TSG-RAN Meeting #13 *TSGRP#13(01) 0589*
Beijing, China, 18 - 21, September, 2001

Title: **Agreed CRs to TS 25.435**

Source: **TSG-RAN WG3**

Agenda item: **8.3.3/8.3.4/9.4.3**

RP Tdoc	R3 Tdoc	Spec	CR_Num	Rev	Release	CR_Subject	Cat	Cur_Ver	New_Ver	Workitem
RP-010589	R3-012247	25.435	047		Rel-4	Addition of missing control frame type	A	4.1.0	4.2.0	TEI
RP-010589	R3-012246	25.435	051		R99	Addition of missing control frame type	F	3.7.0	3.8.0	TEI
RP-010589	R3-012592	25.435	052	1	Rel-4	Applicability of the control frames on transport bearers	A	4.1.0	4.2.0	TEI
RP-010589	R3-012591	25.435	054	1	R99	Applicability of the control frames on transport bearers	F	3.7.0	3.8.0	TEI
RP-010589	R3-012307	25.435	055		R99	General Corrections to TS 25.435	F	3.7.0	3.8.0	TEI
RP-010589	R3-012308	25.435	056		Rel-4	General Corrections to TS 25.435	A	4.1.0	4.2.0	TEI
RP-010589	R3-012248	25.435	057	1	R99	General Corrections on CTrCH Data Streams	F	3.7.0	3.8.0	TEI
RP-010589	R3-012249	25.435	058	1	Rel-4	General Corrections on CTrCH Data Stream	A	4.1.0	4.2.0	TEI

CR-Form-v3

CHANGE REQUEST

⌘	**25.435**	**CR**	**047**	⌘	rev	**-**	⌘	Current version:	**4.1.0** ⌘

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

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

Title: ⌘	Addition of missing control frame type		
Source: ⌘	R-WG3		
Work item code: ⌘	TEI	***Date:*** ⌘	August 2001
Category: ⌘	**A**	***Release:*** ⌘	REL-4
	Use one of the following categories: ***F*** *(essential correction)* ***A*** *(corresponds to a correction in an earlier release)* ***B*** *(Addition of feature),* ***C*** *(Functional modification of feature)* ***D*** *(Editorial modification)* Detailed explanations of the above categories can be found in 3GPP TR 21.900.		*Use one of the following releases:* *2 (GSM Phase 2)* *R96 (Release 1996)* *R97 (Release 1997)* *R98 (Release 1998)* *R99 (Release 1999)* *REL-4 (Release 4)* *REL-5 (Release 5)*

Reason for change: ⌘	In the current specification the control frame type of DSCH TFCI signalling is missing.
Summary of change: ⌘	This CR adds the missing control frame type. Change according to RAN3#22 comments: the added row has been moved one row down.
Consequences if not approved: ⌘	If this CR is not approved there is a possibility for different interpretations and problems might occur in a multivendor environment. This CR is backward compatible.

Clauses affected: ⌘	6.3.2.3	
Other specs affected: ⌘	[X] Other core specifications [ ] Test specifications [ ] O&M Specifications	⌘ CR051 25.435 R99
Other comments: ⌘		

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

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

6.3.2.3 Control Frame Type

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

Value: values of the Control Frame Type parameter are defined in the following table:

Type of control frame	Value
Timing adjustment	0000 0010
DL synchronisation	0000 0011
UL synchronisation	0000 0100
DSCH TFCI signalling	0000 0101
DL Node synchronisation	0000 0110
UL Node synchronisation	0000 0111
Dynamic PUSCH assignment	0000 1000
Timing Advance	0000 1001

Field Length: 8 bits.

3GPP TSG-RAN3 Meeting #23 ***R3-012246***
Helsinki, Finland, 27th – 31st August 2001

CR-Form-v3

CHANGE REQUEST

⌘	**25.435 CR 051**	⌘ rev	**-**	⌘ Current version:	**3.7.0**	⌘

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

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

Title: ⌘	Addition of missing control frame type			
Source: ⌘	R-WG3			
Work item code: ⌘	TEI		***Date:*** ⌘	August 2001
Category: ⌘	**F**		***Release:*** ⌘	R99
	Use one of the following categories: ***F*** *(essential correction)* ***A*** *(corresponds to a correction in an earlier release)* ***B*** *(Addition of feature),* ***C*** *(Functional modification of feature)* ***D*** *(Editorial modification)* Detailed explanations of the above categories can be found in 3GPP TR 21.900.			*Use one of the following releases:* *2 (GSM Phase 2)* *R96 (Release 1996)* *R97 (Release 1997)* *R98 (Release 1998)* *R99 (Release 1999)* *REL-4 (Release 4)* *REL-5 (Release 5)*

Reason for change: ⌘	In the current specification the control frame type of DSCH TFCI signalling is missing.
Summary of change: ⌘	This CR adds the missing control frame type. Change according to RAN3#22 comments: the added row has been moved one row down.
Consequences if not approved: ⌘	If this CR is not approved there is a possibility for different interpretations and problems might occur in a multivendor environment. This CR is backward compatible.

Clauses affected: ⌘	6.3.2.3	
Other specs affected: ⌘	[X] Other core specifications ⌘ [ ] Test specifications [ ] O&M Specifications	CR047 25.435 REL-4
Other comments: ⌘		

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

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

6.3.2.3 Control Frame Type

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

Value: values of the Control Frame Type parameter are defined in the following table:

Type of control frame	Value
Timing adjustment	0000 0010
DL synchronisation	0000 0011
UL synchronisation	0000 0100
DSCH TFCI signalling	0000 0101
DL Node synchronisation	0000 0110
UL Node synchronisation	0000 0111
Dynamic PUSCH assignment	0000 1000
Timing Advance	0000 1001

Field Length: 8 bits.

3GPP TSG-RAN3 Meeting #23 **R3-012592**
Helsinki, Finland, 27th – 31st , August 2001

CR-Form-v3

CHANGE REQUEST

⌘	**25.435**	**CR**	**052**	⌘ rev	**1**	⌘	Current version:	**4.1.0** ⌘

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

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

Title:	⌘ Applicability of control frames on transport bearers		
Source:	⌘ R-WG3		
Work item code:	⌘ TEI	***Date:*** ⌘	August 2001
Category:	⌘ **A**	***Release:*** ⌘	REL-4
	Use one of the following categories: ***F*** *(essential correction)* ***A*** *(corresponds to a correction in an earlier release)* ***B*** *(Addition of feature),* ***C*** *(Functional modification of feature)* ***D*** *(Editorial modification)* Detailed explanations of the above categories can be found in 3GPP TR 21.900.		*Use one of the following releases:* *2 (GSM Phase 2)* *R96 (Release 1996)* *R97 (Release 1997)* *R98 (Release 1998)* *R99 (Release 1999)* *REL-4 (Release 4)* *REL-5 (Release 5)*

Reason for change: ⌘	In the current specification the association of the control frames and the transport bearers is indicated only for Transport Channels Synchronisation and timing adjustment control frames. The association of transport channel synchronisation to the TFCI2 bearer is also missing.
Summary of change: ⌘	R0: This CR clarifies the association of all control frames to the transport bearers / transport channels in a separate table. The existing association text is removed from the figure text in order to be consistent in all procedures. A similar clarification in the TS 25.425 is not considered necessary, because the naming of the control frames clearly indicates the control frame and transport bearer association. Changes according to RAN3#22 comments: (a) Timing Advance is not applicable for RACH, (b) the added chapter is numbered to be 5.x. R1: The column header 'Transport bearer' has been changed to 'Transport bearer used for'
Consequences if not approved: ⌘	If this CR is not approved there is a possibility for different interpretations and problems might occur in a multivendor environment. This CR is backward compatible.

Clauses affected: ⌘	5.3, 5.4, 5.8, 5.8.1	
Other specs affected: ⌘	[X] Other core specifications [ ] Test specifications	⌘ CR054 25.435 R99

	☐ O&M Specifications	
Other comments:	⌘	

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

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

5.3 DL Transport Channels Synchronisation

CRNC sends a DL SYNCHRONISATION Control Frame to 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 message.

The procedure shall not be applied on transport bearers transporting UL traffic channels RACH or USCH.

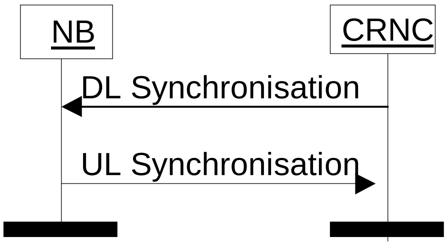


Figure 8: ~~FACH, PCH and DSCH~~ Transport Channels Synchronisation procedure

5.4 DL Timing Adjustment

Timing Adjustment procedure is used to indicate for the CRNC the incorrect arrival time of downlink data to Node B.

Timing adjustment procedure is initiated by the Node B if a DL frame arrives outside of the defined arrival window.

If the DL frame has arrived before the ToAWS or after the ToAWE nodeB includes the ToA and the target CFN as message parameters for TIMING ADJUSTMENT Control Frame.

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].

Figure 9: ~~FACH, PCH, DSCH and [FDD - DSCH TFCI signalling]~~ Timing Adjustment procedure

5.7 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.

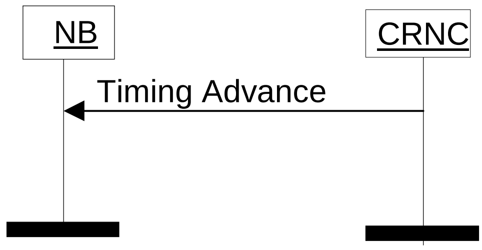


Figure 12: Timing Advance Signalling

5.x General

5.x.1 Association between transport bearer and data/control frames

The following table shows how the data and control frames are associated to the transport bearers. 'Yes' indicates that the control frame is applicable to the transport bearer, 'no' indicates that the control frame is not applicable to the transport bearer.

Transport bearer used for	Associated data frame	Associated control frames					
		Timing adjust-ment	DL transport channels synchronisation	Node synchroni-sation	Dynamic PUSCH assignment	Timing advance	DSCH TFCI signalling
RACH	RACH data frame	no	no	no	no	no	no
FACH	FACH data frame	yes	yes	yes	no	no	no
CPCH	CPCH data frame	no	no	no	no	no	no
PCH	PCH data frame	yes	yes	yes	no	no	no
DSCH	DSCH data frame	yes	yes	yes	no	no	no
USCH	USCH data frame	no	no	no	yes	yes	no
TFCI2	-	yes	yes	yes	no	no	yes

R3-012591

CR-Form-v3

CHANGE REQUEST

⌘	**25.435**	**CR**	**054**	⌘ rev	**1**	⌘	Current version:	**3.7.0** ⌘

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

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

Title: ⌘	Applicability of control frames on transport bearers			
Source: ⌘	R-WG3			
Work item code: ⌘	TEI		***Date:*** ⌘	August 2001
Category: ⌘	**F**		***Release:*** ⌘	R99

Use one of the following categories:
- ***F*** *(essential correction)*
- ***A*** *(corresponds to a correction in an earlier release)*
- ***B*** *(Addition of feature),*
- ***C*** *(Functional modification of feature)*
- ***D*** *(Editorial modification)*

Detailed explanations of the above categories can be found in 3GPP TR 21.900.

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

Reason for change: ⌘ In the current specification the association of the control frames and the transport bearers is indicated only for Transport Channels Synchronisation and timing adjustment control frames. The association of transport channel synchronisation to the TFCI2 bearer is also missing.

Summary of change: ⌘ R0:
This CR clarifies the association of all control frames to the transport bearers / transport channels in a separate table. The existing association text is removed from the figure text in order to be consistent in all procedures.

A similar clarification in the TS 25.425 is not considered necessary, because the naming of the control frames clearly indicates the control frame and transport bearer association.

Changes according to RAN3#22 comments: (a) Timing Advance is not applicable for RACH, (b) the added chapter is numbered to be 5.x.

R1:
The column header 'Transport bearer' has been changed to 'Transport bearer used for'

Consequences if not approved: ⌘ If this CR is not approved there is a possibility for different interpretations and problems might occur in a multivendor environment.
This CR is backward compatible.

Clauses affected: ⌘ 5.3, 5.4, 5.8, 5.8.1

Other specs affected: ⌘
- [X] Other core specifications ⌘ CR052 25.435 REL-4
- [ ] Test specifications
- [ ] O&M Specifications

Other comments: ⌘	

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

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

5.3 DL Transport Channels Synchronisation

CRNC sends a DL SYNCHRONISATION Control Frame to 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 message.

The procedure shall not be applied on transport bearers transporting UL traffic channels RACH or USCH.

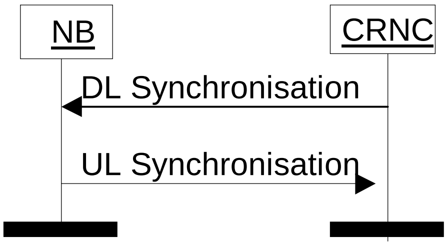


Figure 8: ~~FACH, PCH and DSCH~~ Transport Channels Synchronisation procedure

5.4 DL Timing Adjustment

Timing Adjustment procedure is used to indicate for the CRNC the incorrect arrival time of downlink data to Node B.

Timing adjustment procedure is initiated by the Node B if a DL frame arrives outside of the defined arrival window.

If the DL frame has arrived before the ToAWS or after the ToAWE nodeB includes the ToA and the target CFN as message parameters for TIMING ADJUSTMENT Control Frame.

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].

Figure 9: ~~FACH, PCH, DSCH and [FDD - DSCH TFCI signalling]~~ Timing Adjustment procedure

5.7 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.

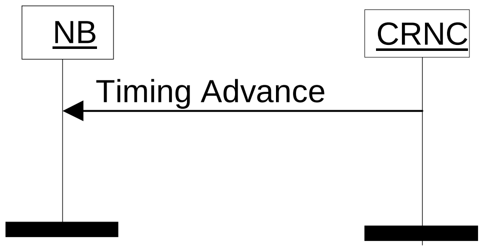


Figure 12: Timing Advance Signalling

5.x General

5.x.1 Association between transport bearer and data/control frames

The following table shows how the data and control frames are associated to the transport bearers. 'Yes' indicates that the control frame is applicable to the transport bearer, 'no' indicates that the control frame is not applicable to the transport bearer.

Transport bearer used for	Associated data frame	Associated control frames					
		Timing adjust-ment	DL transport channels synchronisation	Node synchroni-sation	Dynamic PUSCH assignment	Timing advance	DSCH TFCI signalling
RACH	RACH data frame	no	no	no	no	no	no
FACH	FACH data frame	yes	yes	yes	no	no	no
CPCH	CPCH data frame	no	no	no	no	no	no
PCH	PCH data frame	yes	yes	yes	no	no	no
DSCH	DSCH data frame	yes	yes	yes	no	no	no
USCH	USCH data frame	no	no	no	yes	yes	no
TFCI2	-	yes	yes	yes	no	no	yes

3GPP TSG-RAN WG3 Meeting #23
Helsinki, Finland, August 27th-31st, 2001

Tdoc R3-012307

CR-Form-v4

CHANGE REQUEST

⌘	25.435	CR	055	⌘	ev	-	⌘	Current version:	3.7.0	⌘

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

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

Title:	⌘ General Corrections to TS 25.435		
Source:	⌘ R-WG3		
Work item code:	⌘ TEI	***Date:*** ⌘	August 17, 2001
Category:	⌘ **F** *Use one of the following categories:* ***F*** *(correction)* ***A*** *(corresponds to a correction in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)* Detailed explanations of the above categories can be found in 3GPP TR 21.900.	***Release:*** ⌘	R99 *Use one of the following releases:* *2 (GSM Phase 2)* *R96 (Release 1996)* *R97 (Release 1997)* *R98 (Release 1998)* *R99 (Release 1999)* *REL-4 (Release 4)* *REL-5 (Release 5)*

Reason for change: ⌘	Corrections to this Technical Specification.
Summary of change: ⌘	In Section 2, added reference to TS 25.331 In Section 5.1.3, an editorial correction. In Section 5.4, an editorial corrections. In Section 6.2.1, italicised two IE's. In Section 6.2.5, italicised one IE. In Section 6.2.7.8, capitalized first letter of "indicator" In Section 6.2.7.10, capitalized the first letter in "power" and "level" In Section 6.2.7.14, capitalized "data frame" In Section 6.2.7.15, created reference to TS 25.331. In Section 6.3.2.2, capitalized "type" and corrected referenced section number. In Section 6.3.3.1.2, corrected referenced section number. In Section 6.3.3.2.2, corrected referenced section number. In Section 6.3.3.3.2, corrected referenced section number. In Section 6.3.3.3.4, editorial correction. In Section 6.3.3.4.3, editorial correction. In Section 6.3.3.7.1, editorial correction. In Section 6.3.3.7.3, changed the spare extension from 0-2 octets to be 0-32 octets to align

		with TS 25.427's control frame definition. In Section 6.3.3.8.2, corrected referenced section number. In Section 6.3.3.7.1, editorial correction.
Consequences if not approved:	⌘	If this CR is not approved, these mistakes will remain in this specification. Backward compatibility: This CR is backwards compatible

Clauses affected:	⌘	2, 5.1.3, 5.4, 6.2.1, 6.2.5, 6.2.7.8, 6.2.7.10, 6.2.7.14, 6.2.7.15, 6.3.2.2, 6.3.3.1.2, 6.3.3.2.2, 6.3.3.3.2, 6.3.3.3.4, 6.3.3.4.3, 6.3.3.7.1, 6.3.3.7.3, 6.3.3.8.2, 6.3.3.8.4			
Other specs affected:	⌘	X	Other core specifications	⌘	TS 23.435 v4.1.0 CR 056
			Test specifications		
			O&M Specifications		
Other comments:	⌘				

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

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] 3GPP TS UMTS 25.301: "Radio Interface Protocol Architecture".

[2] 3GPP TS 25.402: "Synchronisation in UTRAN, Stage 2".

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

[4] 3GPP TS 25.221: "Physical channels and mapping of transport channels to physical channels (TDD)".

[5] 3GPP TS 25.211: “Physical channels and mapping of transport channels onto physical channels (FDD)”.

[6] 3GPP TS 25.433: "UTRAN Iub interface NBAP signalling".

[7] 3GPP TS 25.225: "Physical layer – Measurements (TDD)".

[8] 3GPP TS 25.331: “RRC Protocol Specification”.

5.1.3 Secondary-CCPCH related transport Channels

For the FACH transport channel, a Data Transfer procedure is used to transfer data from CRNC to Node B. Data Transfer Procedure c~~C~~onsists of a transmission of Data Frame from CRNC to Node B.

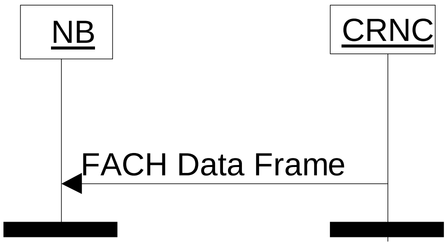


Figure 3: FACH Data Transfer Procedure

For the PCH transport channel, a Data Transfer procedure is used to transfer data from CRNC to Node B. Data Transfer Procedure Consists of a transmission of Data Frame from CRNC to Node B.

Figure 4: PCH Data Transfer Procedure

In this case the PCH Data Frame may also transport information related to the PICH channel.

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. For the FACH and PCH transport channels, the TFS shall never define a Transport Block Size of zero bits.

If the Node B is aware of a TFI value corresponding to zero bits for this transport channel, this TFI is assumed. When combining the TFI's of the different transport channels, a valid TFCI might result and in this case data shall be transmitted on the 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 secondary-CCPCH according to the TFIs of the transport channels multiplexed on this secondary-CCPCH and scheduled for that frame. [FDD — In case the Node B receives an unknown TFI combination, no pilot bits, TFCI bits or Data bits shall be transmitted.] [TDD — In case the Node B receives an unknown TFI combination, it shall apply DTX, i.e. suspend transmission on the corresponding S-CCPCH – except if this S-CCPCH provides the "beacon function", in which case the Node B shall maintain the physical layer transmission as specified in TS 25.221].

If the Node B does not receive a valid FP frame in a TTI or a frame without paging indication information, it assumes that no UE's have to be paged on the Uu in this TTI. In this case the default PICH bit pattern of all zeros shall be transmitted.

Data Frames sent on Iub for different transport channels multiplexed on one secondary-CCPCH might indicate different transmission power levels to be used in a certain Uu frame. Node-B shall determine the highest DL power level required for any of the transport channels multiplexed in a certain Uu frame and use this power level as the desired output level.

5.4 DL Timing Adjustment

Timing Adjustment procedure is used to indicate for the CRNC the incorrect arrival time of downlink data to Node B.

Timing Aadjustment procedure is initiated by the Node B if a DL frame arrives outside of the defined arrival window.

If the DL frame has arrived before the ToAWS or after the ToAWE nodeB includes the ToA and the target CFN as message parameters for TIMING ADJUSTMENT Control Frame.

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].

Figure 9: FACH, PCH, DSCH and [FDD - DSCH TFCI signalling] Timing Adjustment procedure

6.2.1 RACH Channels

The RACH Data Frame includes the CFN corresponding to the SFN of the frame in which the payload was received. If the payload was received in several frames, the CFN corresponding to the first Uu frame in which the information was received shall be indicated.

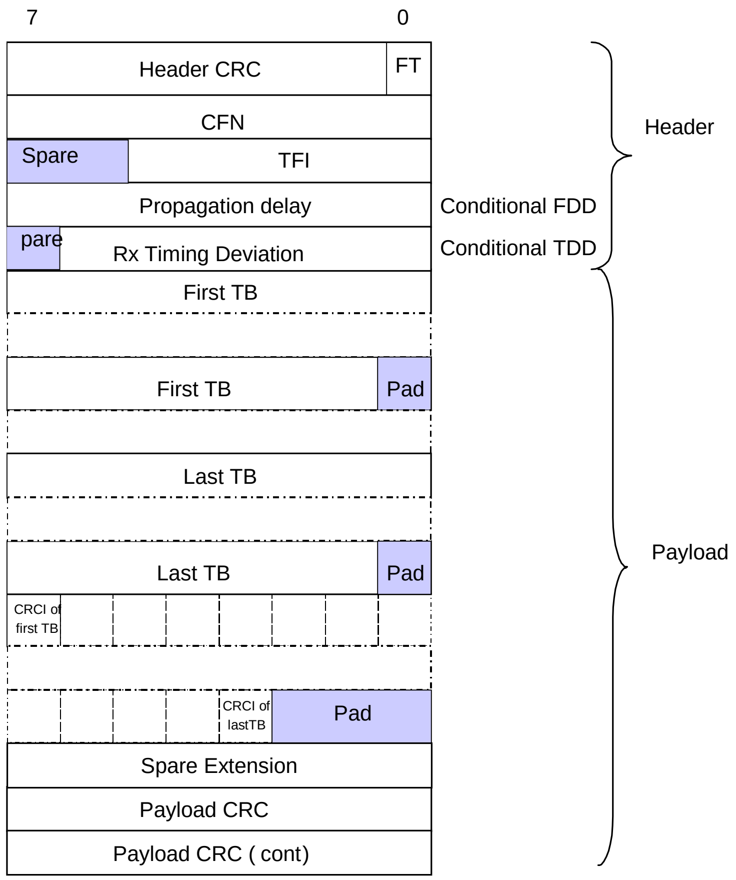


Figure 15: RACH Data Frame structure

Propagation Ddelay is a conditional Information Element which is only present when the Cell supporting the RACH Transport Channel is a FDD Cell.

Rx Timing Deviation is a conditional Information Element which is only present when the Cell supporting the RACH Transport Channel is a TDD Cell.

6.2.5 Downlink Shared Channels

DSCH Data Frame includes a CFN indicating the SFN of the PDSCH in which the payload shall be sent. If the payload is to be sent over several frames, the CFN corresponding to the first frame shall be indicated.

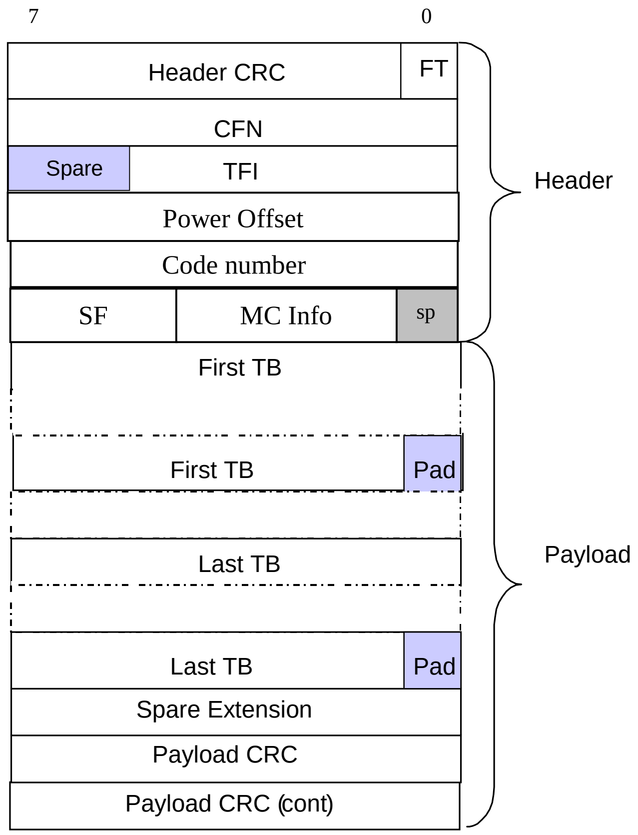


Figure 19: FDD DSCH Data Frame structure

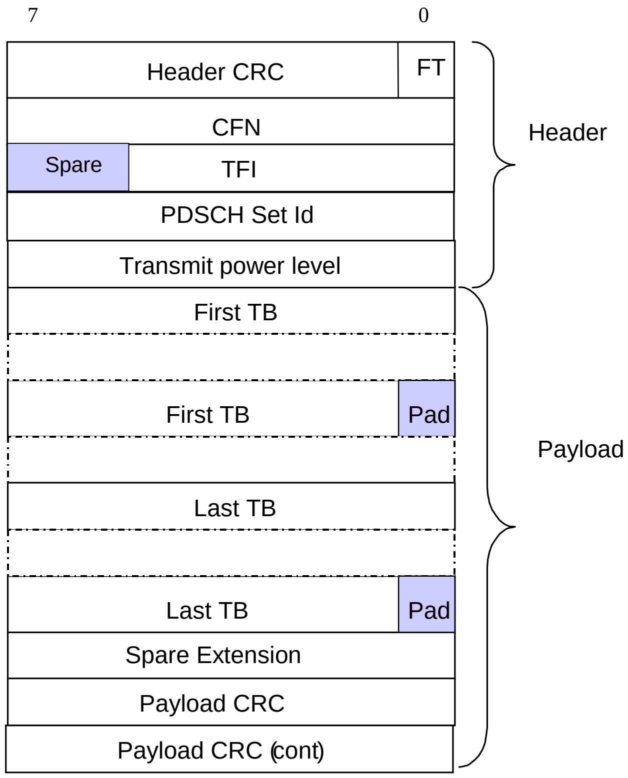


Figure 20: TDD DSCH Data Frame structure

Transmit Ppower Llevel is a conditional Information Element which is only present when the Cell supporting the DSCH Transport Channel is a TDD Cell.

6.2.7.8 CRC Iindicator

Description: Shows if the transport block has a correct CRC. The UL Outer Loop Power Control may use the CRC indication.

Value range: {0=Correct, 1=Not Correct}.

Field length: 1 bit.

6.2.7.10 Transmit Ppower Llevel

Description: Preferred transmission power level during this TTI for the corresponding transport channel. The indicated value is the negative offset relative to the maximum power configured for the physical channel(s) used for the respective transport channel.

Value range: {0 .. 25,5 dB}.

Granularity: 0,1 dB.

Field length: 8 bits.

6.2.7.14 [TDD - PDSCH Set Id]

Description: A pointer to the PDSCH Set which shall be used to transmit the DSCH DATAdata FRAMEframe over the radio interface.

Value range: {0..255}.

Field length: 8 bits.

6.2.7.15 [FDD - Code Number]

Description: the code number of the PDSCH (the same mapping is used as for the 'code number' IE in [8]25.331).

Value Range: {0 .. 255}.

Field length: 8 bits.

6.3.2.2 Frame Ttype (FT)

Refer to section 6.2.76.2.

6.3.3.1.2 CFN

Refer to section 6.2.76.3.

6.3.3.2.2 CFN

Refer to section 6.2.76.3.

6.3.3.3.2 CFN

Refer to section 6.2.76.3.

6.3.3.3.4 Spare Extension

Description: The Spare Extension is described inRefer to -section 6.3.3.1.4.

6.3.3.4.3 Spare Extension

Description: The Spare Extension is described in Refer to section 6.3.3.1.4.

6.3.3.7.1 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 N~~n~~ode B to create the TFCI word(s) for transmission on the DPCCH.

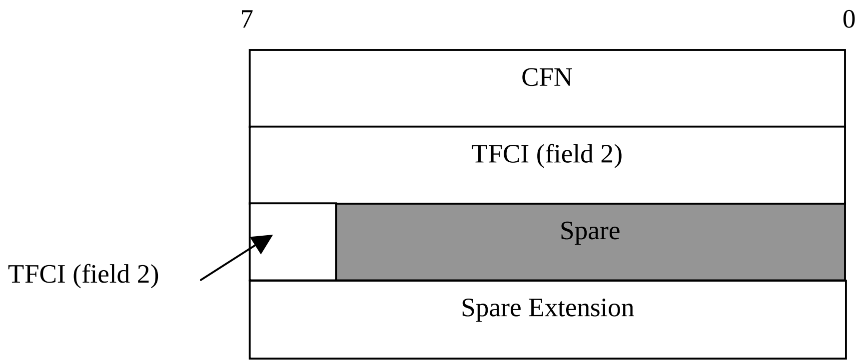


Figure 29: [FDD - Structure of the payload for the DSCH TFCI signalling control frame]

6.3.3.7.2 TFCI (field 2)

Description: TFCI (field 2) is as described in [6], it takes the same values as the TFCI (field 2) which is transmitted over the Uu interface.

Value range: {0 - 1023}

Field length: 10 bits

6.3.3.7.3 Spare Extension

~~The Spare Extension is described in subclause~~ Refer to section 6.3.3.1.4~~2.7.19~~.

6.3.3.8.2 CFN

The CFN value in the control frame is the frame that the timing advance will occur and is coded as in subclause Refer to section 6.2.76.3.

6.3.3.8.4 Spare Extension

Refer to section 6.3.3.1.4.**Description**: Indicates the location where new IEs can in the future be added in a backward compatible way.

Field length: 0-32 octets.

3GPP TSG-RAN WG3 Meeting #23
Helsinki, Finland, August 27th-31st, 2001

Tdoc R3-012308

CR-Form-v4

CHANGE REQUEST

⌘ **25.435 CR 056** ⌘ ev **-** ⌘ Current version: **4.1.0** ⌘

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

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

Title:	⌘ General Corrections to TS 25.435		
Source:	⌘ R-WG3		
Work item code:	⌘ TEI	***Date:*** ⌘	August 17, 2001
Category:	⌘ **A**	***Release:*** ⌘	REL-4
	Use one of the following categories: ***F*** *(correction)* ***A*** *(corresponds to a correction in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)* Detailed explanations of the above categories can be found in 3GPP TR 21.900.		*Use one of the following releases:* *2 (GSM Phase 2)* *R96 (Release 1996)* *R97 (Release 1997)* *R98 (Release 1998)* *R99 (Release 1999)* *REL-4 (Release 4)* *REL-5 (Release 5)*

Reason for change: ⌘	Corrections to this Technical Specification.
Summary of change: ⌘	In Section 2, added reference to TS 25.331 In Section 5.1.3, an editorial correction. In Section 5.4, an editorial corrections. In Section 6.2.1, italicised two IE's. In Section 6.2.5, italicised one IE. In Section 6.2.7.8, capitalized first letter of "indicator" In Section 6.2.7.10, capitalized the first letter in "power" and "level" In Section 6.2.7.14, capitalized "data frame" In Section 6.2.7.15, created reference to TS 25.331. In Section 6.3.2.2, capitalized "type" and corrected referenced section number. In Section 6.3.3.1.2, corrected referenced section number. In Section 6.3.3.2.2, corrected referenced section number. In Section 6.3.3.3.2, corrected referenced section number. In Section 6.3.3.3.4, editorial correction. In Section 6.3.3.4.3, editorial correction. In Section 6.3.3.7.1, editorial correction. In Section 6.3.3.7.3, changed the spare extension from 0-2 octets to be 0-32 octets to align

		with TS 25.427's control frame definition. In Section 6.3.3.8.2, corrected referenced section number. In Section 6.3.3.7.1, editorial correction.
Consequences if not approved:	⌘	If this CR is not approved, these mistakes will remain in this specification. Backward compatibility: This CR is backwards compatible

Clauses affected:	⌘	2, 5.1.3, 5.4, 6.2.1, 6.2.5, 6.2.7.8, 6.2.7.10, 6.2.7.14, 6.2.7.15, 6.3.2.2, 6.3.3.1.2, 6.3.3.2.2, 6.3.3.3.2, 6.3.3.3.4, 6.3.3.4.3, 6.3.3.7.1, 6.3.3.7.3, 6.3.3.8.2, 6.3.3.8.4			
Other specs affected:	⌘	X	Other core specifications	⌘	TS 23.435 v3.7.0 CR 055
			Test specifications		
			O&M Specifications		
Other comments:	⌘				

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

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

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] 3GPP TS UMTS 25.301: "Radio Interface Protocol Architecture".

[2] 3GPP TS 25.402: "Synchronisation in UTRAN, Stage 2".

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

[4] 3GPP TS 25.221: "Physical channels and mapping of transport channels to physical channels (TDD)".

[5] 3GPP TS 25.211: "Physical channels and mapping of transport channels onto physical channels (FDD)".

[6] 3GPP TS 25.433: "UTRAN Iub interface NBAP signalling".

[7] 3GPP TS 25.225: "Physical layer – Measurements (TDD)".

[8] 3GPP TS 25.331: “RRC Protocol Specification”.

5.1.3 Secondary-CCPCH related transport Channels

For the FACH transport channel, a Data Transfer procedure is used to transfer data from CRNC to Node B. Data Transfer Procedure cConsists of a transmission of Data Frame from CRNC to Node B.

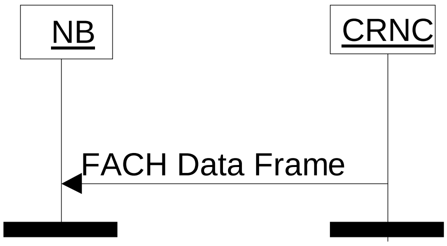


Figure 3: FACH Data Transfer Procedure

For the PCH transport channel, a Data Transfer procedure is used to transfer data from CRNC to Node B. Data Transfer Procedure Consists of a transmission of Data Frame from CRNC to Node B.

Figure 4: PCH Data Transfer Procedure

In this case the PCH Data Frame may also transport information related to the PICH channel.

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. For the FACH and PCH transport channels, the TFS shall never define a Transport Block Size of zero bits.

If the Node B is aware of a TFI value corresponding to zero bits for this transport channel, this TFI is assumed. When combining the TFI's of the different transport channels, a valid TFCI might result and in this case data shall be transmitted on the 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 secondary-CCPCH according to the TFIs of the transport channels multiplexed on this secondary-CCPCH and scheduled for that frame. [FDD — In case the Node B receives an unknown TFI combination, no pilot bits, TFCI bits or Data bits shall be transmitted.] [TDD — In case the Node B receives an unknown TFI combination, it shall apply DTX, i.e. suspend transmission on the corresponding S-CCPCH – except if this S-CCPCH provides the "beacon function", in which case the Node B shall maintain the physical layer transmission as specified in TS 25.221].

If the Node B does not receive a valid FP frame in a TTI or a frame without paging indication information, it assumes that no UE's have to be paged on the Uu in this TTI. In this case the default PICH bit pattern of all zeros shall be transmitted.

Data Frames sent on Iub for different transport channels multiplexed on one secondary-CCPCH might indicate different transmission power levels to be used in a certain Uu frame. Node-B shall determine the highest DL power level required for any of the transport channels multiplexed in a certain Uu frame and use this power level as the desired output level.

5.4 DL Timing Adjustment

Timing Adjustment procedure is used to indicate for the CRNC the incorrect arrival time of downlink data to Node B.

Timing Aadjustment procedure is initiated by the Node B if a DL frame arrives outside of the defined arrival window.

If the DL frame has arrived before the ToAWS or after the ToAWE nodeB includes the ToA and the target CFN as message parameters for TIMING ADJUSTMENT Control Frame.

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].

Figure 9: FACH, PCH, DSCH and [FDD - DSCH TFCI signalling] Timing Adjustment procedure

6.2.1 RACH Channels

The RACH Data Frame includes the CFN corresponding to the SFN of the frame in which the payload was received. If the payload was received in several frames, the CFN corresponding to the first Uu frame in which the information was received shall be indicated.

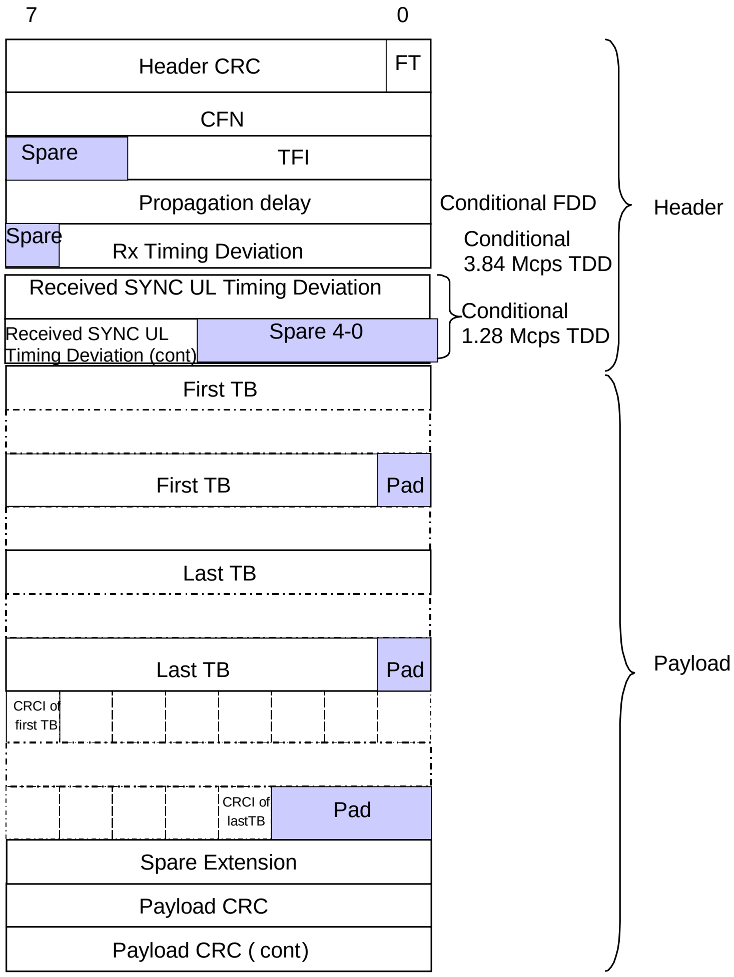


Figure 15: RACH Data Frame structure

Propagation Ddelay is a conditional Information Element which is only present when the Cell supporting the RACH Transport Channel is a FDD Cell.

Rx Timing Deviation is a conditional Information Element which is only present when the Cell supporting the RACH Transport Channel is a 3.84Mcps TDD Cell.

Received SYNC UL Timing Deviation is a conditional Information Element which is only present when the Cell supporting the RACH Transport Channel is a 1.28Mcps TDD Cell.

6.2.5 Downlink Shared Channels

DSCH Data Frame includes a CFN indicating the SFN of the PDSCH in which the payload shall be sent. If the payload is to be sent over several frames, the CFN corresponding to the first frame shall be indicated.

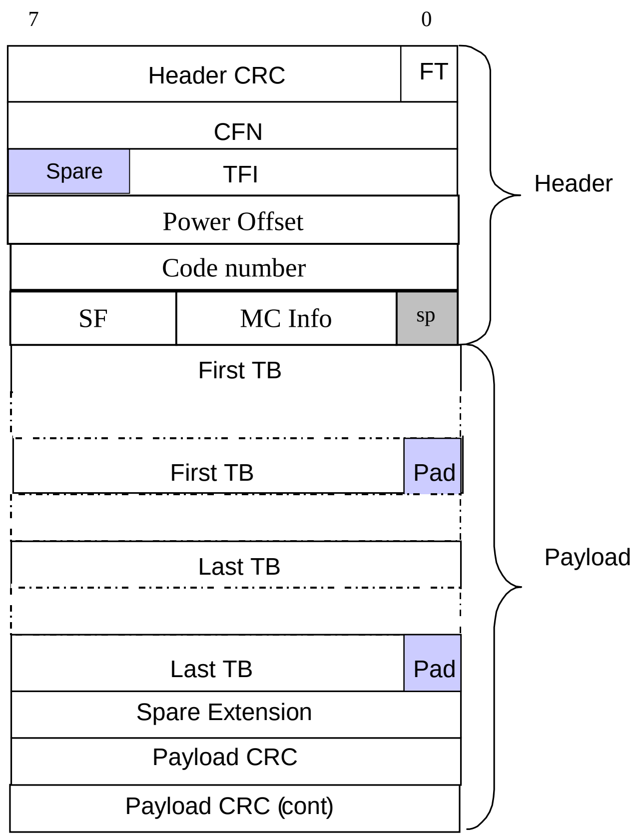


Figure 19: FDD DSCH Data Frame structure

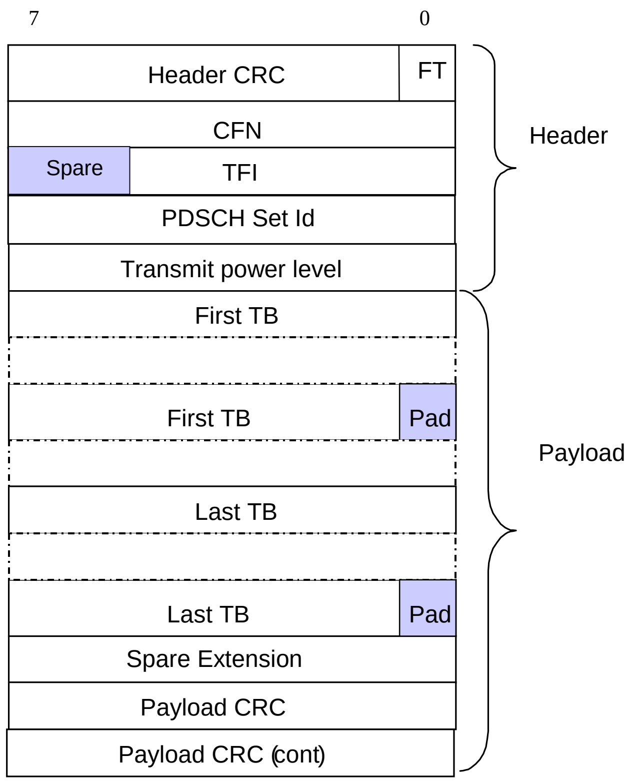


Figure 20: TDD DSCH Data Frame structure

Transmit Ppower Llevel is a conditional Information Element which is only present when the Cell supporting the DSCH Transport Channel is a TDD Cell.

6.2.7.8 CRC Iindicator

Description: Shows if the transport block has a correct CRC. The UL Outer Loop Power Control may use the CRC indication.

Value range: {0=Correct, 1=Not Correct}.

Field length: 1 bit.

6.2.7.10 Transmit P~~p~~ower L~~l~~evel

Description: Preferred transmission power level during this TTI for the corresponding transport channel. The indicated value is the negative offset relative to the maximum power configured for the physical channel(s) used for the respective transport channel.

Value range: {0 .. 25,5 dB}.

Granularity: 0,1 dB.

Field length: 8 bits.

6.2.7.14 [TDD - PDSCH Set Id]

Description: A pointer to the PDSCH Set which shall be used to transmit the DSCH DATAdata FRAMEframe over the radio interface.

Value range: {0..255}.

Field length: 8 bits.

6.2.7.15 [FDD - Code Number]

Description: the code number of the PDSCH (the same mapping is used as for the 'code number' IE in [8]25.331).

Value Range: {0 .. 255}.

Field length: 8 bits.

6.3.2.2 Frame Ttype (FT)

Refer to section 6.2.76.2.

6.3.3.1.2 CFN

Refer to section 6.2.76.3.

6.3.3.2.2 CFN

Refer to section 6.2.76.3.

6.3.3.3.2 CFN

Refer to section 6.2.76.3.

6.3.3.3.4 Spare Extension

Description: The Spare Extension is described inRefer to section 6.3.3.1.4.

6.3.3.4.3 Spare Extension

~~Description: The Spare Extension is described in~~Refer to section 6.3.3.1.4.

6.3.3.7.1 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 N~~n~~ode B to create the TFCI word(s) for transmission on the DPCCH.

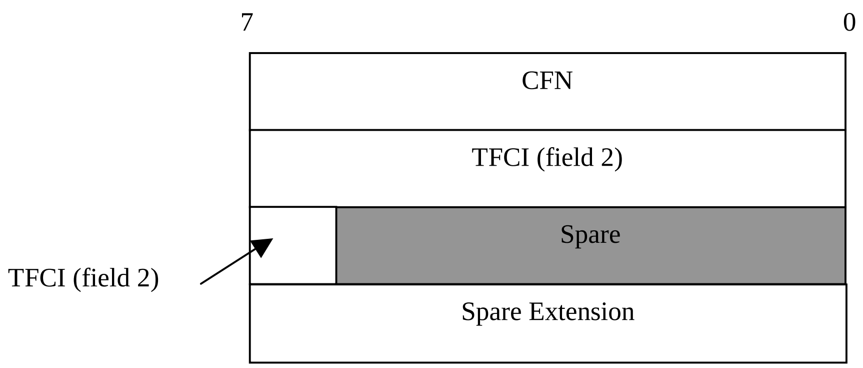


Figure 29: [FDD - Structure of the payload for the DSCH TFCI signalling control frame]

6.3.3.7.3 Spare Extension

~~The Spare Extension is described in subclause~~Refer to section 6.3.3.1.4~~2.7.19~~.

6.3.3.8.2 CFN

The CFN value in the control frame is the frame that the timing advance will occur and is coded as in subclause Refer to section 6.2.76.3.

6.3.3.8.4 Spare Extension

Refer to section 6.3.3.1.4Description: Indicates the location where new IEs can in the future be added in a backward compatible way.

Field length: 0-32 octets.

3GPP TSG-RAN WG3 Meeting #23
Helsinki, Finland, 27th – 31st August 2001

Tdoc R3-012248

CR-Form-v3

CHANGE REQUEST

⌘ **25.435**	**CR** **057**	⌘ rev **1**	⌘ Current version: **3.7.0** ⌘

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

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

Title: ⌘	General Corrections on Common Transport Channel Data Streams		
Source: ⌘	R-WG3		
Work item code: ⌘	TEI	***Date:*** ⌘	August 2001
Category: ⌘	**F**	***Release:*** ⌘	*R99*
	Use one of the following categories: ***F*** *(essential correction)* ***A*** *(corresponds to a correction in an earlier release)* ***B*** *(Addition of feature),* ***C*** *(Functional modification of feature)* ***D*** *(Editorial modification)* Detailed explanations of the above categories can be found in 3GPP TR 21.900.		*Use one of the following releases:* *2 (GSM Phase 2)* *R96 (Release 1996)* *R97 (Release 1997)* *R98 (Release 1998)* *R99 (Release 1999)* *REL-4 (Release 4)* *REL-5 (Release 5)*

Reason for change: ⌘	Editorial Corrections and addition of abbreviation
Summary of change: ⌘	In 3.2, 'LTOA', 'ToAWE' and 'ToAWS' is added to the abbreviation. In 4.2, 'data transport' is modified to 'the Data Transport Network Layer' to specify where services are served. In 5.1.1, 5.1.2, 5.1.3, 5.1.4 and 5.1.5, each 'XXXX Data Frame' is changed to 'XXXX DATA FRAME'. In 5.2, 5.3, 5.4, 5.5, 5.6 and 5.7, each control frame name is changed to upper case characters. In 5.2, 5.3 and 5.4, according to the specification notations, there are some modifications. In 5.6, 'PDSCH Uu frame' is ~~deleted~~moved to previous sentence. In paragraph of 6.1, 'Figure 10' is changed to 'Figure 14' In 6.3.3.4, 6.3.3.5 and 6.3.3.6, the titles of figures are added.
Consequences if not approved: ⌘	If this CR is not approved editorial mistake will remain in the specification Backward compatibility: This CR is backward .

Clauses affected: ⌘	3.2, 4.2, 5.1.1, 5.1.2, 5.1.3, 5.1.4, 5.1.5, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 6.1, 6.2, 6.3	
Other specs affected: ⌘	[X] Other core specifications [ ] Test specifications [ ] O&M Specifications	⌘ 25.435 V4.1.0 CR 058
Other comments: ⌘		

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

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

3.2 Abbreviations

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

CFN Connection Frame Number
CPCH Common Packet Channel
CRC Cyclic Redundancy Checksum
CRCI CRC Indicator
DCH Dedicated Transport Channel
DL Downlink
DSCH Downlink Shared Channel
FP Frame Protocol
FT Frame Type
LTOA Latest Time of Arrival
PC Power Control
PDSCH Physical Downlink Shared Channel
PUSCH Physical Uplink Shared Channel
QE Quality Estimate
TB Transport Block
TBS Transport Block Set
TFI Transport Format Indicator
ToA Time of Aarrival
ToAWE Time of Arrival Window Endpoint

ToAWS Time of Arrival Window Startpoint

TTI Transmission Time Interval
UL Uplink
USCH Uplink Shared Channel

For other abbreviations, please refer to [2].

4 General aspects

4.1 Common Transport Channel Data Stream User Plane Protocol Services

Common transport channel provides the following services:

- Transport of TBS between the Node B and the CRNC for common transport channels.
- Support of transport channel synchronisation mechanism.
- Support of Node Synchronisation mechanism.

4.2 Services expected from the Ddata Ttransport Network layer

The following services are expected from the transport layer:

- Delivery of Frame Protocol PDUs.

In sequence delivery is not required. However, frequent out-of-sequence delivery may impact the performance and should be avoided.

5 Data Streams User Plane Procedures

5.1 Data Transfer

5.1.1 RACH Channels

Data Transfer procedure is used to transfer data received from Uu interface from Node B to CRNC. Data Transfer procedure consists of a transmission of Data Frame from Node B to CRNC.

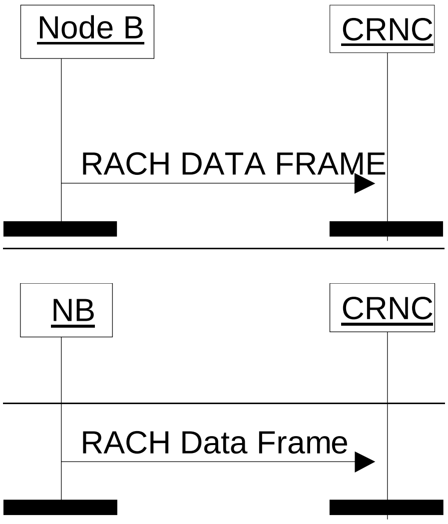


Figure 1: RACH Data Transfer Pprocedure

5.1.2 CPCH [FDD] Channels [FDD]

Data Transfer procedure is used to transfer data received from Uu interface from Node B to CRNC. Data Transfer procedure consists of a transmission of Data Frame from Node B to CRNC.

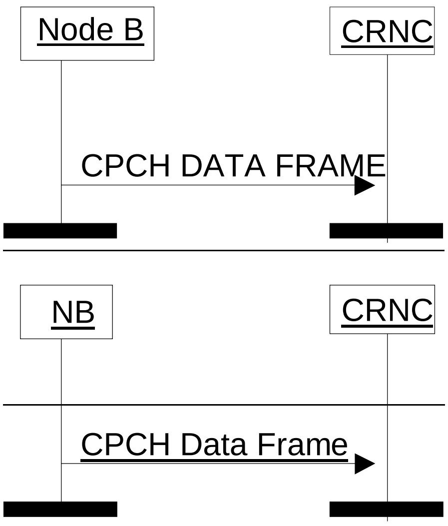


Figure 2: CPCH [FDD] Data Transfer Pprocedure

5.1.3 Secondary-CCPCH related transport Channels

For the FACH transport channel, a Data Transfer procedure is used to transfer data from CRNC to Node B. Data Transfer Procedure Consists of a transmission of Data Frame from CRNC to Node B.

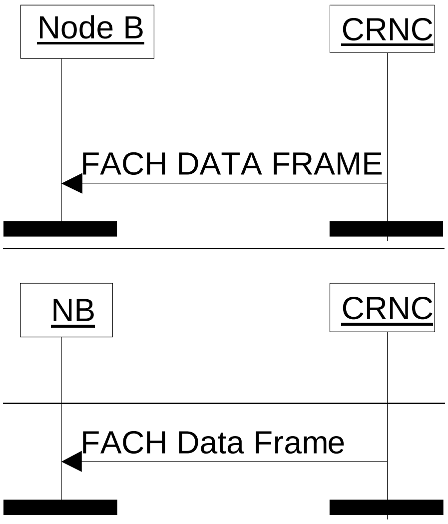


Figure 3: FACH Data Transfer ~~P~~procedure

For the PCH transport channel, a Data Transfer procedure is used to transfer data from CRNC to Node B. Data Transfer ~~P~~procedure ~~C~~consists of a transmission of Data Frame from CRNC to Node B.

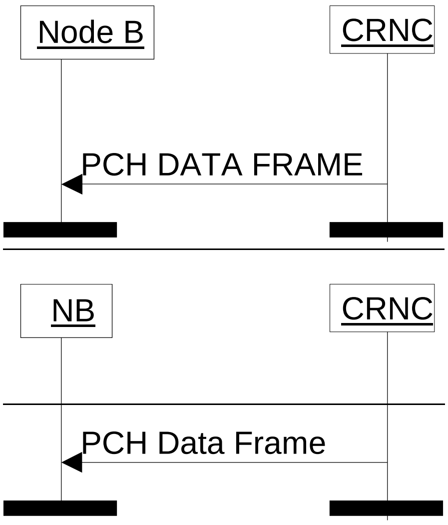


Figure 4: PCH Data Transfer ~~P~~procedure

In this case the PCH D~~ata~~ATA F~~rame~~RAME may also transport information related to the PICH channel.

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. For the FACH and PCH transport channels, the TFS shall never define a Transport Block Size of zero bits.

If the Node B is aware of a TFI value corresponding to zero bits for this transport channel, this TFI is assumed. When combining the TFI's of the different transport channels, a valid TFCI might result and in this case data shall be transmitted on the 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 secondary-CCPCH according to the TFIs of the transport channels multiplexed on this secondary-CCPCH and scheduled for that frame. [FDD — In case the Node B receives an unknown TFI combination, no pilot bits, TFCI bits or Data bits shall be transmitted.] [TDD — In case the Node B receives an unknown TFI combination, it shall apply DTX, i.e. suspend transmission on the corresponding S-CCPCH – except if this S-CCPCH provides the "beacon function", in which case the Node B shall maintain the physical layer transmission as specified in TS 25.221].

If the Node B does not receive a valid FP frame in a TTI or a frame without paging indication information, it assumes that no UE's have to be paged on the Uu in this TTI. In this case the default PICH bit pattern of all zeros shall be transmitted.

Data Frames sent on Iub for different transport channels multiplexed on one secondary-CCPCH might indicate different transmission power levels to be used in a certain Uu frame. Node-B shall determine the highest DL power level required for any of the transport channels multiplexed in a certain Uu frame and use this power level as the desired output level.

5.1.4 Downlink Shared Channels

The Data Transfer procedure is used to transfer a DSCH ~~data~~DATA ~~frame~~FRAME from the CRNC to a Node B.

If the Node B does not receive a valid DSCH ~~data~~DATA ~~frame~~FRAME for transmission in a given TTI, it assumes that there is no data to be transmitted in that TTI for this transport channel. For the DSCH transport channel, the TFS shall never define a Transport Block Size of zero bits.

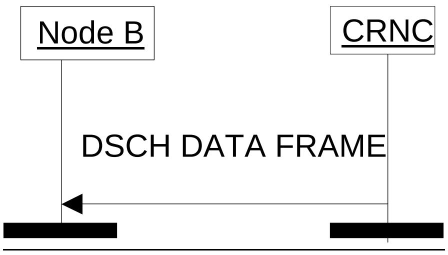
[FDD - The Node B shall use the header information in the DSCH ~~data~~DATA ~~frame~~FRAME to determine which channelisation code(s) and power offset should be used in the PDSCH Uu frame associated to the specified CFN. The specified channelisation code(s) and power offset shall then be used for PDSCH transmission for as long as there is data to transmit or until a new DSCH ~~data~~DATA ~~frame~~FRAME arrives that specifies that a different PDSCH channelisation code(s) and/or power offset should be used. This feature enables multiple DSCH's with different TTI to be supported].

[FDD - In the event that the DSCH FP header indicates that a multi-code PDSCH transmission is to be applied ('MC Info' value > 1) then the 'power offset' field indicates the power offset at which each individual code should be transmitted relative to the power of the TFCI bits of the downlink DPCCH directed to the same UE as the DSCH].

[FDD - The Node B may receive a DSCH ~~data~~DATA ~~frame~~FRAME which contains a TFI value corresponding to there being no data to transmit, such a DSCH ~~data~~DATA ~~frame~~FRAME will have no transport blocks. On receiving such a data frame the Node B shall apply the specified channelisation code(s) and power offset as described above starting in the PDSCH Uu frame associated to the specified CFN. This feature enables multiple DSCH's with different TTI to be supported, the use of such a zero payload DSCH ~~data~~DATA ~~frame~~FRAME solves the problem of how the Node B should determine what channelisation code(s) and power offset should be used in the event that transmission of a transport block set being transmitted with a short TTI comes to an end, whilst the transmission of a TBS with a long TTI continues].

[TDD - The Node B shall use the header information in the DSCH ~~data~~DATA ~~frame~~FRAME to determine which PDSCH Set and power offset should be used in the PDSCH Uu frames associated to the specified CFN. The specified PDSCH Set and power offset shall then be used for DSCH transmission for as long as there is data to transmit or until a new DSCH ~~data~~DATA ~~frame~~FRAME arrives that specifies that a different PDSCH Set and/or power offset should be used. This feature enables multiple DSCH's with different TTI to be supported].

[TDD - The Node B may receive a DSCH ~~data~~DATA ~~frame~~FRAME which contains a TFI value corresponding to there being no data to transmit, such a DSCH ~~data~~DATA ~~frame~~FRAME will have no transport blocks. On receiving such a data frame the Node B shall apply the specified PDSCH Set and power offset as described above starting in the PDSCH Uu frame associated to the specified CFN. This feature enables multiple DSCH's with different TTI to be supported, the use of such a zero payload DSCH ~~data~~DATA ~~frame~~FRAME solves the problem of how the Node B should determine what PDSCH Set and power offset should be used in the event that transmission of a transport block set being transmitted with a short TTI comes to an end, whilst the transmission of a TBS with a long TTI continues].



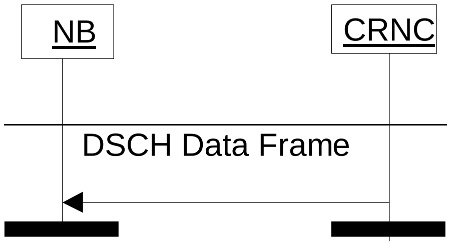


Figure 5: DSCH Data Transfer ~~P~~procedure

5.1.5 ~~[TDD –~~ Uplink Shared Channels [TDD]

Data Transfer procedure is used to transfer data received from Uu interface from Node B to CRNC. Data Transfer procedure consists of a transmission of Data Frame from Node B to CRNC.

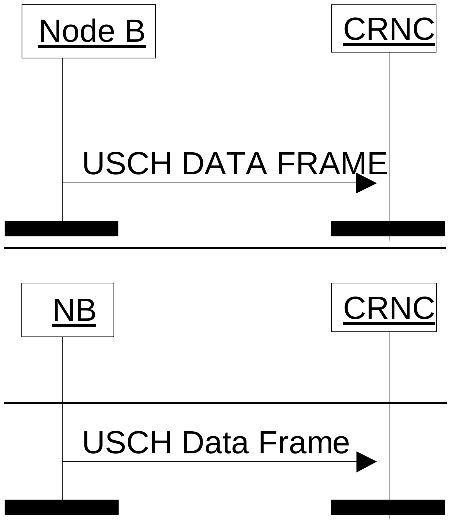


Figure 6: USCH Data Transfer ~~P~~procedure

Node B shall always send an USCH ~~data~~DATA ~~frame~~FRAME to the CRNC provided the Transport Format addressed by the TFI indicates that the number of Transport Blocks is greater than 0.

When UL synchronisation is lost or not yet achieved on the Uu, USCH ~~data~~DATA ~~frame~~FRAMEs shall not be sent to the CRNC.

When Node B receives an invalid TFCI in the PUSCH, USCH ~~data~~DATA ~~frame~~FRAMEs shall not be sent to the CRNC.

5.2 Node Synchronisation

In the Node Synchronisation procedure, the RNC sends a DL ~~Node Synchronisation~~NODE SYNCHRONISATION control frame to Node B containing ~~Containing~~ the parameter T1~~t1~~ ~~T1~~. Upon reception of a DL ~~Node Synchronisation~~NODE SYNCHRONISATION control frame, the Node B shall respond with UL ~~Node Synchronisation~~NODE SYNCHRONISATION c~~C~~ontrol f~~F~~rame, indicating ~~t~~T2 and ~~t~~T3, as well as ~~t~~T1 which was indicated in the initiating DL ~~Node Synchronisation~~NODE SYNCHRONISATION control frame.

The ~~t~~T1, ~~t~~T2, ~~t~~T3 parameters are defined as:

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

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

~~t~~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].

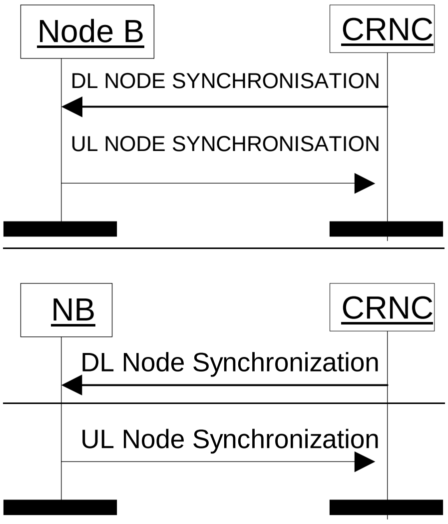


Figure 7: Node Synchronisation procedure

5.3 DL Transport Channels Synchronisation

CRNC sends a DL SYNCHRONISATION c~~C~~ontrol f~~F~~rame to Node B. This message indicates the target CFN.

Upon reception of the DL SYNCHRONISATION c~~C~~ontrol f~~F~~rame Node B shall immediately respond with UL SYNCHRONISATION c~~C~~ontrol f~~F~~rame indicating the ToA for the DL SYNCHRONISATION ~~Synchronisation~~ control frame and the CFN indicated in the received message.

The procedure shall not be applied on transport bearers transporting UL traffic channels, RACH or USCH.

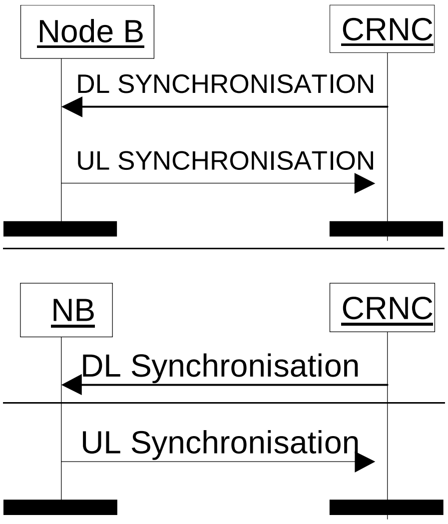


Figure 8: FACH, PCH and DSCH Transport Channels Synchronisation procedure

5.4 DL Timing Adjustment

Timing Adjustment procedure is used to indicate for the CRNC the incorrect arrival time of downlink data to Node B.

Timing adjustment procedure is initiated by the Node B if a DL frame arrives outside of the defined arrival window.

If the DL frame has arrived before the ToAWS or after the ToAWE N~~n~~ode B includes the ToA and the target CFN as message parameters for TIMING ADJUSTMENT c~~C~~ontrol f~~F~~rame.

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 N~~n~~ode 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 ~~n~~Node B internal delays. ToAWE is set via control plane. If data does not arrive before ToAWE a TIMING ADJUSTMENT ~~Timing Adjustment~~ c~~C~~ontrol f~~F~~rame shall be sent by ~~n~~Node B.
- **Time of Arrival Window Startpoint (ToAWS):** ToAWS represents the time after which the DL data shall arrive to the ~~n~~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 ~~Timing Adjustment~~ c~~C~~ontrol f~~F~~rame shall be sent by N~~n~~ode 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].

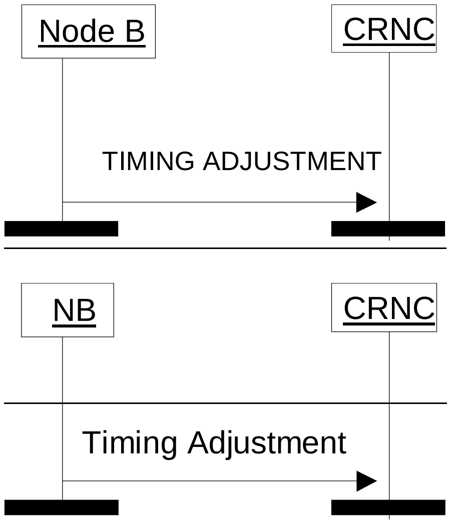


Figure 9: FACH, PCH, DSCH and [FDD - DSCH TFCI signalling] Timing Adjustment procedure

5.5 ~~[TDD –~~Dynamic PUSCH ~~a~~Assignment [TDD]

Procedure for dynamic allocation of physical resources to uplink shared channels (USCH) in the Node B. The control frame includes a parameter "PUSCH Set Id" which is a pointer to a pre-configured table of PUSCH Sets in the Node B.

When this control frame is sent via a certain Iub USCH data port, then it applies to that USCH and in addition to any other USCH channel which is multiplexed into the same CCTrCH in the Node B.

The time limitation of the PUSCH allocation is expressed with the parameters "Activation CFN" and "Duration".

Node B behaviour: When the Node B receives ~~the control frame "Dynamic~~DYNAMIC PUSCH ~~assignment"~~ASSIGNMENT control frame from the CRNC in the USCH frame protocol over an Iub USCH data port within a Traffic Termination Point, it shall behave as follows:

1) The Node B shall extract the PUSCH Set Id.
2) It shall extract the parameters "Activation CFN" and "Duration" which identify the allocation period of that physical channel.
3) It shall retrieve the PUSCH Set which is referred to by the PUSCH Set Id.

4) It shall identify the CCTrCH to which the USCH is multiplexed, and hence the TFCS which is applicable for the USCH.

5) Within the time interval indicated by Activation CFN and Duration, the Node B shall make the specified PUSCH Set available to the CCTrCH.

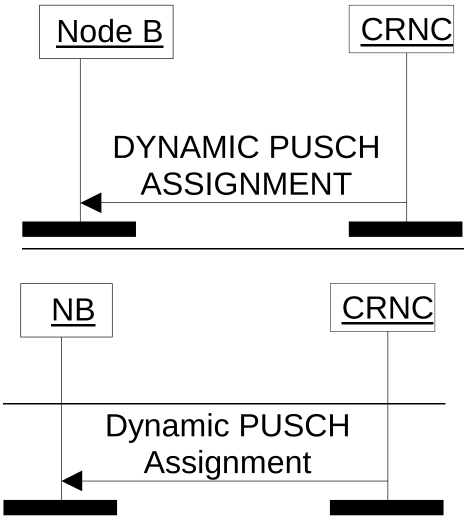


Figure 10: Dynamic PUSCH ~~a~~Assignment procedure

5.6 DSCH TFCI Signalling [FDD]

This procedure is used in order to signal to the ~~n~~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.

The procedure consists in sending the DSCH TFCI ~~signalling~~ SIGNALLING control frame from the CRNC to the ~~n~~Node B. The frame contains the TFCI (field 2) and the correspondent Connection Frame Number. 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.

~~PDSCH Uu frame.~~ In the event that the ~~n~~Node B does not receive a DSCH TFCI ~~signalling~~SIGNALLING control frame then the ~~n~~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.

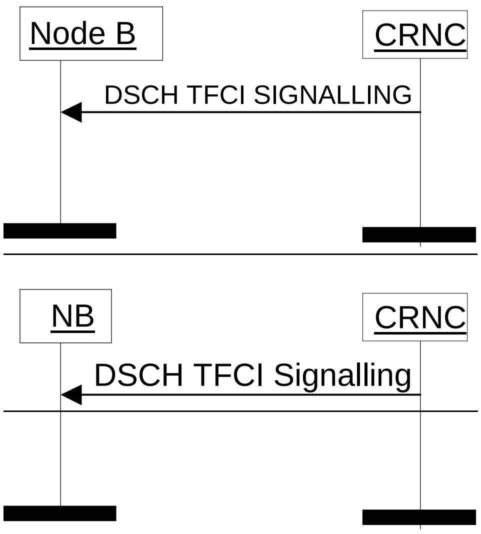


Figure 11: DSCH TFCI Signalling procedure

5.7 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.

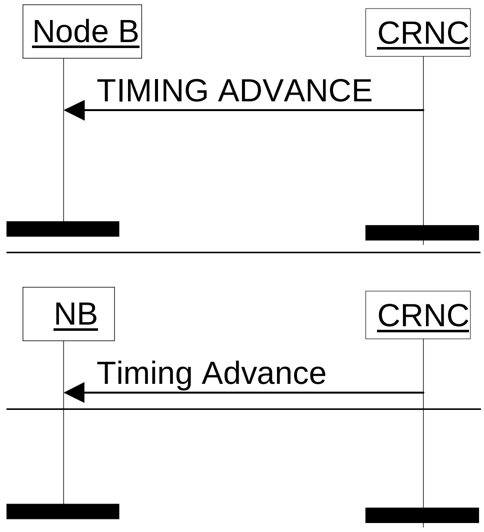


Figure 12: Timing Advance ~~Signalling~~procedure

6 Frame Structure and Coding

6.1 General

The general structure of a Common Transport Channel frame consists of a header and a payload. This structure is depicted in the below:

Header	Payload: Data or Control Information

Figure 13: General Frame Structure

The header shall contain the ~~f~~Frame ~~t~~Type field and information related to the ~~f~~Frame ~~t~~Type.

There are two types of frames (indicated by the Frame ~~t~~Type field).

- Data frame.
- Control frame.

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

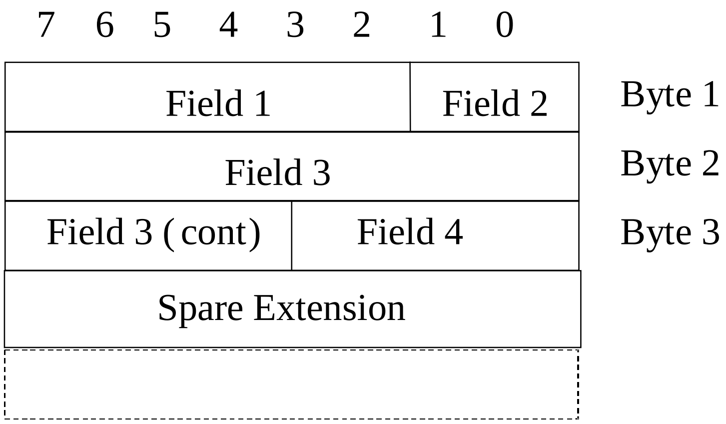


Figure 14: Example frame structure

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 14~~10~~). In addition, if a field spans several bytes, more significant bits will be located in lower numbered bytes (right of frame in Figure 14 ~~10~~).

On the Iub 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 2's complement binary coded.

The Spare Extension indicates the location where new IEs can in the future be added in a backward compatible way.

The Spare Extension shall not be used by the transmitter and shall be ignored by the receiver.

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

6.2 Data frame structure

6.2.1 RACH Channels

The RACH D~~ata~~ATA F~~rame~~RAME includes the CFN corresponding to the SFN of the frame in which the payload was received. If the payload was received in several frames, the CFN corresponding to the first Uu frame in which the information was received shall be indicated.

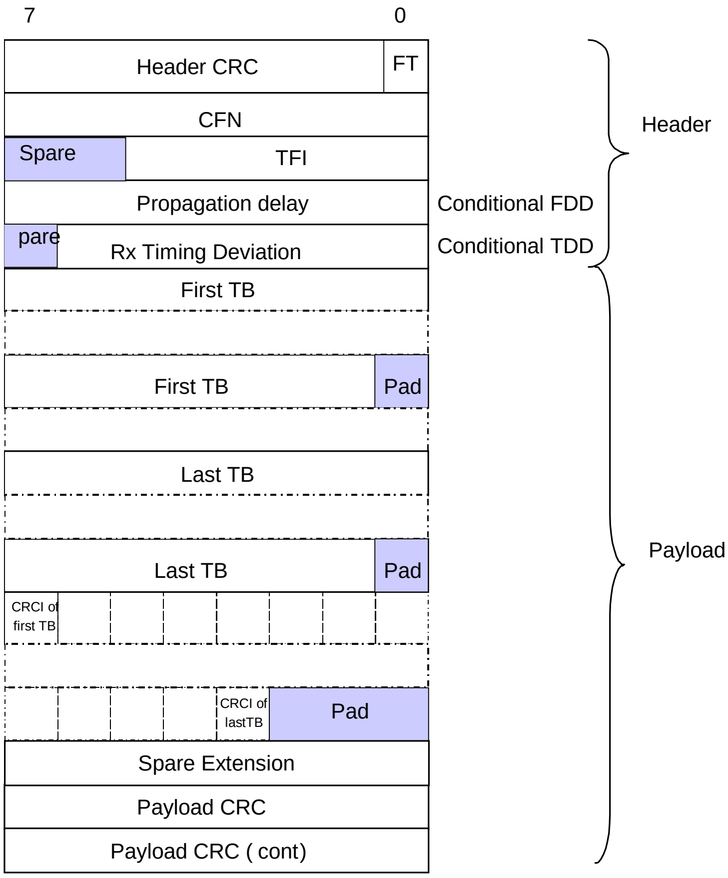


Figure 15: RACH D~~ata~~ATA F~~rame~~RAME structure

Propagation delay is a conditional Information Element which is only present when the Cell supporting the RACH Transport Channel is a FDD Cell.

Rx Timing Deviation is a conditional Information Element which is only present when the Cell supporting the RACH Transport Channel is a TDD Cell.

6.2.2 [FDD - CPCH~~ [FDD]~~ Channels]

The CPCH [FDD] D~~ata~~ATA F~~rame~~RAME includes the CFN corresponding to the 8 least significant bits of the SFN of the frame in which the payload was received. If the payload was received in several frames, the CFN corresponding to the first Uu frame in which the information was received shall be indicated.

Data frame structure is only applicable to FDD.

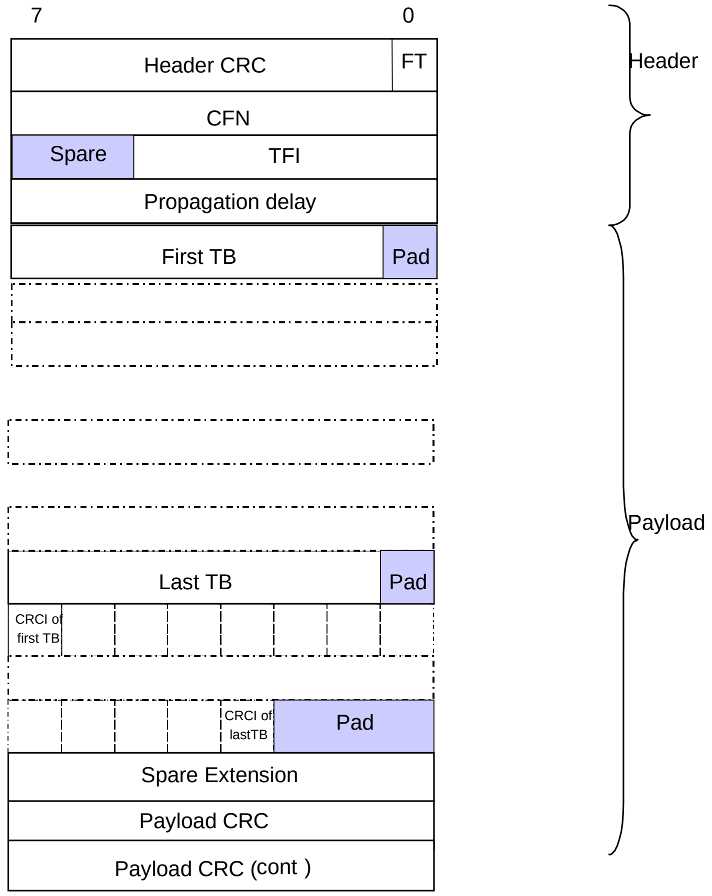


Figure 16: FDD CPCH D~~ata~~ATA F~~rame~~RAME structure

6.2.3 FACH Channels

FACH D~~ata~~ATA F~~rame~~RAME includes the CFN corresponding to the Uu frame at which this data in which the payload (FACH TBS) has to be transmitted. If the payload is to be sent in several frames, the CFN corresponding to the first frame shall be indicated.

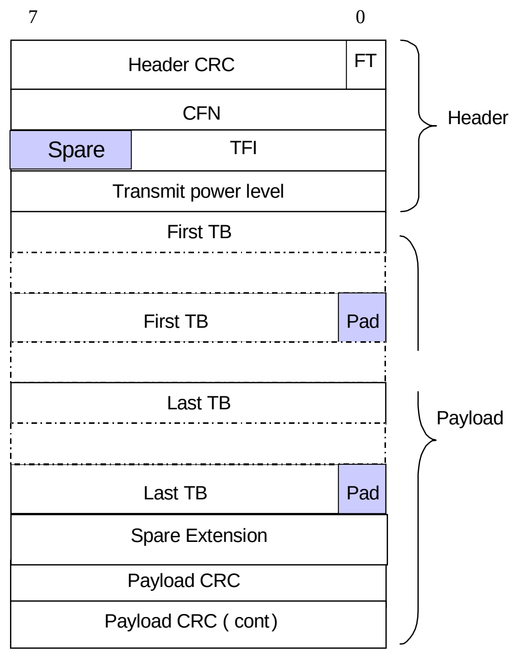


Figure 17: FACH D~~ata~~ATA F~~rame~~RAME structure

6.2.4 PCH Channels

The PCH D~~ata~~ATA F~~rame~~RAME includes the paging indication information and paging messages. To page one User Equipment, two consecutive PCH D~~ata~~ATA F~~rame~~RAMEs with consecutive CFN numbers are transmitted, the first frame contains the Paging Indication Information and the second contains the Paging Message.

[TDD- If PI-bitmap and PCH TBS are transmitted within the PCH ~~data~~DATA ~~frame~~FRAME, the CFN is related to the PCH TBS only. The PI bitmap is mapped to the PICH frames, transmitted at the beginning of the paging block.]

The paging messages are transmitted in S-CCPCH frames. The CFN in the PCH D~~ata~~ATA F~~rame~~RAME header corresponds to the Cell SFN of the frame in which the start of the S-CCPCH frame is located. [TDD - If the paging messages are to be sent in several frames, the CFN corresponding to the first frame shall be indicated.]

[FDD - The timing of the PICH frame (containing the paging indication information) is τ_{PICH} prior to the S-CCPCH frame timing [5]].

In contrast to all other Common Transport Channel data frames, which use a CFN of length 8, the PCH D~~ata~~ATA F~~rame~~RAME includes a CFN of length 12.

The ~~n~~Node-~~ ~~B has no responsibility to ensure the consistency between the paging indication information and the corresponding paging messages. E.g. if the paging indication information is lost over the Iub, the paging messages might be sent over the Uu while no UE is actually listening.

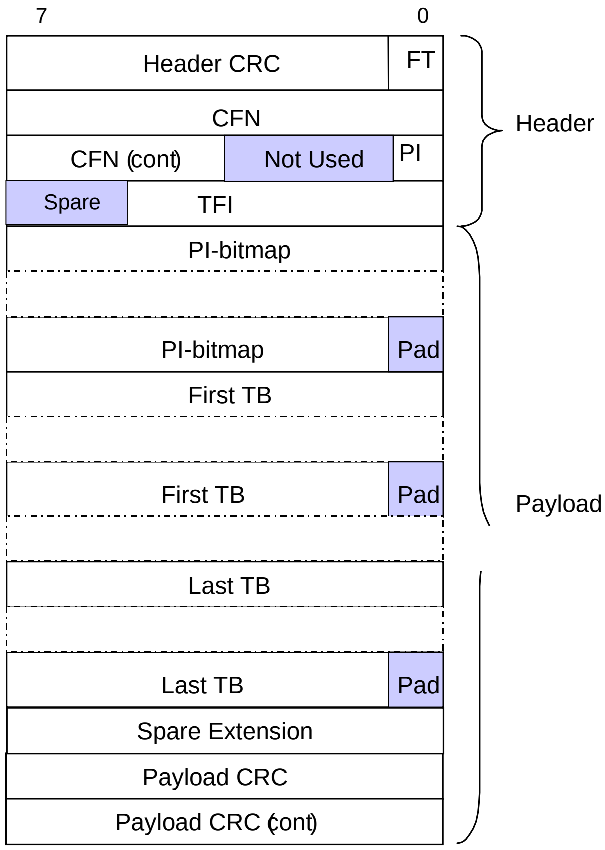


Figure 18: PCH D~~ata~~ATA F~~rame~~RAME structure

"Not Used" bits shall be set to 0 by the RNC and ignored by the Node B.

6.2.5 Downlink Shared Channels

DSCH D~~ata~~ATA F~~rame~~RAME includes a CFN indicating the SFN of the PDSCH in which the payload shall be sent. If the payload is to be sent over several frames, the CFN corresponding to the first frame shall be indicated.

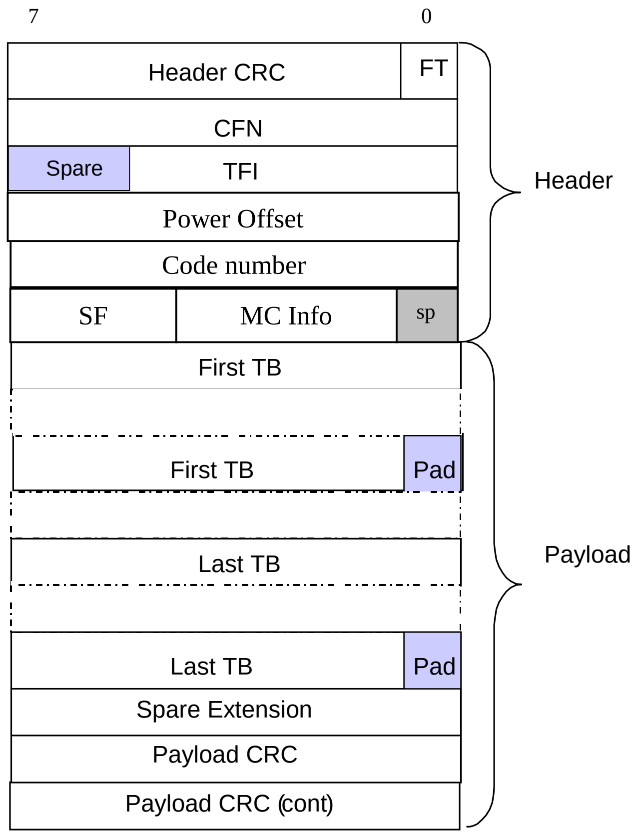


Figure 19: FDD DSCH ~~Data~~ATA ~~Frame~~RAME structure

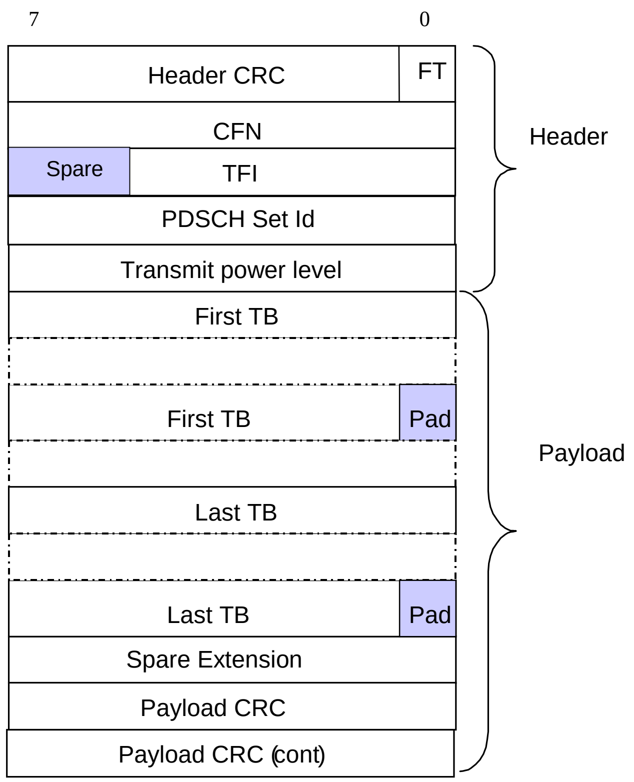


Figure 20: TDD DSCH ~~Data~~ATA ~~Frame~~RAME structure

Transmit power level is a conditional Information Element which is only present when the Cell supporting the DSCH Transport Channel is a TDD Cell.

6.2.6 [TDD - Uplink Shared Channels [TDD]

USCH DataATA FrameRAME includes the CFN in which the payload was received. If the payload was received in several frames, the CFN corresponding to the first frame will be indicated.

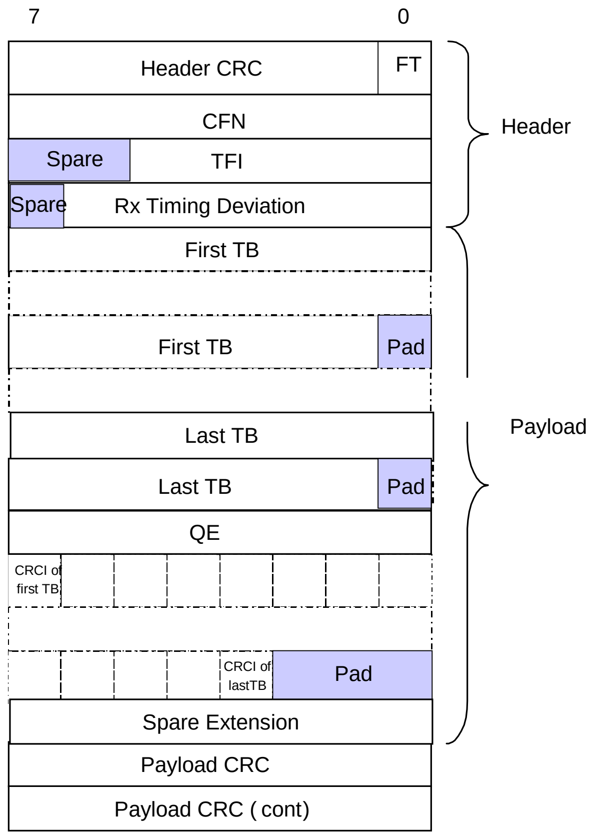


Figure 21: USCH DataATA FrameRAME structure

6.2.7 Coding of information elements in data frames

6.2.7.1 Header CRC

Description: Cyclic Redundancy Polynomial calculated on the header of a data frame with polynom: X^7+X^6+X^2+1.

The CRC calculation shall cover all bits in the header, starting from bit 0 in the first byte (FT field) up to the end of the header. See subclause 7.1.

Value range: {0-127}.

Field length: 7 bits.

6.2.7.2 Frame Type

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

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

Field Length: 1 bit.

6.2.7.3 Connection Frame Number (CFN)

Description: iIndicator as to which radio frame the first data was received on uplink or shall be transmitted on downlink. The value range and field length depend on the transport channel for which the CFN is used.

Value range (PCH): {0-4095}.

Value range (other): {0-255}.

Field length (PCH): 12 bits.

Field length (other): 8 bits.

6.2.7.4 Transport Format Indicator

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 reference [3].

Value range: {0-31}.

Field length: 5 bits.

6.2.7.5 [FDD — Propagation Delay]

Description: One-way radio interface delay as measured during RACH access.

Value range: {0 – 765 chips}.

Granularity: 3 chips.

Field length: 8 bits.

6.2.7.6 [TDD — Rx Timing Deviation]

Description: Measured Rx Timing Deviation as a basis for timing advance. This value should consider measurements made in all frames and all timeslots that contain the transport blocks in the payload. In case the *Timing Advance Applied* IE indicates "No" (see Ref. [6]) in a cell, the Rx Timing Deviation field shall be set to N = 0.

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.

6.2.7.7 Transport Block

Description: A block of data to be transmitted or have been received over the radio interface. The transport format indicated by the TFI describes the transport block length and transport block set size. See [3].

6.2.7.8 CRC indicator

Description: Shows if the transport block has a correct CRC. The UL Outer Loop Power Control may use the CRC indication.

Value range: {0=Correct, 1=Not Correct}.

Field length: 1 bit.

6.2.7.9 Payload CRC

Description: Cyclic Redundancy Polynomial calculated on the payload of a data frame with polynom X^16+X^15+X^2+1.

The CRC calculation shall cover all bits in the data frame payload, starting from bit 7 in the first byte up to bit 0 in the byte before the payload CRC. See chapter 7.1.

Field length: 16 bits.

6.2.7.10 Transmit power level

Description: Preferred transmission power level during this TTI for the corresponding transport channel. The indicated value is the negative offset relative to the maximum power configured for the physical channel(s) used for the respective transport channel.

Value range: {0 .. 25,.5 dB}.

Granularity: 0,1 dB.

Field length: 8 bits.

6.2.7.11 Paging Indication (PI)

Description: Describes if the PI Bitmap is present in the payload.

Value range: {0=no PI-bitmap in payload, 1=PI-bitmap in payload}.

Field length: 1 bit.

6.2.7.12 Paging Indication bitmap (PI-bitmap)

Description: Bitmap of Paging Indications $PI_0..PI_{N-1}$. Bit 7 of the first byte contains PI0, Bit6 of the first byte contains PI1,,…, Bit7 of the second byte contains PI8 and so on.

Value range: [FDD - {18, 36, 72 or 144 Paging Indications}.

[TDD – {30, 34, 60, 68, 120 and 136} Paging Indications for 2 PICH frames,
{60, 68, 120, 136, 240 and 272} Paging Indications for 4 PICH frames].

Field length: [FDD - 3, 5, 9 or 18 bytes (the PI-bitmap field is padded at the end up to an octet boundary)].

[TDD – 4, 5, 8, 9, 15, 17, 30 or 34 bytes (the PI-bitmap field is padded at the endup to an octet boundary)].

6.2.7.13 [TDD — Rx Timing Deviation on RACH]

Void.

6.2.7.14 [TDD - PDSCH Set Id]

Description: A pointer to the PDSCH Set which shall be used to transmit the DSCH data DATA frameFRAME over the radio interface.

Value range: {0..255}.

Field length: 8 bits.

6.2.7.15 [FDD - Code Number]

Description: tThe code number of the PDSCH (the same mapping is used as for the 'code number' IE in 25.331).

Value Range: {0 .. 255}.

Field length: 8 bits.

6.2.7.16 [FDD - Spreading Factor (SF)]

Description: tThe spreading factor of the PDSCH.

Spreading factor = 0 Spreading factor to be used = 4.

Spreading factor = 1 Spreading factor to be used = 8.

Spreading factor = 6 Spreading factor to be used = 256.

Value Range: {4,8,16,32,64,128, 256}.

Field length: 3 bits.

6.2.7.17 [FDD - Power Offset]

Description: Used to indicate the preferred FDD PDSCH transmission power level. The indicated value is the offset relative to the power of the TFCI bits of the downlink DPCCH directed to the same UE as the DSCH.

Power offset = 0 Power offset to be applied = -32 dB.

Power offset = 1 Power offset to be applied = -31.75 dB.

Power offset = 255 Power offset to be applied = +31.75 dB.

Value range: {-32 to +31.75 dB}.

Granularity: 0.25 dB.

Field length: 8 bits.

6.2.7.18 [FDD - MC Info]

Description: Used to indicate the number of parallel PDSCH codes on which the DSCH data will be carried. Where multi-code transmission is used the SF of all codes is the same and code numbers are contiguous within the code tree with increasing code number values starting from the code number indicated in the 'code number' field.

Value range: {1..16}.

Field length: 4 bits.

6.2.7.19 Spare Extension

Description: Indicates the location where new IEs can in the future be added in a backward compatible way.

Field length: 0-2 octets.

6.2.7.20 [TDD - Quality Estimate (QE)]

Description: The quality estimate is derived from the Transport channel BER.

If the USCH FP frame includes TB's for the USCH then the QE is the Transport channel BER for the selected USCH. If no Transport channel BER is available the QE shall be set to 0.

The quality estimate shall be set to the Transport channel BER and be measured in the units TrCH_BER_LOG respectively (see Ref [6]). The UL Outer Loop Power Control may use the quality estimate.

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

Granularity: 1.

Field length: 8 bits.

6.3 Control frame structure

6.3.1 Introduction

The Common Control Channel control frames are used to transport control information between the CRNC and the Node B. The figure below defines the Control Frame structure for common transport channels.

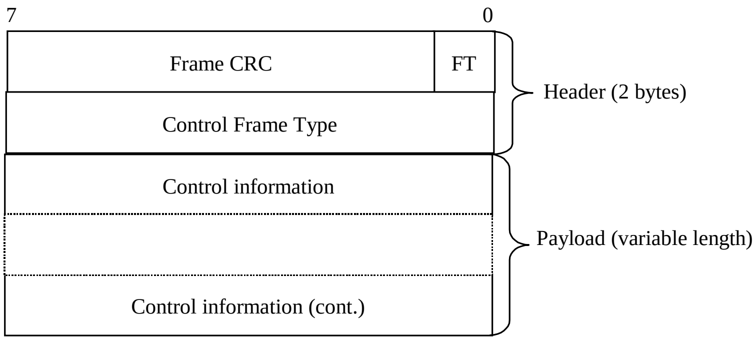


Figure 22: Iub Common Transport Channel Control Frame Format

The structure of the header and the payload of the control frames is defined in the following subclauses:

6.3.2 Coding of information elements of the Control frame header

6.3.2.1 Frame CRC

Description: Cyclic Redundancy Polynomial calculated on a control frame with polynom: X^7+X^6+X^2+1.

The CRC calculation shall cover all bits in the control frame, starting from bit 0 in the first byte (FT field) up to the end of the control frame. See subclause 7.1.

Value range: {0-127}.

Field length: 7 bits.

6.3.2.2 Frame type (FT)

Refer to section 6.2.7~~6~~.2.

6.3.2.3 Control Frame Type

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

Value: ~~v~~Values of the Control Frame Type parameter are defined in the following table:

Type of control frame	Value
T~~iming~~IMING ~~adjustment~~ADJUSTMENT	0000 0010
DL ~~synchronisation~~SYNCHRONISATION	0000 0011
UL ~~synchronisation~~SYNCHRONISATION	0000 0100
DL ~~Node~~NODE ~~synchronisation~~SYNCHRONISATION	0000 0110
UL ~~Node~~NODE ~~synchronisation~~SYNCHRONISATION	0000 0111
D~~ynamic~~YNAMIC PUSCH ~~assignment~~ASSIGNMENT	0000 1000
T~~iming~~IMING ADVANCE~~dvance~~	0000 1001

Field Length: 8 bits.

6.3.3 Payload structure and information elements

6.3.3.1 T~~iming~~IMING A~~djustment~~DJUSTMENT

6.3.3.1.1 Payload Structure

The figure below shows the structure of the payload when control frame is used for the timing adjustment.

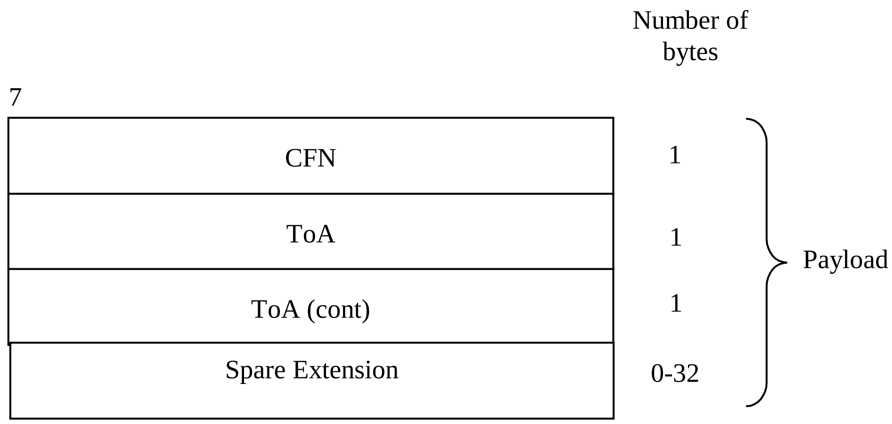


Figure 23: T~~iming~~IMING ~~adjustment~~ADJUSTMENT payload structure (non-PCH transport bearers)

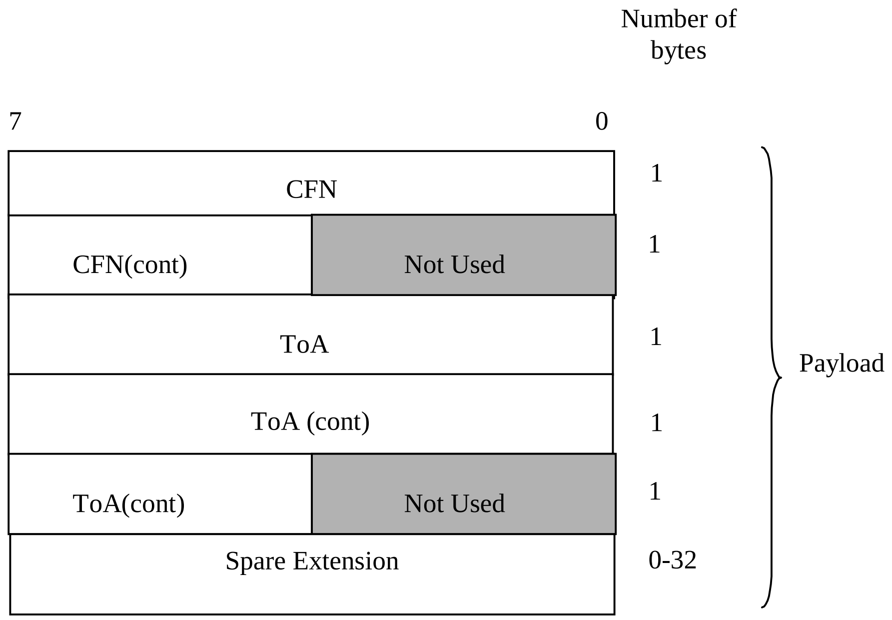


Figure 24: T~~iming~~IMING ~~adjustment~~ADJUSTMENT payload structure (PCH transport bearer)

6.3.3.1.2 CFN

Refer to section 6.2.7~~6~~.3.

6.3.3.1.3 Time of arrival (ToA)

Description: Time difference between the arrival of the DL frame with respect to TOAWE (based on the CFN in the frame). The value range and field length depend on the transport channel for which the CFN is used.

Value range (PCH): {-20480ms, +20479.875ms}.

Value range (other): {-1280ms, +1279.875ms}.

Granularity: 125µs.

Field length (PCH): 20 bits.

Field length (other): 16 bits.

6.3.3.1.4 Spare Extension

Description: Indicates the location where new IEs can in the future be added in a backward compatible way.

Field length: 0-32 octets.

6.3.3.2 DL ~~synchronisation~~SYNCHRONISATION

6.3.3.2.1 Payload Structure

Figure below shows the structure of the payload when control frame is used for the user plane synchronisation.

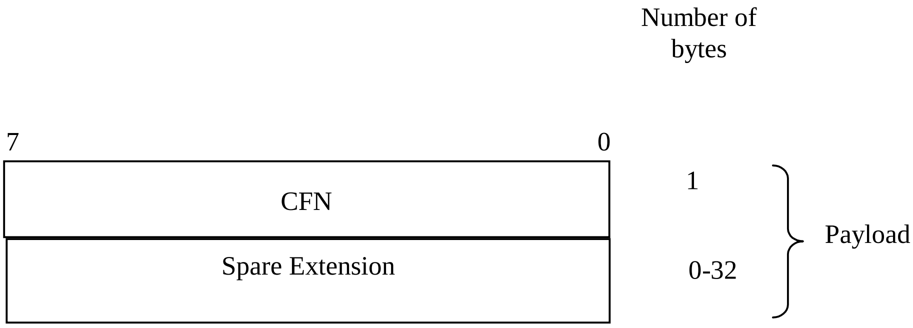


Figure 25: DL S~~ynchronisation~~YNCHRONISATION payload structure (non-PCH transport bearers)

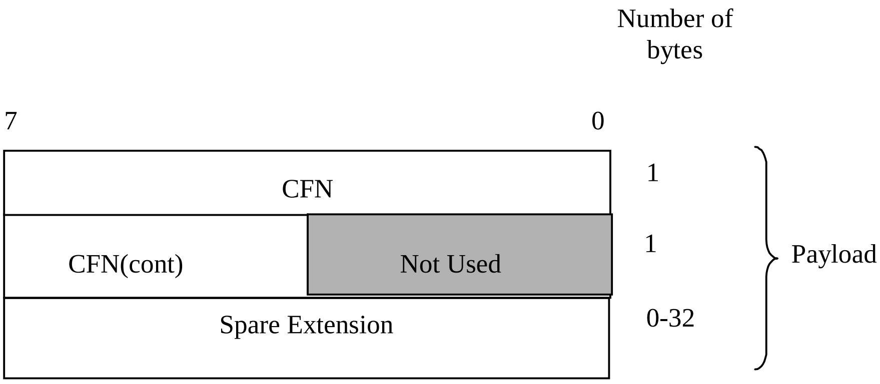


Figure 26: DL S~~ynchronisation~~YNCHRONISATION payload structure (PCH transport bearers)

6.3.3.2.2 CFN

Refer to section 6.2.~~6~~7.3.

6.3.3.2.3 Spare Extension

Description: The Spare Extension is described in section 6.3.3.1.4.

6.3.3.3 UL S~~ynchronisation~~YNCHRONISATION

6.3.3.3.1 Payload Structure

Figure below shows the structure of the payload when the control frame is used for the user plane synchronisation (UL).

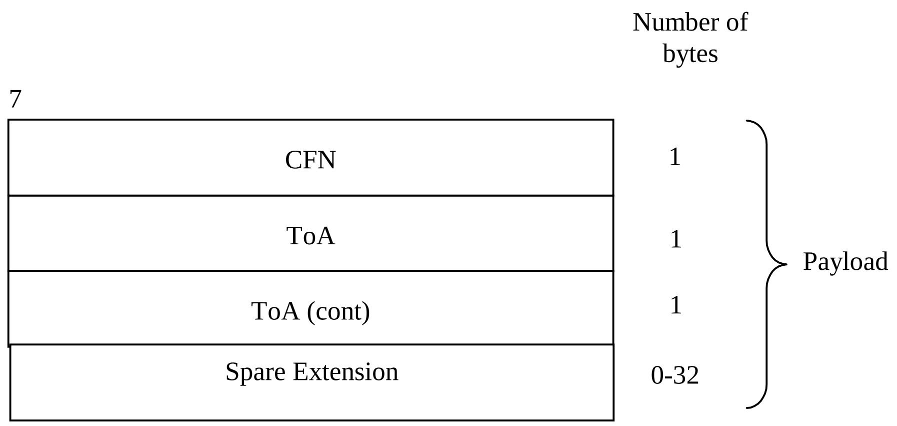


Figure 27: UL S~~ynchronisation~~YNCHRONISATION payload structure (non-PCH transport bearers)

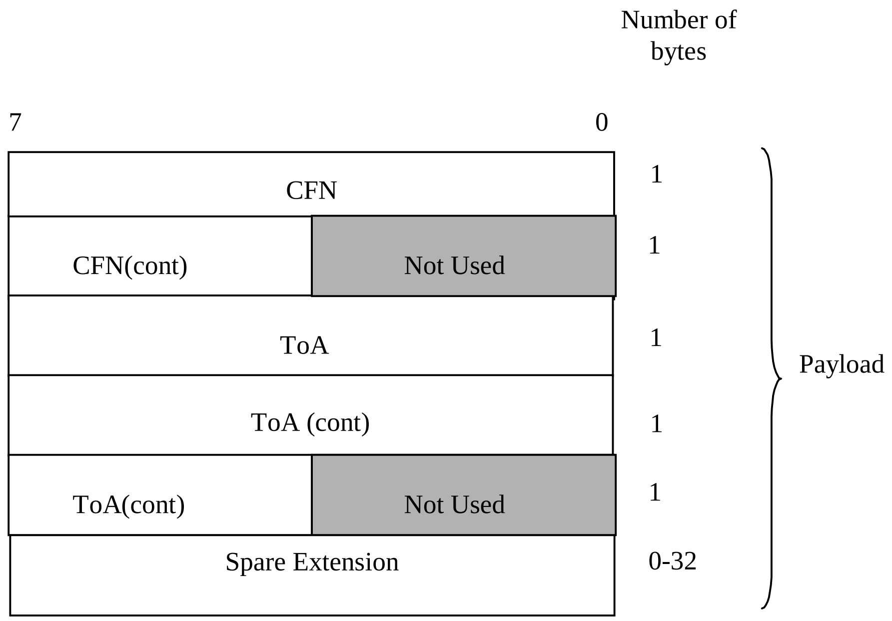


Figure 28: UL S~~ynchronisation~~YNCHRONISATION payload structure (PCH transport bearers)

6.3.3.3.2 CFN

Refer to section 6.2.7~~6~~.3.

6.3.3.3.3 Time of Arrival (TOA)

Refer to section 6.3.3.1.3.

6.3.3.3.4 Spare Extension

Description: The Spare Extension is described in section 6.3.3.1.4.

6.3.3.4 DL N~~ode~~ODE S~~ynchronisation~~YNCHRONISATION

6.3.3.4.1 Payload Structure

The payload of the DL Node synchronisation control frames is shown in the figure below:

7 … 0	Number of bytes	
T1	1	Payload
T1 (cont)	1	
T1 (cont)	1	
Spare Extension	0-32	

Figure 29: DL NODE SYNCHRONISATION payload structure

6.3.3.4.2 T1

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

Value range: {0-40959.875 ms}~~, and the granularity is 0.125 ms~~.

Granularity : 0.125ms.

Field length: 24 bits.

6.3.3.4.3 Spare Extension

Description: The Spare Extension is described in section 6.3.3.1.4.

6.3.3.5 UL N~~ode~~ODE S~~ynchronisation~~YNCHRONISATION

6.3.3.5.1 Payload Structure

The payload of the UL Node synchronisation control frames is shown in the figure below:

Field (bits 7 … 0)	Number of bytes	
T1	1	Payload
T1 (cont)	1	
T1 (cont)	1	
T2	1	
T2 (cont)	1	
T2 (cont)	1	
T3	1	
T3 (cont)	1	
T3 (cont)	1	
Spare Extension	0-32	

Figure 30: UL NODE SYNCHRONISATION payload structure

6.3.3.5.2 T1

Description: T1 timer is extracted from the correspondent DL Node synchronisation control frame.

Value range: {0-40959.875 ms}~~, and the granularity is 0.125 ms~~.

Granularity : 0.125ms.

Field length: 24 bits.

6.3.3.5.3 T2

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

Value range: {0-40959.875 ms}~~, and the granularity is 0.125 ms~~.

Granularity : 0.125ms.

Field length: 24 bits.

6.3.3.5.4 T3

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

Value range: {0-40959.875 ms}~~, and the granularity is 0.125 ms~~.

Granularity : 0.125ms.

Field length: 24 bits.

6.3.3.5.5 Spare Extension

Description: The Spare Extension is described in section 6.3.3.1.4.

6.3.3.6 [TDD – D~~ynamic~~YNAMIC PUSCH ~~assignment~~ASSIGNMENT]

6.3.3.6.1 Payload structure

The payload of the Dynamic PUSCH Assignment control frames is shown in the figure below:

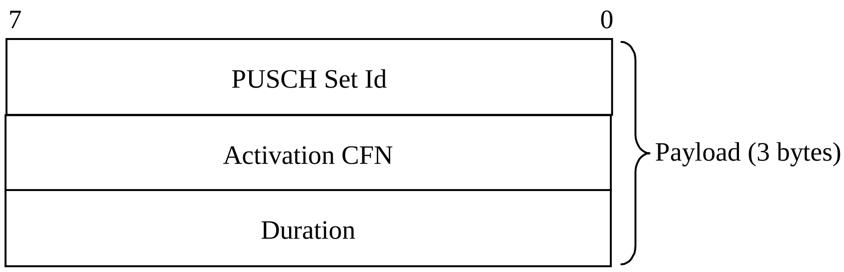


Figure 31: DYNAMIC PUSCH ASSIGNMENT payload structure

6.3.3.6.2 PUSCH Set Id

Description: Identifies a PUSCH Set from the collection of PUSCH Sets which have been pre-configured in the Node B, for the respective cell in which the USCH exists. The PUSCH Set Id is unique within a cell.

Value range: {0...255}.

Field length: 8 bits.

6.3.3.6.3 Activation CFN

Description: Activation CFN, specifies the Connection Frame Number where the allocation period of that PUSCH Set starts.

Value range: Integer {~~(~~0...255}~~)~~.

Field length: 8 bits.

6.3.3.6.4 Duration

Description: Indicates the duration of the activation period of the PUSCH Set, in radio frames.

Value range: {0 ... 255} means: 0 to 255 radio frames, i.e. 0 to 2550 msec.

Field length: 8 bits.

6.3.3.7 [FDD - DSCH TFCI~~ signalling~~SIGNALLING]

6.3.3.7.1 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.

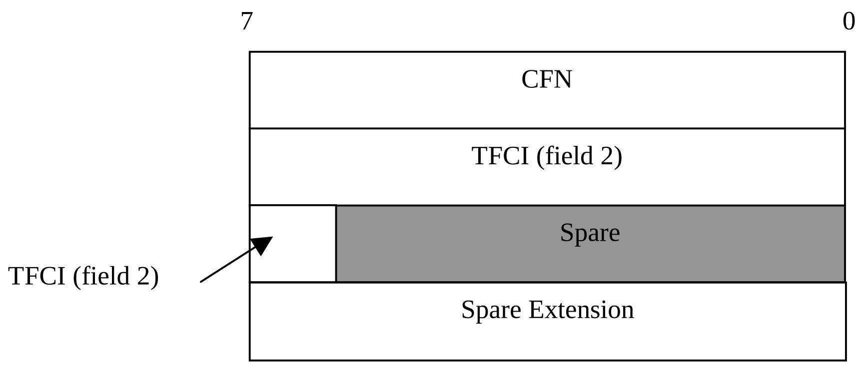


Figure ~~29~~32: ~~[FDD - Structure of the payload for the~~ DSCH TFCI SIGNALLING payload structure~~signalling control frame]~~

6.3.3.7.2 TFCI (field 2)

Description: TFCI (field 2) is as described in [6], it takes the same values as the TFCI (field 2) which is transmitted over the Uu interface.

Value range: {0 - 1023}

Field length: 10 bits

6.3.3.7.3 Spare Extension

The Spare Extension is described in subclause 6.2.7.19.

6.3.3.8 [TDD - T~~iming~~IMING A~~dvance~~DVANCE]

6.3.3.8.1 Payload structure

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

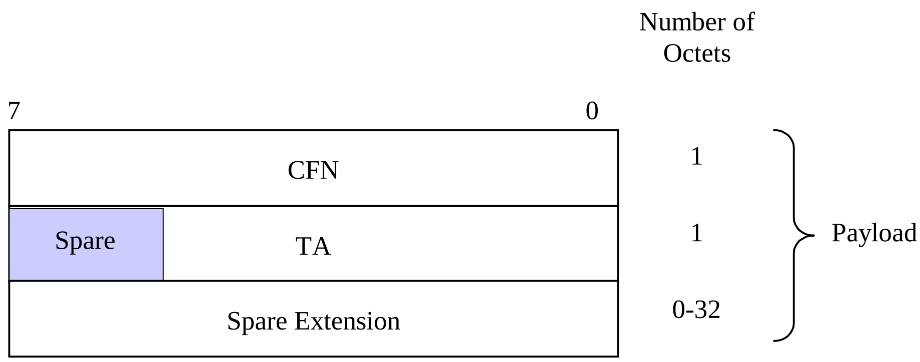


Figure ~~30~~33: ~~Structure of the~~ T~~iming~~IMING A~~dvance~~DVANCE payload structure~~control frame~~

6.3.3.8.2 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.~~6~~7.3.

6.3.3.8.3 TA

Description: UE applied UL timing advance adjustment.

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

Granularity : 4 chips.

Field length: 6 bits.

6.3.3.8.4 Spare Extension

Description: Indicates the location where new IEs can in the future be added in a backward compatible way.

Field length: 0-32 octets.

3GPP TSG-RAN WG3 Meeting #23
Helsinki, Finland, 27th – 31st August 2001

Tdoc R3-012249

CR-Form-v3

CHANGE REQUEST

⌘ **25.435**	**CR** **058**	⌘ rev **1**	⌘ Current version: **4.1.0** ⌘

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

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

Title: ⌘	General Corrections on Common Transport Channel Data Streams
Source: ⌘	R-WG3
Work item code: ⌘	TEI
Date: ⌘	August 2001
Category: ⌘	**A**
Release: ⌘	*REL-4*

Use one of the following categories:
- ***F*** *(essential correction)*
- ***A*** *(corresponds to a correction in an earlier release)*
- ***B*** *(Addition of feature),*
- ***C*** *(Functional modification of feature)*
- ***D*** *(Editorial modification)*

Detailed explanations of the above categories can be found in 3GPP TR 21.900.

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

Reason for change: ⌘ Editorial Corrections and addition of abbreviation

Summary of change: ⌘

In 3.2, 'LTOA', 'ToAWE' and 'ToAWS' is added to the abbreviation.

In 4.2, 'data transport' is modified to 'the Data Transport Network Layer' to specify where services are served.

In 5.1.1, 5.1.2, 5.1.3, 5.1.4 and 5.1.5, each 'XXXX Data Frame' is changed to 'XXXX DATA FRAME'.

In 5.2, 5.3, 5.4, 5.5, 5.6 and 5.7, each control frame name is changed to upper case characters.

In 5.2, 5.3 and 5.4, according to the specification notations, there are some modifications.

In 5.6, 'PDSCH Uu frame' is ~~deleted~~moved to previous sentence..

In paragraph of 6.1, 'Figure 10' is changed to 'Figure 14'

In 6.3.3.4, 6.3.3.5 and 6.3.3.6, the titles of figures are added.

Consequences if not approved: ⌘

If this CR is not approved editorial mistake will remain in the specification

Backward compatibility:
This CR is backward .

Clauses affected: ⌘	3.2, 4.2, 5.1.1, 5.1.2, 5.1.3, 5.1.4, 5.1.5, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 6.1, 6.2, 6.3
Other specs affected: ⌘	[X] Other core specifications ⌘ 25.435 V3.7.0 CR 057 [ ] Test specifications [ ] O&M Specifications
Other comments: ⌘	

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

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

3.2 Abbreviations

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

CFN	Connection Frame Number
CPCH	Common Packet Channel
CRC	Cyclic Redundancy Checksum
CRCI	CRC Indicator
DCH	Dedicated Transport Channel
DL	Downlink
DSCH	Downlink Shared Channel
FP	Frame Protocol
FT	Frame Type
LTOA	Latest Time of Arrival
PC	Power Control
PDSCH	Physical Downlink Shared Channel
PUSCH	Physical Uplink Shared Channel
QE	Quality Estimate
TB	Transport Block
TBS	Transport Block Set
TFI	Transport Format Indicator
ToA	Time of Aarrival
ToAWE	Time of Arrival Window Endpoint
ToAWS	Time of Arrival Window Startpoint
TTI	Transmission Time Interval
UL	Uplink
USCH	Uplink Shared Channel

For other abbreviations, please refer to [2].

4 General aspects

4.1 Common Transport Channel Data Stream User Plane Protocol Services

Common transport channel provides the following services:

- Transport of TBS between the Node B and the CRNC for common transport channels.
- Support of transport channel synchronisation mechanism.
- Support of Node Synchronisation mechanism.

4.2 Services expected from the D~~d~~ata T~~t~~ransport Network layer

The following services are expected from the transport layer:

- Delivery of Frame Protocol PDUs.

In sequence delivery is not required. However, frequent out-of-sequence delivery may impact the performance and should be avoided.

5 Data Streams User Plane Procedures

5.1 Data Transfer

5.1.1 RACH Channels

Data Transfer procedure is used to transfer data received from Uu interface from Node B to CRNC. Data Transfer procedure consists of a transmission of Data Frame from Node B to CRNC.

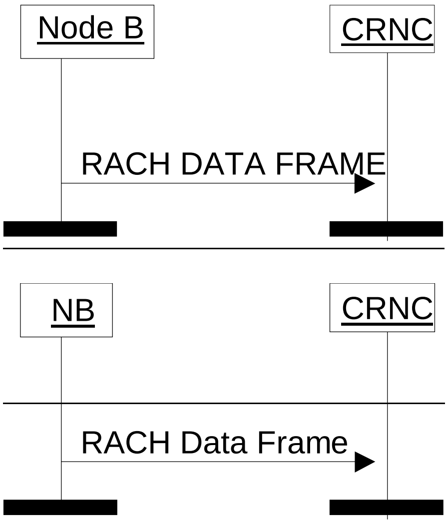


Figure 1: RACH Data Transfer Pprocedure

5.1.2 CPCH [FDD] Channels [FDD]

Data Transfer procedure is used to transfer data received from Uu interface from Node B to CRNC. Data Transfer procedure consists of a transmission of Data Frame from Node B to CRNC.

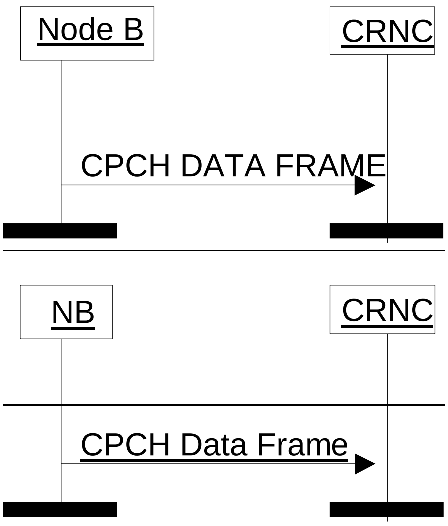


Figure 2: CPCH [FDD] Data Transfer Pprocedure

5.1.3 Secondary-CCPCH related transport Channels

For the FACH transport channel, a Data Transfer procedure is used to transfer data from CRNC to Node B. Data Transfer Procedure Consists of a transmission of Data Frame from CRNC to Node B.

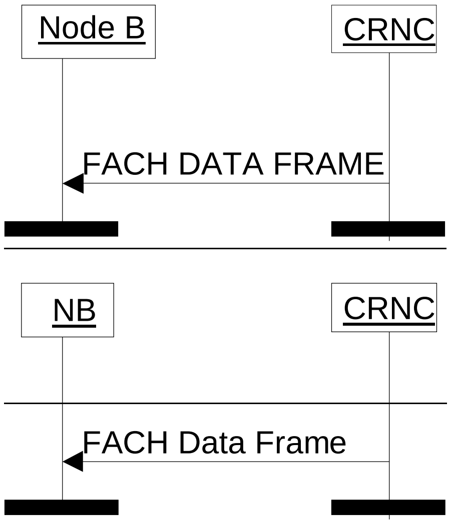


Figure 3: FACH Data Transfer ~~P~~procedure

For the PCH transport channel, a Data Transfer procedure is used to transfer data from CRNC to Node B. Data Transfer ~~P~~procedure ~~C~~consists of a transmission of Data Frame from CRNC to Node B.

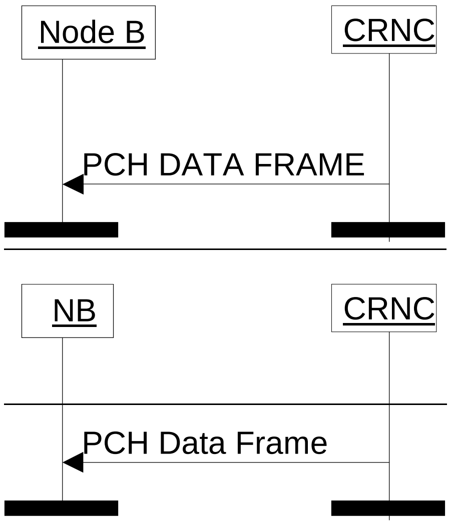


Figure 4: PCH Data Transfer ~~P~~procedure

In this case the PCH D~~ata~~ATA F~~rame~~RAME may also transport information related to the PICH channel.

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. For the FACH and PCH transport channels, the TFS shall never define a Transport Block Size of zero bits.

If the Node B is aware of a TFI value corresponding to zero bits for this transport channel, this TFI is assumed. When combining the TFI's of the different transport channels, a valid TFCI might result and in this case data shall be transmitted on the 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 secondary-CCPCH according to the TFIs of the transport channels multiplexed on this secondary-CCPCH and scheduled for that frame. [FDD — In case the Node B receives an unknown TFI combination, no pilot bits, TFCI bits or Data bits shall be transmitted.] [TDD — In case the Node B receives an unknown TFI combination, it shall apply DTX, i.e. suspend transmission on the corresponding S-CCPCH – except if this S-CCPCH provides the "beacon function", in which case the Node B shall maintain the physical layer transmission as specified in TS 25.221].

If the Node B does not receive a valid FP frame in a TTI or a frame without paging indication information, it assumes that no UE's have to be paged on the Uu in this TTI. In this case the default PICH bit pattern of all zeros shall be transmitted.

Data Frames sent on Iub for different transport channels multiplexed on one secondary-CCPCH might indicate different transmission power levels to be used in a certain Uu frame. Node-B shall determine the highest DL power level required for any of the transport channels multiplexed in a certain Uu frame and use this power level as the desired output level.

5.1.4 Downlink Shared Channels

The Data Transfer procedure is used to transfer a DSCH ~~data~~DATA ~~frame~~FRAME from the CRNC to a Node B.

If the Node B does not receive a valid DSCH ~~data~~DATA ~~frame~~FRAME for transmission in a given TTI, it assumes that there is no data to be transmitted in that TTI for this transport channel. For the DSCH transport channel, the TFS shall never define a Transport Block Size of zero bits.

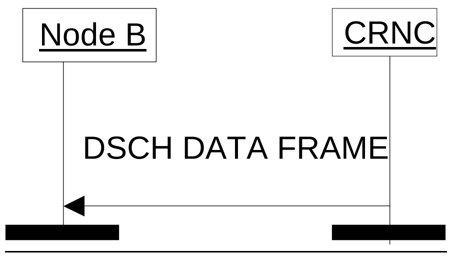
[FDD - The Node B shall use the header information in the DSCH ~~data~~DATA ~~frame~~FRAME to determine which channelisation code(s) and power offset should be used in the PDSCH Uu frame associated to the specified CFN. The specified channelisation code(s) and power offset shall then be used for PDSCH transmission for as long as there is data to transmit or until a new DSCH ~~data~~DATA ~~frame~~FRAME arrives that specifies that a different PDSCH channelisation code(s) and/or power offset should be used. This feature enables multiple DSCH's with different TTI to be supported].

[FDD - In the event that the DSCH FP header indicates that a multi-code PDSCH transmission is to be applied ('MC Info' value > 1) then the 'power offset' field indicates the power offset at which each individual code should be transmitted relative to the power of the TFCI bits of the downlink DPCCH directed to the same UE as the DSCH].

[FDD - The Node B may receive a DSCH ~~data~~DATA ~~frame~~FRAME which contains a TFI value corresponding to there being no data to transmit, such a DSCH ~~data~~DATA ~~frame~~FRAME will have no transport blocks. On receiving such a data frame the Node B shall apply the specified channelisation code(s) and power offset as described above starting in the PDSCH Uu frame associated to the specified CFN. This feature enables multiple DSCH's with different TTI to be supported, the use of such a zero payload DSCH ~~data~~DATA ~~frame~~FRAME solves the problem of how the Node B should determine what channelisation code(s) and power offset should be used in the event that transmission of a transport block set being transmitted with a short TTI comes to an end, whilst the transmission of a TBS with a long TTI continues].

[TDD - The Node B shall use the header information in the DSCH ~~data~~DATA ~~frame~~FRAME to determine which PDSCH Set and power offset should be used in the PDSCH Uu frames associated to the specified CFN. The specified PDSCH Set and power offset shall then be used for DSCH transmission for as long as there is data to transmit or until a new DSCH ~~data~~DATA ~~frame~~FRAME arrives that specifies that a different PDSCH Set and/or power offset should be used. This feature enables multiple DSCH's with different TTI to be supported].

[TDD - The Node B may receive a DSCH ~~data~~DATA ~~frame~~FRAME which contains a TFI value corresponding to there being no data to transmit, such a DSCH ~~data~~DATA ~~frame~~FRAME will have no transport blocks. On receiving such a data frame the Node B shall apply the specified PDSCH Set and power offset as described above starting in the PDSCH Uu frame associated to the specified CFN. This feature enables multiple DSCH's with different TTI to be supported, the use of such a zero payload DSCH ~~data~~DATA ~~frame~~FRAME solves the problem of how the Node B should determine what PDSCH Set and power offset should be used in the event that transmission of a transport block set being transmitted with a short TTI comes to an end, whilst the transmission of a TBS with a long TTI continues].



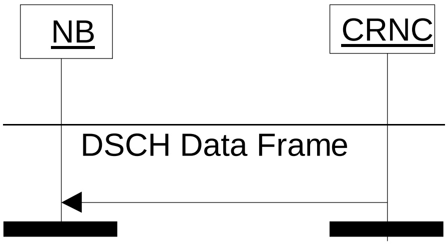


Figure 5: DSCH Data Transfer ~~P~~procedure

5.1.5 [~~TDD – ~~Uplink Shared Channels [TDD]

Data Transfer procedure is used to transfer data received from Uu interface from Node B to CRNC. Data Transfer procedure consists of a transmission of Data Frame from Node B to CRNC.

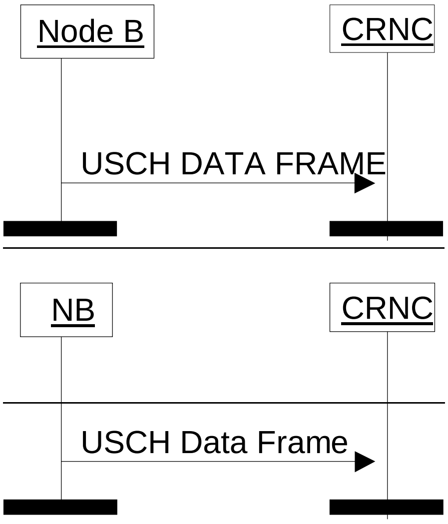


Figure 6: USCH Data Transfer ~~P~~procedure

Node B shall always send an USCH ~~data~~DATA ~~frame~~FRAME to the CRNC provided the Transport Format addressed by the TFI indicates that the number of Transport Blocks is greater than 0.

When UL synchronisation is lost or not yet achieved on the Uu, USCH ~~data~~DATA ~~frame~~FRAMEs shall not be sent to the CRNC.

When Node B receives an invalid TFCI in the PUSCH, USCH ~~data~~DATA ~~frame~~FRAMEs shall not be sent to the CRNC.

5.2 Node Synchronisation

In the Node Synchronisation procedure, the RNC sends a DL ~~Node Synchronisation~~NODE SYNCHRONISATION control frame to Node B containing ~~Containing~~ the parameter T1~~t1~~ ~~T1~~. Upon reception of a DL ~~Node Synchronisation~~ NODE SYNCHRONISATION control frame, the Node B shall respond with UL ~~Node Synchronisation~~NODE SYNCHRONISATION c~~C~~ontrol f~~F~~rame, indicating ~~t~~T2 and ~~t~~T3, as well as ~~t~~T1 which was indicated in the initiating DL ~~Node Synchronisation~~NODE SYNCHRONISATION control frame.

The ~~t~~T1, ~~t~~T2, ~~t~~T3 parameters are defined as:

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

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

tT3: 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].

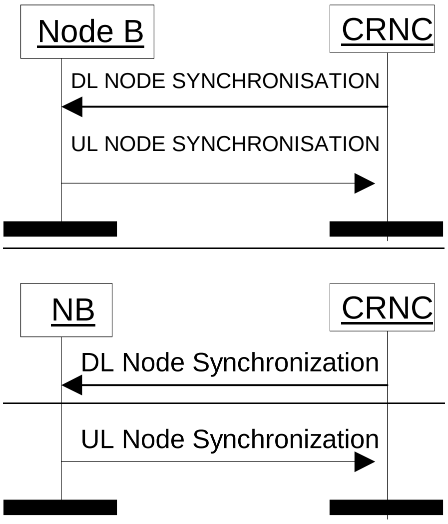


Figure 7: Node Synchronisation procedure

5.3 DL Transport Channels Synchronisation

CRNC sends a DL SYNCHRONISATION cControl fFrame to Node B. This message indicates the target CFN.

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

The procedure shall not be applied on transport bearers transporting UL traffic channels, RACH or USCH.

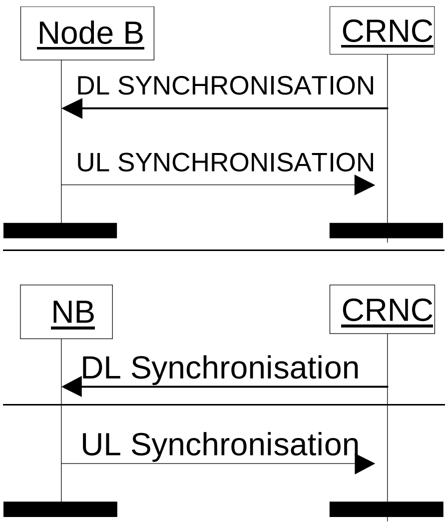


Figure 8: FACH, PCH and DSCH Transport Channels Synchronisation procedure

5.4 DL Timing Adjustment

Timing Adjustment procedure is used to indicate for the CRNC the incorrect arrival time of downlink data to Node B.

Timing adjustment procedure is initiated by the Node B if a DL frame arrives outside of the defined arrival window.

If the DL frame has arrived before the ToAWS or after the ToAWE NnodeB includes the ToA and the target CFN as message parameters for TIMING ADJUSTMENT cControl fFrame.

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 Nnode 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 nNode B internal delays. ToAWE is set via control plane. If data does not arrive before ToAWE a TIMING ADJUSTMENT Timing Adjustment cControl fFrame shall be sent by nNode B.
- **Time of Arrival Window Startpoint (ToAWS):** ToAWS represents the time after which the DL data shall arrive to the nNode 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 Timing Adjustment cControl fFrame shall be sent by Nnode -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].

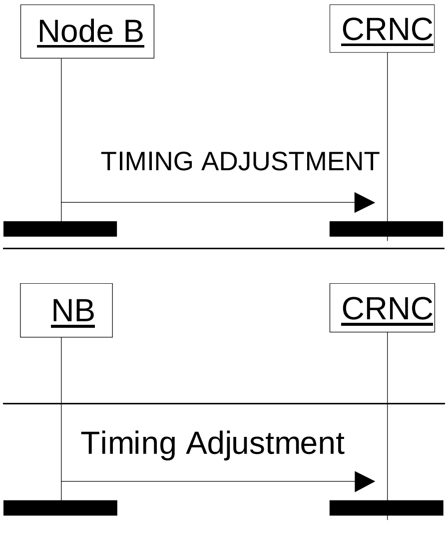


Figure 9: FACH, PCH, DSCH and [FDD - DSCH TFCI signalling] Timing Adjustment procedure

5.5 [TDD – Dynamic PUSCH aAssignment [TDD]

Procedure for dynamic allocation of physical resources to uplink shared channels (USCH) in the Node B. The control frame includes a parameter "PUSCH Set Id" which is a pointer to a pre-configured table of PUSCH Sets in the Node B.

When this control frame is sent via a certain Iub USCH data port, then it applies to that USCH and in addition to any other USCH channel which is multiplexed into the same CCTrCH in the Node B.

The time limitation of the PUSCH allocation is expressed with the parameters "Activation CFN" and "Duration".

Node B behaviour: When the Node B receives the control frame "DynamicYNAMIC PUSCH assignment"ASSIGNMENT control frame from the CRNC in the USCH frame protocol over an Iub USCH data port within a Traffic Termination Point, it shall behave as follows:

1) The NodeB shall extract the PUSCH Set Id.
2) It shall extract the parameters "Activation CFN" and "Duration" which identify the allocation period of that physical channel.
3) It shall retrieve the PUSCH Set which is referred to by the PUSCH Set Id.

4) It shall identify the CCTrCH to which the USCH is multiplexed, and hence the TFCS which is applicable for the USCH.

5) Within the time interval indicated by Activation CFN and Duration, the Node B shall make the specified PUSCH Set available to the CCTrCH.

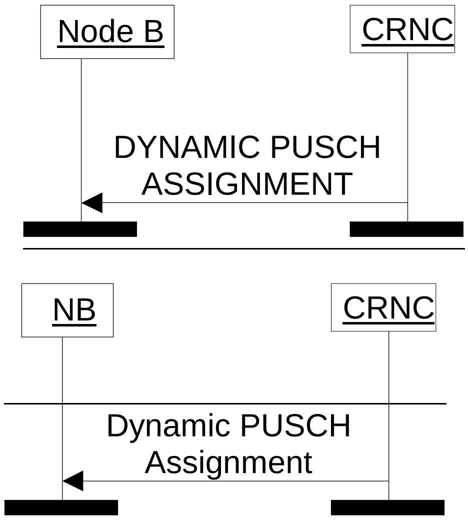


Figure 10: Dynamic PUSCH aAssignment procedure

5.6 DSCH TFCI Signalling [FDD]

This procedure is used in order to signal to the nNode B the TFCI (field 2). This allows the node B to build the TFCI word(s) which have to be transmitted on the DPCCH.

The procedure consists in sending the DSCH TFCI signalling SIGNALLING control frame from the CRNC to the nNode B. The frame contains the TFCI (field 2) and the correspondent Connection Frame Number. 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.

PDSCH Uu frame. In the event that the nNode B does not receive a DSCH TFCI signalling SIGNALLING control frame then the nNode 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.

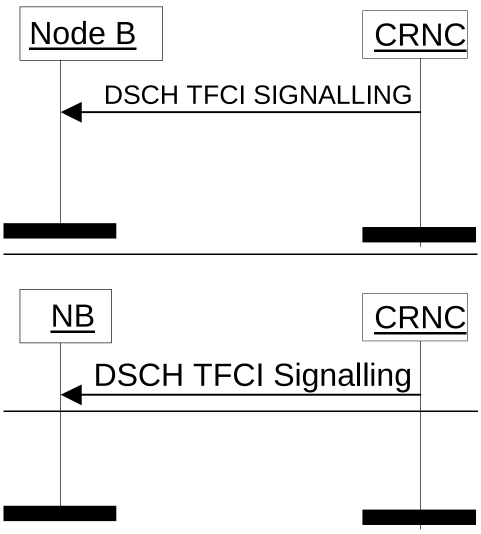


Figure 11: DSCH TFCI Signalling procedure

5.7 Timing Advance [3.84Mcps 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.

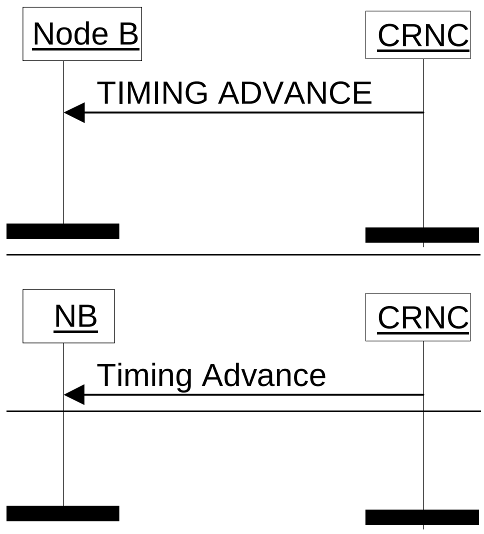


Figure 12: Timing Advance ~~Signalling~~procedure

6 Frame Structure and Coding

6.1 General

The general structure of a Common Transport Channel frame consists of a header and a payload. This structure is depicted in the below:

Header	Payload: Data or Control Information

Figure 13: General Frame Structure

The header shall contain the ~~f~~Frame ~~t~~Type field and information related to the ~~f~~Frame ~~t~~Type.

There are two types of frames (indicated by the Frame ~~t~~Type field).

- Data frame.
- Control frame.

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

<table>
<tr><td>7</td><td>6</td><td>5</td><td>4</td><td>3</td><td>2</td><td>1</td><td>0</td><td></td></tr>
<tr><td colspan="6">Field 1</td><td colspan="2">Field 2</td><td>Byte 1</td></tr>
<tr><td colspan="8">Field 3</td><td>Byte 2</td></tr>
<tr><td colspan="4">Field 3 (cont)</td><td colspan="4">Field 4</td><td>Byte 3</td></tr>
<tr><td colspan="8">Spare Extension</td><td></td></tr>
<tr><td colspan="8"></td><td></td></tr>
</table>

Figure 14: Example 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 14~~10~~). In addition, if a field spans several bytes, more significant bits will be located in lower numbered bytes (right of frame in Figure 14 ~~10~~).

On the Iub 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 2's complement binary coded.

The Spare Extension indicates the location where new IEs can in the future be added in a backward compatible way.

The Spare Extension shall not be used by the transmitter and shall be ignored by the receiver.

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

6.2 Data frame structure

6.2.1 RACH Channels

The RACH D~~ata~~ATA F~~rame~~RAME includes the CFN corresponding to the SFN of the frame in which the payload was received. If the payload was received in several frames, the CFN corresponding to the first Uu frame in which the information was received shall be indicated.

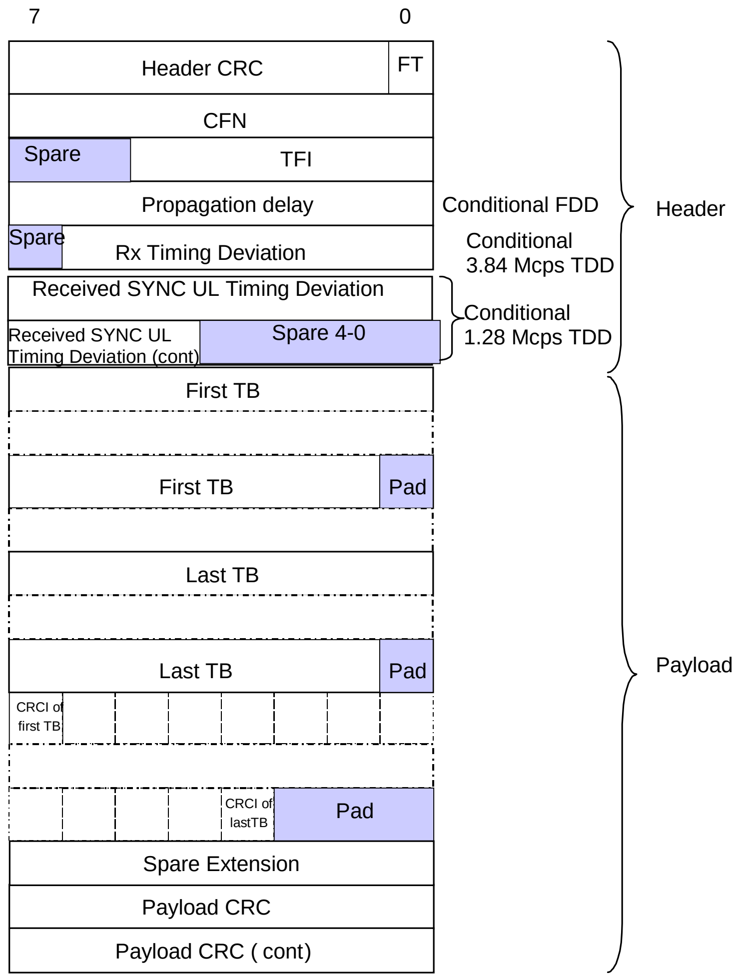


Figure 15: RACH D~~ata~~ATA F~~rame~~RAME structure

Propagation delay is a conditional Information Element which is only present when the Cell supporting the RACH Transport Channel is a FDD Cell.

Rx Timing Deviation is a conditional Information Element which is only present when the Cell supporting the RACH Transport Channel is a 3.84Mcps TDD Cell.

Received SYNC UL Timing Deviation is a conditional Information Element which is only present when the Cell supporting the RACH Transport Channel is a 1.28Mcps TDD Cell.

6.2.2 [FDD - CPCH ~~[FDD]~~ Channels]

The CPCH [FDD] D~~ata~~ATA F~~rame~~RAME includes the CFN corresponding to the 8 least significant bits of the SFN of the frame in which the payload was received. If the payload was received in several frames, the CFN corresponding to the first Uu frame in which the information was received shall be indicated.

Data frame structure is only applicable to FDD.

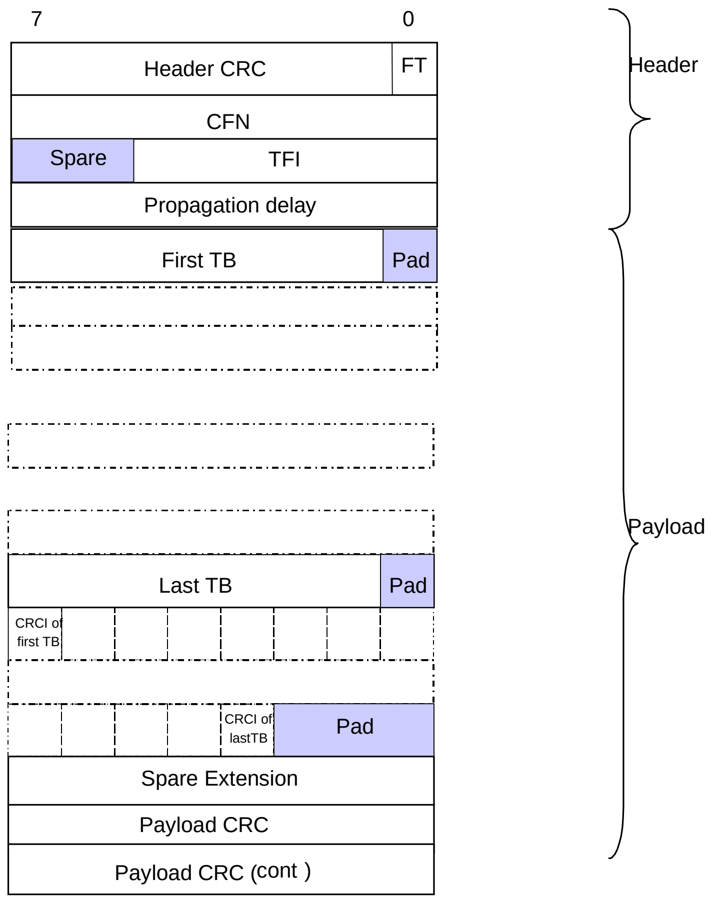


Figure 16: FDD CPCH D~~ata~~ATA F~~rame~~RAME structure

6.2.3 FACH Channels

FACH D~~ata~~ATA F~~rame~~RAME includes the CFN corresponding to the Uu frame at which this data in which the payload (FACH TBS) has to be transmitted. If the payload is to be sent in several frames, the CFN corresponding to the first frame shall be indicated.

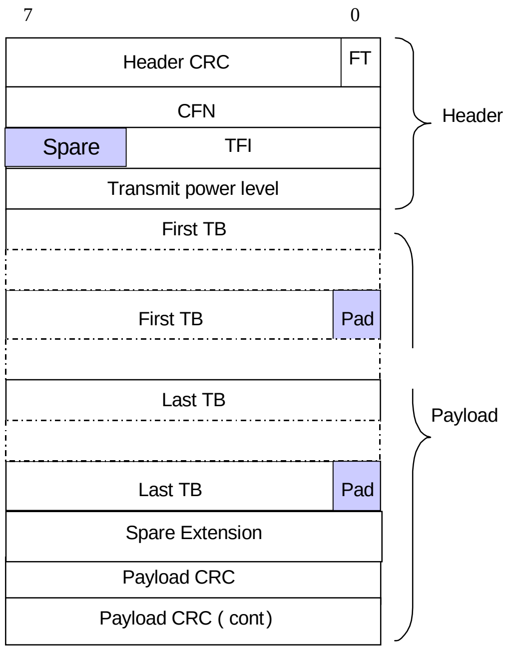


Figure 17: FACH D~~ata~~ATA F~~rame~~RAME structure

6.2.4 PCH Channels

The PCH D~~ata~~ATA F~~rame~~RAME includes the paging indication information and paging messages. To page one User Equipment, two consecutive PCH D~~ata~~ATA F~~rame~~RAMEs with consecutive CFN numbers are transmitted, the first frame contains the Paging Indication Information and the second contains the Paging Message.

[TDD- If PI-bitmap and PCH TBS are transmitted within the PCH ~~data~~DATA ~~frame~~FRAME, the CFN is related to the PCH TBS only. The PI bitmap is mapped to the PICH frames, transmitted at the beginning of the paging block.]

The paging messages are transmitted in S-CCPCH frames. The CFN in the PCH D~~ata~~ATA F~~rame~~RAME header corresponds to the Cell SFN of the frame in which the start of the S-CCPCH frame is located. [TDD - If the paging messages are to be sent in several frames, the CFN corresponding to the first frame shall be indicated.]

[FDD - The timing of the PICH frame (containing the paging indication information) is τ_{PICH} prior to the S-CCPCH frame timing [5]].

In contrast to all other Common Transport Channel data frames, which use a CFN of length 8, the PCH D~~ata~~ATA F~~rame~~RAME includes a CFN of length 12.

The ~~n~~Node -B has no responsibility to ensure the consistency between the paging indication information and the corresponding paging messages. E.g. if the paging indication information is lost over the Iub, the paging messages might be sent over the Uu while no UE is actually listening.

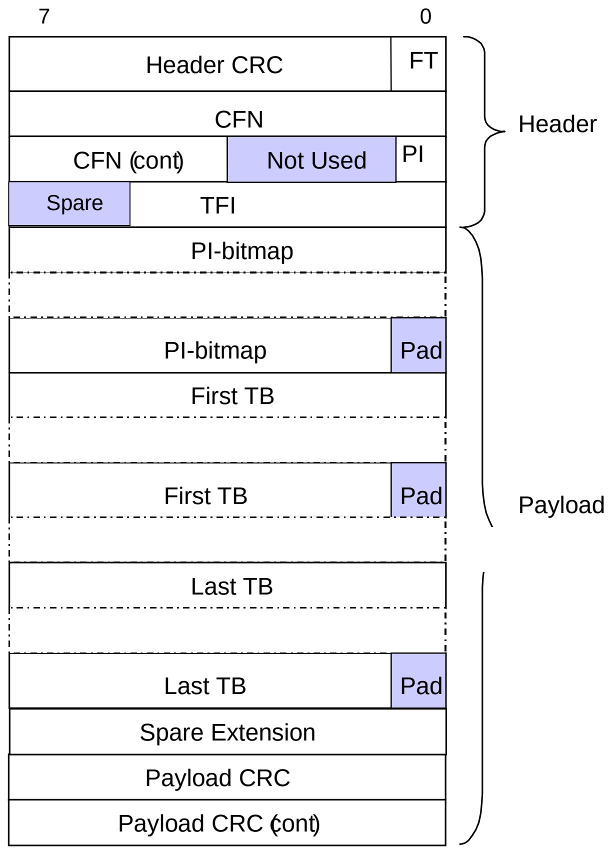


Figure 18: PCH ~~Data~~ATA ~~Frame~~RAME structure

"Not Used" bits shall be set to 0 by the RNC and ignored by the Node B.

6.2.5 Downlink Shared Channels

DSCH D~~ata~~ATA F~~rame~~RAME includes a CFN indicating the SFN of the PDSCH in which the payload shall be sent. If the payload is to be sent over several frames, the CFN corresponding to the first frame shall be indicated.

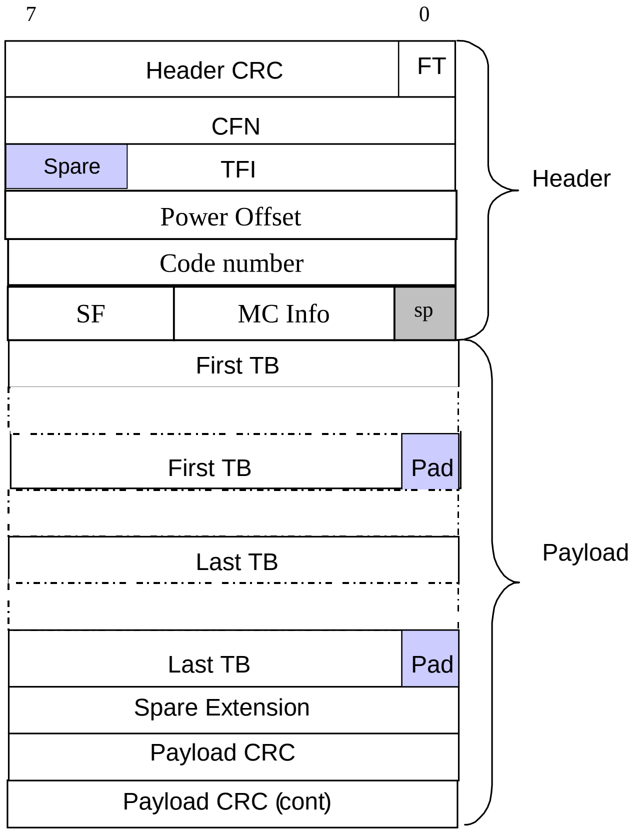


Figure 19: FDD DSCH ~~Data~~ATA ~~Frame~~RAME structure

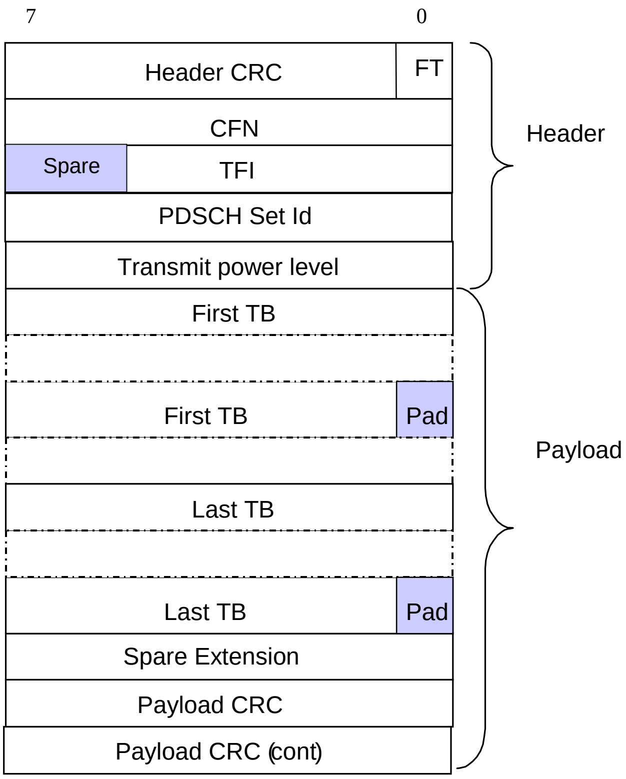


Figure 20: TDD DSCH ~~Data~~ATA ~~Frame~~RAME structure

Transmit power level is a conditional Information Element which is only present when the Cell supporting the DSCH Transport Channel is a TDD Cell.

6.2.6 [TDD - Uplink Shared Channels [TDD]

USCH DataATA FrameRAME includes the CFN in which the payload was received. If the payload was received in several frames, the CFN corresponding to the first frame will be indicated.

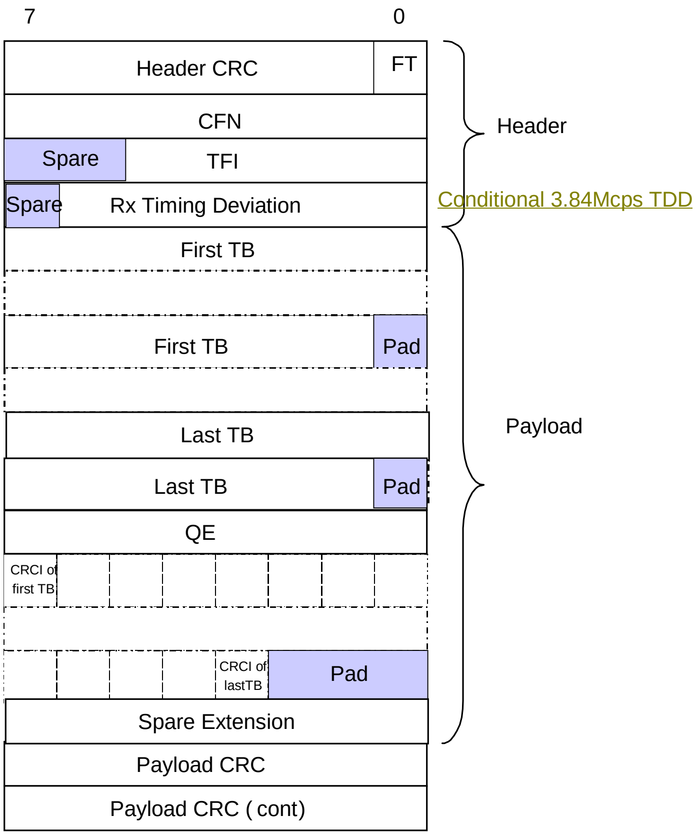


Figure 21: USCH DataATA FrameRAME structure

6.2.7 Coding of information elements in data frames

6.2.7.1 Header CRC

Description: Cyclic Redundancy Polynomial calculated on the header of a data frame with polynom: X^7+X^6+X^2+1.

The CRC calculation shall cover all bits in the header, starting from bit 0 in the first byte (FT field) up to the end of the header. See subclause 7.1.

Value range: {0-127}.

Field length: 7 bits.

6.2.7.2 Frame Type

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

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

Field Length: 1 bit.

6.2.7.3 Connection Frame Number (CFN)

Description: iIndicator as to which radio frame the first data was received on uplink or shall be transmitted on downlink. The value range and field length depend on the transport channel for which the CFN is used.

Value range (PCH): {0-4095}.

Value range (other): {0-255}.

Field length (PCH): 12 bits.

Field length (other): 8 bits.

6.2.7.4 Transport Format Indicator

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 reference [3].

Value range: {0-31}.

Field length: 5 bits.

6.2.7.5 [FDD — Propagation Delay]

Description: One-way radio interface delay as measured during RACH access.

Value range: {0 – 765 chips}.

Granularity: 3 chips.

Field length: 8 bits.

6.2.7.6 [3.84Mcps TDD — Rx Timing Deviation]

Description: Measured Rx Timing Deviation as a basis for timing advance. This value should consider measurements made in all frames and all timeslots that contain the transport blocks in the payload. In case the *Timing Advance Applied* IE indicates "No" (see Ref. [6]) in a cell, the Rx Timing Deviation field shall be set to N = 0.

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.

6.2.7.6A [1.28Mcps TDD – Received SYNC UL Timing Deviation]

Description: Measured Received SYNC UL Timing Deviation as a basis for propagation delay.

Value range: {0, ..., +256} chips

Granularity: 1/8 chips.

Field length: 11 bits.

6.2.7.7 Transport Block

Description: A block of data to be transmitted or have been received over the radio interface. The transport format indicated by the TFI describes the transport block length and transport block set size. See [3].

6.2.7.8 CRC indicator

Description: Shows if the transport block has a correct CRC. The UL Outer Loop Power Control may use the CRC indication.

Value range: {0=Correct, 1=Not Correct}.

Field length: 1 bit.

6.2.7.9 Payload CRC

Description: Cyclic Redundancy Polynomial calculated on the payload of a data frame with polynom X^16+X^15+X^2+1.

The CRC calculation shall cover all bits in the data frame payload, starting from bit 7 in the first byte up to bit 0 in the byte before the payload CRC. See chapter 7.1.

Field length: 16 bits.

6.2.7.10 Transmit power level

Description: Preferred transmission power level during this TTI for the corresponding transport channel. The indicated value is the negative offset relative to the maximum power configured for the physical channel(s) used for the respective transport channel.

Value range: {0 .. 25,.5 dB}.

Granularity: 0,1 dB.

Field length: 8 bits.

6.2.7.11 Paging Indication (PI)

Description: Describes if the PI Bitmap is present in the payload.

Value range: {0=no PI-bitmap in payload, 1=PI-bitmap in payload}.

Field length: 1 bit.

6.2.7.12 Paging Indication bitmap (PI-bitmap)

Description: Bitmap of Paging Indications PI_0..PI_{N-1}. Bit 7 of the first byte contains PI0, Bit6 of the first byte contains PI1,,…, Bit7 of the second byte contains PI8 and so on.

Value range: [FDD - {18, 36, 72 or 144 Paging Indications}.

[TDD – {30, 34, 60, 68, 120 and 136} Paging Indications for 2 PICH frames,
{60, 68, 120, 136, 240 and 272} Paging Indications for 4 PICH frames].

Field length: [FDD - 3, 5, 9 or 18 bytes (the PI-bitmap field is padded at the end up to an octet boundary)].

[TDD – 4, 5, 8, 9, 15, 17, 30 or 34 bytes (the PI-bitmap field is padded at the endup to an octet boundary)].

6.2.7.13 [3.84 Mcps TDD — Rx Timing Deviation on RACH]

Void.

6.2.7.14 [TDD - PDSCH Set Id]

Description: A pointer to the PDSCH Set which shall be used to transmit the DSCH ~~data~~ DATA ~~frame~~FRAME over the radio interface.

Value range: {0..255}.

Field length: 8 bits.

6.2.7.15 [FDD - Code Number]

Description: ~~t~~The code number of the PDSCH (the same mapping is used as for the 'code number' IE in 25.331).

Value Range: {0 .. 255}.

Field length: 8 bits.

6.2.7.16 [FDD - Spreading Factor (SF)]

Description: ~~t~~The spreading factor of the PDSCH.

Spreading factor = 0 Spreading factor to be used = 4.

Spreading factor = 1 Spreading factor to be used = 8.

Spreading factor = 6 Spreading factor to be used = 256.

Value Range: {4,8,16,32,64,128, 256}.

Field length: 3 bits.

6.2.7.17 [FDD - Power Offset]

Description: Used to indicate the preferred FDD PDSCH transmission power level. The indicated value is the offset relative to the power of the TFCI bits of the downlink DPCCH directed to the same UE as the DSCH.

Power offset = 0 Power offset to be applied = -32 dB.

Power offset = 1 Power offset to be applied = -31.75 dB.

Power offset = 255 Power offset to be applied = +31.75 dB.

Value range: {-32 to +31.75 dB}.

Granularity: 0.25 dB.

Field length: 8 bits.

6.2.7.18 [FDD - MC Info]

Description: Used to indicate the number of parallel PDSCH codes on which the DSCH data will be carried. Where multi-code transmission is used the SF of all codes is the same and code numbers are contiguous within the code tree with increasing code number values starting from the code number indicated in the 'code number' field.

Value range: {1..16}.

Field length: 4 bits.

6.2.7.19 Spare Extension

Description: Indicates the location where new IEs can in the future be added in a backward compatible way.

Field length: 0-2 octets.

6.2.7.20 [TDD - Quality Estimate (QE)]

Description: The quality estimate is derived from the Transport channel BER.

If the USCH FP frame includes TB's for the USCH then the QE is the Transport channel BER for the selected USCH. If no Transport channel BER is available the QE shall be set to 0.

The quality estimate shall be set to the Transport channel BER and be measured in the units TrCH_BER_LOG respectively (see Ref [6]). The UL Outer Loop Power Control may use the quality estimate.

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

Granularity: 1.

Field length: 8 bits.

6.3 Control frame structure

6.3.1 Introduction

The Common Control Channel control frames are used to transport control information between the CRNC and the Node B. The figure below defines the Control Frame structure for common transport channels.

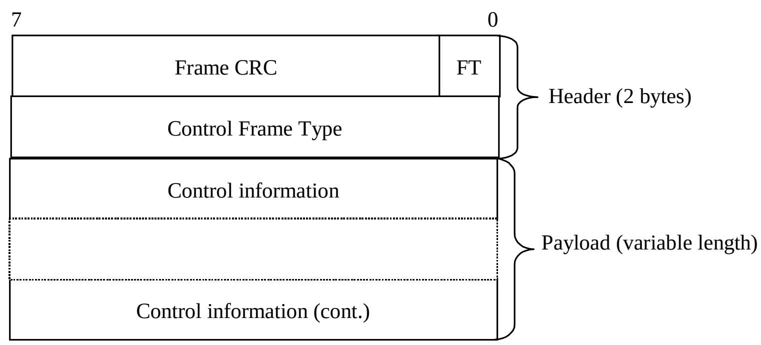


Figure 22: Iub Common Transport Channel Control Frame Format

The structure of the header and the payload of the control frames is defined in the following subclauses:

6.3.2 Coding of information elements of the Control frame header

6.3.2.1 Frame CRC

Description: Cyclic Redundancy Polynomial calculated on a control frame with polynom: X^7+X^6+X^2+1.

The CRC calculation shall cover all bits in the control frame, starting from bit 0 in the first byte (FT field) up to the end of the control frame. See subclause 7.1.

Value range: {0-127}.

Field length: 7 bits.

6.3.2.2 Frame type (FT)

Refer to section 6.2.6.2.

6.3.2.3 Control Frame Type

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

Value: ~~v~~Values of the Control Frame Type parameter are defined in the following table:

Type of control frame	Value
T~~iming~~IMING ~~adjustment~~ADJUSTMENT	0000 0010
DL ~~synchronisation~~SYNCHRONISATION	0000 0011
UL ~~synchronisation~~SYNCHRONISATION	0000 0100
DL N~~ode~~ ODE ~~synchronisation~~SYNCHRONISATION	0000 0110
UL N~~ode~~ODE ~~synchronisation~~SYNCHRONISATION	0000 0111
D~~ynamic~~YNAMIC PUSCH ~~assignment~~ASSIGNMENT	0000 1000
T~~iming~~IMING A~~dvance~~DVANCE	0000 1001

Field Length: 8 bits.

6.3.3 Payload structure and information elements

6.3.3.1 T~~iming~~IMING A~~djustment~~DJUSTMENT

6.3.3.1.1 Payload Structure

The figure below shows the structure of the payload when control frame is used for the timing adjustment.

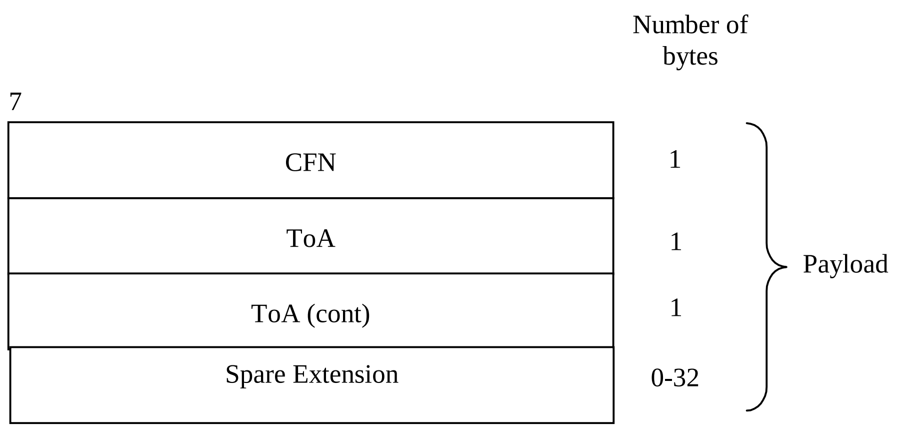


Figure 23: T~~iming~~IMING ~~adjustment~~ADJUSTMENT payload structure (non-PCH transport bearers)

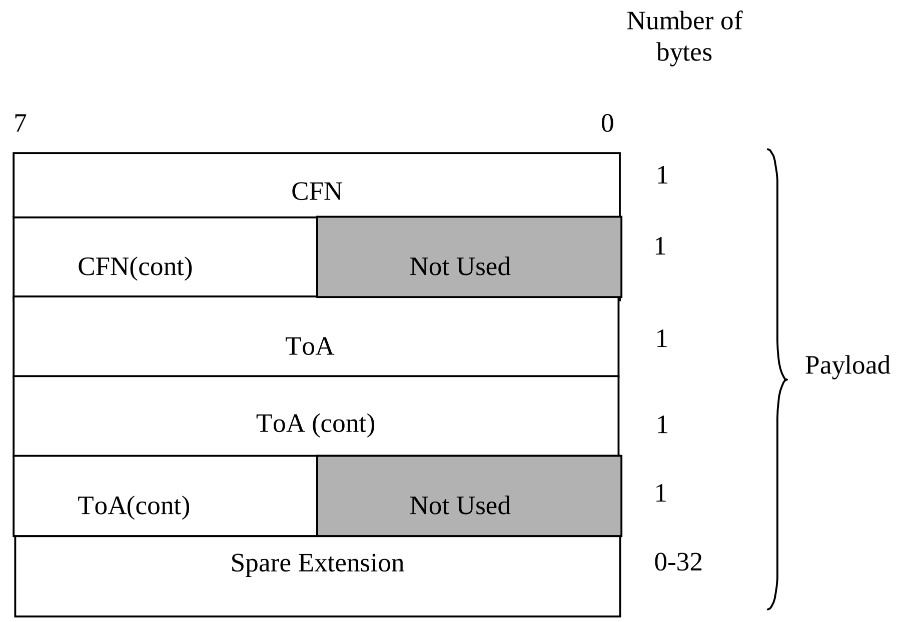


Figure 24: T~~iming~~IMING ~~adjustment~~ADJUSTMENT payload structure (PCH transport bearer)

6.3.3.1.2 CFN

Refer to section 6.2.~~6~~7.3.

6.3.3.1.3 Time of arrival (ToA)

Description: Time difference between the arrival of the DL frame with respect to TOAWE (based on the CFN in the frame). The value range and field length depend on the transport channel for which the CFN is used.

Value range (PCH): {-20480ms, +20479.875ms}.

Value range (other): {-1280ms, +1279.875ms}.

Granularity: 125µs.

Field length (PCH): 20 bits.

Field length (other): 16 bits.

6.3.3.1.4 Spare Extension

Description: Indicates the location where new IEs can in the future be added in a backward compatible way.

Field length: 0-32 octets.

6.3.3.2 DL ~~synchronisation~~SYNCHRONIZATION

6.3.3.2.1 Payload Structure

Figure below shows the structure of the payload when control frame is used for the user plane synchronisation.

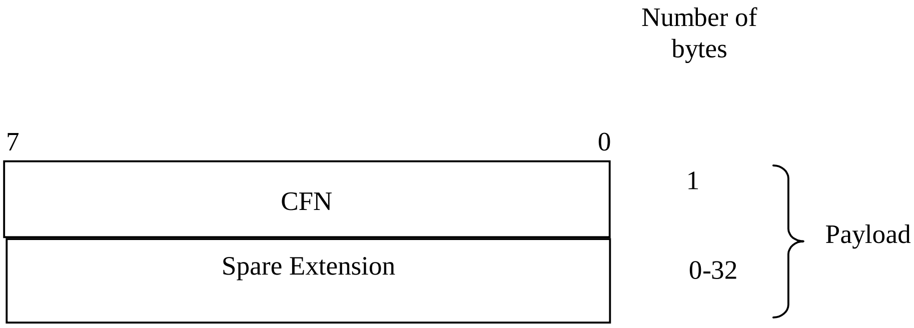


Figure 25: DL S~~ynchronisation~~YNCHRONIZATION payload structure (non-PCH transport bearers)

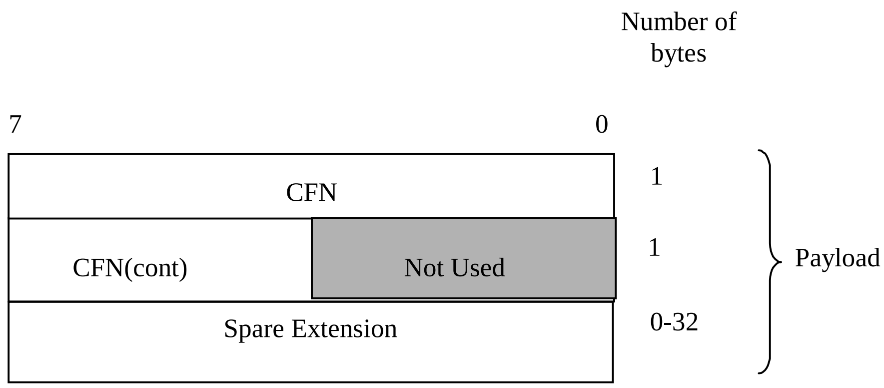


Figure 26: DL S~~ynchronisation~~YNCHRONIZATION payload structure (PCH transport bearers)

6.3.3.2.2 CFN

Refer to section 6.2.~~6~~7.3.

6.3.3.2.3 Spare Extension

Description: The Spare Extension is described in section 6.3.3.1.4.

6.3.3.3 UL S~~ynchronisation~~YNCHRONIZATION

6.3.3.3.1 Payload Structure

Figure below shows the structure of the payload when the control frame is used for the user plane synchronisation (UL).

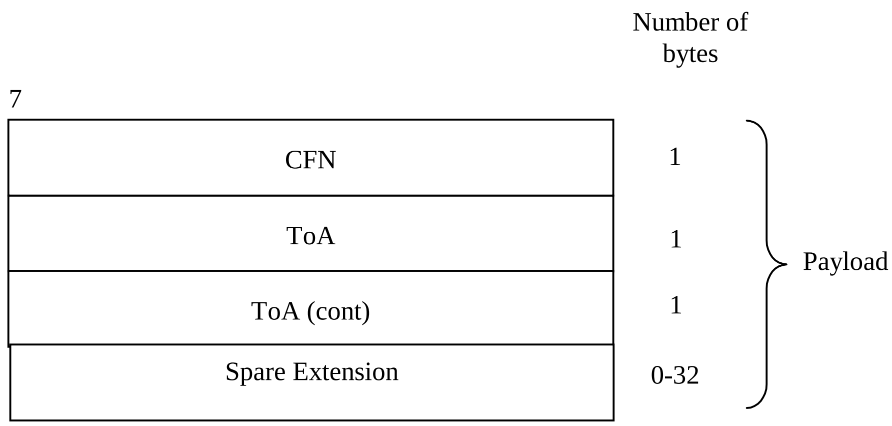


Figure 27: UL S~~ynchronisation~~YNCHRONIZATION payload structure (non-PCH transport bearers)

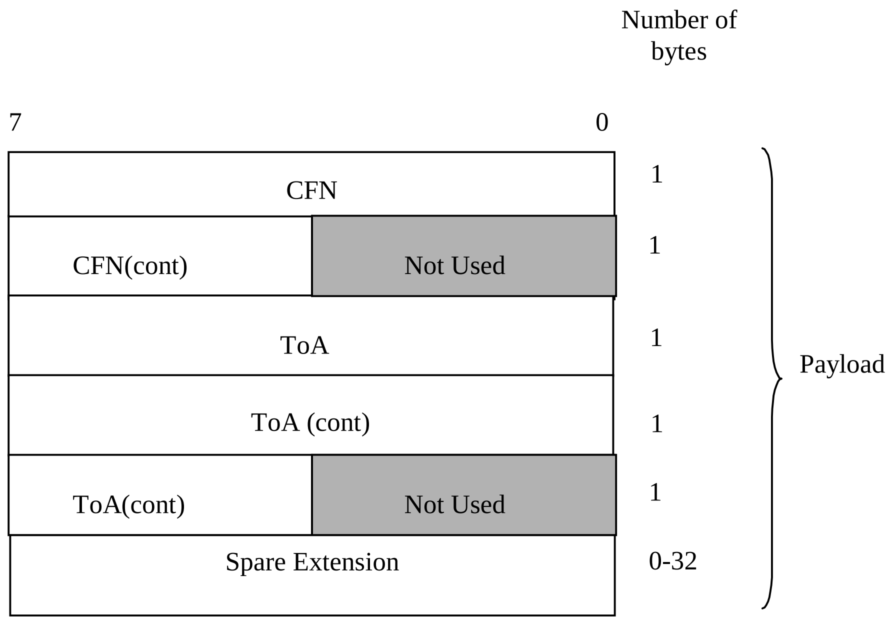


Figure 28: UL S~~ynchronisation~~YNCHRONIZATION payload structure (PCH transport bearers)

6.3.3.3.2 CFN

Refer to section 6.2.~~6~~7.3.

6.3.3.3.3 Time of Arrival (TOA)

Refer to section 6.3.3.1.3.

6.3.3.3.4 Spare Extension

Description: The Spare Extension is described in section 6.3.3.1.4.

6.3.3.4 DL N~~ode~~ODE S~~ynchronisation~~YNCHRONIZATION

6.3.3.4.1 Payload Structure

The payload of the DL Node synchronisation control frames is shown in the figure below:

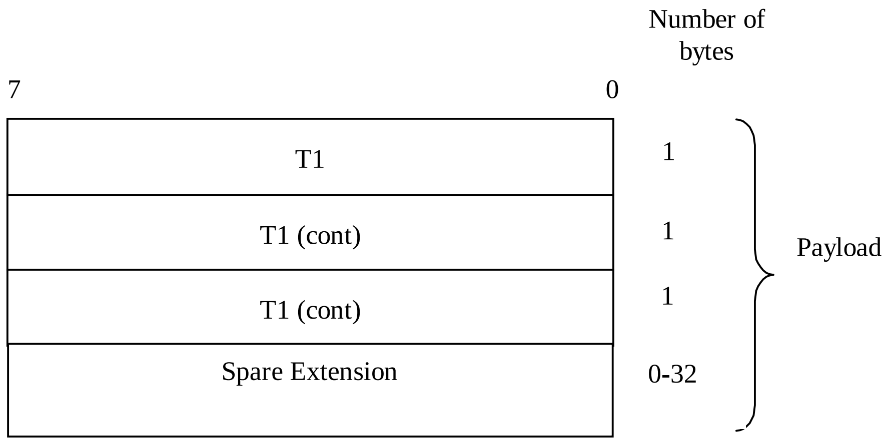


Figure 29: DL NODE SYNCHRONISATION payload structure

6.3.3.4.2 T1

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

Value range: {0-40959.875 ms}~~, and the granularity is 0.125 ms~~.

Granularity : 0.125ms.

Field length: 24 bits.

6.3.3.4.3 Spare Extension

Description: The Spare Extension is described in section 6.3.3.1.4.

6.3.3.5 UL N~~ode~~ODE S~~ynchronisation~~YNCHRONISATION

6.3.3.5.1 Payload Structure

The payload of the UL Node synchronisation control frames is shown in the figure below:

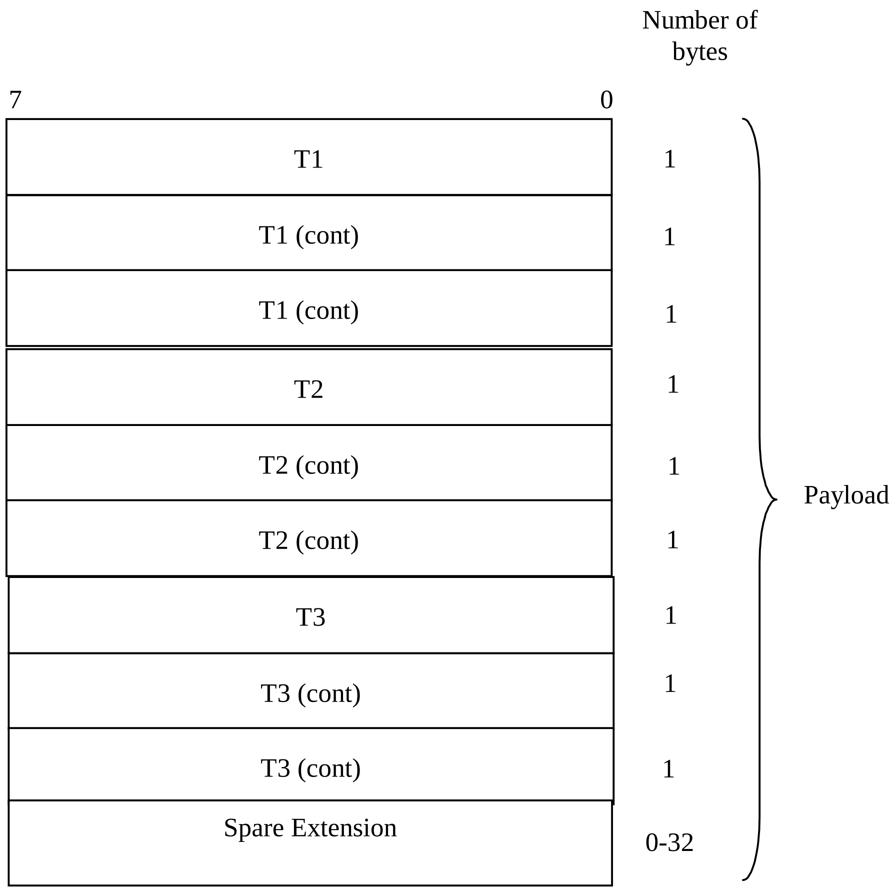


Figure 30: UL NODE SYNCHRONISATION payload structure

6.3.3.5.2 T1

Description: T1 timer is extracted from the correspondent DL Node synchronisation control frame.

Value range: {0-40959.875 ms}~~, and the granularity is 0.125 ms~~.

Granularity : 0.125ms.

Field length: 24 bits.

6.3.3.5.3 T2

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

Value range: {0-40959.875 ms}~~, and the granularity is 0.125 ms~~.

Granularity : 0.125ms.

Field length: 24 bits.

6.3.3.5.4 T3

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

Value range: {0-40959.875 ms}~~, and the granularity is 0.125 ms~~.

Granularity : 0.125ms.

Field length: 24 bits.

6.3.3.5.5 Spare Extension

Description: The Spare Extension is described in section 6.3.3.1.4.

6.3.3.6 [TDD – D~~ynamic~~YNAMIC PUSCH ~~assignment~~ASSIGNMENT]

6.3.3.6.1 Payload structure

The payload of the Dynamic PUSCH Assignment control frames is shown in the figure below:

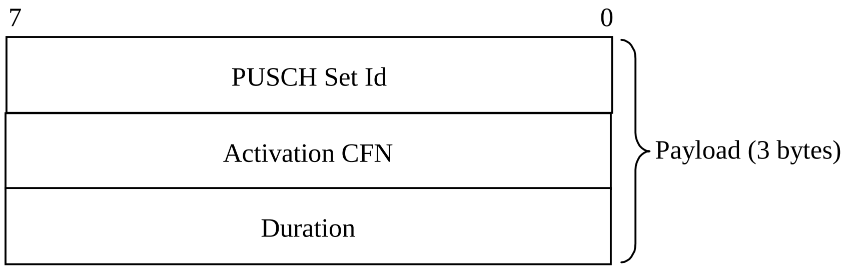


Figure 31: DYNAMIC PUSCH ASSIGNMENT payload structure

6.3.3.6.2 PUSCH Set Id

Description: Identifies a PUSCH Set from the collection of PUSCH Sets which have been pre-configured in the Node B, for the respective cell in which the USCH exists. The PUSCH Set Id is unique within a cell.

Value range: {0...255}.

Field length: 8 bits.

6.3.3.6.3 Activation CFN

Description: Activation CFN, specifies the Connection Frame Number where the allocation period of that PUSCH Set starts.

Value range: Integer ~~(~~{0...255~~)~~}.

Field length: 8 bits.

6.3.3.6.4 Duration

Description: Indicates the duration of the activation period of the PUSCH Set, in radio frames.

Value range: {0 ... 255} means: 0 to 255 radio frames, i.e. 0 to 2550 msec.

Field length: 8 bits.

6.3.3.7 [FDD - DSCH TFCI ~~signalling~~SIGNALLING]

6.3.3.7.1 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.

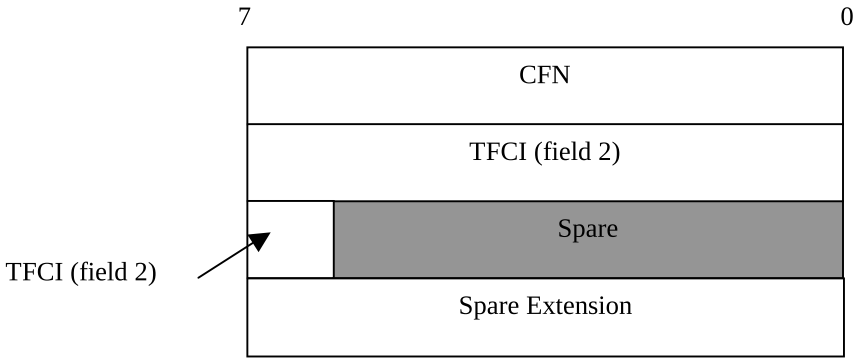


Figure ~~29~~32: ~~[FDD - Structure of the payload for the~~ DSCH TFCI SIGNALLING payload structure~~signalling control frame]~~

6.3.3.7.2 TFCI (field 2)

Description: TFCI (field 2) is as described in [6], it takes the same values as the TFCI (field 2) which is transmitted over the Uu interface.

Value range: {0 - 1023}

Field length: 10 bits

6.3.3.7.3 Spare Extension

The Spare Extension is described in subclause 6.2.7.19.

6.3.3.8 [3.84 Mcps TDD - T~~iming~~IMING A~~dvance~~DVANCE]

6.3.3.8.1 Payload structure

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

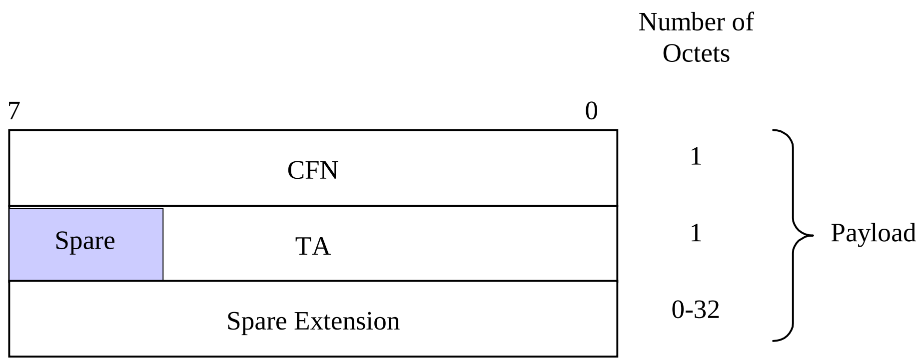


Figure ~~30~~33: ~~Structure of the~~ ~~Timing~~IMING ~~Advance~~DVANCE payload structure~~control frame~~

6.3.3.8.2 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.~~6~~7.3.

6.3.3.8.3 TA

Description: UE applied UL timing advance adjustment.

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

Granularity : 4 chips.

Field length: 6 bits.

6.3.3.8.4 Spare Extension

Description: Indicates the location where new IEs can in the future be added in a backward compatible way.

Field length: 0-32 octets.