

ETSI TS 101 851-4-3 V3.1.1 (2011-09)



**Satellite Earth Stations and Systems (SES);
Satellite Component of UMTS/IMT-2000;
Part 4: Physical layer procedures;
Sub-part 3: G-family enhancements
(S-UMTS-G enhanced 25.214)**

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ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - 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
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Contents

Intellectual Property Rights	5
Foreword.....	5
Introduction	5
1 Scope	7
2 References	7
2.1 Normative references	7
2.2 Informative references.....	8
3 Definitions and abbreviations.....	8
3.1 Definitions.....	8
3.2 Abbreviations	9
4 Synchronization procedures	10
4.1 Spot search	10
4.2 Common physical channel synchronization	10
4.2.1 P-CCPCH radio frame timing.....	10
4.2.2 S-CCPCH soft combining timing	10
4.3 DPCCH/DPDCH synchronization.....	10
4.3.1 Synchronization primitives	10
4.3.1.1 General	10
4.3.1.2 Downlink synchronization primitives	11
4.3.1.3 Uplink synchronization primitives	11
4.3.2 Radio link establishment and physical layer reconfiguration for dedicated channels.....	12
4.3.2.1 General	12
4.3.2.2 Satellite gateway radio link set state machine	12
4.3.2.3 Synchronization procedure A	13
4.3.2.4 Synchronization procedure B	13
4.3.3 Radio link monitoring	14
4.3.3.1 Downlink radio link failure	14
4.3.3.2 Uplink radio link failure/restore	14
4.3.4 Transmission timing adjustments	14
5 Power control	15
5.1 Uplink power control.....	15
5.1.1 PRACH.....	15
5.1.1.1 General	15
5.1.1.2 Setting of PRACH control and data part power difference	15
5.1.2 DPCCH/DPDCH	15
5.1.2.1 General	15
5.1.2.1.1 Normal operations	15
5.1.2.1.2 Operations in Optional mode C	16
5.1.2.2 Ordinary transmit power control	16
5.1.2.2.1 Normal operation.....	16
5.1.2.2.2 Operation in optional mode C	19
5.1.2.3 Transmit power control in compressed mode	22
5.1.2.3.1 Normal operation.....	22
5.1.2.3.2 Operations in Optional mode C	24
5.1.2.4 Transmit power control in the uplink DPCCH power control preamble.....	25
5.1.2.5 Setting of the uplink DPCCH/DPDCH power difference	25
5.1.2.5.1 General	25
5.1.2.5.2 Signalled gain factors	26
5.1.2.5.3 Computed gain factors.....	26
5.1.2.5.4 Setting of the uplink DPCCH/DPDCH power difference in compressed mode	27
5.1.2.6 Maximum and minimum power limits.....	27
5.1.2.6.1 Normal operation.....	27
5.1.2.6.2 Operation in Optional mode C.....	28

5.2	Downlink power control.....	28
5.2.1	DPCCH/DPDCH	28
5.2.1.1	General.....	28
5.2.1.2	Ordinary transmit power control	28
5.2.1.2.1	Normal operations	28
5.2.1.2.2	Operation in Optional mode C.....	30
5.2.1.3	Power control in compressed mode	32
5.2.1.4	Spot selection diversity transmit power control	33
5.2.1.4.1	General	33
5.2.1.4.2	TPC procedure in UE	34
5.2.1.4.3	Selection of primary spot.....	34
5.2.1.4.4	Delivery of primary spot ID	35
5.2.1.4.5	TPC procedure in the network.....	36
5.2.1.5	Open Loop power control	36
5.2.2	AICH	36
5.2.3	PICH	36
5.2.4	S-CCPCH.....	37
5.2.5	MICH.....	37
6	Random access procedure	37
6.1	Physical random access procedure	37
6.1.1	RACH sub-channels	39
6.1.2	RACH access slot sets	40
Annex A (informative):	Power control	42
A.1	Downlink power control timing	42
Annex B (informative):	Spot search procedure	43
Annex C (normative):	Description of G-family enhancements.....	44
C.1	Definition of the optional modes A and C.....	44
C.2	Description of Optional mode A	44
C.3	Description of Optional mode C	45
Annex D (informative):	Bibliography.....	46
Annex E (informative):	Change history	47
E.1	A-family optional features.....	47
E.2	C-family optional features.....	47
History		50

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Satellite Earth Stations and Systems (SES).

The present document is specifying the Satellite Radio Interface referenced as SRI Family G at ITU-R, in the frame of the modification of ITU-R Recommendation M.1457 [i.5]. This modification has been approved at SG8 meeting in November 2005.

The present document is part 4, sub-part 3 of a multi-part deliverable covering Satellite Earth Stations and Systems (SES); Satellite Component of UMTS/IMT-2000; G-family enhancements, as identified below:

Part 1: "Physical channels and mapping of transport channels into physical channels";

Part 2: "Multiplexing and channel coding";

Part 3: "Spreading and modulation";

Part 4: "Physical layer procedures";

Sub-part 1: "G-family (S-UMTS-G 25.214)";

Sub-part 2: "A-family (S-UMTS-A 25.214)";

Sub-part 3: "G-family enhancements (S-UMTS-G enhanced 25.214)";

Part 5: "UE Radio Transmission and Reception";

Part 6: "Ground stations and space segment radio transmission and reception".

Introduction

S-UMTS stands for the Satellite component of the Universal Mobile Telecommunication System. S-UMTS systems will complement the Terrestrial UMTS (T-UMTS) and inter-work with other IMT-2000 family members through the UMTS core network. S-UMTS will be used to deliver 3rd generation Mobile Satellite Services (MSS) utilizing either low (LEO) or medium (MEO) earth orbiting, or geostationary (GEO) satellite(s). S-UMTS systems are based on terrestrial 3GPP specifications and will support access to GSM/UMTS core networks.

NOTE 1: The term T-UMTS will be used in the present document to further differentiate the Terrestrial UMTS component.

Due to the differences between terrestrial and satellite channel characteristics, some modifications to the terrestrial UMTS (T-UMTS) standards are necessary. Some specifications are directly applicable, whereas others are applicable with modifications. Similarly, some T-UMTS specifications do not apply, whilst some S-UMTS specifications have no corresponding T-UMTS specification.

Since S-UMTS is derived from T-UMTS, the organization of the S-UMTS specifications closely follows the original 3rd Generation Partnership Project (3GPP) structure. The S-UMTS numbers have been designed to correspond to the 3GPP terrestrial UMTS numbering system. All S-UMTS specifications are allocated a unique S-UMTS number as follows:

S-UMTS-n xx.yyy

Where:

- The numbers xx and yyy correspond to the 3GPP-numbering scheme.
- n (n = A, B, C, etc.) denotes the family of S-UMTS specifications.

An S-UMTS system is defined by the combination of a family of S-UMTS specifications and 3GPP specifications, as follows:

- If an S-UMTS specification exists it takes precedence over the corresponding 3GPP specification (if any). This precedence rule applies to any references in the corresponding 3GPP specifications.

NOTE 2: Any references to 3GPP specifications within the S-UMTS specifications are not subject to this precedence rule.

EXAMPLE: An S-UMTS specification may contain specific references to the corresponding 3GPP specification.

- If an S-UMTS specification does not exist, the corresponding 3GPP specification may or may not apply. The exact applicability of the complete list of 3GPP specifications shall be defined at a later stage.

The present document is part of the S-UMT sub-part 3 specifications. Sub-part 3 specifications are identified in the title and can also be identified by the specification number:

- Sub-part 1 specifications have a S-UMTS-G prefix in the title and a sub-part number of "1" (TS 101 851-x-1).
- Sub-part 2 specifications have a S-UMTS-A prefix in the title and a sub-part number of "2" (TS 101 851-x-2).
- Sub-part 3 specifications have a S-UMTS-G enhanced prefix in the title and a sub-part number of "3" (TS 101 851-x-3).

The sub-part 1 specifications introduce the WCDMA satellite radio interface (ITU-R G-family) specifications for the third generation (3G) wireless communication systems. It is also based on the WCDMA UTRA FDD radio interface already standardized in 3GPP. Mobile satellite systems intending to use this interface will address user equipment fully compatible with 3GPP UTRA FDD WCDMA, with adaptation for agility to the Mobile Satellite Service (MSS) frequency band.

The sub-part 2 specifications introduce the SW-CDMA satellite radio interface (ITU-R A-family) specifications for third generation (3G) wireless communication systems. SW-CDMA is based on the adaptation to the satellite environment of terrestrial WCDMA. The intention is to reuse the same core network and reuse the radio interface specifications for the Is and Cu interface. Only the Uu interface is adapted to the satellite environment. SW-CDMA operates in FDD mode with RF channel bandwidth of either 2,350 MHz or 4,700 MHz for each transmission direction.

The sub-part 3 specifications introduce the WCDMA satellite radio interface enhancement (G enhance-family). It considers G-family as radio interface basis, adding option selected enhancing features from ITU-R A and C-family in order to optimize the radio interface over satellite. It is based on the results of the TR 102 278 [i.6] identifying a way to achieve harmonization between A, C and G-family satellite radio interfaces for IMT-2000 in ITU-R. The G-family enhancements made of A, C and G features are described in annex E.

The sub-parts 1 and 2 will be withdrawn if the A and C family will be removed from the satellite radio interface list of IMT-2000 in ITU-R Recommendation M.1850 [i.7] and then, the sub-part 3 will be revised.

1 Scope

The present document specifies the characteristics of the physical layer procedures used for family G enhanced of the satellite component of UMTS (S-UMTS-G).

It is based on the FDD mode of UTRA defined by TS 125 211 [4], TS 125 212 [i.1], TS 125 213 [i.2], TS 125 215 [i.3], TS 125 214 [5], TS 125 331 [i.4] and TS 125 433 [6] and adapted for operation over satellite transponders.

Furthermore, it specifies enhancing features optimizing the basic G family radio interface performances over satellite and new functions.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific. For specific references, only the cited version applies. For non-specific references, the latest version of the reference document (including any amendments) applies.

Referenced documents which are not found to be publicly available in the expected location might be found at <http://docbox.etsi.org/Reference>.

NOTE: While any hyperlinks included in this clause were valid at the time of publication, ETSI cannot guarantee their long term validity.

2.1 Normative references

The following referenced documents are necessary for the application of the present document.

- [1] ETSI TS 101 851-1-3: "Satellite Earth Stations and Systems (SES); Satellite Component of UMTS/IMT-2000; Part 1: Physical channels and mapping of transport channels into physical channels; Sub-part 3: G-family enhancements (S-UMTS-G enhanced 25.211)".
- [2] ETSI TS 101 851-2-3: "Satellite Earth Stations and Systems (SES); Satellite Component of UMTS/IMT-2000; Part 2: Multiplexing and channel coding; Sub-part 3: G-family enhancements (S-UMTS-G enhanced 25.212)".
- [3] ETSI TS 101 851-3-3: "Satellite Earth Stations and Systems (SES); Satellite Component of UMTS/IMT-2000; Part 3: Spreading and modulation; Sub-part 3: G-family enhancements (S-UMTS-G enhanced 25.213)".
- [4] ETSI TS 125 211: "Universal Mobile Telecommunications System (UMTS); Physical channels and mapping of transport channels onto physical channels (FDD) (3GPP TS 25.211)".
- [5] ETSI TS 125 214: "Universal Mobile Telecommunications System (UMTS); Physical layer procedures (FDD) (3GPP TS 25.214)".
- [6] ETSI TS 125 433: "Universal Mobile Telecommunications System (UMTS); UTRAN Iub interface Node B Application Part (NBAP) signalling (3GPP TS 25.433)".
- [7] ETSI TS 125 101: "Universal Mobile Telecommunications System (UMTS); User Equipment (UE) radio transmission and reception (FDD) (3GPP TS 25.101)".
- [8] ETSI TS 125 133: "Universal Mobile Telecommunications System (UMTS); Requirements for support of radio resource management (FDD) (3GPP TS 25.133)".