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Technical Specification

**3rd Generation Partnership Project (3GPP);
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**Low chip rate TDD Iub/Iur protocol aspects
(Release 2000)**

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Foreword

This Technical Report (TR) has been produced by the 3rd Generation Partnership Project (3GPP), Technical Specification Group RAN.

The contents of this TR are subject to continuing work within 3GPP and may change following formal TSG approval. Should the TSG modify the contents of this TR, 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.

1 Scope

The work item “Low chip rate TDD Iub/Iur protocol aspects” is a Building Block which has been agreed at TSG RAN#8 as described in contribution [1]. Its parent feature is “Low chip rate TDD” which has been agreed at TSG-RAN#6 and updated at RAN#7. The purpose of the work item “Low chip rate TDD Iub/Iur protocol aspects” is to update the Iub/Iur interface protocol specifications and related overview specifications in RAN WG3 in support of the several aspects of the feature “Low chip rate TDD”.

The purpose of the present document is to help the TSG RAN WG3 group to specify the changes to existing specifications, needed for the introduction of the low chip rate TDD option in the UTRAN for Release 2000. It is intended to gather all information in order to trace the history and the status of the Work Task in RAN WG3. It is not intended to replace contributions and Change Requests, but only to list conclusions and make reference to agreed contributions and CRs. When solutions are sufficiently stable, the CRs can be issued.

It describes agreed requirements related to the Work Task, and split the Work Task into “Study Areas” in order to group contributions in a consistent way.

It identifies the affected specifications with related Change Requests.

It also describes the schedule of the Work Task.

This document is a ‘living’ document, i.e. it is permanently updated and presented to all TSG-RAN meetings.

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.
- 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] RP-(00)0316rev, Low chip rate TDD Iub/Iur protocol aspects, Work Item Description
- [2] R3(#15)-002003: LS from R1 to R2, R3, R4: Progress report of the Work Item “Low chip rate TDD, physical layer” and request for support.
- [3] TR 25.928 (by RAN WG1), 1.28 Mcps functionality for UTRA TDD Physical Layer
- [4] TR 25.834 (by RAN WG2), UTRA TDD Low Chip Rate Option Radio Protocol Aspects, TR 25.834 V 0.0.1 (R2-001528)
- [5] TS 25.302, Services provided by the Physical Layer
- [6] TS 25.420, UTRAN I_{ur} Interface: General Aspects and Principles
- [7] TS 25.430, UTRAN I_{ub} Interface: General Aspects and Principles
- [8] TS 25.401: UTRAN Overall Description
- [9] TS 25.423, UTRAN Iur interface RNSAP signalling
- [10] TS 25.425, UTRAN Iur interface user plane protocols for CCH data streams
- [11] TS 25.427, UTRAN Iur and Iub interface user plane protocols for DCH data streams
- [12] TS 25.433, UTRAN Iub interface NBAP signalling
- [13] TS 25.435, UTRAN Iub interface user plane protocols for CCH data streams
- [14] TR 25.990: Vocabulary for the UTRAN

3 Definitions, symbols and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in [14] apply.

3.2 Symbols

3.3 Abbreviations

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

ASC	Access Service Class
BCCH	Broadcast Control Channel
BCH	Broadcast Channel
BMC	Broadcast/Multicast Control
C-	Control-
CCCH	Common Control Channel
CCH	Control Channel
CCTrCH	Coded Composite Transport Channel
CN	Core Network
CRC	Cyclic Redundancy Check
CTCH	Common Traffic Channel
DC	Dedicated Control (SAP)
DCA	Dynamic Channel Allocation
DCCH	Dedicated Control Channel
DCH	Dedicated Channel
DL	Downlink
DRNC	Drift Radio Network Controller
DSCH	Downlink Shared Channel
DTCH	Dedicated Traffic Channel
DwPTS	Downlink Pilot Timeslot
FACH	Forward Link Access Channel
FDD	Frequency Division Duplex
FPACH	Fast Physical Access Channel
GC	General Control (SAP)
GP	Guard Period
HO	Handover
ITU	International Telecommunication Union
kbps	kilo-bits per second
L1	Layer 1 (physical layer)
L2	Layer 2 (data link layer)
L3	Layer 3 (network layer)
MAC	Medium Access Control
Nt	Notification (SAP)
PCCH	Paging Control Channel
P-CCPCH	Primary Common Control Physical Channel
PCH	Paging Channel
PDCP	Packet Data Convergence Protocol
PDSCH	Physical Downlink Shared Channel

PDU	Protocol Data Unit
PHY	Physical layer
PhyCH	Physical Channels
P-RACH	Physical Random Access Channel
PU	Payload Unit
PUSCH	Physical Uplink Shared Channel
RAB	Radio Access Bearer
RACH	Random Access Channel
RB	Radio Bearer
RLC	Radio Link Control
RNC	Radio Network Controller
RNS	Radio Network Subsystem
RNTI	Radio Network Temporary Identity
RRC	Radio Resource Control
Rx	Receive
SAP	Service Access Point
SCH	Synchronization Channel
SDU	Service Data Unit
SHCCH	Shared Channel Control Channel
SIR	Signal to Interference Ratio
SRNC	Serving Radio Network Controller
SRNS	Serving Radio Network Subsystem
TCH	Traffic Channel
TDD	Time Division Duplex
TFCI	Transport Format Combination Indicator
TFI	Transport Format Indicator
TPC	Transmit Power Control
Ts	Timeslot
Tx	Transmit
U-	User-
UE	User Equipment
UL	Uplink
UMTS	Universal Mobile Telecommunications System
UpPTS	Uplink Pilot Timeslot
URA	UTRAN Registration Area
USCH	Uplink Shared Channel
UTRA	UMTS Terrestrial Radio Access
UTRAN	UMTS Terrestrial Radio Access Network

4 Overview of the TDD low chip rate option

4.1 Physical layer

4.2 Transport Channel and higher layer differences compared to TDD-high

4.3 Other key features of low-chip-rate TDD

5 lrb/lur aspects of Low chip rate TDD radio frame structure

5.1 Introduction

5.2 Requirements

5.3 Study areas

5.4 Agreements and associated contributions

5.5 Specification impact and associated Change Requests

5.6 Open issues

6 lrb/lur aspects of physical channel types

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6.1.1 General

6.1.2 DwPTS

6.1.3 UpPTS

6.1.4 FPACH

6.1.5 PRACH

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7 lrb/lur aspects of transport channel features

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7.1.1 General

7.1.2 Types of Transport Channels

7.1.3 System information broadcast

7.1.4 Usage of RACH

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8 lrb/lur aspects of Uplink synchronisation

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8.5 Specification impact and associated Change Requests

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9 Iub/Iur aspects of RACH concept

9.1 Introduction: RACH procedure

9.2 Requirements

9.3 Study areas

9.4 Agreements and associated contributions

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9.6 Open issues

10 Iub/Iur aspects of Measurements

10.1 Introduction

10.2 Requirements

10.3 Study areas

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10.6 Open issues

11 Project Plan

11.1 General

It is intended to focus on the basic features of low-chip-rate TDD first, and then on the advanced features.

Basic features includes:

- L1 interface
- primitives to MAC, RRC
- uplink synchronisation
- support of RACH, FACH, PCH, BCH, DCH
- cell selection/reselection
- handover (set of measurements)
- incorporation of basic features of the smart antenna concept

Advanced features include:

- Support of USCH/DSCH
- Support of Iur
- baton handover
- extended functionality and completion of smart antenna concept
- alignment with UTRA LCS concept

11.2 Schedule

Date	Meeting	Scope	[expected] Input	[expected]Output

11.3 Work Task Status

	Planned Date	Milestone	Status
1.			
2.			

12 History

Document history		
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