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These changes have not yet been approved in RAN WG3*



# 3GPP

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**3GPP**

Postal address

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Office address

---

Internet

---

secretariat@3gpp.org  
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*Note: The content has to be reviewed according to the 3GPP IPR rules*

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## Foreword

This Technical Specification (TS) has been produced by the 3<sup>rd</sup> Generation Partnership Project (3GPP). The contents of this TS are subject to continuing work within 3GPP TSG RAN and may change following formal TSG RAN approval. Should the TSG modify the contents of this TS, it will be re-released with an identifying change of release date and an increase in version number as follows:

Version m.t.e

where:

- m indicates [major version number]
- x the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- y the third digit is incremented when editorial only changes have been incorporated into the specification.

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## Introduction

*This clause is optional. If it exists, it is always the third unnumbered clause.  
No text block identified.*

### 1 Scope

This document shall provide a description of the UTRAN RNC-Node B(Iub) interface user plane protocols for Common Transport Channel data streams as agreed within the TSG-RAN working group 3.

*Note : by Common Transport Channel one must understand RACH, ~~FACH~~FACH/PCH and DSCH.*

### 2 References

References may be made to:

- a) specific versions of publications (identified by date of publication, edition number, version number, etc.), in which case, subsequent revisions to the referenced document do not apply;
- b) all versions up to and including the identified version (identified by "up to and including" before the version identity);
- c) all versions subsequent to and including the identified version (identified by "onwards" following the version identity); or
- d) publications without mention of a specific version, in which case the latest version applies.

A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1] Merged version of Iub interface Description

*Editor's Note : [1] is a temporary reference only to ease the definition of what should be in the different sections of this document.*

### 3 Definitions, symbols and abbreviations

#### 3.1 Definitions

*[Editor's note: For list of definitions, see [1]. Only definitions specific to this document are listed below, in order to avoid inconsistency between documents. When list is stable, definitions relevant for this document should be extracted.]*

#### 3.2 Symbols

#### 3.3 Abbreviations

*[Editor's note: For list of abbreviations, see [1]. Only abbreviations specific to this document are listed below, in order to avoid inconsistency between documents. When list is stable, abbreviations relevant for this document should be extracted.]*

### 4 General aspects

#### 4.1 Common Transport Channel Data Stream User Plane Protocol Services

##### 4.1.1 RACH/~~FACH~~FACH/PCH Data Streams User Plane Protocol Services

*[Editor's Note: This chapter describes the services that the User Plane Protocols provide such as data transfer, flow control, etc.]*

##### 4.1.2 Downlink Shared Channels Data Streams User Plane Protocol Services

*[Editor's Note: This chapter describes the services that the User Plane Protocols provide such as data transfer, flow control, etc.]*

##### 4.1.3 [TDD — Uplink Shared Channels Data Streams User Plane Protocol Services]

*[Editor's Note: This chapter describes the services that the User Plane Protocols provide such as data transfer, flow control, etc.]*

#### 4.2 Services expected from data transport

### 5 Frame Structure and Coding

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

<u>Header</u>	<u>Payload: Data or Control Information</u>	<u>Tail</u>
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**General Frame Structure**

## 5.1 Data frame structure

### 5.1.1 RACH/FACH Channels

RACH Data Frame includes the Cell SFN in which the payload was received. If the payload was received in several Cell SFNs the first Cell SFN shall be indicated.

	<u>Information element</u>	<u>Description</u>
<u>Header</u>	<u>Frame Type</u>	<u>Data Frame</u>
	<u>FN<sub>CELL</sub></u>	<u>Indicates the Cell Frame Number count when the RACH was received.</u>
	<u>Transport Format Indicator</u>	<u>The TFI to denote the format of the Transport Block set carrying the RACH payload.</u>
<u>Payload</u>	<u>Checksum indicator</u>	<u>Indicates if the transport block CRC is correct</u>
	<u>Transport Block 1</u>	<u>Data from the Radio interface</u>
	<u>⋮</u>	<u>⋮</u>
	<u>Checksum indicator</u>	<u>Indicates if the transport block CRC is correct</u>
	<u>Transport Block N</u>	<u>Data from the Radio interface</u>
<u>Tail</u>	<u>Data frame checksum.</u>	<u>Checksum of the header and payload</u>

### 5.1.2 FACH/PCH Channels

FACH/PCH Data Frame includes the Cell SFN in which the payload shall be sent. If the payload is to be sent in several Cell SFNs the first Cell SFN shall be indicated.

	<u>Information element</u>	<u>Description</u>
<u>Header</u>	<u>Frame Type</u>	<u>Data Frame</u>
	<u>FN<sub>CELL</sub></u>	<u>Indicates the Cell Frame Number on which this DL FACH/PCH TBSs need to be transmitted</u>
	<u>FACH Transport Format Indicator</u>	<u>This TFI to denote the format of the Transport Block set carrying the FACH payload.</u>
	<u>PCH Transport Format Indicator</u>	<u>This TFI to denote the format of the Transport Block set carrying the PCH payload.</u>
	<u>Transmission power level</u>	<u>Indicator of the transmission power level</u>
<u>Payload</u>	<u>FACH Transport Block Set</u>	<u>The TBS includes the FACH payload data to be transmitted by the physical layer over the air-interface.</u>
	<u>Paging Indication Information</u>	<u>Its content and coding is FFS.</u>
	<u>PCH Transport Block Set</u>	<u>The TBS includes the PCH payload data to be transmitted by the physical layer over the air-interface.</u>
<u>Tail</u>	<u>Data frame checksum.</u>	<u>Checksum of the header and payload</u>

### 5.1.25.1.3 Downlink Shared Channels

DSCH Data Frame includes the Cell SFN in which the payload shall be sent. If the payload is to be sent in several Cell SFNs the first Cell SFN shall be indicated.

### 5.1.35.1.4 [TDD — Uplink Shared Channels]

## 5.2 Control frame structure

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

	<u>Information Element</u>	<u>Description</u>
<u>Header</u>	<u>Frame Type</u>	<u>Common Transport Channel Control Frame</u>
<u>Payload</u>	<u>NAME</u>	<u>Name of the control information element</u>
	<u>Parameters</u>	<u>The Parameters of the control information.</u>
<u>Tail</u>	<u>Control Frame checksum</u>	<u>Checksum of the header and payload data</u>

### lub Common Transport Channel Control Frame Format



The payload defines the type of the control information and its parameters (measurement or command). The control information in the frame protocol are defined below.

### 5.2.1 Timing Adjustment

Timing adjustment control frames are sent by the Node B to notify to the CRNC that the DL data is received too late or too early, accordingly to the timing adjustment procedure.

Table below shows the structure of the payload when control frame is used for the timing adjustment. This control information is sent in UL only on the transport connection used to convey the FACH/PCH transport channel and the DSCH transport channel.

<u>NAME</u>	<u>Timing Adjustment</u>
<u>Parameters</u>	<u>Time of Arrival: time difference between the arrival of the DL frame with respect to the optimal time (based on the CN value in the frame)</u>
	<u>FN<sub>CELL</sub></u>

*Note: The range of the timing adjustment report parameter is equivalent to the Radio Frame period multiplied by the maximum CFN value. The resolution of the Timing Adjustment Report parameter is 1 ms.*

### 5.2.2 DL Synchronisation

DL Synchronisation control frames are used to achieve and maintain the initial synchronisation of the CTCH user plane accordingly to the synchronisation procedure.

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

This control information is sent in DL only.

<u>NAME</u>	<u>DL Synchronisation</u>
<u>Parameters</u>	<u>FN<sub>CELL</sub></u>

### 5.2.3 UL Synchronisation

UL Synchronisation control frames are used to achieve and maintain the initial synchronisation of the CTCH user plane accordingly to the synchronisation procedure.

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

This control information is sent in UL only.

<u>NAME</u>	<u>Synchronisation</u>
<u>Parameters</u>	<u>FN<sub>CELL</sub></u>
	<u>TOA, Time of arrival</u>

### 5.2.1 RACH/FACH Channels

### 5.2.2 Downlink Shared Channels

### 5.2.3 5.2.4 [TDD — Uplink Shared Channels]

## **5.3 Coding**

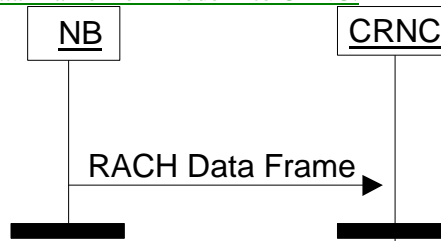
## **6 Data Streams User Plane Procedures**

[Editor's Note: This chapter specifies the user plane procedures for RACH/~~FACH~~FACH/PCH data streams. Typical related scenarios at Iub interface should be described.]

## 6.1 Data Transfer

### 6.1.1 RACH/FACH Channels

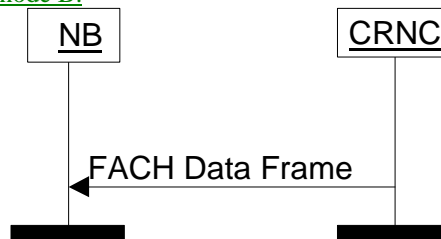
Data Transfer procedure is used to transfer data received from Uu interface from NodeB to CRNC. Data Transfer procedure consists of a transmission of Data Frame from Node B to CRNC.



**Figure 1. RACH Data Transfer Procedure.**

### 6.1.2 FACH/PCH Channels

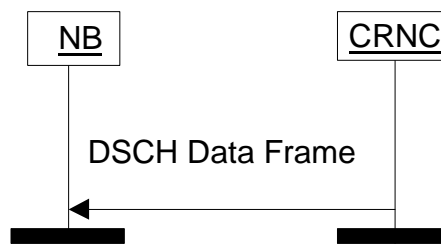
Data Transfer procedure is used to transfer data from CRNC to node B. Data Transfer Procedure Consists of a transmission of Data Frame from CRNC to node B.



**Figure 2. FACH/PCH Data Transfer Procedure.**

### 6.1.26.1.3 Downlink Shared Channels

Data Transfer procedure is used to transfer data from CRNC to node B. Data Transfer Procedure Consists of transmission a Data Frame from CRNC to node B.



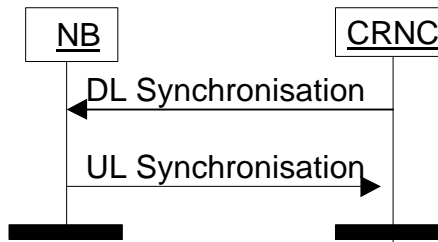
**Figure 3. DSCH Data Transfer Procedure.**

### 6.1.36.1.4 [TDD — Uplink Shared Channels]

## 6.2 Synchronisation

### 6.2.1 FACH/PCH Channels

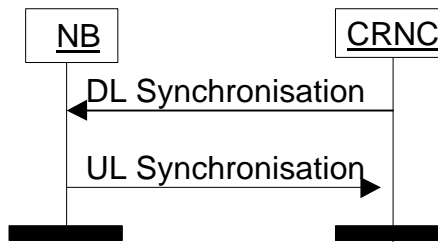
CRNC sends a DL SYNCHRONISATION Control Frame to node B. This message indicates the target Cell SFN. Upon reception of the DL SYNCHRONISATION Control Frame Node B shall immediately respond with UL SYNCHRONISATION Control Frame indicating the ToA for the DL Synchronisation frame and the Cell SFN indicated in the received message.



**Figure 4. FACH/PCH Synchronisation procedure.**

**6.2.2 DSCH Channels**

CRNC sends a DL SYNCHRONISATION Control Frame to node B. This message indicates the target Cell SFN. 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 Cell SFN indicated in the received message.

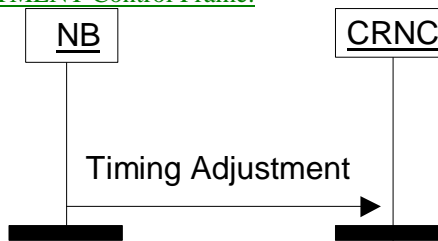


**Figure 5. DSCH Synchronisation procedure.**

**6.3 DL Timing Adjustment**

**6.3.1 FACH/PCH Channels**

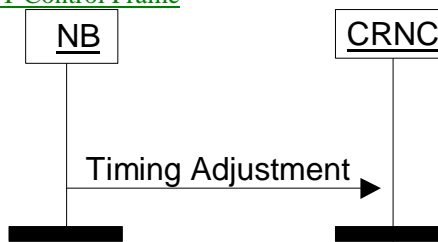
Timing Adjustment procedure is used to indicate for the CRNC the incorrect arrival time of downlink data to node B. Timing adjustment procedure is initiated by the node B if a DL frame arrives outside of the defined arrival window. If the DL frame has arrived before the ToAWS or after the ToAWE nodeB includes the ToA and the target Cell SFN as message parameters for TIMING ADJUSTMENT Control Frame.



**Figure 6. FACH/PCH Timing Adjustment procedure.**

**6.3.2 DSCH Channels**

Timing Adjustment procedure is used to indicate the incorrect arrival time of downlink data for the CRNC. 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 Cell SFN as parameters to the TIMING ADJUSTMENT Control Frame



**Figure 7. DSCH Timing Adjustment procedure.**

## 6.26.4 Flow Control

### 6.2.16.4.1 RACH/FACH/FACH/PCH Channels

### 6.2.26.4.2 Downlink Shared Channels

### 6.2.36.4.3 [TDD — Uplink Shared Channels]

## 7 Bibliography

## Appendices

### Annex A Document Stability Assessment Table

Section	Content missing	Incomplete	Restructuring needed	Checking needed	Editorial work required	Finalisation needed	Almost stable	Stable
1					√			
2					√			
3	√							
4	√							
5	√					√		
6	√					√		
7	√							

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0.0.2	February 1999	Renaming of section 4.1, 5.1 and 6.1 to RACH/FACH instead of common channels.
0.0.3	March 1999	<ul style="list-style-type: none"> <li>Alignment of document structure to the structure of S3.25</li> <li>Renaming of CCH to Common Transport Channel.</li> </ul>
0.1.0	April 1999	Mail Approval of version 0.0.3 by TSG RAN WG3.
0.1.1	May 1999	Addition of Document Stability Assessment Table
0.2.0	June 1999	Approval of 0.1.1 by 3GPP TSG RAN WG3. Version raised to 0.2.0
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0.3.0	July 1999	Approval of 0.2.1 by 3GPP TSG RAN WG3. Version raised to 0.3.0

<u>0.3.1</u>	<u>July 1999</u>	<u>Revised according to the decisions of 3GPP TSG RAN WG3 Meeting #5</u> <ul style="list-style-type: none"><li>• <u>Filling of section "5_Frame Structure and Coding" from Tdocs R3-99632, R3-99633, R3-99674 and R3-99735.</u></li><li>• <u>Filling of section "6_Data Streams User Plane Procedures" from Tdoc R3-99663</u></li><li>• <u>Editorial work to reach some consistency.</u></li><li>• <u>New Stability Assessment proposal.</u></li></ul>
Editor for 3GPP RAN <del>S3.25</del> <u>TS25.435</u> is:		
Jean-Marie Calmel Nortel Networks Tel.: +33 1 39 44 52 82 Fax : +33 1 39 44 50 12 Email : <a href="mailto:calmel@nortelnetworks.com">calmel@nortelnetworks.com</a>		
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