

SLOVENSKI STANDARD
SIST EN 301 349 V7.3.1:2005**01-februar-2005**

8 [[]HJb]`WV] b]`hY`Y_ca i b]_UW`g_]`g]ghYa `fZuU&ZL!`Gd`cybUfUX]`g_Ug]cf]Hj `g
dU_Y]f]Ub]a]`dcXU]`f] DFGL!`AcV]`bUdcghU`fA GL!`Ja Ygb]_`g]ghYa UVUhb]\
dcghU`f6 GGL`dfc]c`_`cb]fc`YfUX]`g_Y`dc] YnUj Y]b`Xc]g]cdUXc`dfYbc]gbY] U
a YX]`UfF @`#A57L`f] GA`\$(`"\$zfU]`]WU+`" "%z]nXUU%`- , L

Digital cellular telecommunications system (Phase 2+) (GSM); General Packet Radio Service (GPRS); Mobile Station (MS) - Base Station System (BSS) interface; Radio Link Control/Medium Access Control (RLC/MAC) protocol (GSM 04.60 version 7.3.1 Release 1998)

ITeH STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 301 349 V7.3.1:2005](https://standards.iteh.ai/catalog/standards/sist/ef815c86-cf8e-4456-813f-e78e4d0f6fb/sist-en-301-349-v7-3-1-2005)

<https://standards.iteh.ai/catalog/standards/sist/ef815c86-cf8e-4456-813f-e78e4d0f6fb/sist-en-301-349-v7-3-1-2005>

Ta slovenski standard je istoveten z: EN 301 349 Version 7.3.1

ICS:

33.070.01 Mobilni servisi na splošno Mobile services in general

SIST EN 301 349 V7.3.1:2005 en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 301 349 V7.3.1:2005](https://standards.iteh.ai/catalog/standards/sist/efa15c86-cf8e-4456-813f-e78e4d0f6fb/sist-en-301-349-v7-3-1-2005)

<https://standards.iteh.ai/catalog/standards/sist/efa15c86-cf8e-4456-813f-e78e4d0f6fb/sist-en-301-349-v7-3-1-2005>

ETSI EN 301 349 V7.3.1 (2000-09)

European Standard (Telecommunications series)

**Digital cellular telecommunications system (Phase 2+);
General Packet Radio Service (GPRS);
Mobile Station (MS) - Base Station System (BSS) interface;
Radio Link Control/Medium Access
Control (RLC/MAC) protocol
(GSM 04.60 version 7.3.1 Release 1998)**

iTeh STANDARD PREVIEW
(standards.iteh.ai)

GSM®
GLOBAL SYSTEM FOR
MOBILE COMMUNICATIONS

[SIST EN 301 349 V7.3.1:2005](https://standards.iteh.ai/catalog/standards/sist/efa15c86-cf8e-4456-813f-e78e4d0f61b/sist-en-301-349-v7-3-1-2005)

<https://standards.iteh.ai/catalog/standards/sist/efa15c86-cf8e-4456-813f-e78e4d0f61b/sist-en-301-349-v7-3-1-2005>



Reference

REN/SMG-020460Q7R2

Keywords

Digital cellular telecommunications system,
Global System for Mobile communications
(GSM), General Packet Radio Service (GPRS)

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

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 301 349 V7.3.1:2005

<https://standards.iteh.ai/catalog/standards/sist/efa15c86-cf8e-4456-813f-e78e4d0f6fb/sist-en-301-349-v7-3-1-2005>

Important notice

Individual copies of the present document can be downloaded from:

<http://www.etsi.org>

The present document may be made available in more than one electronic version or in print. In any case of existing or perceived difference in contents between such versions, the reference version is the Portable Document Format (PDF). In case of dispute, the reference shall be the printing on ETSI printers of the 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://www.etsi.org/tb/status/>

If you find errors in the present document, send your comment to:
editor@etsi.fr

Copyright Notification

No part may be reproduced except as authorized by written permission.
The copyright and the foregoing restriction extend to reproduction in all media.

© European Telecommunications Standards Institute 2000.
All rights reserved.

Contents

Intellectual Property Rights	10
Foreword.....	10
1 Scope	11
2 References	12
3 Definitions and abbreviations.....	13
3.1 Vocabulary	13
4 Layered overview of radio interface.....	14
4.1 Layer services.....	15
4.2 Layer functions.....	15
4.3 Service primitives.....	16
4.4 Services required from lower layers.....	16
5 Introduction to the Medium Access Control (MAC) procedures	16
5.1 General	16
5.2 Multiplexing principles	16
5.2.1 Temporary Block Flow	16
5.2.2 Temporary Flow Identity	16
5.2.3 Uplink State Flag	17
5.2.4 Medium Access modes	17
5.3 Packet idle mode	17
5.4 Packet transfer mode	17
5.5 General procedures in packet idle and packet transfer modes	18
5.5.1 Mobile station side.....	18
5.5.1.1 Cell reselection.....	18
5.5.1.2 System information on PBCCH	19
5.5.1.2.1 Supervision of PBCCH_CHANGE_MARK and update of PBCCH information	19
5.5.1.2.2 Replacement of PBCCH.....	20
5.5.1.2.3 PSII reception failure.....	20
5.5.1.3 System information on BCCH	20
5.5.1.3.1 Supervision of BCCH_CHANGE_MARK and update of BCCH information	20
5.5.1.3.2 Establishment of PBCCH	21
5.5.1.3.3 SII3 reception failure	21
5.5.1.4 Acquisition of system information on the broadcast channel.....	21
5.5.1.4.1 Consistent sets of system information messages	22
5.5.1.4.2 Suspension of operation to receive system information	22
5.5.1.4.3 Request for acquisition of system information	22
5.5.1.5 Discontinuous reception (DRX).....	23
5.5.1.6 Page mode procedures on PCCCH.....	23
5.5.1.7 Frequency Parameters	24
5.5.1.8 TLLI management.....	25
5.5.2 Network side.....	25
5.5.2.1 System Information broadcasting.....	25
5.5.2.1.1 System information on PBCCH	25
5.5.2.1.2 System information on BCCH.....	25
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	27
5.6 Measurement reports	27
5.6.1 Network Control (NC) measurement reporting	27
5.6.2 Extended measurement (EM) reporting.....	28
6 Paging procedures	28
6.1 Paging procedure for RR connection establishment.....	28
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
6.2.1	Paging procedure using paging subchannel on CCCH	30
6.2.2	Paging using paging subchannel on PCCCH	30
6.2.3	Paging response	30
7	Medium Access Control (MAC) procedures on PCCCH	30
7.1	TBF establishment initiated by the mobile station on PCCCH	30
7.1.1	Permission to access the network	31
7.1.2	Initiation of a TBF establishment	31
7.1.2.1	Initiation of the packet access procedure	31
7.1.2.1.1	Access persistence control on PRACH	31
7.1.2.2	Packet assignment procedure	32
7.1.2.2.1	On receipt of a PACKET CHANNEL REQUEST message	32
7.1.2.2.2	Packet access queuing notification procedure	33
7.1.2.2.3	Packet polling procedure	34
7.1.2.2.4	Packet access reject procedure	34
7.1.2.3	Contention resolution at one phase access	35
7.1.2.4	One phase packet access completion	35
7.1.2.5	Timing Advance	35
7.1.3	TBF establishment using two phase access	35
7.1.3.1	Initiation of the Packet resource request procedure	35
7.1.3.2	Packet resource assignment for uplink procedure	36
7.1.3.2.1	On receipt of a PACKET RESOURCE REQUEST message	36
7.1.3.3	Contention resolution at two phase access	36
7.1.3.4	Two phase packet access completion	37
7.1.3.5	Timing Advance	37
7.1.4	Abnormal cases	37
7.2	TBF establishment initiated by the network on PCCCH	37
7.2.1	Entering the packet transfer mode	37
7.2.1.1	Packet downlink assignment procedure	38
7.2.1.2	Packet downlink assignment procedure completion	39
7.2.1.3	Packet polling procedure	39
7.2.2	Abnormal cases	39
7.3	Procedure for measurement report sending in packet idle mode	39
7.3.1	Measurement report sending procedure initiated on PCCCH	39
7.3.1.1	On receipt of a PACKET CHANNEL REQUEST message	40
7.3.1.2	On receipt of a PACKET UPLINK ASSIGNMENT message	40
7.3.1.3	On receipt of a PACKET ACCESS REJECT message	40
7.3.1.4	Abnormal cases	40
7.3.2	Measurement report sending procedure initiated on CCCH	40
7.4	Cell Change Order procedures in Packet Idle mode	41
7.4.1	Cell Change Order procedure initiated on PCCCH	41
7.4.2	Cell Change Order procedure initiated on CCCH	41
7.5	Measurement Order procedures in Packet Idle mode	42
7.5.1	Measurement Order procedures initiated on PCCCH	42
7.5.2	Measurement Order procedures initiated on CCCH	42
8	Medium Access Control (MAC) Procedures in Packet Transfer Mode	43
8.1	Transfer of RLC data blocks	43
8.1.1	Uplink RLC data block transfer	43
8.1.1.1	Dynamic allocation uplink RLC data block transfer	44
8.1.1.1.1	PACCH operation	44
8.1.1.1.2	Resource Reallocation for Uplink	45
8.1.1.1.2.1	Abnormal cases	46
8.1.1.1.3	Establishment of Downlink TBF	46
8.1.1.1.3.1	Abnormal cases	47
8.1.1.2	Extended Dynamic Allocation uplink RLC data block transfer	47
8.1.1.2.1	Uplink PDCH Allocation	47
8.1.1.2.2	PACCH operation	47
8.1.1.2.3	Neighbour cell power measurements	48

8.1.1.3	Fixed Allocation uplink RLC data block transfer	48
8.1.1.3.1	Transfer of RLC/MAC blocks	48
8.1.1.3.2	Reallocation for open-ended TBF	49
8.1.1.3.2.1	At the beginning of each fixed allocation	50
8.1.1.3.2.2	Upon receipt of the reallocation request	50
8.1.1.3.2.3	Upon exhaustion of the current allocation	51
8.1.1.3.2.4	Ending the TBF.....	51
8.1.1.3.2.5	Abnormal Cases	51
8.1.1.3.3	Neighbour cell power measurements.....	52
8.1.1.3.4	PACCH operation.....	52
8.1.1.3.5	Establishment of Downlink TBF	52
8.1.1.3.5.1	Abnormal cases.....	53
8.1.1.4	Network initiated release of uplink TBF.....	54
8.1.1.5	Abnormal cases	54
8.1.2	Downlink RLC data block transfer	55
8.1.2.1	Downlink RLC data block transfer	55
8.1.2.1.1	Abnormal cases	55
8.1.2.2	Polling for Packet Downlink Ack/Nack.....	56
8.1.2.3	Spare	56
8.1.2.4a	Establishment of downlink TBF after downlink TBF release.....	56
8.1.2.4.1	Abnormal cases	57
8.1.2.5	Establishment of uplink TBF	57
8.1.2.5.1	Abnormal cases	58
8.1.2.6	Spare	59
8.1.2.7	Fixed allocation neighbour cell power measurements	59
8.1.2.8	Network initiated abnormal release of downlink TBF	59
8.1.3	Concurrent TBF procedures for half duplex operation	59
8.1.3.1	Spare	59
8.1.3.2	Spare	59
8.1.3.2.1	Saving downlink TBF state and initiating uplink TBF	60
8.1.3.2.2	Saving downlink TBF state and restoring uplink TBF state	60
8.1.3.2.3	Ending downlink TBF and restoring uplink TBF state	60
8.1.3.2.4	Saving uplink TBF state and initiating downlink TBF	60
8.1.3.2.5	Saving uplink TBF state and restoring downlink TBF state	60
8.1.3.2.6	Ending uplink TBF and restoring downlink TBF state.....	60
8.2	Packet PDCH Release	60
8.3	Procedure for measurement report sending in Packet Transfer mode	61
8.4	Network controlled cell reselection procedure.....	61
8.4.1	Network controlled cell reselection completion	61
8.4.2	Abnormal cases.....	62
8.5	Measurement Order procedures in Packet Transfer mode.....	62
8.6	PACKET CONTROL ACKNOWLEDGEMENT	63
8.7	Abnormal cases	63
8.7.1	Abnormal release with return to CCCH or PCCCH	63
8.7.2	Abnormal release with random access.....	63
8.7.3	Abnormal release with system information	63
9	Radio Link Control (RLC) procedures in packet transfer mode	64
9.1	Procedures and parameters for peer-to-peer operation.....	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).....	65
9.1.3	Acknowledge state array V(B).....	65
9.1.4	Block sequence number BSN	65
9.1.4a	Reduced Block Sequence Number RBSN	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
9.1.8	Starting sequence number (SSN) and received block bitmap (RBB)	66
9.1.9	Window Size.....	67
9.1.10	Segmentation of LLC PDUs into RLC data units.....	67
9.1.11	Re-assembly of LLC PDUs from RLC data units.....	67

9.1.11a	Segmentation of RLC/MAC control messages into RLC/MAC control blocks	68
9.1.11b	Re-assembly of RLC/MAC control messages from RLC/MAC control blocks	68
9.1.12	Priority of LLC PDUs.....	69
9.2	Operation during RLC/MAC control message transfer	69
9.3	Operation during RLC data block transfer	69
9.3.1	Countdown procedure.....	69
9.3.2	Acknowledged mode operation	70
9.3.2.1	Establishment of Temporary Block Flow	70
9.3.2.2	Operation of uplink Temporary Block Flow.....	70
9.3.2.3	Release of uplink Temporary Block Flow	71
9.3.2.4	Operation of downlink Temporary Block Flow	71
9.3.2.5	Release of downlink Temporary Block Flow.....	72
9.3.3	Unacknowledged mode operation.....	72
9.3.3.1	Establishment of Temporary Block Flow	72
9.3.3.2	Operation of uplink Temporary Block Flow.....	72
9.3.3.3	Release of uplink Temporary Block Flow	73
9.3.3.4	Operation of downlink Temporary Block Flow	73
9.3.3.5	Release of downlink Temporary Block Flow.....	74
9.4	Abnormal release cases	74
9.4.1	Abnormal release with random access.....	74
9.4.2	Abnormal release with cell reselection	74
10	RLC/MAC block structure	75
10.1	Spare bits	75
10.2	RLC data blocks	75
10.2.1	Downlink RLC data block	76
10.2.2	Uplink RLC data block	76
10.3	RLC/MAC control blocks	76
10.3.1	Downlink RLC/MAC control block	77
10.3.2	Uplink RLC/MAC control block	77
10.4	Header fields	77
10.4.1	Uplink state flag (USF) field.....	77
10.4.2	Retry (R) bit.....	77
10.4.3	Stall indicator (SI) bit	78
10.4.4	Supplementary/Polling (S/P) Bit	78
10.4.5	Relative Reserved Block Period (RRBP) field	78
10.4.6	Countdown Value (CV) field.....	79
10.4.7	Payload Type field	79
10.4.8	Final block indicator (FBI) bit	79
10.4.9	TLLI Indicator (TI) bit.....	79
10.4.9a	Address Control (AC) bit.....	80
10.4.9b	Final Segment (FS) bit.....	80
10.4.9c	Radio Transaction Identifier (RTI) field.....	80
10.4.9d	Direction (D) bit	80
10.4.10	Temporary Flow Identity (TFI) field	80
10.4.10a	Power Reduction (PR) field	80
10.4.11	Extension (E) Bit	81
10.4.12	Block Sequence Number (BSN) field.....	81
10.4.12a	Reduced Block Sequence Number (RBSN) bit	81
10.4.13	More (M) bit	82
10.4.14	Length Indicator (LI) field	82
10.4.15	TLLI field	82
10.4.16	RLC data field.....	83
10.4.17	Control message contents field	83
11.1	Handling of erroneous protocol data	84
11.1.1	Message classification	84
11.1.1.1	Distribution messages	84
11.1.1.2	Non-distribution messages	85
11.1.1.2.1	Format of the address information.....	85
11.1.2	Error detection mechanism	85
11.1.3	Error labels.....	85
11.1.3.1	Generic error labels	86

11.1.3.2	'Ignore' error label	86
11.1.3.3	'Message escape' error label	87
11.1.4	Error detection and order of precedence	87
11.1.4.1	Unknown message type.....	87
11.1.4.2	Message not compatible with current protocol state	87
11.1.4.3	Syntactically incorrect message	87
11.1.4.3.1	Messages with error label: 'Distribution part error'	88
11.1.4.3.2	Messages with error label: 'Address information part error'	88
11.1.4.3.3	Messages with error label: 'Non-distribution part error'	88
11.1.4.3.4	Messages with error label: 'Message escape'	88
11.1.4.3.5	Messages with error label: 'Ignore'	88
11.1.4.4	Syntactic error in truncated concatenation	88
11.1.4.5	Exceptions	89
11.2	RLC/MAC control messages.....	89
11.2.0	Message format.....	90
11.2.0.1	Downlink RLC/MAC messages.....	91
11.2.0.2	Uplink RLC/MAC messages.....	92
11.2.1	Packet Access Reject	93
11.2.2	Packet Control Acknowledgement	94
11.2.3	Packet Cell Change Failure.....	95
11.2.4	Packet Cell Change Order.....	96
11.2.5	Packet Channel Request.....	98
11.2.6	Packet Downlink Ack/Nack.....	100
11.2.7	Packet Downlink Assignment.....	102
11.2.8	Packet Downlink Dummy Control Block	105
11.2.8a	Void	105
11.2.8b	Packet Uplink Dummy Control Block.....	105
11.2.9	Packet Measurement Report	106
11.2.9a	Void	108
11.2.9b	Packet Measurement Order.....	109
11.2.9c	Packet Mobile TBF Status	114
11.2.10	Packet Paging Request.....	115
11.2.11	Packet PDCH Release.....	117
11.2.12	Packet Polling Request	118
11.2.13	Packet Power Control/Timing Advance	119
11.2.14	Packet PRACH Parameters.....	120
11.2.15	Packet Queueing Notification	121
11.2.16	Packet Resource Request	122
11.2.17	Packet PSI Status	124
11.2.18	Packet System Information Type 1.....	126
11.2.19	Packet System Information Type 2.....	129
11.2.19.1	Reference Frequency Lists in PSI2	131
11.2.19.2	Cell Allocation in PSI2	131
11.2.19.3	GPRS Mobile Allocation in PSI2.....	132
11.2.19.4	PCCCH Description	132
11.2.19.5	Abnormal cases	132
11.2.20	Packet System Information Type 3.....	133
11.2.21	Packet System Information Type 3 bis	140
11.2.22	Packet System Information Type 4.....	143
11.2.23	Packet System Information Type 5.....	145
11.2.24	Spare	148
11.2.25	Packet System Information 13	149
11.2.26	Packet TBF Release	152
11.2.27	Spare	152
11.2.28	Packet Uplink Ack/Nack	153
11.2.29	Packet Uplink Assignment.....	156
11.2.30	Spare	161
11.2.31	Packet Timeslot Reconfigure.....	162
12	Information element coding	168
12.1	Overview	168
12.2	Spare.....	168

12.3	Ack/Nack Description	168
12.4	ALLOCATION_BITMAP	169
12.5	Spare.....	169
12.6	Spare.....	169
12.7	Channel Request Description	170
12.8	Frequency Parameters	171
12.8.1	Abnormal cases.....	172
12.9	Global Power Control Parameters	173
12.10	Global TFI	174
12.10a	GPRS Mobile Allocation.....	174
12.10a.1	Abnormal cases.....	175
12.11	Packet Request Reference	175
12.12	Packet Timing Advance	176
12.12a	Global Packet Timing Advance.....	177
12.13	Power Control Parameters.....	178
12.14	PRACH Control Parameters.....	178
12.15	Temporary Flow Identity (TFI)	180
12.16	Temporary Logical Link Identity (TLLI)	181
12.17	Temporary Queueing Identifier (TQI).....	181
12.18	TIMESLOT_ALLOCATION.....	181
12.19	TS_OVERRIDE	181
12.20	PAGE_MODE.....	182
12.21	Starting Framenumber Description	182
12.21.1	Absolute Framenumber Encoding	182
12.21.2	Relative Framenumber Encoding	182
12.22	Spare.....	183
12.23	Cell Identification.....	183
12.24	GPRS Cell Options.....	184
12.25	PCCCH Organization Parameters	186
12.26	Extension Bits IE.....	186
12.27	Non GPRS Cell Options IE	187
13	Timers and counters	189
13.1	Timers on the Mobile Station side	189
13.2	Timers on the network side	193
13.3	Counters on the Mobile Station side	194
13.4	Counters on the Network side	194

iTech STANDARD PREVIEW
(standards.itech.ai)

[SIST EN 301 349 V7.3.1:2005](https://standards.itech.ai/catalog/standards/sist/en/15-c86-cf8c-4456-813f-e78c4d01611b/sist-en-301-349-v7-3-1-2005)

<https://standards.itech.ai/catalog/standards/sist/en/15-c86-cf8c-4456-813f-e78c4d01611b/sist-en-301-349-v7-3-1-2005>

Annex A (informative):	Bibliography.....	195
Annex B (informative):	RLC data block encoding.....	196
B.1	Example 1.....	196
B.2	Example 2.....	197
B.3	Example 3.....	198
B.4	Example 4.....	199
B.5	Example 5.....	199
B.6	Example 6.....	200
B.7	Example 7.....	201
Annex C (informative):	Message Sequence Diagrams	202
Annex D (informative):	Examples of Fixed Allocation Timeslot Assignment.....	203
Annex E (informative):	Repeated Fixed Allocations.....	207
Annex F (informative):	Examples of Countdown procedure operation.....	209
F.1	Example 1.....	209
F.2	Example 2.....	210
F.3	Example 3.....	210
Annex G (informative):	Handling of erroneous protocol data, examples.....	211
G.1	Application of error labels.....	211
G.2	Application of the 'Message escape' error label.....	211
G.3	Application of truncated concatenation including 'padding bits'.....	212
G.4	Message extension using 'padding bits'.....	213
Annex H (informative):	Document change History	214
History		216

iTech STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 301 349 V7.3.1:2005
<https://standards.iteh.ai/catalog/standards/sist/efa15c86-cf8e-4456-813f-e78e4d01611b/sist-en-301-349-v7-3-1-2005>

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://www.etsi.org/ipr>).

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 European Standard (Telecommunications series) has been produced by ETSI Technical Committee Special Mobile Group (SMG).

The present document specifies the procedures used at the radio interface (Reference Point Um, see GSM 04.02) for the General Packet Radio Service (GPRS) Medium Access Control /Radio Link Control (MAC/RLC) layer within the digital cellular telecommunications system (Phase 2+).

The contents of the present document are subject to continuing work within SMG and may change following formal SMG approval. Should SMG modify the contents of the present document it will then be re-submitted for OAP with an identifying change of release date and an increase in version number as follows:

Version 7.x.y

where:

- 7 indicates GSM Release 1998 of Phase 2+
- x the second digit is incremented for changes of substance, i.e. technical enhancements, corrections, updates, etc.
- y the third digit is incremented when editorial only changes have been incorporated in the specification.

National transposition dates

Date of adoption of this EN:	25 August 2000
Date of latest announcement of this EN (doa):	30 November 2000
Date of latest publication of new National Standard or endorsement of this EN (dop/e):	31 May 2001
Date of withdrawal of any conflicting National Standard (dow):	31 May 2001

1 Scope

The present document specifies the procedures used at the radio interface (Reference Point Um, see GSM 04.02) for the General Packet Radio Service (GPRS) Medium Access Control /Radio Link Control (MAC/RLC) layer.

When the notations for "further study" or "FS" or "FFS" are present in the present document they mean that the indicated text is not a normative portion of the present document.

The present document is applicable to the following GPRS Um functional layers:

- Radio Link Control functions;
- Medium Access Control functions; and
- Physical Link Control functions.

The procedures described in the present document are for the RLC/MAC functions of the GPRS radio interface (Um) when operating on a Packet Data Channel (PDCH).

GSM 03.64 contains an overview of the GPRS radio interface (Um).

GSM 04.03 and GSM 04.04 contains the definition of the control channels used in the present document.

GSM 04.07 contains a description in general terms of the structured functions and procedures of this protocol and the relationship of this protocol with other layers and entities.

GSM 04.08 contains the definition of GPRS RLC/MAC procedures when operating on the Common Control Channel (CCCH).

GSM 04.64 contains functional procedures for the Logical Link Control (LLC) layer.

Application to interface structure

The RLC/MAC procedures apply to the interface structures defined in GSM 04.03. They use the functions and services provided by layer 1 defined in GSM 04.04. GSM 04.07 gives the general description of layer 3 including procedures, messages format and error handling.

Test procedures

Test procedures of the GSM radio interface signalling are described in GSM 11.10 and GSM 11.2x series.

Use of logical control channels

The logical control channels are defined in GSM 05.02. Two similar sets of logical channels are defined. The first set consists of the logical channels:

- Broadcast Control Channel (BCCH): downlink only, used to broadcast Cell specific information;
- Paging Channel (PCH): downlink only, used to send page requests to Mobile Stations (MSs);
- Random Access Channel (RACH): uplink only, used to request GPRS resources or a Dedicated Control Channel;
- Access Grant Channel (AGCH): downlink only, used to allocate GPRS resources or a Dedicated Control Channel;
- The second set consists of the logical channels:
 - Packet Broadcast Control Channel (PBCCH): downlink only, used to broadcast Cell specific information;
 - Packet Paging Channel (PPCH): downlink only, used to send page requests to Mobile Stations (MSs);
 - Packet Random Access Channel (PRACH): uplink only, used to request GPRS resources;
 - Packet Access Grant Channel (PAGCH): downlink only, used to allocate GPRS resources;

- Packet Associated Control Channel (PACCH): bi-directional, associated with a Temporary Block Flow (TBF);
- Packet Timing advance control channel uplink (PTCCH/U): used to transmit random access bursts to allow estimation of the timing advance for one MS in transfer state;
- Packet Timing advance control channel downlink (PTCCH/D): used to transmit timing advance updates for several MS. One PTCCH/D is paired with several PTCCH/U's.

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.
- For this Release 1998 document, references to GSM documents are for Release 1998 versions (version 7.x.y).

- [1] GSM 01.04: "Digital cellular telecommunications system (Phase 2+); Abbreviations and acronyms".
- [2] GSM 02.60: "Digital cellular telecommunications system (Phase 2+); Stage 1 Service Description of the General Packet Radio Service (GPRS)".
- [3] GSM 03.03: "Digital cellular telecommunications system (Phase 2+); Numbering, addressing and identification".
- [4] GSM 03.13: "Digital cellular telecommunications system (Phase 2+); Discontinuous Reception (DRX) in the GSM system".
- [5] GSM 03.64: "Digital cellular telecommunications system (Phase 2+); General Packet Radio Service (GPRS); Overall description of GPRS radio Interface; Stage 2".
- [6] GSM 04.02: "Digital cellular telecommunications system (Phase 2+); GSM Public Land Mobile Network (PLMN) access reference configuration".
- [7] GSM 04.03: "Digital cellular telecommunications system (Phase 2+); Mobile Station - Base Station System (MS - BSS) interface Channel structures and access capabilities".
- [8] GSM 04.04: "Digital cellular telecommunications system (Phase 2+); Layer 1 General requirements".
- [9] GSM 04.05: "Digital cellular telecommunications system (Phase 2+); Data Link (DL) layer General aspects".
- [10] GSM 04.07: "Digital cellular telecommunications system (Phase 2+); Mobile radio interface signalling layer 3 General aspects".
- [11] GSM 04.08: "Digital cellular telecommunications system (Phase 2+); Mobile radio interface layer 3 specification".
- [12] GSM 04.64: "Digital cellular telecommunications system (Phase 2+); General Packet Radio Service (GPRS); Logical Link Control (LLC)".
- [13] GSM 05.02: "Digital cellular telecommunications system (Phase 2+); Multiplexing and multiple access on the radio path".

- [14] GSM 05.03: "Digital cellular telecommunications system (Phase 2+); Channel coding".
- [15] GSM 05.08: "Digital cellular telecommunications system (Phase 2+); Radio subsystem link control".
- [16] GSM 05.10: "Digital cellular telecommunications system (Phase 2+); Radio subsystem synchronisation".
- [17] GSM 11.10: "Digital cellular telecommunications system (Phase 2+); Mobile Station (MS) conformity specification".
- [18] GSM 11.21: "Digital cellular telecommunications system (Phase 2); The GSM Base Station System (BSS) equipment specification".

3 Definitions and abbreviations

Abbreviations used in the present document are listed in GSM 01.04 and GSM 02.60.

3.1 Vocabulary

For the purposes of the present document, the following terms and definitions apply:

Block period: block period is the sequence of four timeslots on a PDCH used to convey one radio block.

GPRS multislot class: term GPRS multislot class refers to the different mobile station capabilities to transmit and receive on different combinations of multiple PDCHs. The multislot classes are defined in GSM 05.02. Note that the mobile station may indicate different multislot classes for circuit mode services and for GPRS (see GSM 04.08). Different multislot class mobile stations are capable of supporting different medium access modes (see subclause 5.2.4).

Packet idle mode: in packet idle mode, the mobile station is prepared to transfer LLC PDUs on packet data physical channels (see subclause 5.3). The mobile station is not allocated any radio resource on a packet data physical channel; it listens to the PBCCH and PCCCH or, if those are not provided by the network, to the BCCH and the CCCH.

Packet transfer mode: in packet transfer mode, the mobile station is prepared to transfer LLC PDUs on packet data physical channels (see subclause 5.4). The mobile station is allocated radio resource on one or more packet data physical channels for the transfer of LLC PDUs.

Radio block: radio block is the sequence of four normal bursts carrying one RLC/MAC protocol data unit (see GSM 04.04). (The one exception is a radio block occasionally used on PACCH consisting of a sequence of four access bursts, each carrying a repetition of one short RLC/MAC block.)

Random values: in a number of places in this Technical Specification, it is mentioned that some value must take a "random" value, in a given range, or more generally with some statistical distribution. For such random values refer to GSM 04.08.

RLC/MAC block: RLC/MAC block is the protocol data unit exchanged between RLC/MAC entities (see clause 10 and GSM 04.04).

RLC/MAC control block: RLC/MAC control block is the part of a RLC/MAC block carrying a control message between RLC/MAC entities (see subclause 10.3).

RR connection: RR connection is a physical connection established between a mobile station and the network to support the upper layers' exchange of information flows. An RR connection is maintained and released by the two peer entities.

RLC data block: RLC data block is the part of a RLC/MAC block carrying user data or upper layers' signalling data (see subclause 10.2).

TBF abort: term "abort" as applied to TBF is used when the TBF is abruptly stopped without using the Release of TBF procedures defined in clause 9.