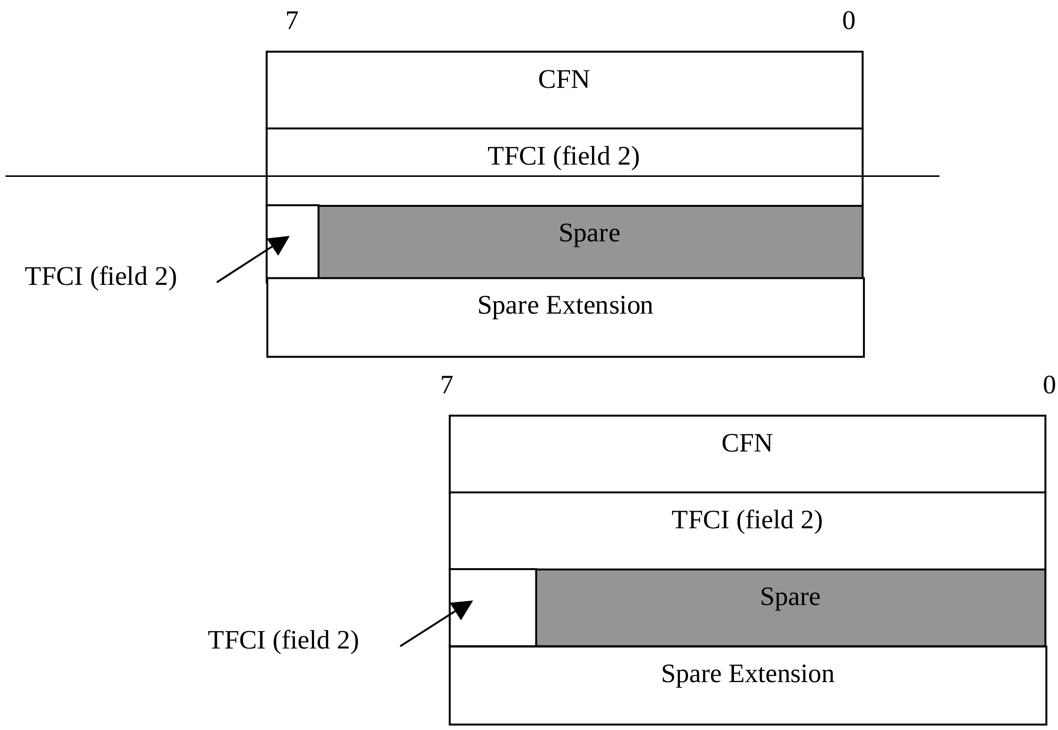

Figure 21: [FDD - Structure of the payload for the DSCH DL signalling control frame

6.3.3.8.2 TFCI (field 2)

Description: TFCI (field 2) is as described in [4], it takes the same values as the TFCI(field 2) which is transmitted over the Uu interface.

Value range: {0 - 1023~~511~~}

Field length: ~~9~~ 10 bits

6.3.3.8.3 Spare Extension

The Spare Extension is described in subclause 6.3.3.1.4.

6.3.3.9 Radio Interface Parameter Update

6.3.3.9.1 Payload structure

The figure below shows the structure of the payload when the control frame is used for signalling radio interface parameter updates.

7		0
Radio Interface Parameter Update flags 15 14 13 12 11 10 9 8		
Radio Interface Parameter Update flags 7 6 5 4 3 2 1 0		
CFN		
7 6 5 spare	TPC PO	
Spare Extension		

Payload (>=4 bytes)

Figure 22: Structure of the payload for the Radio Interface Parameter Update control frame

6.3.3.9.2 Radio Interface Parameter Update flags

Description: Contains flags indicating which information is present in this control frame.

Value range:

Bit 0: Indicates if the 3rd byte of the control frame payload contains a CFN (1) or not (0);

3GPP TSG-RAN Working Group 3 Meeting #15
Berlin, Germany, 21 - 25 August 2000

***Document* R3-002188**
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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25.427 CR 32r1 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 #9 — For approval: X — For information: — strategic: — non-strategic: — *(for SMG use only)*
list expected approval meeting # here ↑

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:	R-WG3
Date:	August 2000
Subject:	BER at UL DTX for TDD
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: The calculation of a Bit Error Rate during DTX applied on uplink DCHs in TDD had been an open issue. This CR describes how Node B shall behave in this case.

Rev 1- This change also takes the elimination of Physical channel BER by WG1 into account.

Clauses affected: 5.1.1, 6.2.4.5

Other specs affected:

Other 3G core specifications	X	→ List of CRs: 25.225CR16 25.435CR28, 25.423CR171, 25.433CR203
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:

5 DCH Frame Protocol procedures

5.1 Data transfer

When there is some data to be transmitted, DCH data frames are transferred every transmission time interval between the SRNC and the Node B for downlink transfer, and between Node B and SRNC for uplink transfer.

An optional error detection mechanism may be used to protect the data transfer if needed. At the transport channel setup it shall be specified if the error detection on the user data is used.

5.1.1 Uplink

Figure 1: Uplink data transfer

Two modes can be used for the UL transmission: *normal mode* and *silent mode*. The mode is selected by the SRNC when the transport connection is setup and signaled to the Node B with the relevant control plane procedure.

- In normal mode, the Node B shall always send an UL data frame to the RNC for all the DCHs in a set of coordinated DCHs regardless of the number of Transport Blocks of the DCHs.
- In silent mode and in case only one transport channel is transported on a transport bearer, the node-B shall not send an UL data frame to the RNC when it has received a TFI indicating “number of TB equal to 0” for the transport channel during a TTI.
- In silent mode and in case of coordinated DCHs, when the Node B receives a TFI indicating “number of TB equal to 0” for all the DCHs in a set of coordinated DCHs, the Node B shall not send an UL data frame to the RNC for this set of coordinated DCHs.

For any TTI in which the Node B Layer 1 generated at least one CPHY-Out-of-Sync-IND primitive, the Node B is not required to send an UL data frame to the SRNC.

~~When UL synchronisation is lost or not yet achieved on the Uu, UL data frames are not sent to the SRNC.~~

When Node B receives an invalid TFCI no data frame shall be sent to the SRNC.

6.2.4.5 Quality Estimate (QE)

Description: The quality estimate is derived from the Transport channel BER [FDD - or Physical channel BER.]

[FDD - If the DCH FP frame includes TB's for the DCH which was indicated as "selected" with the QE-selector IE in the control plane [4][6], then the QE is the Transport channel BER for the selected DCH. If no Transport channel BER is available the QE is the Physical channel BER.]

[FDD - If the IE QE-Selector equals “non-selected” for all DCHs in the DCH FP frame, then the QE is the Physical channel BER.]

[TDD - If no Transport channel BER is available, then the QE shall be set to 0. This is in particular the case when no Transport Blocks have been received. The value of QE will be ignored by the RNC in this case.]

The quality estimate shall be set to the Transport channel BER [FDD -or Physical channel BER] and be measured in the units TrCh_BER_LOG [FDD - and PhCh_BER_LOG respectively] (see Ref [7] and [8]). The quality estimate is needed in order to select a transport block when all CRC indications are showing bad (or good) frame. The UL Outer Loop Power Control may also use the quality estimate.

Value range: {0-255}, granularity 1.

Field length: 8 bits.

3GPP TSG RAN WG3 Meeting #15
Berlin, Germany, 21st – 25th August 2000

***Document* R3-002252**
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

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TS 25.427	**CR**	**33r1**	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:	RAN#9	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:	R-WG3
Date:	August 2000
Subject:	Node B knowledge of timing advance
Work item:	

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

Reason for change:	A requirement added in WG1 requires that the node B must be made aware of an timing adjustment to allow layer 1 to adapt correctly to the change.
Clauses affected:	5.x, 6.3.2.3, 6, 6.3.3.x

Other specs Affected:				
	Other 3G core specifications	X	→ List of CRs:	25.224 CR 26
	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:	

5.x Timing Advance [TDD]

This procedure is used in order to signal to the node B the adjustment to be performed by the UE in the uplink timing.

The Node B shall use the CFN and timing adjustment values to adjust its layer 1 to allow for accurate impulse averaging.

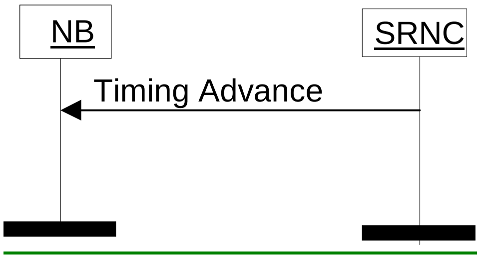

Figure x: Timing Advance Signalling

6.3.2.3 Control Frame Type

Description: Indicates the type of the control information (information elements and length) contained in the payload.

Value The values are defined in the following table:

Control frame type	Coding
Outer loop power control	0000 0001
Timing adjustment	0000 0010
DL synchronisation	0000 0011
UL synchronisation	0000 0100
DL signalling for DSCH	0000 0101
DL Node synchronisation	0000 0110
UL Node synchronisation	0000 0111
Rx Timing Deviation	0000 1000
Radio Interface Parameter Update	0000 1001
Timing Advance	0000 1010

Field length: 8 bits.

6.3.3.x [TDD - Timing Advance]

6.3.3.x.1 Payload structure

Figure below shows the structure of the payload when the control frame is used for timing advance.

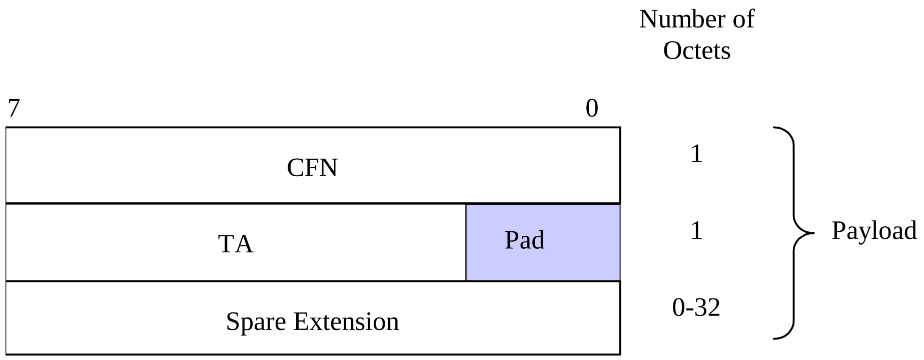

Figure x: Structure of the Timing Advance control frame

6.3.3.x.2 CFN

The CFN value in the control frame is the frame that the timing advance will occur and is coded as in subclause 6.2.4.3.

6.3.3.x.3 TA

Description: UE applied UL timing advance adjustment.

Value range: : 0-252 chips, and the resolution is 4 chips.

Field length: 6 bits.

6.3.3.x.4 Spare Extension

The Spare Extension is described in subclause 6.3.3.1.4.

TSG-RAN Working Group 3 Meeting #15
Berlin, Germany, 21st – 25th August 2000

Document ***R3-002248***
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.

25.427 CR 34 R1 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 #9
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: R-WG3 **Date:** August 2000

Subject CRCI field when number of TBs is equal to zero.

Work item:

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

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

Release:

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

Reason for change:

In Normal Mode DCH frames are transmitted in each TTI although there is no data to be sent on any DCH channel. Number of TBs is in that case equal to zero and no CRCI bits are available.

This CR clarifies that when there are no CRCI bits to be transmitted, the CRCI field does not exist.

Clauses affected: 6.2.2

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

6.2.2 Uplink data frame

The structure of the UL data frame is shown below.

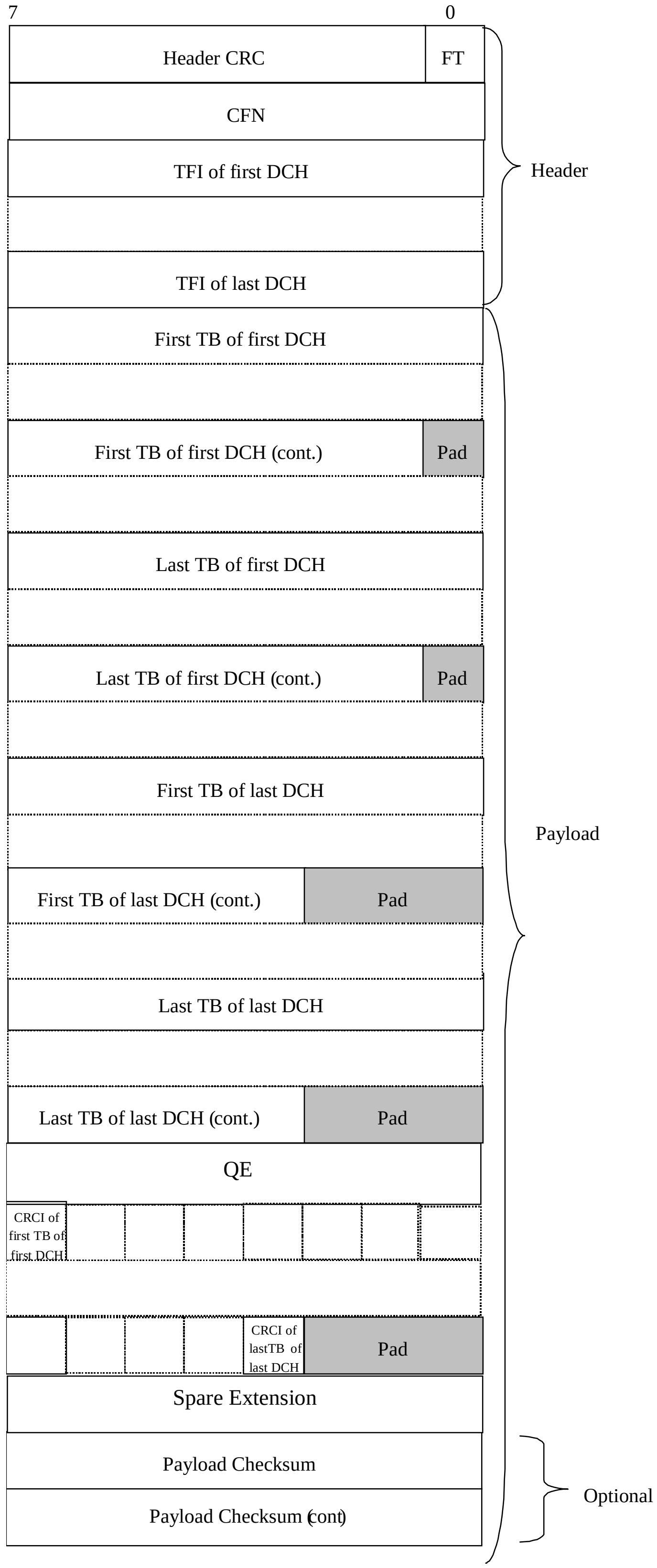

Figure 11: Uplink data frame structure

For the description of the fields see subclause 6.2.4.

There are as many TFI fields as number of DCH multiplexed in the same transport connection.

The DCHs in the frame structure are ordered from the lower DCH id ('first DCH') to the higher DCH id ('last DCH').

The size and the number of TBs for each DCH is defined by the correspondent TFI.

If the TB does not fill an integer number of bytes, then bit padding is used as shown in the figure in order to have the octet aligned structure (ex: a TB of 21 bits requires 3 bits of padding).

There is a CRCI for each TB included in the frame. If the CRC indicators of one data frame do not fill an integer number of bytes, then bit padding is used as shown in the figure in order to have the octet aligned structure (ex. 3 CRCI bits require 5 bits of padding, but there are no CRCI bits and no padding, when number TBs is zero).

The payload CRC is optional, i.e. the whole 2 bytes field may or may not be present in the frame structure (this is defined at the setup of the transport connection).

3GPP TSG-RAN WG3 Meeting #15
Berlin, Germany, 21st –25th August 2000

***Document* R3-002365**

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.

25.427	**CR**	**035r3**	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:	RAN#9	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: R-WG3   **Date:** Aug. 2000

Subject: Editorial Modification to 25.427

Work item:

Category:				**Release:**	
	F	Correction	X	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		Release 98	
	D	Editorial modification		Release 99	X
				Release 00	

Reason for change: This CR proposes editorial modification to 25.427, mainly related to the procedure description. Principles used in the control plane specification are adopted.

Clauses affected: 2, 3.1, 3.2, 4, 4,1, 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 5.8, 6.2.2, 6.2.3, 6.3.3.8.1

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:

1 Scope

This document shall provide a description of the UTRAN Iur and Iub interfaces user plane protocols for Dedicated Transport Channel data streams as agreed within the TSG-RAN working group 3.

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.
- For this Release 1999 document, references to 3G documents are for Release 1999 versions (version 3.x.y).

[1] TS 25.301: "Radio Interface Protocol Architecture".

[2] TS 25.401: "UTRAN architecture description".

[3] TS 25.302: "Services provided by the Physical Layer, Source WG2".

[4] TS 25.433: "UTRAN Iub interface NBAP signalling".

[5] TS 25.402: "Synchronisation in UTRAN, Stage 2".

[6] TS 25.423: "UTRAN Iur interface RNSAP signalling".

[7] TS 25.215: "Physical layer – Measurements (FDD)".

[8] TS 25.225: "Physical layer – Measurements (TDD)".

[9] TS 25.212: "Multiplexing and channel coding, FDD".

[10] TS 25.222: "Multiplexing and channel coding, TDD".

3 Definitions and abbreviations

3.1 Definitions

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

Transport Bearer : service provided by the transport layer and used by Frame Protocol for the delivery of FP PDU.

3.2 Abbreviations

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

CFN Connection Frame Number
CRC Cyclic Redundancy Checksum
CRCI CRC Indicator
DCH Dedicated Transport Channel
DL Downlink
DSCH Downlink Shared Channel

DTX	Discontinuous Transmission
FP	Frame Protocol
FT	Frame Type
PC	Power Control
QE	Quality Estimate
TB	Transport Block
TBS	Transport Block Set
TFI	Transport Format Indicator
TFCI	Transport Format Combination Indicator
ToA	Time of arrival
TTI	Transmission Time Interval
UL	Uplink

4 General aspects

The specification of I_{ub} DCH data streams is also valid for I_{ur} DCH data streams.

The complete configuration of the transport channel is selected by the SRNC and signalled to the Node B via the Iub and Iur control plane protocols.

The parameters of a Transport channel are described in [1]. Transport channels are multiplexed on the downlink by the Node B on radio physical channels, and de-multiplexed on the uplink from radio physical channels to Transport channels.

In Iur interface, every set of coordinated Transport channel related to one UE context that is communicated over a set of cells that are macro-diversity combined within Node B or DRNC, is carried on one transport bearer. This means that there are as many transport bearers as set of coordinated Transport channels and Iur User ports for that communication.

In Iub interface, every set of coordinated Transport channel related to one UE context that is communicated over a set of cells that are macro-diversity combined within Node B is carried on one transport bearer. This means that there are as many transport bearers as set of coordinated Transport channels and Iub User ports for that communication.

Bi-directional transport bearers are used.

4.1 DCH FP services

DCH frame protocol provides the following services:

- Transport of TBS across Iub and Iur interface.
- Transport of outer loop power control information between the SRNC and the Node B.
- Support of transport channel synchronisation mechanism.
- Support of Node Synchronisation mechanism.
- Transfer of DSCH TFI from SRNC to Node B.
- Transfer of Rx timing deviation (TDD) from the Node B to the SRNC.
- Transfer of radio interface parameters from the SRNC to the Node B.

4.2 Services expected from data transport

Following service is required from the transport layer:

- In sequence delivery of FP PDU.

4.3 Protocol Version

This revision of the specification specifies version 1 of the protocol.

5 DCH Frame Protocol procedures

5.1 Data Transfer

5.1.0 General

When there is some data to be transmitted, DCH data frames are transferred every transmission time interval from the SRNC to the Node B for downlink transfer, and from Node B to the SRNC for uplink transfer.

An optional error detection mechanism may be used to protect the data transfer if needed. At the transport channel setup it shall be specified if the error detection on the user data is used.

5.1.1 Uplink

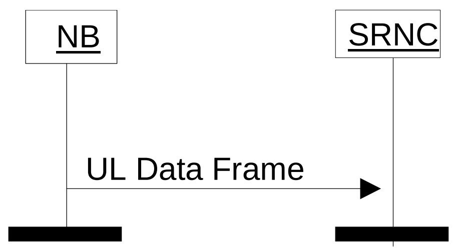

Figure 1: Uplink data transfer

Two modes can be used for the UL transmission: *normal mode* and *silent mode*. The mode is selected by the SRNC when the transport bearer is setup and signaled to the Node B with the relevant control plane procedure.

- In normal mode, the Node B shall always send an UL Data Frame to the RNC for all the DCHs in a set of coordinated DCHs regardless of the number of Transport Blocks of the DCHs.
- In silent mode and in case only one transport channel is transported on a transport bearer, the node-B shall not send an UL Data Frame to the RNC when it has received a TFI indicating "number of TB equal to 0" for the transport channel during a TTI.

In silent mode and in case of coordinated DCHs, when the Node B receives a TFI indicating "number of TB equal to 0" for all the DCHs in a set of coordinated DCHs, the Node B shall not send an UL data frame to the RNC for this set of coordinated DCHs.

When UL synchronisation is lost or not yet achieved on the Uu, UL Data Frames are not sent to the SRNC.

When Node B receives an invalid TFCI, no Data Frame shall be sent to the SRNC.

5.1.2 Downlink

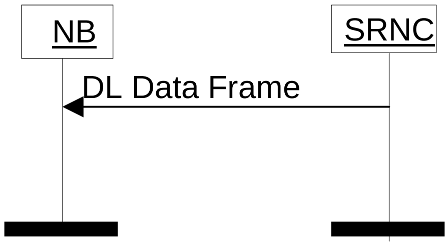

Figure 2: Downlink data transfer

The Node B shall only consider a transport bearer synchronised after it has received at least one data frame on this transport bearer with a positive ToA [4].

The Node B shall consider the DL user plane for a certain RL synchronised if all transport bearers established for carrying DL data frames for this RL are synchronised.

Only when the DL user plane is considered synchronised, the Node B shall transmit on the [FDD - DL DPDCH][TDD – DPCH].

When the DL user plane is considered synchronised and the Node B does not receive a valid DL Data Frame in a TTI, it assumes that there is no data to be transmitted in that TTI for this transport channel, and shall act as one of the following cases:

- If the node B is aware of a TFI value corresponding to zero bits for this transport channel, this TFI is assumed. If the TFS contains both a TFI corresponding to “TB length equal to 0 bits” and a TFI corresponding to “number of TB equal to 0”, the node-B shall assume the TFI corresponding to “number of TB equal to 0”. When combining the TFI’s of the different transport channels, a valid TFCI might result and in this case data shall be transmitted on Uu.
- If the node B is not aware of a TFI value corresponding to zero bits for this transport channel or if combining the TFI corresponding to zero bits with other TFI’s, results in an unknown TFI combination, the handling as described in the following paragraph shall be applied.

At each radio frame, the Node B shall build the TFCI value of each CCTrCH, according to the TFI of the DCH data frames multiplexed on this CCTrCH and scheduled for that frame. [FDD - In case the Node B receives an unknown combination of TFIs from the DL Data Frames, it shall transmit only the DPCCH without TFCI bits.] [TDD - In case the Node receives an unknown combination of DCH data frames, it shall apply DTX, i.e. suspend transmission on the corresponding DPCHs.]

5.2 Timing adjustment

The Timing Adjustment procedure is used to keep the synchronisation of the DCH data stream in DL direction, i.e to ensure that the Node B receives the DL frames in an appropriate time for the transmission of the data in the air interface.

SRNC always includes the Connection Frame Number (CFN) to all DL DCH FP frames. The same applies to the DSCH TFI Signalling control frame.

If a DL data frame or a DSCH TFCI Signalling control frame arrives outside the arrival window defined in the Node B, the Node B shall send a TIMING ADJUSTMENT control frame, containing the measured ToA and the CFN value of the received DL Data Frame.

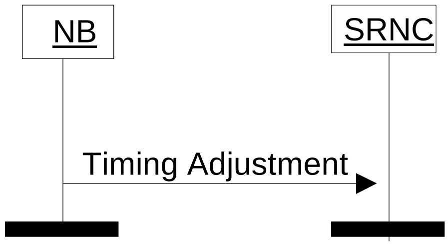

Figure 3: Timing Adjustment

The arrival window and the time of arrival are defined as follows:

Time of Arrival Window Endpoint (ToAWE): ToAWE represents the time point by which the DL data shall arrive to the node B from Iub. The ToAWE is defined as the amount of milliseconds before the last time point from which a timely DL transmission for the identified CFN would still be possible taking into account the node B internal delays. ToAWE is set via control plane. If data does not arrive before ToAWE a Timing Adjustment Control Frame shall be sent by node B.

Time of Arrival Window Startpoint (ToAWS): ToAWS represents the time after which the DL data shall arrive to the node B from Iub. The ToAWS is defined as the amount of milliseconds from the ToAWE. ToAWS is set via control plane. If data arrives before ToAWS a Timing Adjustment Control Frame shall be sent by node B.

Time of Arrival (ToA): ToA is the time difference between the end point of the DL arrival window (ToAWE) and the actual arrival time of DL frame for a specific CFN. A positive ToA means that the frame is received before the ToAWE, a negative ToA means that the frame is received after the ToAWE.

The general overview on the timing adjustment procedure is reported in [2].

5.3 Synchronisation

Synchronisation procedure is used to achieve or restore the synchronisation of the DCH data stream in DL direction, and as a keep alive procedure in order to maintain activity on the Iur/Iub transport bearer.

The procedure is initiated by the SRNC by sending a DL SYNCHRONISATION control frame towards Node B. This message indicates the target CFN.

Upon reception of the DL SYNCHRONISATION control frame, Node B shall immediately respond with UL SYNCHRONISATION control frame indicating the ToA for the DL synchronisation frame and the CFN indicated in the received DL SYNCHRONISATION message.

UL SYNCHRONISATION control frame shall always be sent, even if the DL SYNCHRONISATION control frame is received by the Node B within the arrival window.

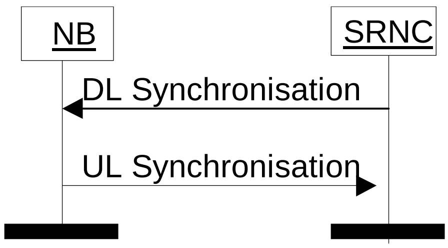

Figure 4: DCH Synchronisation procedure

5.4 Outer loop PC information transfer [FDD]

Based, for example, on the CRCI values and on the quality estimate in the UL frames, SRNC modifies the SIR target used by the UL Inner Loop Power Control by including the absolute value of the new SIR target in the OUTER LOOP PC control frame sent to the Node B's.

At the reception of the OUTER LOOP PC control frame, the Node B shall immediately update the SIR target used for the inner loop power control with the specified value.

The OUTER LOOP PC control frame can be sent via any of the transport bearers dedicated to one UE.

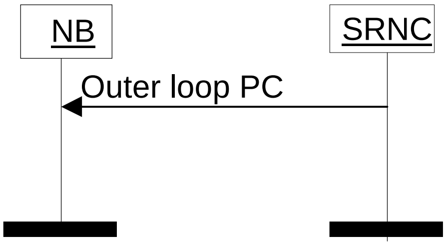

Figure 5: Outer loop power control information transfer

5.5 Node Synchronisation

The Node Synchronisation procedure is used by the SRNC to acquire information on the Node B timing.

The procedure is initiated by the SRNC by sending a DL NODE SYNCHRONISATION control frame to Node B containing the parameter T1.

Upon reception of a DL NODE SYNCHRONISATION control frame, the Node B shall respond with UL NODE SYNCHRONISATION Control Frame, including the parameters T2 and T3, as well as the T1 which was indicated in the initiating DL NODE SYNCHRONISATION control frame.

The T1, T2, T3 parameters are defined as:

T1: RNC specific frame number (RFN) that indicates the time when RNC sends the frame through the SAP to the transport layer.

T2: Node B specific frame number (BFN) that indicates the time when Node B receives the correspondent DL synchronisation frame through the SAP from the transport layer.

T3: Node B specific frame number (BFN) that indicates the time when Node B sends the frame through the SAP to the transport layer.

The general overview on the Node Synchronisation procedure is reported in [2].

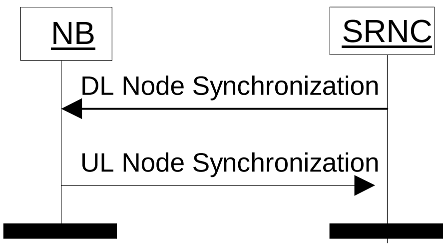

Figure 6: Node Synchronisation procedure

5.6 Rx timing deviation measurement [TDD]

The Node B shall, for all UEs using DCHs, monitor the receive timing of the uplink DPCH bursts arriving over the radio interface, and shall calculate the Rx Timing Deviation. If the calculated value, after rounding, is not zero, it shall be reported to the SRNC in a RX TIMING DEVIATION Control Frame belonging to that UE. For limitation of the frequency of this reporting, the Node B shall not send more than one RX TIMING DEVIATION Control Frame per UE within one radio frame.

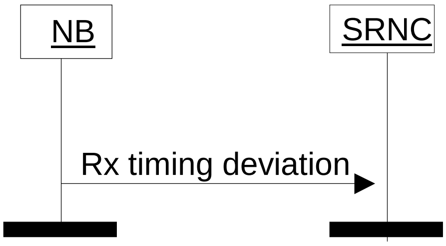

Figure 7: Rx timing deviation

5.7 DSCH TFCI Signalling [FDD]

This procedure is used in order to signal to the node B the TFCI (field 2) . This allows the node B to build the TFCI word(s) which have to be transmitted on the DPCCH. A transport bearer of any DCH directed to this same UE may be employed for transport over the Iub / Iur.

The procedure consists in sending the DSCH TFCI signalling control frame from the SRNC to the node B. The frame contains the TFCI(field 2) and the correspondent CFN. The DSCH TFCI signalling frame is sent once every Uu frame interval (10 ms) for as long as there is DSCH data for that UE to be transmitted in the associated PDSCH Uu frame. In the event that the node B does not receive a DSCH TFCI signalling control frame then the node B shall infer that no DSCH data is to be transmitted to the UE on the associated PDSCH Uu frame and will build the TFCI word(s) accordingly.

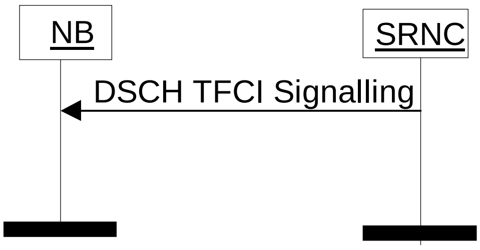

Figure 8: DSCH TFCI Signalling

5.8 Radio Interface Parameter Update [FDD]

This procedure is used to update radio interface parameters which are applicable to all RL's for the concerning UE. Both synchronised and unsynchronised parameter updates are supported.

The procedure consists of a RADIO INTERFACE PARAMETER UPDATE control frame sent by the SRNC to the Node B.

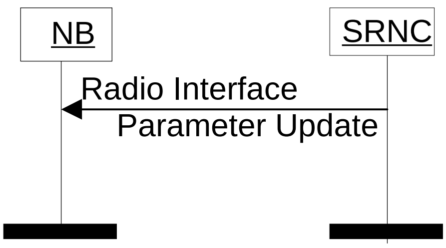

Figure 9: Radio Interface Parameter Update

If the RADIO INTERFACE PARAMETER UPDATE control frame contains a TPC Power Offset value, the Node B shall apply the newly provided TPC PO as soon as possible in case no CFN is included or from the indicated CFN.

6.2.2 Uplink data frame

The structure of the UL data frame is shown below.

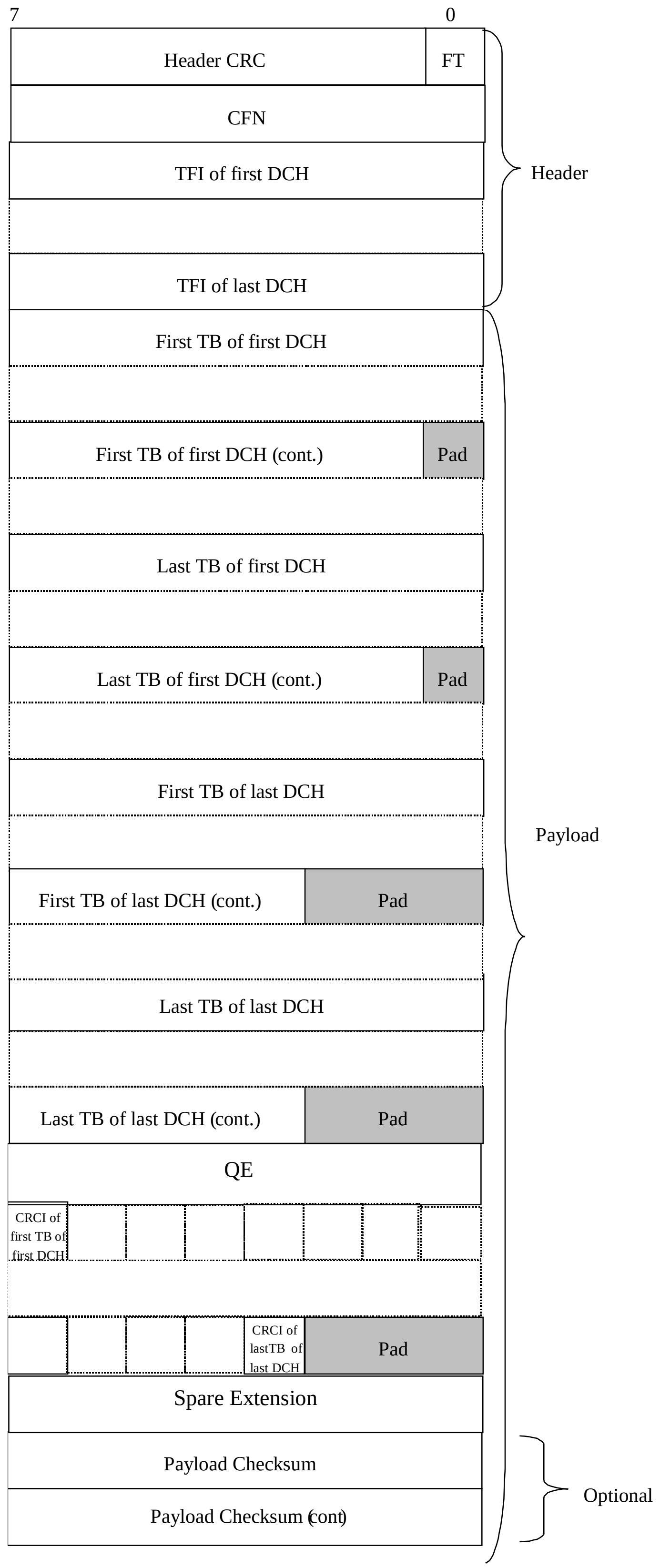

Figure 11: Uplink data frame structure

For the description of the fields see subclause 6.2.4.

There are as many TFI fields as number of DCH multiplexed in the same transport bearer.

The DCHs in the frame structure are ordered from the lower DCH id ('first DCH') to the higher DCH id ('last DCH').

The size and the number of TBs for each DCH is defined by the correspondent TFI.

If the TB does not fill an integer number of bytes, then bit padding is used as shown in the figure in order to have the octet aligned structure (ex: a TB of 21 bits requires 3 bits of padding).

There is a CRCI for each TB included in the frame. If the CRC indicators of one data frame do not fill an integer number of bytes, then bit padding is used as shown in the figure in order to have the octet aligned structure.

The payload CRC is optional, i.e. the whole 2 bytes field may or may not be present in the frame structure
(this is defined at the setup of the transport bearer).

6.2.3 Downlink data frame

The structure of the DL data frame is shown below.

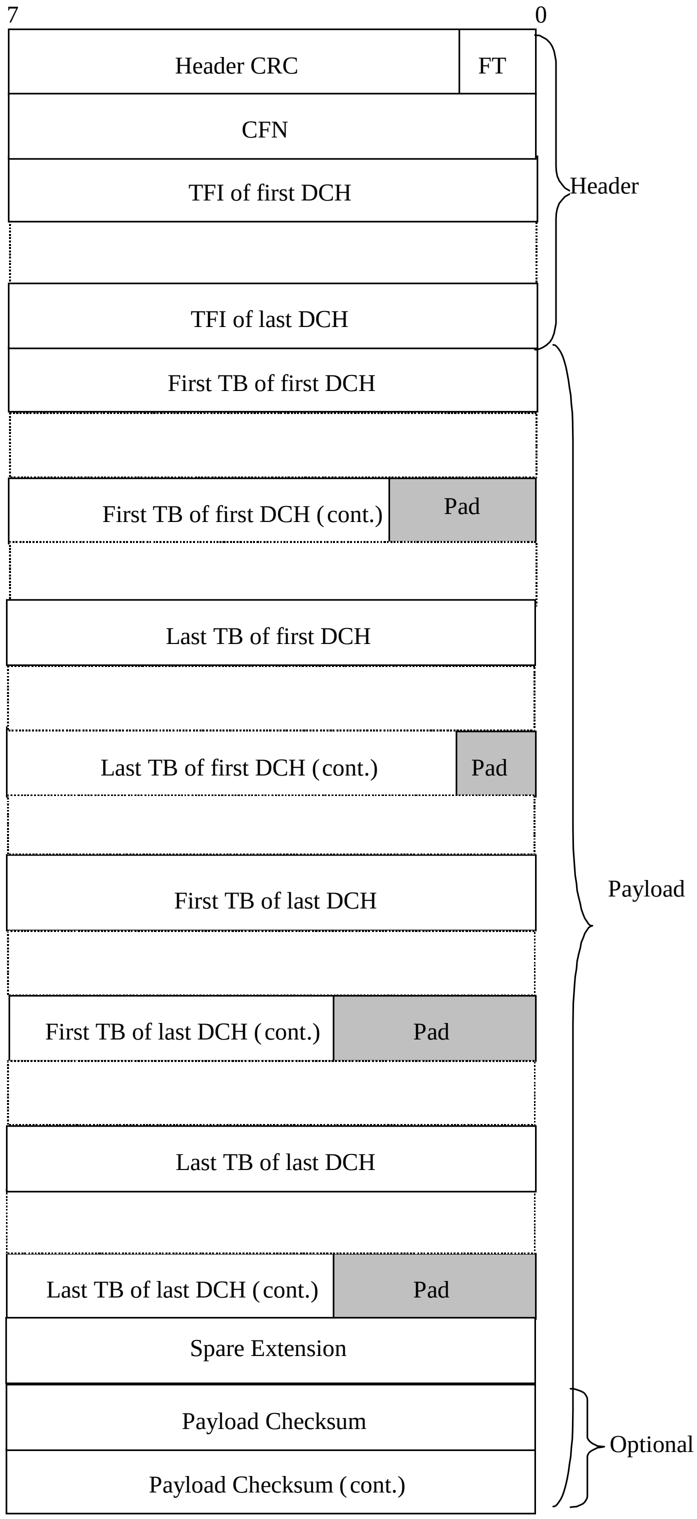

Figure 12: Downlink data frame structure

For the description of the fields see subclause 6.2.4.

There are as many TFI fields as number of DCH multiplexed in the same transport bearer.

The DCHs in the frame structure are ordered from the lower DCH id ('first DCH') to the higher DCH id ('last DCH').

The size and the number of TBs for each DCH is defined by the correspondent TFI.

If the TB does not fill an integer number of bytes, then bit padding is used as shown in the figure in order to have the octet aligned structure (ex: a TB of 21 bits requires 3 bits of padding).

The payload CRC is optional, i.e. the whole 2 bytes field may or may not be present in the frame structure (this is defined at the setup of the transport bearer).

6.3.3.8 [FDD - DSCH TFCI signalling]

6.3.3.8.1 Payload structure

The figure below shows the structure of the payload when the control frame is used for signalling TFCI (field 2) bits.

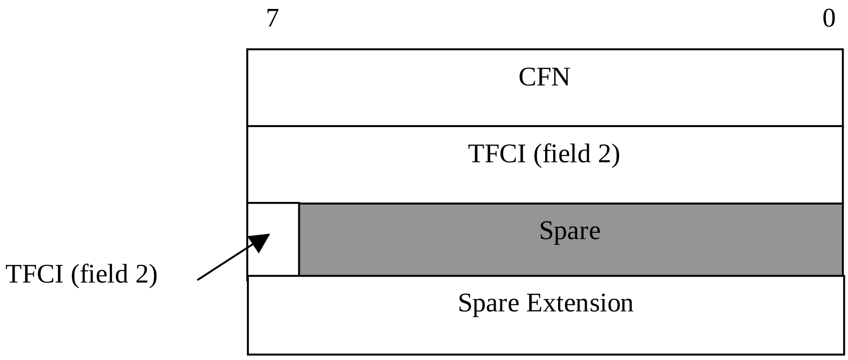

Figure 21: [FDD - Structure of the payload for the DSCH DL signalling control frame