



**GEO-Mobile Radio Interface Specifications (Release 3);  
Third Generation Satellite Packet Radio Service;  
Part 4: Radio interface protocol specifications;  
Sub-part 12: Mobile Earth Station (MES) -  
Base Station System (BSS) interface;  
Radio Link Control/Medium  
Access Control (RLC/MAC) protocol;  
GMR-1 3G 44.060**

---

Reference

RTS/SES-00374-4-12

---

Keywords

3G, GMPRS, GMR, GPRS, GSM, GSO, MES,  
mobile, MSS, radio, satellite, S-PCN

**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  
Sous-Préfecture de Grasse (06) N° 7803/88

---

**Important notice**

The present document can be downloaded from:

<http://www.etsi.org/standards-search>

The present document may be made available in electronic versions and/or in print. The content of any electronic and/or print versions of the present document shall not be modified without the prior written authorization of ETSI. In case of any existing or perceived difference in contents between such versions and/or in print, the only prevailing document is the print of the Portable Document Format (PDF) version kept on a specific network drive within ETSI Secretariat.

Users of the present document should be aware that the document may be subject to revision or change of status. Information on the current status of this and other ETSI documents is available at

<http://portal.etsi.org/tb/status/status.asp>

If you find errors in the present document, please send your comment to one of the following services:

<https://portal.etsi.org/People/CommiteeSupportStaff.aspx>

---

**Copyright Notification**

No part may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm except as authorized by written permission of ETSI.

The content of the PDF version shall not be modified without the written authorization of ETSI.

The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 2015.

All rights reserved.

**DECT™**, **PLUGTESTS™**, **UMTS™** and the ETSI logo are Trade Marks of ETSI registered for the benefit of its Members. **3GPP™** and **LTE™** are Trade Marks of ETSI registered for the benefit of its Members and of the 3GPP Organizational Partners.  
**GSM®** and the GSM logo are Trade Marks registered and owned by the GSM Association.

# Contents

Intellectual Property Rights .....	12
Foreword.....	12
Modal verbs terminology.....	13
Introduction .....	13
1 Scope .....	15
2 References .....	16
2.1 Normative references .....	16
2.2 Informative references.....	18
3 Definitions and abbreviations.....	18
3.1 Definitions.....	18
3.2 Abbreviations .....	20
4 Layered overview of radio interface.....	20
4.0 General .....	20
4.1 Layer services.....	21
4.2 Layer functions.....	21
4.3 Service primitives.....	22
4.4 Services required from lower layers.....	22
5 Introduction to the Medium Access Control (MAC) procedures.....	22
5.1 General .....	22
5.2 Multiplexing principles .....	22
5.2.1 Temporary Block Flow (TBF).....	22
5.2.2 Temporary Flow Identity (TFI) .....	23
5.2.3 Uplink state flag.....	23
5.2.4 Medium access modes .....	23
5.2.4a Multiplexing of GMPRS and future MESS.....	24
5.3 Packet idle mode .....	24
5.4 Packet transfer mode .....	24
5.5 General procedures in packet idle and packet transfer modes.....	24
5.5.1 Mobile earth station side.....	24
5.5.1.0 General .....	24
5.5.1.1 Cell reselection.....	24
5.5.1.1a Network Assisted Cell Change .....	24
5.5.1.1a.1 Neighbour Cell System Information Distribution .....	25
5.5.1.1a.2 CCN Mode .....	25
5.5.1.2 System Information (SI) on PBCCH.....	25
5.5.1.3 System Information (SI) on BCCH.....	25
5.5.1.3.0 General .....	25
5.5.1.3.1 Supervision of BCCH_CHANGE_MARK and update of BCCH information .....	25
5.5.1.3.2 GPRS SI reception failure .....	25
5.5.1.4 Acquisition of system information on the broadcast channel.....	25
5.5.1.4.0 General .....	25
5.5.1.4.1 Suspension of operation to receive system information .....	25
5.5.1.4.2 Request for acquisition of system information .....	25
5.5.1.5 Discontinuous reception (DRX).....	25
5.5.1.6 Page mode procedures on PCCCH.....	26
5.5.1.7 Frequency parameters .....	26
5.5.2 Network side.....	26
5.5.2.1 System Information broadcasting.....	26
5.5.2.1.1 System information on PBCCH .....	26
5.5.2.1.2 System information on BCCH.....	26
5.5.2.1.3 System information on PACCH (and other logical channels).....	26
5.5.2.1.4 Consistent sets of system information messages .....	26
5.5.2.2 Paging .....	26
5.6 Measurement reports .....	26

5.6.0	General.....	26
5.6.1	Network Control (NC) measurement reporting .....	26
5.6.2	Void .....	27
5.6.3	Additional measurement and reporting parameters .....	27
5.6.3.0	General .....	27
5.6.3.1	Deriving the 3G Neighbour Cell list from the 3G Neighbour Cell description.....	27
5.6.3.2	Deriving BA(GPRS) and the GSM Neighbour Cell list.....	28
5.6.3.3	Deriving the Neighbour Cell list from the GSM Neighbour Cell list and the 3G Neighbour Cell list.....	28
5.6.3.4	GPRS Real Time Differences .....	28
5.6.3.5	GPRS Report Priority Descriptions.....	28
5.6.3.6	GPRS Measurement Parameters and GPRS 3G Measurement Parameters.....	28
5.6.3.7	The GPRS 3G Cell Reselection list.....	28
6	Paging procedures (A/Gb mode only).....	28
6.0	General .....	28
6.1	Paging procedure for RR connection establishment.....	29
6.1.0	General.....	29
6.1.1	Paging initiation using paging subchannel on CCCH.....	29
6.1.2	Paging initiation using paging subchannel on PCCCH.....	29
6.1.3	Paging initiation using PACCH.....	29
6.1.4	Paging response .....	29
6.2	Paging procedure for downlink packet transfer.....	29
6.2.0	General.....	29
6.2.1	Paging procedure using paging subchannel on CCCH .....	30
6.2.2	Paging using paging subchannel on PCCCH .....	30
6.2.3	Paging response to a page on CCCH .....	30
7	Medium Access Control (MAC) procedures on PCCCH.....	30
7.0	General .....	30
7.0a	Support of multiple TBF procedures .....	30
7.1	TBF establishment initiated by the mobile earth station on PCCCH .....	31
7.1.0	General.....	31
7.1.1	Permission to access the network .....	31
7.1.2	Initiation of a TBF establishment .....	32
7.1.2.1	Initiation of the packet access procedure .....	32
7.1.2.1.0	General .....	32
7.1.2.1.1	Access persistence control on PRACH.....	33
7.1.2.1.2	Handling of T3202 expiry.....	34
7.1.2.2	Packet assignment procedure .....	34
7.1.2.2.1	On receipt of a PACKET CHANNEL REQUEST or PACKET CHANNEL REQ TYPE 2 message .....	34
7.1.2.2.2	Void.....	35
7.1.2.2.3	Void.....	35
7.1.2.2.4	Packet access reject procedure .....	35
7.1.2.3	One phase packet access completion.....	35
7.1.2.4	Timing and frequency correction .....	36
7.1.3	Packet Resource Request Procedure (Iu mode only) .....	36
7.1.3.0	General .....	36
7.1.3.1	Initiation of the Packet resource request procedure .....	36
7.1.3.2	On receipt of a PACKET RESOURCE REQUEST message .....	36
7.1.3.3	Completion of Packet resource request procedure .....	37
7.1.4	Initiation of TBF Establishment on CCCH.....	37
7.1.5	Abnormal cases.....	38
7.2	TBF establishment initiated by the network on CCCH (A/Gb mode only).....	38
7.2.1	Entering the packet transfer mode .....	38
7.2.1.0	General .....	38
7.2.1.1	Packet downlink assignment procedure .....	38
7.2.1.2	Packet downlink assignment procedure completion .....	39
7.2.1.3	Void.....	39
7.2.2	Abnormal cases.....	39
7.3	Procedure for measurement report sending in packet idle mode.....	40

7.4	Cell change order procedures in packet idle mode .....	40
7.4.0	General .....	40
7.4.1	Cell change order procedure initiated on PCCCH .....	40
7.4.2	Cell change order procedure initiated on CCCH .....	40
7.5	Measurement order procedures in packet idle mode .....	40
7.6	Void .....	40
7.7	Void .....	40
7.8	TBF establishment on PACCH by network .....	40
7.9	GMPRS Resume procedure on PCCCH (A/Gb mode only) .....	40
7.9.0	General .....	40
7.9.1	Initiation of GMPRS resume procedure .....	40
7.9.2	Completion of GMPRS resume procedure .....	41
7.9.3	Abnormal cases .....	41
7.10	Talk Burst Request Transmission on PCCCH .....	41
7.10.0	General .....	41
7.10.1	Access persistence control on PRACH .....	41
7.10.2	On receipt of a PACKET CHANNEL REQ TYPE 2 message with Talk Burst Request Indication .....	42
7.10.3	Absence of PACKET UPLINK TALK BURST CONTROL RESPONSE .....	42
7.11	Uplink Talk Burst Control Transmission on Established TBF .....	42
7.11.0	General .....	42
7.11.1	On receipt of a PACKET UPLINK TALK BURST CONTROL message .....	42
8	Medium access control (MAC) procedures in packet transfer mode .....	43
8.1	Transfer of RLC data blocks .....	43
8.1.0	General .....	43
8.1.1	Uplink RLC data block transfer .....	43
8.1.1.0	General .....	43
8.1.1.1	Dynamic allocation uplink RLC data block transfer .....	44
8.1.1.1.0	General .....	44
8.1.1.1.1	PACCH operation (A/Gb mode only) .....	45
8.1.1.1.1a	PDCH3 PACCH operation (Iu mode only) .....	45
8.1.1.1.2	Resource reallocation for uplink TBF .....	45
8.1.1.1.3	Establishment of downlink TBF .....	48
8.1.1.2	Uplink PDCH(5,3) and PDCH(5,12) multiplexing .....	49
8.1.1.3	Void .....	49
8.1.1.4	Network initiated release of uplink TBF .....	49
8.1.1.5	Abnormal cases .....	50
8.1.1.6	Network initiated establishment of uplink TBF .....	50
8.1.1.7	Fixed allocation uplink RLC data block transfer .....	50
8.1.2	Downlink RLC data block transfer .....	51
8.1.2.0	General .....	51
8.1.2.1	Downlink RLC data block transfer .....	51
8.1.2.1.0	General .....	51
8.1.2.1.1	Abnormal cases .....	51
8.1.2.2	Polling for packet downlink ACK/NACK .....	52
8.1.2.3	Downlink PDCH(5,3) and PDCH(5,12) multiplexing .....	52
8.1.2.4	Resource reassignment for downlink .....	53
8.1.2.4a	Establishment of downlink TBF after downlink TBF release .....	53
8.1.2.4a.0	General .....	53
8.1.2.4a.1	Abnormal cases .....	54
8.1.2.5	Establishment of uplink TBF .....	55
8.1.2.5.0	General .....	55
8.1.2.5.1	Abnormal cases (A/Gb mode) .....	57
8.1.2.5.1a	Abnormal cases (Iu mode) .....	57
8.1.2.6	Void .....	58
8.1.2.7	Void .....	58
8.1.2.8	Network initiated abnormal release of downlink TBF .....	58
8.1.2.9	Network initiated release of downlink TBF .....	58
8.1.2.10	Network initiated Establishment of Uplink TBF .....	58
8.1.3	Void .....	59
8.1.4	Multiplexing of control and data messages (A/Gb mode only) .....	59
8.1.5	Multiplexing multiple TBFs on the same burst (Iu mode only) .....	59

8.2	Packet PDCH release (Iu mode only).....	60
8.3	Procedure for measurement report sending in Packet Transfer mode (Iu mode only) .....	60
8.4	Network controlled cell reselection procedure (Iu mode only) .....	60
8.4.0	General.....	60
8.4.1	Network controlled cell reselection completion .....	61
8.4.2	Abnormal cases.....	61
8.5	Measurement order procedures in packet transfer mode (Iu mode only) .....	62
8.6	Packet control acknowledgement .....	62
8.7	Abnormal cases .....	62
8.7.1	Abnormal release with return to CCCH or PCCCH .....	62
8.7.2	Abnormal release with random access.....	62
8.7.3	Abnormal release with system information .....	63
8.8	Packet link quality reporting in packet transfer mode (A/Gb mode only).....	63
8.8a	Packet link quality reporting in packet transfer mode (Iu mode only) .....	63
8.9	Coding rate change procedure in packet transfer mode.....	63
8.9.0	General.....	63
8.9.1	Downlink TBF coding rate change procedure .....	63
8.9.2	Uplink TBF coding rate change procedure.....	63
9	Radio Link Control (RLC) procedures in packet transfer mode .....	63
9.0	General .....	63
9.1	Procedures and parameters for peer-to-peer operation.....	64
9.1.0	General.....	64
9.1.1	Send state variable V(S) .....	64
9.1.1a	Control send state variable V(CS) .....	64
9.1.2	Acknowledge state variable V(A).....	64
9.1.3	Acknowledge state array V(B).....	65
9.1.3.1	Acknowledge state array V(B) for GMPRS .....	65
9.1.3.2	Void.....	65
9.1.4	Block Sequence Number BSN.....	65
9.1.4.1	Block Sequence Number BSN for GPRS TBF .....	65
9.1.4.2	Void.....	65
9.1.4a	Void .....	65
9.1.5	Receive state variable V(R) .....	65
9.1.6	Receive window state variable V(Q) .....	66
9.1.7	Receive state array V(N).....	66
9.1.7.1	Receive state array V(N) in GMPRS TBF .....	66
9.1.7.2	Void.....	66
9.1.8	Starting Sequence Number (SSN) and Received Block Bitmap (RBB) .....	66
9.1.8.1	Starting Sequence Number (SSN) and Received Block Bitmap (RBB) in GMPRS TBF .....	66
9.1.8.1.0	General .....	66
9.1.8.1.1	Generation of the bitmap .....	66
9.1.8.1.2	Interpretation of the bitmap .....	67
9.1.8.2	Void.....	67
9.1.9	Window size .....	67
9.1.9a	Filler octets .....	67
9.1.10	Compression .....	67
9.1.11	Segmentation of upper layer PDUs into RLC data units .....	69
9.1.12	Re-assembly of upper layer PDUs from RLC data units .....	70
9.1.12a	Void .....	70
9.1.12b	Void .....	70
9.1.12c	Dummy Data Block (Iu mode only) .....	70
9.1.13	Void .....	70
9.2	Operation during RLC/MAC control message transfer .....	70
9.3	Operation during RLC data block transfer .....	71
9.3.0	General.....	71
9.3.1	Void .....	71
9.3.2	Acknowledged mode operation .....	71
9.3.2.0	General .....	71
9.3.2.1	Additional functionality in acknowledged mode on PDCH3 (Iu mode only) .....	71
9.3.2.2	Establishment of temporary block flow .....	71
9.3.2.3	Operation of uplink temporary block flow.....	71



9.3.2.4	Release of uplink temporary block flow .....	72
9.3.2.5	Operation of downlink temporary block flow .....	73
9.3.2.6	Release of downlink temporary block flow .....	73
9.3.3	Unacknowledged mode operation.....	74
9.3.3.0	General .....	74
9.3.3.1	Establishment of temporary block flow .....	74
9.3.3.2	Operation of uplink temporary block flow .....	74
9.3.3.3	Release of uplink temporary block flow .....	75
9.3.3.4	Operation of downlink temporary block flow .....	76
9.3.3.5	Release of downlink temporary block flow .....	76
9.4	Abnormal release cases .....	76
9.4.1	Abnormal release with random access.....	76
9.4.2	Abnormal release with spotbeam reselection.....	76
9.5	Radio Link Control (RLC) procedures in packet transfer mode when using PNB3(1,6) Data in shared mode.....	77
10	RLC/MAC block structure .....	77
10.0a	PNB(m,n) bursts - A/Gb mode.....	77
10.0b	PNB2(m,n) bursts - A/Gb mode.....	77
10.0c	PDCH - Iu mode.....	78
10.1	Radio block structure.....	79
10.2	Public information bits .....	82
10.2.0	General.....	82
10.2.1	Downlink PUI for PDCH (4,n) and PDCH (5,n) and PDCH2(5,3) .....	85
10.2.1a	Downlink PUI for PDCH3(5,3) .....	86
10.2.1b	Downlink PUI for PDCH3(5,12) .....	86
10.2.1c	Downlink PUI for PDCH3(10,3) .....	87
10.2.2	Downlink Extended PUI for PDCH2(5,12).....	88
10.2.3	Uplink PUI for PDCH (4,3), PDCH (5,n), PDCH2(5,n) and PDCH3(5,n).....	88
10.2.4	Downlink PUI for PDCH (2,6).....	89
10.2.4a	Downlink PUI for PDCH3(2,6).....	89
10.2.5	Uplink PUI for PDCH (1,n), PDCH3(1,n) and PDCH3(2,6).....	90
10.3	RLC/MAC header .....	90
10.3.1	Downlink RLC/MAC header for PNB(m,n) and PNB2(m,n) bursts .....	90
10.3.1a	Downlink RLC/MAC Data header for PNB3(m,n) bursts - Iu mode only .....	90
10.3.1b	Downlink RLC/MAC Control header for PNB3(m,n) bursts - Iu mode only.....	91
10.3.2	Uplink RLC/MAC header for PNB(m,n) and PNB2(m,n) bursts - A/Gb mode only .....	91
10.3.2a	Uplink RLC/MAC Data header for PNB3(m,n) bursts - Iu mode only .....	91
10.3.2b	Uplink RLC/MAC Control header for PNB3(m,n) bursts - Iu mode only.....	91
10.3.2c	Header type 2: Uplink RLC/MAC Data header for PNB3(1,6) Data in dynamic allocation mode - Iu mode only .....	92
10.4	Header fields .....	92
10.4.1	Uplink state flag (USF) field.....	92
10.4.1.1	PDCH(4,3), PDCH(5,3) PDCH2(5,3) and PDCH2(5,12) - A/Gb mode only .....	92
10.4.1.1a	PDCH3(5,3),PDCH3(5,12) and PDCH3(10,3) - Iu mode only .....	92
10.4.1.2	PDCH(2,6) - A/Gb mode only .....	93
10.4.1.2a	PDCH3(2,6) and PDCH3(1,6) - Iu mode only .....	93
10.4.2	Void .....	93
10.4.3	Stall indicator (SI) bit .....	93
10.4.4	Supplementary/polling (S/P) bit .....	93
10.4.5	Unsolicited uplink grant (UUG) field .....	94
10.4.5.0	General .....	94
10.4.5.1	UUG field for terminal type A and C - A/Gb mode only.....	94
10.4.5.2	UUG field for terminal type D - A/Gb mode only .....	94
10.4.5.3	PDCH3 UUG field - Iu mode only.....	95
10.4.5.3.0	General .....	95
10.4.5.3.1	PDCH3(10,3) and PDCH3(5,3) - Iu mode only .....	95
10.4.5.3.2	PDCH3(5,12) and PDCH3(2,6) - Iu mode only .....	95
10.4.5.3.3	DACCH - Iu mode only .....	95
10.4.6	Void .....	96
10.4.7	Payload type field .....	96
10.4.7a	Void .....	96

10.4.8	Final Block Indicator (FBI) bit .....	96
10.4.8a	Void .....	97
10.4.8b.1	Split Block Number (SPBN) - Iu mode only .....	97
10.4.8b.2	Final Split Block (FSB) - Iu mode only .....	97
10.4.9	Void .....	97
10.4.9a	Void .....	97
10.4.9b	Void .....	97
10.4.9c	Void .....	97
10.4.9d	Direction (D) bit (A/Gb mode only) .....	97
10.4.9e	SRB field (Iu mode only) .....	97
10.4.10	Temporary flow identifier (TFI) field .....	98
10.4.10.1	Downlink header TFI .....	98
10.4.10.1.0	General .....	98
10.4.10.1.1	Data-only downlink RLC/MAC block .....	98
10.4.10.1.2	Control-only downlink RLC/MAC block (A/Gb mode only) .....	98
10.4.10.1.3	Control+data downlink RLC/MAC block (A/Gb mode only) .....	98
10.4.10.1a	Downlink header TFI (bit7) .....	98
10.4.10.2	Uplink header TFI .....	98
10.4.10.2.0	General .....	98
10.4.10.2.1	Data-only uplink RLC/MAC block .....	99
10.4.10.2.2	Control-only uplink RLC/MAC block (A/Gb mode only) .....	99
10.4.10.2.3	Control+data uplink RLC/MAC block (A/Gb mode only) .....	99
10.4.10a	Power control (PC) Parameters field .....	99
10.4.11	Extension (E) bit .....	99
10.4.12	Block Sequence Number (BSN) field .....	100
10.4.12a	Void .....	100
10.4.13	Void .....	100
10.4.14	Void .....	100
10.4.14a	Void .....	100
10.4.15	Last Part Size (LPS) field .....	100
10.4.15a	PDU Length .....	100
10.4.15b	Length Indicator (LI) .....	100
10.4.16	RLC data field .....	100
10.4.17	Control message contents field .....	100
10.4.18	Unsatisfied Demand (UD) .....	101
10.4.19	Immediate Termination Request (ITR) .....	101
11	Message functional definitions and contents .....	101
11.0	General .....	101
11.1	Handling of erroneous protocol data .....	102
11.1.0	General .....	102
11.1.1	Message classification .....	103
11.1.1.0	General .....	103
11.1.1.1	Distribution messages .....	103
11.1.1.2	Non-distribution messages .....	103
11.1.1.2.0	General .....	103
11.1.1.2.1	Format of the address information .....	103
11.1.2	Error detection mechanism .....	104
11.1.3	Error labels .....	104
11.1.3.0	General .....	104
11.1.3.1	Generic error labels .....	104
11.1.3.2	"Ignore" error label .....	104
11.1.3.3	"Message escape" error label .....	105
11.1.4	Error detection and order of precedence .....	105
11.1.4.0	General .....	105
11.1.4.1	Unknown message type .....	105
11.1.4.2	Message not compatible with current protocol state .....	105
11.1.4.3	Syntactically incorrect message .....	105
11.1.4.3.0	General .....	105
11.1.4.3.1	Messages with error label: "Distribution part error" .....	106
11.1.4.3.2	Messages with error label: "Address information part error" .....	106
11.1.4.3.3	Messages with error label: "Non-distribution part error" .....	106



11.1.4.3.4	Messages with error label: "Message escape" .....	106
11.1.4.3.5	Messages with error label: "Ignore" .....	106
11.1.4.4	Syntactic error in truncated concatenation .....	106
11.1.4.5	Void.....	107
11.2	RLC/MAC control messages.....	107
11.2.0	Message format.....	108
11.2.0.0	General .....	108
11.2.0.1	Downlink RLC/MAC messages.....	108
11.2.0.2	Uplink RLC/MAC messages.....	108
11.2.1	Packet access reject.....	109
11.2.2	Packet control acknowledgement .....	110
11.2.3	Packet cell change failure (Iu mode only) .....	111
11.2.4	Packet cell change order (Iu mode only) .....	112
11.2.5	Packet channel request (A/Gb Mode only) .....	114
11.2.5a	Packet Channel Request Type 2 (Iu mode only).....	115
11.2.5b	Packet DCH Assignment (Iu mode only) .....	117
11.2.6	GMPRS packet downlink Ack/Nack (A/Gb mode only).....	118
11.2.6a	Packet downlink Ack/Nack (Iu mode only).....	119
11.2.6b	Packet DCH Downlink Ack/Nack (Iu mode only) .....	120
11.2.7	Packet downlink assignment (A/Gb mode only) .....	120
11.2.7a	Packet downlink assignment type 2 (Iu mode only) .....	121
11.2.7b	Multiple TBF Downlink Assignment (Iu mode only).....	122
11.2.7c	Packet TBF Assignment (Iu mode only).....	123
11.2.8	Packet downlink dummy control block .....	125
11.2.8a	Packet uplink dummy control block .....	125
11.2.9	Packet mobile TBF status .....	126
11.2.9a	Packet Measurement Report (Iu mode only).....	127
11.2.9b	Packet Measurement Order (Iu mode only).....	128
11.2.10	Packet Paging Request (A/Gb mode only).....	129
11.2.11	Packet PDCH release (Iu mode only) .....	130
11.2.12	Packet polling request.....	131
11.2.13	Packet link control .....	131
11.2.14	Packet PRACH parameters.....	131
11.2.15	Packet queuing notification.....	131
11.2.16	Packet resource request (Iu mode only).....	132
11.2.16a	Void .....	132
11.2.17	Packet PSI status.....	132
11.2.18	Packet system information type 1.....	132
11.2.19	Packet TBF release (A/Gb mode only).....	132
11.2.19a	Packet TBF release type 2 (Iu mode only).....	133
11.2.20	Void .....	134
11.2.21	Packet uplink Ack/Nack (A/Gb mode only).....	134
11.2.21a	Packet uplink Ack/Nack type 2 (Iu mode only).....	135
11.2.21b	Packet DCH Uplink Ack/Nack (Iu mode only) .....	136
11.2.22	Packet uplink assignment (A/Gb mode only) .....	136
11.2.22a	Packet uplink assignment type 2 (Iu mode only).....	138
11.2.22b	Multiple TBF Uplink Assignment (Iu mode only) .....	139
11.2.23	Void .....	141
11.2.24	Void .....	141
11.2.25	Packet link quality report (A/Gb mode only).....	141
11.2.25a	Packet link quality report type 2 (Iu mode) .....	142
11.2.26	Packet GMPRS Resume Response (A/Gb mode only).....	142
11.2.27	Packet Timeslot Reconfigure (Iu mode only) .....	143
11.2.28	Multiple TBF Timeslot Reconfigure (Iu mode only).....	144
11.2.29	Physical Information (Iu mode only) .....	146
11.2.30	PDCH Organization (Iu mode only) .....	146
11.2.31	Packet Uplink Talk Burst Control.....	146
11.2.32	Packet Uplink Talk Burst Control Response .....	147
11.2.33	Packet Link Adaptation Control .....	148
12	Information element coding .....	149
12.1	Overview .....	149

12.2	Void.....	149
12.3	GMPRS Ack/Nack description.....	149
12.3a	DCCH Ack/Nack description.....	150
12.4	Void.....	151
12.5	Void.....	151
12.6	Void.....	151
12.7	Channel Request Description.....	151
12.7a	Iu mode Channel Request Description.....	152
12.8	Frequency parameters.....	152
12.8a	Frequency Allocation.....	153
12.9	Void.....	153
12.10	Global TFI.....	153
12.10a	Void.....	154
12.10b	Void.....	154
12.10c	Void.....	154
12.10d	Void.....	154
12.10e	Void.....	154
12.11	Void.....	154
12.12	Void.....	154
12.12a	Void.....	154
12.13	Void.....	154
12.14	PRACH control parameters.....	154
12.15	Temporary Flow Identifier (TFI).....	155
12.16	Temporary logical link identity (TLLI).....	155
12.16a	GERAN Radio Network Temporary Identity (G-RNTI).....	156
12.17	Void.....	156
12.18	MAC Slot Allocation.....	156
12.18a	Slot Allocation.....	157
12.19	Void.....	157
12.20	Void.....	157
12.21	Void.....	157
12.22	Void.....	157
12.23	Void.....	157
12.24	Void.....	157
12.25	Void.....	157
12.26	Void.....	157
12.27	Void.....	157
12.28	Void.....	157
12.29	Packet link synchronization parameter.....	157
12.29a	Time and Frequency Correction.....	158
12.30	Link quality report.....	159
12.31	Number of Blocks.....	159
12.32	UTRAN Target cell.....	159
12.32a	UTRAN FDD Target cell.....	159
12.32b	UTRAN TDD Target cell.....	160
12.33	Void.....	161
12.34	Void.....	161
12.35	PDCH MCS.....	161
12.35a	DCH MCS.....	161
12.36	Channel Info.....	162
12.36a	PDCH Channel Info.....	162
12.37	PDCH Uplink Organization.....	162
12.38	Power Control Synch Offset.....	163
13	Timers and counters.....	163
13.0	General.....	163
13.1	Timers on the mobile earth station side.....	164
13.2	Timers on the network side.....	168
13.3	Counters on the mobile earth station side.....	169
13.4	Counters on the network side.....	169
<b>Annex A (normative):</b>	<b>Uplink Map (ULMAP).....</b>	<b>170</b>

A.1	When downlink carrier is mapped to one UL 5x carrier .....	170
A.2	When downlink carrier is mapped to multiple uplink carriers .....	170
<b>Annex B (informative):</b>	<b>RLC data block encoding.....</b>	<b>171</b>
<b>Annex C (informative):</b>	<b>Message sequence diagrams.....</b>	<b>172</b>
<b>Annex D (informative):</b>	<b>Examples of fixed allocation timeslot assignment.....</b>	<b>173</b>
<b>Annex E (informative):</b>	<b>Repeated fixed allocations.....</b>	<b>174</b>
<b>Annex F (informative):</b>	<b>Examples of countdown procedure operation.....</b>	<b>175</b>
<b>Annex G (informative):</b>	<b>Handling of erroneous protocol data, examples.....</b>	<b>176</b>
G.0	General .....	176
G.1	Application of error labels .....	176
G.2	Application of the "message escape" error label .....	176
G.3	Application of truncated concatenation including "spare padding" .....	177
G.4	Message extension using "padding bits" .....	178
<b>Annex H (informative):</b>	<b>Bibliography.....</b>	<b>179</b>
<b>Annex I (informative):</b>	<b>MES FER Calculation.....</b>	<b>180</b>
History	.....	181

iTEH STANDARD PREVIEW  
 (standards.iteh.ai)  
 Full standard:  
<https://standards.iteh.ai/catalog/standards/sist/d758d3-af-4-see-4d59-be5d-0e81a0fc5a8b/etsi-ts-101-376-4-12-v3.4.1-2015-10>

---

# Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETSI SR 000 314: "*Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards*", which is available from the ETSI Secretariat. Latest updates are available on the ETSI Web server (<http://ipr.etsi.org>).

Pursuant to the ETSI IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETSI SR 000 314 (or the updates on the ETSI Web server) which are, or may be, or may become, essential to the present document.

---

## Foreword

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

The contents of the present document are subject to continuing work within TC-SES and may change following formal TC-SES approval. Should TC-SES modify the contents of the present document it will then be republished by ETSI with an identifying change of release date and an increase in version number as follows:

Version 3.m.n

where:

- the third digit (n) is incremented when editorial only changes have been incorporated in the specification;
- the second digit (m) is incremented for all other types of changes, i.e. technical enhancements, corrections, updates, etc.

The present document is part 4, sub-part 12 of a multi-part deliverable covering the GEO-Mobile Radio Interface Specifications (Release 3) Third Generation Satellite Packet Radio Service, as identified below:

Part 1: "General specifications";

Part 2: "Service specifications";

Part 3: "Network specifications";

**Part 4: "Radio interface protocol specifications":**

Sub-part 1: "Mobile Earth Station-Gateway Station System (MES-GSS) Interface; GMR-1 04.001";

Sub-part 2: "GMR-1 Satellite Network Access Reference Configuration; GMR-1 04.002";

Sub-part 3: "Channel Structures and Access Capabilities; GMR-1 04.003";

Sub-part 4: "Layer 1 General Requirements; GMR-1 3G 44.004";

Sub-part 5: "Data Link Layer General Aspects; GMR-1 04.005";

Sub-part 6: "Mobile earth Station-Gateway Station Interface Data Link Layer Specifications; GMR-1 04.006";

Sub-part 7: "Mobile Radio Interface Signalling Layer 3 General Aspects; GMR-1 3G 24.007";

Sub-part 8: "Mobile Radio Interface Layer 3 Specifications; GMR-1 3G 44.008";

Sub-part 9: "Performance Requirements on the Mobile Radio Interface; GMR-1 04.013";

Sub-part 10: "Rate Adaptation on the Access Terminal-Gateway Station Subsystem (MES-GSS) Interface; GMR-1 04.021";

Sub-part 11: "Radio Link Protocol (RLP) for Data Services; GMR-1 04.022";

**Sub-part 12:** "Mobile Earth Station (MES) - Base Station System (BSS) interface; Radio Link Control/Medium Access Control (RLC/MAC) protocol; GMR-1 3G 44.060";

Sub-part 13: "Radio Resource Control (RRC) protocol; Iu Mode; GMR-1 3G 44.118";

Sub-part 14: "Mobile Earth Station (MES) - Base Station System (BSS) interface; Radio Link Control/Medium Access Control (RLC/MAC) protocol; Iu Mode; GMR-1 3G 44.160";

Sub-part 15: "Packet Data Convergence Protocol (PDCP) specification; GMR-1 3G 25.323";

Part 5: "Radio interface physical layer specifications";

Part 6: "Speech coding specifications";

Part 7: "Terminal adaptor specifications".

---

## Modal verbs terminology

In the present document "shall", "shall not", "should", "should not", "may", "need not", "will", "will not", "can" and "cannot" are to be interpreted as described in clause 3.2 of the [ETSI Drafting Rules](#) (Verbal forms for the expression of provisions).

"**must**" and "**must not**" are **NOT** allowed in ETSI deliverables except when used in direct citation.

---

## Introduction

GMR stands for GEO (Geostationary Earth Orbit) Mobile Radio interface, which is used for Mobile Satellite Services (MSS) utilizing geostationary satellite(s). GMR is derived from the terrestrial digital cellular standard GSM and supports access to GSM core networks.

The present document is part of the GMR Release 3 specifications. Release 3 specifications are identified in the title and can also be identified by the version number.

- Release 1 specifications have a GMR 1 prefix in the title and a version number starting with "1" (V1.x.x).
- Release 2 specifications have a GMPRS.1 prefix in the title and a version number starting with "2" (V2.x.x).
- Release 3 specifications have a GMR-1 3G prefix in the title and a version number starting with "3" (V3.x.x).

The GMR release 1 specifications introduce the GEO-Mobile Radio interface specifications for circuit mode Mobile Satellite Services (MSS) utilizing geostationary satellite(s). GMR release 1 is derived from the terrestrial digital cellular standard GSM (phase 2) and it supports access to GSM core networks.

The GMR release 2 specifications add packet mode services to GMR release 1. The GMR release 2 specifications introduce the GEO-Mobile Packet Radio Service (GMPRS). GMPRS is derived from the terrestrial digital cellular standard GPRS (included in GSM Phase 2+) and it supports access to GSM/GPRS core networks.

The GMR release 3 specifications evolve packet mode services of GMR release 2 to 3rd generation UMTS compatible services. The GMR release 3 specifications introduce the GEO-Mobile Radio Third Generation (GMR-1 3G) service. Where applicable, GMR-1 3G is derived from the terrestrial digital cellular standard 3GPP and it supports access to 3GPP core networks.

Due to the differences between terrestrial and satellite channels, some modifications to the GSM or 3GPP standard are necessary. Some GSM and 3GPP specifications are directly applicable, whereas others are applicable with modifications. Similarly, some GSM and 3GPP specifications do not apply, while some GMR specifications have no corresponding GSM or 3GPP specification.

Since GMR is derived from GSM and 3GPP, the organization of the GMR specifications closely follows that of GSM or 3GPP as appropriate. The GMR numbers have been designed to correspond to the GSM and 3GPP numbering system. All GMR specifications are allocated a unique GMR number. This GMR number has a different prefix for Release 2 and Release 3 specifications as follows:

- Release 1: GMR n xx.zyy