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Technical Report

UMTS Terrestrial Radio Access Network (UTRAN); UTRA physical layer documentation plan (UMTS XX.01 version 1.0.0)

UMTS

Universal Mobile Telecommunications System

ETSI

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ETSI

Postal address
F-06921 Sophia Antipolis Cedex - FRANCE

Office address
650 Route des Lucioles - Sophia Antipolis
Valbonne - FRANCE
Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16
Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

Internet
secretariat@etsi.fr
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Foreword

This Technical Report (TR) has been produced by ETSI Technical Committee Special Mobile Group (SMG).
The contents of the present document are subject to change as the work continues within SMG2 and SMG2 UMTS layer 1 expert group and may change following approval by either of these two groups.

1 Scope

This Technical Report describes the documents being produced by the ETSI SMG2 UMTS Physical Layer Expert Group and first complete versions expected to be available by end of 1998.
The present document does not contain technical information as such, only gives reference where such information is being gathered by ETSI SMG2 UMTS Physical Layer Expert Group.

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] Reference 1.

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document the following terms and definitions apply:
Definition 1: to be completed

3.2 Abbreviations

For the purposes of the present document the following terms and definitions apply:
A1 Abbreviation 1

4 Types of the documents being produced

Different types of deliverables that have been identified so far are:

1. **Description documents**
   A description document defines the "high level requirement" and principles of the air interface (e.g. control channel structure and basic channel coding schemes) and potentially examples. However all details are not fixed yet (the exact bit by bit mapping in the radio frames). A description document is from that point of view close to a stage 2 description.
2. **Specifications**
   A specification ultimately defines completely the physical layer of the radio interface. The requirements for the MS and BTS are set. Tests specification and type approval may then be derived from the specifications. In that view point a specification is analogous to a stage 3 description.
3. **Technical reports**
   Technical reports are documents that collect any type of information that is used in the decision making process (scenarios, performance estimates). It should be noted that performance estimates are different from requirements, requirement referring to minimum quality, potentially at specific reference points.
4. "**Management" documents**
   Management documents are intended to be used by the layer 1 to organise its own work and capture decisions or progress.

The deliverables that UMTS L1 expert group presently identified and will edit until the end of 1998 are of type 1, 3 and 4. Edition of these deliverables will continue in the course of 1999. Specifications will start to be drafted in 1999.

5 List of the deliverables being produced currently

The list of currently identified deliverables and companies responsible for editorship are provided in the table below. FDD and TDD are presently dealt with in separate documents, apart from the handover related issues which will be devoted a separate document. However it is anticipated that some documents may be merged at some point, in particular the RF transmission and reception documents.

Table 1

UMTS-L1 Document	Document title	Editor for overall document	Latest version
XX.01	UTRA Layer 1 documentation plan	Chairman	0.3.0
XX.02	UTRA Physical layer - general description	Chairman	0.1.0
XX.03	UTRA FDD, Transport and physical channels description	Ericsson	1.3.0
XX.04	UTRA FDD, Multiplexing, channel coding and interleaving description	Nokia	0.8.0
XX.05	UTRA FDD, Spreading and modulation description	Siemens	0.6.0
XX.06	UTRA FDD, Radio transmission and reception description	Motorola	0.5.0
XX.07	UTRA FDD, Physical layer procedures description	Ericsson	1.2.1
XX.08	UTRA FDD, Additional features description	Airtouch	0.3.0
XX.09	UTRA TDD, Transport channels and physical channels description	Siemens	1.2.0
XX.10	UTRA TDD, Multiplexing, channel coding and interleaving description	Nokia	0.5.0
XX.11	UTRA TDD, Spreading and modulation description	Ericsson	1.0.0
XX.12	UTRA TDD, Radio transmission and reception description	Motorola	0.1.0
XX.13	UTRA TDD, Physical layer procedures description	Siemens	0.6.0
XX.14	UTRA TDD, Additional features description	Panasonic	0.1.0
XX.15	UTRA Handover	Nortel	0.3.0
XX.16	UTRA Inter operability description	Airtouch	0.2.0
XX.17	UTRA Radio Frequency (RF) System Scenarios	Vodafone	1.0.0
XX.18	UTRA Layer 1 study items	Nortel	0.4.1
XX.19	UTRA Link level simulations results	CSELT	Not completed
XX.20	Collection of UTRA system level simulation results	France Telecom	Not completed
XX.21	UTRA MS capability	NEC	0.1.0

6 Scope of the individual deliverables

6.1 UTRA Physical Layer Documentation Plan

The scope is to describe the documents being produced by the ETSI SMG2 UMTS Physical Layer Expert Group.

6.2 UTRA Physical Layer - General Description

The scope of this document is to give an overview of the UTRA Physical Layer for both FDD and TDD modes.

6.3 UTRA FDD, Transport and physical channels description

The scope of this document is to establish the characteristics of the Layer 1 transport channels and physicals channels in the FDD mode of UTRA.

6.4 UTRA FDD, Multiplexing, channel coding and interleaving description

The scope of this document is to describe multiplexing, channel coding and interleaving for UTRA Physical Layer FDD mode, including also the operation during slotted mode as well.

6.5 UTRA FDD, Spreading and modulation description

The scope of this document is to establish the characteristics of the spreading and modulation in the FDD mode of UTRA.

6.6 UTRA FDD, Radio transmission and reception description

The scope of this document is to establish the characteristics of the radio transmission and reception parameters in the FDD mode of UTRA.

6.7 UTRA FDD, Physical layer procedures description

The scope of this document is to establish the characteristics of the Physical Layer procedures in the FDD mode of UTRA.

6.8 UTRA FDD, Additional features description

The scope of this document is to describe the additional features which are optional for but fully compatible to UTRA FDD mode and could improve system performance when applied appropriately. These features are usually not mandatory in nature.

6.9 UTRA TDD, Transport channels and physical channels description

The scope of this document is to describe the logical channels and physical channels for UTRA Physical Layer TDD mode.

6.10 UTRA TDD, Multiplexing, channel coding and interleaving description

The scope of this document is to describe multiplexing, channel coding and interleaving for UTRA Physical Layer TDD mode.

6.11 UTRA TDD, Spreading and modulation description

The scope of this document is to establish the characteristics of the spreading and modulation in the TDD mode of UTRA.

6.12 UTRA TDD, Radio transmission and reception description

The scope of this document is to establish the characteristics of the radio transmission and reception parameters in the TDD mode of UTRA.

6.13 UTRA TDD, Physical layer procedures description

The scope of this document is to describe the physical layer procedures for UTRA Physical Layer TDD mode.

6.14 UTRA TDD, Additional features description

The scope of this document is to describe the additional features of the UTRA TDD mode that are not covered by the other parts of the UTRA Physical Layer documentation.

6.15 UTRA handover

The scope of this document is to provide a description of the handover from UTRA to UTRA, as well as UTRA to GSM, as seen from the Layer 1.

6.16 UTRA Interoperability description

The scope of this document is to describe the interoperability between UTRA and GSM, and where appropriate between UTRA and non-GSM based second generation system. Idle mode cell selection and reselection as well as redirection in call setup to base station supporting modes other than UTRA will be included.

6.17 UTRA Radio frequency (RF) system scenarios

The scope of this document is to define different system scenarios that can be utilised when evaluating suitable values for various UTRA parameters. It is anticipated that these scenarios will enable guard band recommendations, amongts other parameters, to be made.

6.18 UTRA Layer 1 study items

The scope of this document is to list the study items identified by the layer 1 expert group.

6.19 UTRA Link level simulations results

The scope of this document is to collect the UTRA link level performance results. From these results the Recommendations should be derived in terms of receiver sensitivity figures for the different physical channels and service bearers in the specified propagation channels.

NOTE: This document is not completed, the table of contents of the document is given in Annex A.

6.20 Collection of UTRA system level simulation results

The scope of this document is to present a collection of UTRA system level simulation results obtained by several companies which will lead to the comparison of these simulation assumptions and results and explanation of potential differences between them.

NOTE: This document is not completed, the table of contents of the document is given in Annex B.

6.21 UTRA MS Capability description

The scope of this document is to identify the capabilities of different types of UTRA mobile stations. The capabilities covered are strictly limited to the Physical Layer parameters that have a direct effect on the classification of mobile station types. Any mobile station feature which does not have an impact on the UTRA physical layer is beyond the scope of this document, as such service specific features like speech or video codecs.

7 Timeplan for producing the deliverables

The milestone plan is shown below. Two different types of information are provided in this milestone plan:

- The milestone plan indicates target dates (or equivalently target Layer 1 meeting) at which a working assumption on a particular subject should be agreed. These target dates were copied from the originally proposed work plan that was presented at the last SMG2 UMTS meeting, apart from the date for FDD spreading that is set to September rather than July 98.
- The milestone plan also provides dates (or layer 1 meetings) at which a draft version of the deliverables should be agreed by UMTS L1 for presentation to SMG2. This is for further discussion since the way to produce and agree a document before showing a document to SMG2 is not quite clear yet. In the plan it is assumed that a document is produced either during the meeting, where a working assumption is made and formally agreed during that same meeting or produced shortly after the meeting and agreed via the reflector.

Given the high interaction between the different subjects, it is to be understood that an item on which a working assumption has been agreed, may need to and, in some cases, should be re-visited when a working assumption on a related subject is reached. In addition a working assumption can be challenged at any time, if it proves not to be best one. Relationship between items may be partly found in the Study items clauses in XX.18.

7.1 Milestone plan

Table 2

Subject	L1 #6 (09/98)	L1 #7 (10/98)	L1 #8 (11/98)	L1 #9 (12/98)	Comment
Transport and Physical Channels					
- Dedicated channels		x			Impacts on the downlink diversity solution
- Common channels			x		- BCCH capacity need is unclear - RACH usage access/packet, etc. protocols
XX.03			x ?		
XX.09			x ?		
Multiplexing		x			- Service combinations to support and speed of modifications
Channel coding and interleaving		x			- Issues on the multiplexing have an effect here - Verification of coding solutions, error floors with Turbo codes etc.
XX.04		x ?			
XX.10		x ?			
Spreading and modulation					
- FDD uplink	x				
- FDD downlink	x				
- TDD trafic channels		x			
- TDD common channels			x		
XX.05	x				
XX.11			x		
Radio transmission and reception				x	- Depends on RF scenarios, MCL or statistical approach for co-existence - Not expected to be as detailed as other sections
XX.06				x	
XX.12				x	
Physical Layer Procedures					
- High level description on FDD	x				- On soft handover etc. issues now missing
- High level description on TDD	x				
- Detailed description on FDD & TDD			x		- Discussion on input on various parameters e.g. handover parameters needed - Alignment with other chapters
XX.07			x		
XX.13			x		
XX.15			x		
Additional features Concluded for FDD			x		- Most items that are decided to be supported will be eventually reflected in the relevant chapters, such as downlink diversity
XX.08			x		
Additional features for TDD				x	- Most items that are decided to be supported will be eventually reflected in the relevant chapters, such as downlink diversity
XX.14				x	
Interoperability					

Subject	L1 #6 (09/98)	L1 #7 (10/98)	L1 #8 (11/98)	L1 #9 (12/98)	Comment
- Technical issues for UTRA-GSM handover 10/98		x			
- Technical issues for FDD-TDD handover				x	
XX.16				x	
System scenarios					
first scenarios by 9/98	x				
progressed scenarios				x	
XX.17				x	
XX.19				x	
XX.20				x	
XX.21				x	

Annex A (informative): XX.19, UTRA Link level simulations results, table of contents

Annex B (informative): XX.20, Collection of UTRA system level simulation results, table of contents

History

v0.1.0	1998-04-24	Document created based on the documents Tdoc SMG2 UMTS-L1 36/98 and Tdoc SMG 905/97. (Tdoc SMG2 UMTS-L1 56/98)
V0.2.0	1998-09-16	The scope of the documents updated and version numbers of the available documents included as concluded in SMG2 UMTS-L1 No. 6
V0.2.1	1998-11-16	The scope of the documents updated and version numbers of the available documents updated after SMG2 UMTS-L1 No. 6. The availability information of the documents also updated. The reference types updated.
V.0.2.2	1999-01-19	The document updated in the last UMTS Physical Layer Expert Group meeting (#10), table of contents of XX.19 and XX.20 added as an Annex A & B respectively. Section of the document versions available updated.
V.0.3.0	1999-01-20	Following the approval of SMG2 UMTS-L1 #10. Version numbers of the XX-documents updated following the UMTS-L1 approval of XX-documents.

Editor for UTRA Physical Layer Documentation Plan is:

Antti Toskala
Nokia Telecommunications
Email: antti.toskala@ ntc.nokia.com

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