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

TSGRP#6(99)759

Title: **Agreed CRs of category "C" (Modification) and "F" (Correction) to TS 25.427**

Source: **TSG-RAN WG3**

Agenda item: **5.4.3**

Doc #	Status-	Spec	CR	Rev	Subject	Cat	Versio	Versio
R3-99h87	agreed	25.427	002		Location of quality estimate in	F	3.0.0	3.1.0
R3-99h88	agreed	25.427	003		DCH frame timing related issues	F	3.0.0	3.1.0
R3-99k26	agreed	25.427	006		Aligned definition of quality estimate	F	3.0.0	3.1.0

3GPP TSG-RAN Meeting #6 ***Document*** ***R3-99H87***

Nice, France, 13-15 December 1999

3G CHANGE REQUEST

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25.427 **CR** **002** Current Version: 3.0.0

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

For submision to TSG-RAN#6 *list TSG meeting no. here ↑* for approval [X] for information [ ] *(only one box should be marked with an X)*

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

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

Source: TSG-RAN WG3 **Date:** 6-10 DEC 1999

Subject: Location of quality estimate in payload (equal to R3(99)E09, accepted in SWG during R3#8)

3G Work item:

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

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

Reason for change:

During the R3#7, based on Ericsson contribution TSGW3#7(99)C13, it was agreed to move the CRCI to the end of the payload. Main motivation was to enable parallel processing of the CRCI calculation on the later blocks in the frame while already having started the calculation of the payload CRC on the earlier blocks of the Iub frame. For larger Iub frames, a relevant processing delay reduction should result.

For the same reason, we are now proposing to move the quality estimate to the end of the Iub frame payload. This should again enable parallelism: between calculating the quality estimate (which could be based on the decoding of the last TB in the frame if that would result in the most accurate quality estimate) and the payload CRC calculation.

One additional identified benefit is that all quality related information (CRCI and QE) is now placed together.

Clauses affected: Figure 11 in section 6.2.2.

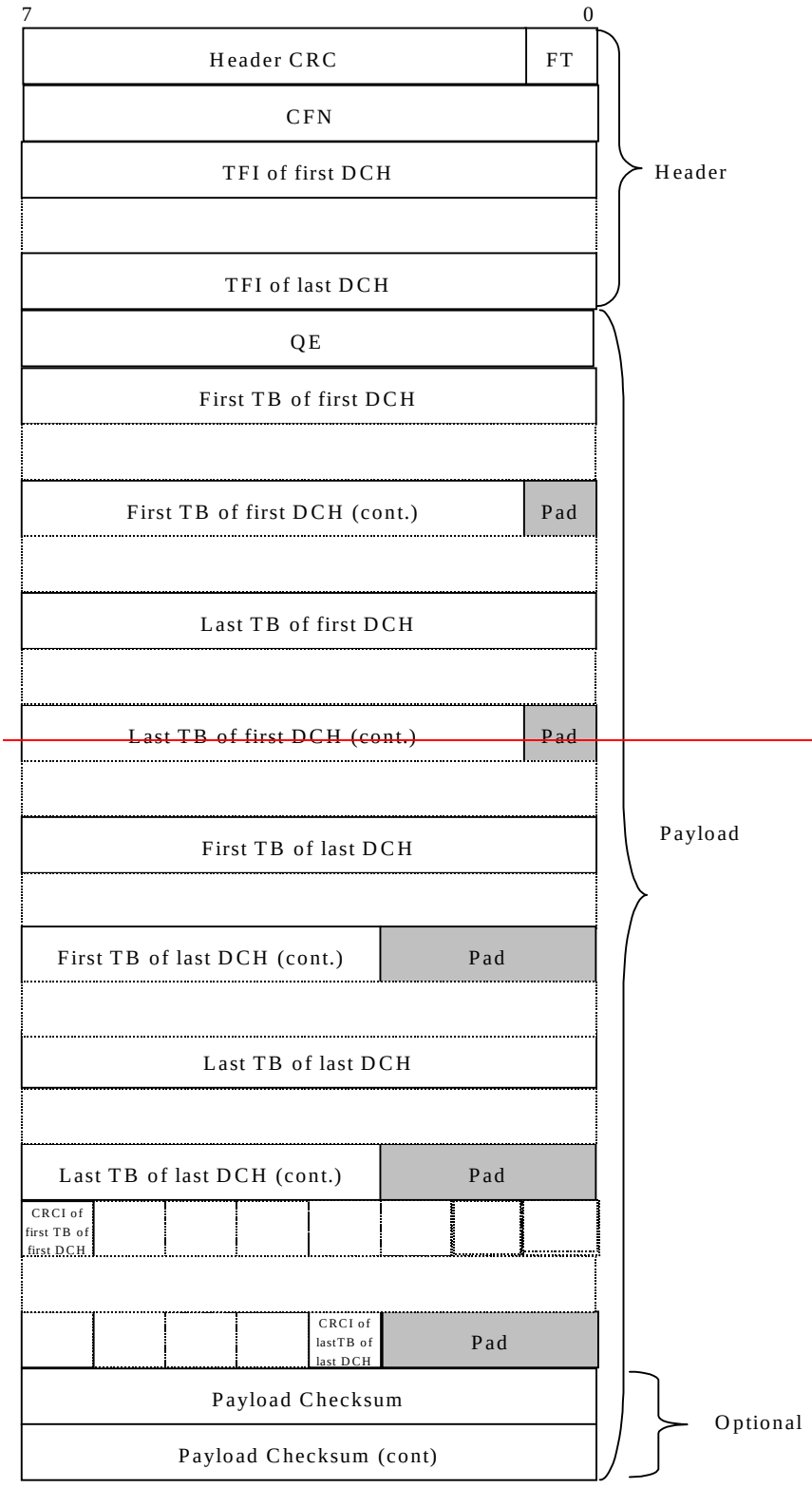
Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:
Other 2G core specifications	[ ]	→ List of CRs:
MS test specifications	[ ]	→ List of CRs:
BSS test specifications	[ ]	→ List of CRs:
O&M specifications	[ ]	→ List of CRs:

Other comments:

help.doc

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


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

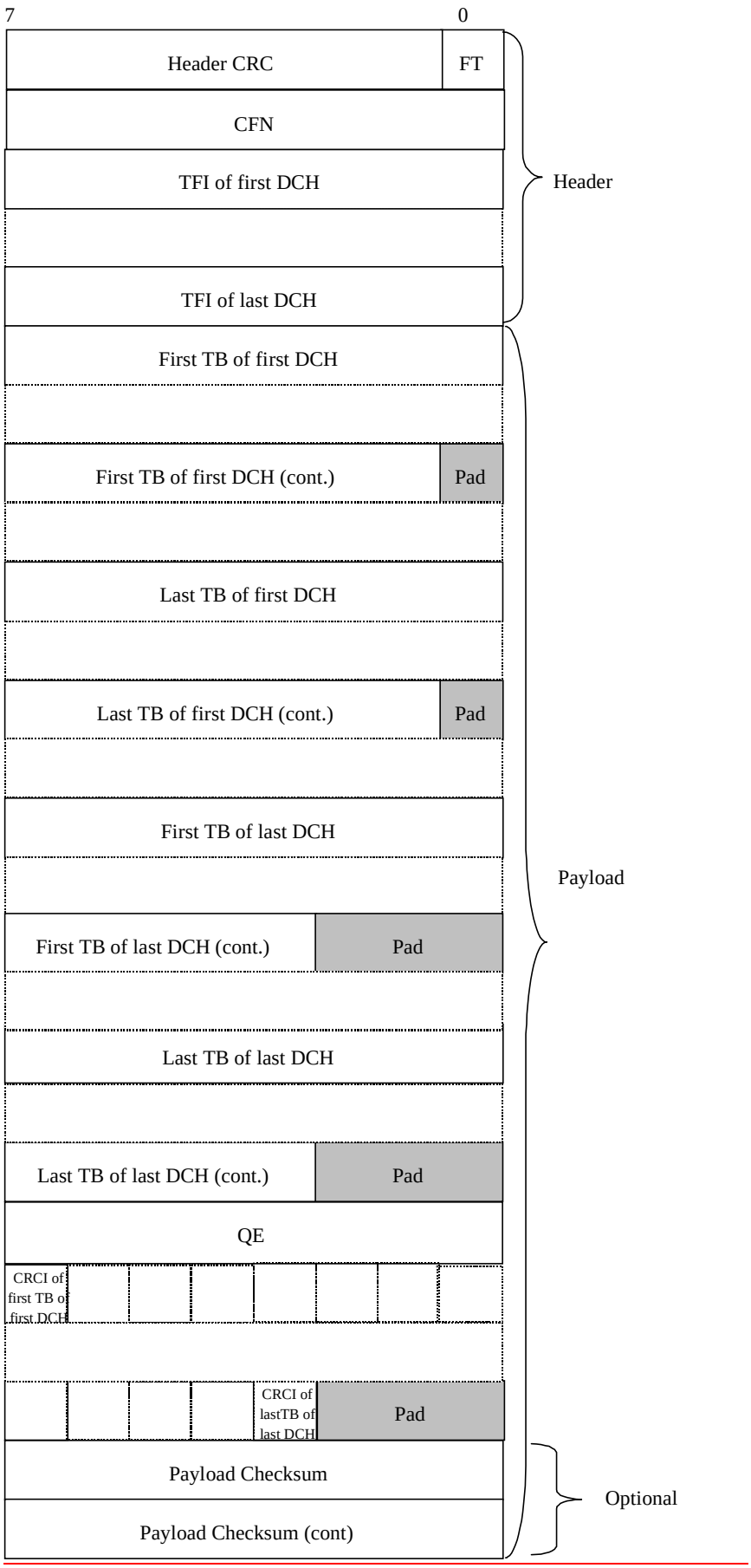


Figure 11: Uplink data frame structure

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3G CHANGE REQUEST

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25.427 **CR** **003** Current Version: 3.0.0

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

For submision to TSG-RAN#6 *list TSG meeting no. here ↑* for approval [X] for information [ ] *(only one box should be marked with an X)*

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

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

Source: TSG-RAN WG2 **Date:** 6-10 DEC 1999

Subject: DCH frame timing related issues (equal first part of R3#8(99)E10, accepted in SWG during R3#8; technically equal to R3#8(99)F95)

3G Work item:

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

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

Reason for change:

This CR addresses triggering of UL synchronisation control frame transmission by node-B as a result of receiving a “DSCH TFI Signalling” control frame.

When the DCH is used in combination with a DSCH, there might be longer periods in which no data is sent on the DCH. However if data is sent on the DSCH during this period, the transmit time of the “DSCH TFI Signalling” control frame on the DCH transport bearer should still be under node-B control. If the receipt of this control frame becomes too late/early, it should be possible for the node-B to control the transmit timing of the frame at the SRNC with a “Timing Adjustment” control frame.

Clauses affected: Section 5.2

Other specs affected:

Other 3G core specifications	[ ]	→ List of CRs:
Other 2G core specifications	[ ]	→ List of CRs:
MS test specifications	[ ]	→ List of CRs:
BSS test specifications	[ ]	→ List of CRs:
O&M specifications	[ ]	→ List of CRs:

Other comments:

help.doc

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

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, NodeB shall always send an UL data frame to the RNC for all the DCHs in a set of coordinated DCHs regardless of length of Transport Block of DCHs, i.e. also when it has received zero bits for a transport channel during a certain TTI.

- 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 zero bits for a transport channel during a certain TTI.

In silent mode and in case of coordinated DCHs, when Node B receives zero bits for all the DCHs in a set of coordinated DCHs, 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, UL data frames are not sent to the SRNC.

5.1.2 Downlink

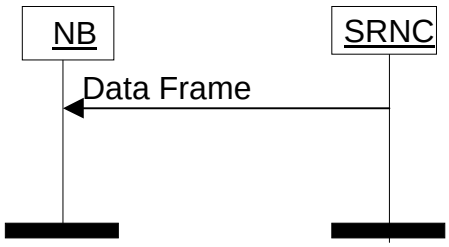

Figure 2: Downlink data transfer

If 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.

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. In case the Node receives an unknown combination of DCH data frames, it shall transmit only the DPCCH without TFCI bits.

5.2 Timing adjustment

To keep the synchronisation of a DCH data stream SRNC 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 TFI Signalling control frame arrives outside the determined arrival window~~, node B should evaluate the time difference between the optimal arrival time for the DL DCH FP frame to be transmitted in the indicated CFN and the actual measured arrival time of the DL DCH FP frame (ToA: time of arrival).~~

, the Node B reports the measured ToA and the indicated CFN in one UL DCH FP control frame.

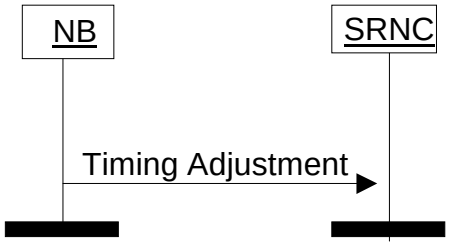

Figure 3: Timing Adjustment

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].

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***Document* R3-99K26**
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	006	Current Version:	3.0.0

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

For submission to:	TSG-RAN#6	for approval	X	strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic		

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

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

Source: TSG-RAN WG3 **Date:** 99.12.06

Subject: Aligned definition of quality estimate (previous I08, K04)

Work item:

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

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

Reason for change: Alignment of quality estimate with 25.215 in terms of range and granularity.

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:

help.doc

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

6.1.1 General principles for the coding

In this specification the structure of frames will be specified by using pictures similar to figure 10.

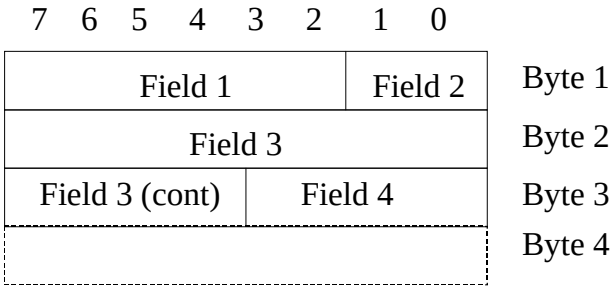

Figure 10: Example of notation used for the definition of the frame structure.

Unless otherwise indicated, fields which consist of multiple bits within a byte will have the more significant bit located at the higher bit position (indicated above frame in figure 10). In addition, if a field spans several bytes, more significant bits will be located in lower numbered bytes (right of frame in figure 10).

On the Iub/Iur interface, the frame will be transmitted starting from the lowest numbered byte. Within each byte, the bits are sent according decreasing bit position (bit position 7 first).

The parameters are specified giving the value range and the step (if not 1). The coding is done as follows (unless otherwise specified):

- Unsigned values are binary coded
- Signed values are coded with the 2's complement notation

Bits labelled “Spare” shall be set to zero by the transmitter and shall be ignored by the receiver.

6.2 Data frames

6.2.1 Introduction

The purpose of the user data frames is to transparently transport the transport blocks between Node B and Serving RNC.

The protocol allows for multiplexing of coordinated dedicated transport channels, with the same transmission time interval, onto one transport bearer.

The transport blocks of all the coordinated DCHs for one transmission time interval are included in one frame.

SRNC indicates the multiplexing of coordinated dedicated transport channels in the appropriate RNSAP/NBAP message.

6.2.2 Uplink data frame

The structure of the UL data frame is shown below.

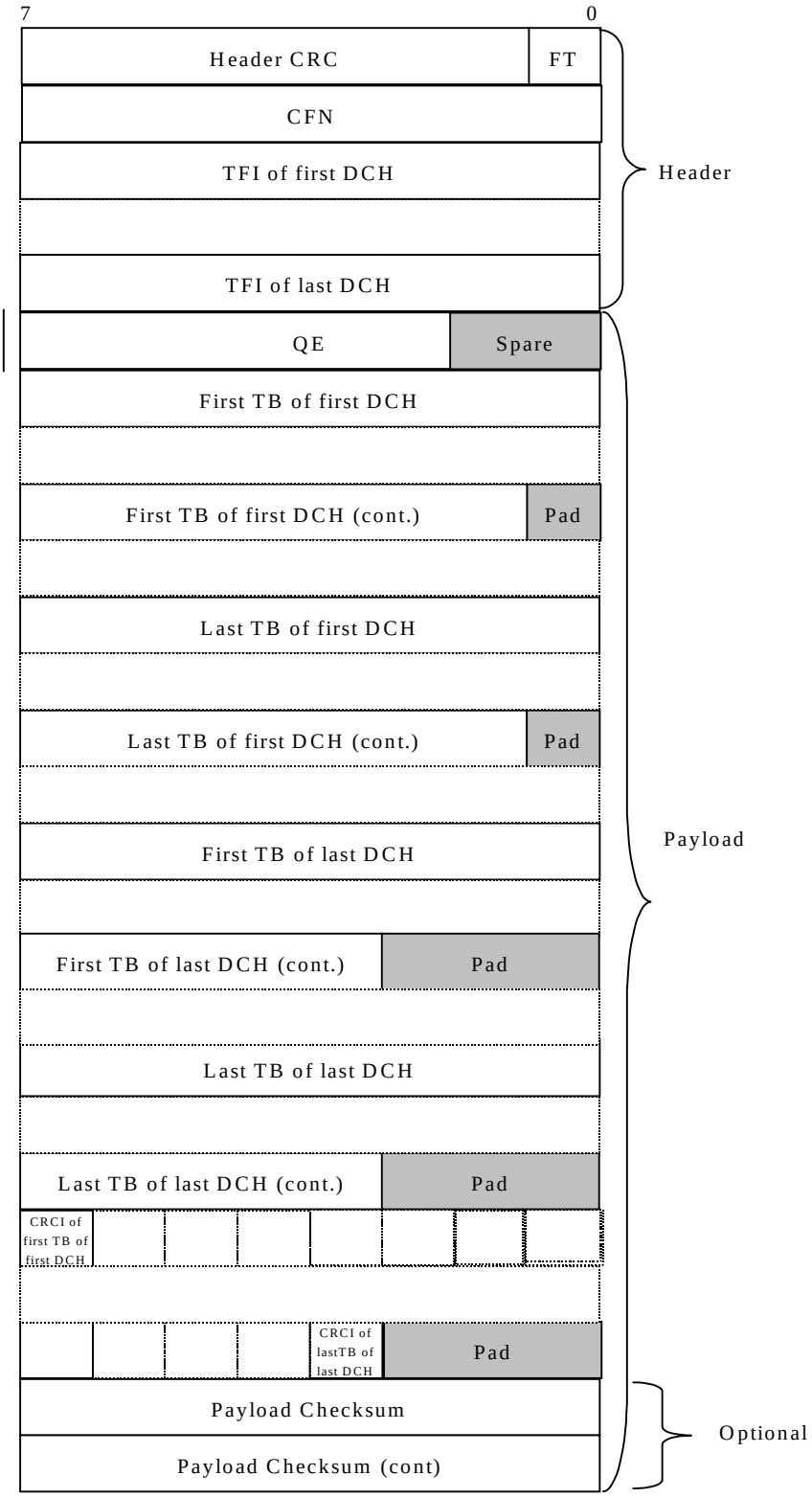

Figure 11: Uplink data frame structure

For the description of the fields see section 6.2.4.

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

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 UL data frame is shown below.

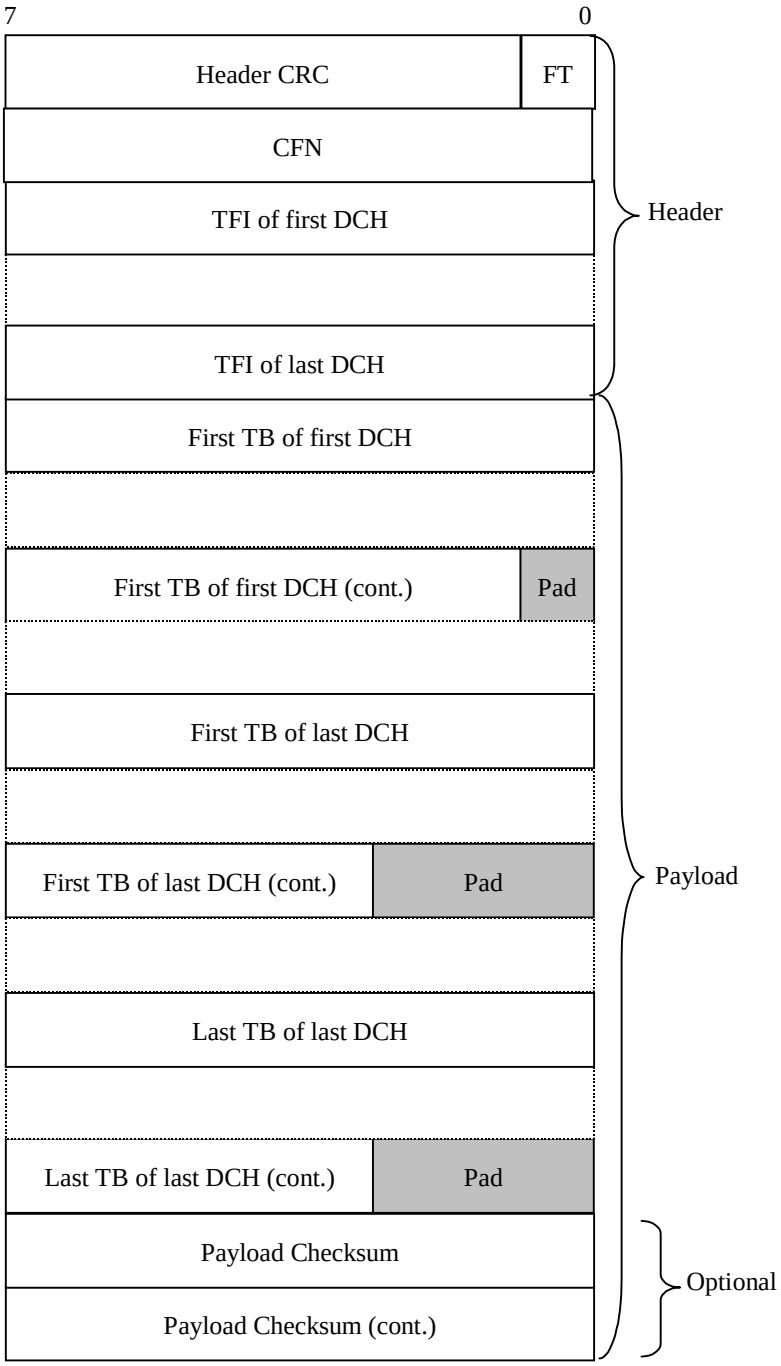

Figure 12: Downlink data frame structure

For the description of the fields see section 6.2.4.

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

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 setu p of the transport connection).

6.2.4 Coding of information elements in data frames

6.2.4.1 Header CRC

Description: Result of the CRC applied to the remaining part of the header, i.e. from bit 0 of the first byte, (the FT field) to the bit 0 (included) of the last byte of the header) with the corresponding generator polynomial:
$G(D) = D^7+D^6+D^2+1$.

Field Length: 7 bits

6.2.4.2 Frame Type (FT)

Description: describes if it is a control frame or a data frame.

Value range: {0=data, 1=control}.

Field Length: 1 bit

6.2.4.3 Connection Frame Number (CFN)

Description: indicator as to which radio frame the first data was received on uplink or shall be transmitted on downlink. See reference [2].

Value range: {0-255}

Field length: 8 bits

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}

Field length: 8 bits

6.2.4.5 Quality Estimate (QE)

Description: The quality estimate is derived from the Physical Channel BER. ~~(see Ref. [25.302]) as follows:~~

~~$QE = -Log_{10}$ (Physical channel BER)~~

The quality estimate shall be set to the Physical channel BER and be measured in the unit BER_dB (see Ref 25.215).
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-~~25.5~~63}, granularity ~~0.1~~1.

Field length: ~~8~~ 6 bits