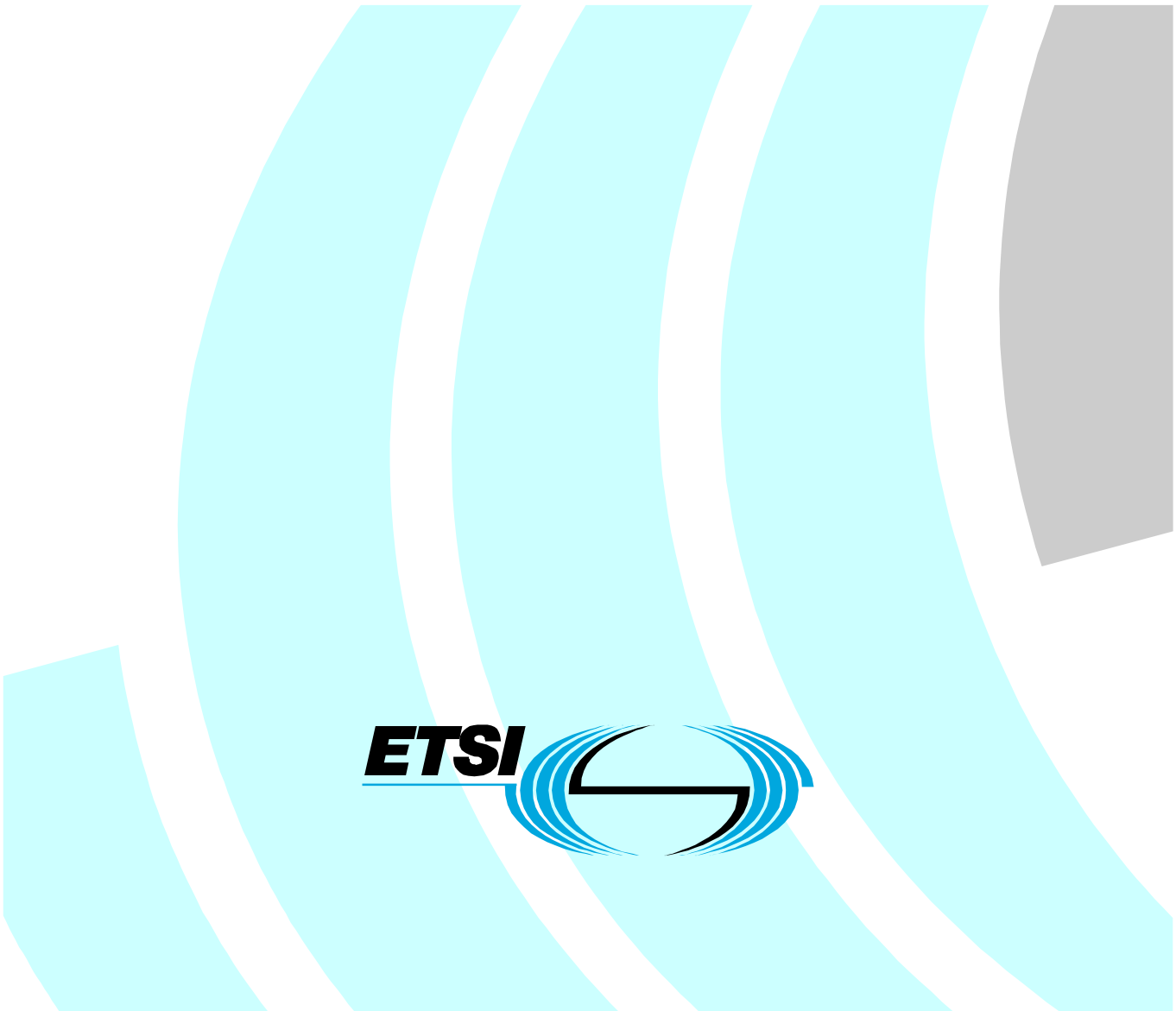
ETSI TS 101 376-1-2 V2.1.1 (2003-03)

Technical Specification

GEO-Mobile Radio Interface Specifications (Release 2);
General Packet Radio Service;
Part 1: General specifications;
Sub-part 2: Introduction to the GMR-1 family;
GMPRS-1 01.201



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Contents

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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:

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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 1, sub-part 2 of a multi-part deliverable covering the GEO-Mobile Radio Interface Specifications, as identified below:

Part 1: "General specifications";

Sub-part 1: "Abbreviations and acronyms; GMR-1 01.004";

Sub-part 2: "Introduction to the GMR-1 family; GMR-1 01.201";

Sub-part 3: "General System Description; GMR-1 01.202";

Part 2: "Service specifications";

Part 3: "Network specifications";

Part 4: "Radio interface protocol specifications";

Part 5: "Radio interface physical layer specifications";

Part 6: "Speech coding specifications";

Part 7: "Terminal adaptor specifications".

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 specification is part of the GMR Release 2 specifications. Release 2 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.)

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.

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

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

- Release 1: GMR-n xx.zyy
- Release 2: GMPRS-n xx.zyy

where:

- xx.0yy (z = 0) is used for GMR specifications that have a corresponding GSM specification. In this case, the numbers xx and yy correspond to the GSM numbering scheme.
- xx.2yy (z = 2) is used for GMR specifications that do not correspond to a GSM specification. In this case, only the number xx corresponds to the GSM numbering scheme and the number yy is allocated by GMR.
- n denotes the first (n = 1) or second (n = 2) family of GMR specifications.

A GMR system is defined by the combination of a family of GMR specifications and GSM specifications as follows:

- If a GMR specification exists it takes precedence over the corresponding GSM specification (if any). This precedence rule applies to any references in the corresponding GSM specifications.

NOTE: Any references to GSM specifications within the GMR specifications are not subject to this precedence rule. For example, a GMR specification may contain specific references to the corresponding GSM specification.

- If a GMR specification does not exist, the corresponding GSM specification may or may not apply. The applicability of the GSM specifications is defined in the present document.

1 Scope

The present document gives a general introduction to the GEO Mobile Radio interface (GMR) specifications in the GMR-1 family.

The present document introduces both the Release 1 and the Release 2 specifications.

The GMR-1 specifications are organized into series that correspond to the organization of the ETSI GSM technical specifications. Clause 4 of the present document defines the contents of each GMR-1 series and shows how the individual GMR-1 specifications relate to their GSM counterparts. Clause 5 of the present document defines the relationship between GMR-1 terminology and the GSM terminology.

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 and/or edition number or version number) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies.

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

[1] GMR-1 01.004 (ETSI TS 101 376-1-1): "GEO-Mobile Radio Interface Specifications; Part 1: General specifications; Sub-part 1: Abbreviations and acronyms; GMR-1 01.004".

[2] GMR-1 03.001 (ETSI TS 101 376-3-1): "GEO-Mobile Radio Interface Specifications; Part 3: Network specifications; Sub-part 1: Network Functions; GMR-1 03.001".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the terms and definitions given in GMR-1 01.004 [1] and the following apply:

GSM applies: this feature is identical to GSM and hence the associated GSM specification applies

GMR specific: this GMR specification describes a new GMR feature that has no equivalent feature in GSM

Replaces GSM: the GMR specification is a replacement for the associated GSM specification. The GMR specification may make reference to the associated GSM specification

3.2 Abbreviations

For the purposes of the present document, the abbreviations defined in GMR-1 01.004 [1] apply.

4 GEO mobile radio interface specifications (GMR-1)

4.1 Scope of the GMR-1 family of specifications

The GEO-Mobile Radio Interface Specifications (GMR-1) is a family of specifications which specify the requirements for implementing the GMR-1 radio interface for Mobile Earth Stations (MESs) communicating using Geosynchronous Earth Orbit satellites and interworking into a GSM core network. The MES may be a handheld, mobile or fixed terminal.

The GMR-1 specifications are based upon the GSM (Global System for Mobile Communications) specifications. The GMR specifications define the differences (i.e. the modifications) relative to the GSM specifications that deal with the different system requirements such as the path losses and delays associated with satellite communications using a Geosynchronous Earth orbit satellite.

4.2 GMR-1 Release 1 and Release 2

The GMR-1 family of specifications is organized into two releases:

Release 1 specifications. This release of specifications defines the GMR-1 circuit mode services, which are based on the GSM phase 2 circuit mode services. The contents of the Release 1 family of specifications are defined in annex A.

Release 2 specifications. This release of specifications define the GMR-1 packet mode services (GMPRS-1) which are based on the GSM phase 2+ packet mode services (GPRS). The contents of the Release 2 family of specifications are defined in annex B.

4.3 Contents of the GMR-1 document series

The GMR-1 family of specifications are organized in document series that correspond the GSM document structure as follows:

- 01-series; General specifications.
- 02-series; Service specifications.
- 03-series; Network specifications.
- 04-series; Radio interface protocol specifications.
- 05-series; Radio interface physical layer specifications.
- 06-series; Speech coding specifications.
- 07-series; Terminal adaptor specifications.

4.4 Numbering of GMR-1 specifications

The GMR-1 specifications follow the GMR numbering rules as described in the Introduction clause to the present document. The GMR document numbering is based on the GSM numbering, except that the GMR documents use a 3-digit document number after the 2-digit series number.

With the exception of GMR-1 specific documents (i.e. those for which no equivalent GSM specification exists) the GMR document numbers within each series are aligned with the equivalent GSM document numbers and this means that these GMR-1 specifications can be directly associated with the corresponding GSM specification. For example, GMR-1 03.001 [2] is associated with GSM 03.01.

4.5 Contents of GMR-1 family of specifications

The complete contents of the GMR-1 Release 1 specifications are given in annex A.

The complete contents of the GMR-1 Release 2 (GMPRS) specifications are given in annex B.

Where appropriate the GMR-1 specifications include references to the corresponding GSM specifications. The relationship between the GMR-1 specifications and the corresponding GSM specifications is defined in annexes A and B using the terminology defined below.

Table 1: GMR-1 specifications

Terminology	Definition
GSM applies	This feature is identical to GSM and hence the associated GSM specification applies.
GMR specific	This GMR specification describes a new GMR feature that has no equivalent feature in GSM.
Replaces GSM	The GMR specification is a replacement for the associated GSM specification. The GMR specification may make reference to the associated GSM specification.

NOTE 1: The associated GSM specification (if any) is directly indicated by the document number as described in clause 4.3.

NOTE 2: In the case of "GSM applies" or "Replaces GSM" the terminology translation defined in clause 5 should be applied when reading the associated GSM specification.

5 Terminology cross reference

This clause provides a terminology cross-reference table that provides a cross-reference between a series of common GSM terms and the equivalent terms that are used in the GMR-1 specifications.

The terminology translations defined in this table should be applied when reading any of the associated GSM specifications (as defined in clause 4) or when reading any GSM specifications that are referenced directly or indirectly by a GMR-1 specification.

GSM term	GMR-1 term	Notes
BSC (Base Station Controller)	GSC (Gateway Station Controller)	
BSS (Base Station System)	Release 1: GSS (Gateway Station System) Release 2: BSS (same as GSM)	
BTS (Base Transceiver Station)	GTS (Gateway Transceiver Station)	
Cell	Spot beam	
GSM	GMR-1	
GSM PLMN	GMR PLMN	
GSM GPRS	GMPRS	
ME (Mobile Equipment)	MES-ME (Mobile Earth Station - Mobile Equipment).	note
MS (Mobile Station)	MES-MS (Mobile Earth Station - Mobile Station).	note
MSC (Mobile Switching Centre)	GSS-MSC (Gateway Station Subsystem-Mobile Switching Centre)	
NOTE: The terms MES-ME and MES-MS are specific terms that indicate a terminal without and with a SIM card respectively. In cases where this distinction is not required, the term "MES" may be used.		

Annex A (informative): Contents of Release 1 of the GMR-1 family

A.1 Contents of the 01-series

GMR number	GSM number	Short title	Comment
01.004		Abbreviations and acronyms	Replaces GSM
01.201		Introduction to the GMR-1 family	GMR specific
01.202		GMR-1 General System Description	GMR specific

A.2 Contents of the 02-series

GMR number	GSM number	Short title	Comment
	02.01	Principles of Telecommunication Services Supported by a GSM Public Land Mobile Network (PLMN)	GSM applies
	02.02	Bearer Services (BS) Supported by a GSM Public Land Mobile Network (PLMN)	GSM applies
	02.03	Teleservices Supported by a GSM Public Land Mobile Network (PLMN)	GSM applies
	02.04	General on Supplementary Services	GSM applies
	02.09	Security Aspects	GSM applies
02.011		Service Accessibility	Replaces GSM
	02.16	International Mobile Station Equipment Identities (IMEI)	GSM applies
	02.17	Subscriber Identity Modules, Functional Characteristics	GSM applies
	02.40	Procedures for Call Progress Indications	GSM applies
	02.41	Operator Determined Barring	GSM applies
	02.81	Line Identification Supplementary Services- Stage 1	GSM applies
	02.82	Call Forwarding (CF) Supplementary Services - Stage 1	GSM applies
	02.83	Call Waiting (CW) and Call Hold (HOLD) Supplementary Services - Stage 1	GSM applies
	02.84	MultiParty (MPTY) Supplementary Services - Stage 1	GSM applies
	02.85	Closed User Group (CUG) Supplementary Services - Stage 1	GSM applies
	02.88	Call Barring (CB) Supplementary Services - Stage 1	GSM applies
	02.90	Stage 1 Decision of Unstructured Supplementary Service Data (USSD)	GSM applies

A.3 Contents of the 03-series

GMR number	GSM number	Short title	Comment
03.001		Network functions	Replaces GSM
03.002		Network architecture	Replaces GSM
03.003		Numbering, addressing and identification	Replaces GSM
	03.04	Signalling Requirements Relating to Routing of Calls to Mobile Subscribers	GSM applies
	03.07	Restoration Procedures	GSM applies
03.008		Organization of subscriber data	Replaces GSM
	03.10	GMR network connection types	GSM applies
03.011		Technical realization of supplementary services	Replaces GSM
03.012		Location registration and position identification procedures	Replaces GSM
03.013		Discontinuous Reception (DRX) in the GMR-1 system	Replaces GSM
03.014		Support of Dual Tone Multi-Frequency signalling (DTMF) via the GMR-1 system	Replaces GSM
	03. 15	Technical Realization of Operator Determined Barring	GSM applies
	03.16	Subscriber Data Management	GSM applies
03.020		Security related network functions	Replaces GSM
03.022		Functions Related to the Mobile Earth Station (MES) in Idle Mode	Replaces GSM
	03.38	Alphabets and Language Specific Information for GSM	GSM applies
03.040		Technical realization of the Short Message Service (SMS) Point-to-Point (PP)	Replaces GSM
03.041		Technical realization of the Short Message Service Cell Broadcast (SMSCB)	Replaces GSM
03.045		Technical realization of group 3 facsimile using transparent mode of transmission	Replaces GSM
03.050		Transmission planning aspects of the speech service in the GMR-1 system	Replaces GSM
	0370	Routing of Calls to/from Public Data Networks (PDN)	GSM applies
03.081		Line identification supplementary services - Stage 2	Replaces GSM
	03.82	Call Forwarding (CF) Supplementary Services - Stage 2	GSM applies
	03.83	Call Waiting (CW) and Call Hold (HOLD) Supplementary Services - Stage 2	GSM applies
	03.84	Multi Party (MPTY) Supplementary Services - Stage 2	GSM applies
	03.85	Closed user Group (CUG) Supplementary Services - Stage 2	GSM applies
03.088		Call Barring (CB) supplementary services - Stage 2	Replaces GSM
03.090		Unstructured Supplementary Service Data (USSD) - Stage 2	Replaces GSM
03.296		Terminal to Terminal Calls - Stage 2	GMR specific
03.297		Technical realization of optimal routing	GMR specific
03.298		Technical realization of high-penetration alerting	GMR specific
03.299		Position reporting services: Stage 2 service description	GMR specific

A.4 Contents of the 04-series

GMR number	GSM number	Short title	Comment
04.001		Mobile Station - Base Station System (MS - BSS) Interface General Aspects and Principles	Replaces GSM
04.002		GSM Public Land Mobile Network (PLMN) Access Reference Configuration	Replaces GSM
04.003		Mobile Station - Base Station System (MS - BSS) Interface Channel Structures and Access Capabilities	Replaces GSM
04.004		Layer 1 - General Requirements	Replaces GSM
04.005		Data Link (DL) Layer General Aspects	Replaces GSM
04.006		Mobile Station - Base Stations System (MS - BSS) Interface Data Link (DL) Layer Specification	Replaces GSM
04.007		Mobile Radio Interface Signalling Layer 3 - General Aspects	Replaces GSM
04.008		Mobile Radio Interface - Layer 3 Specification	Replaces GSM
	04.10	Mobile Radio Interface Layer 3 - Supplementary Services Specification - General Aspects	GSM applies
	04.11	Point-to-Point (PP) Short Message Service (SMS) Support on Mobile Radio Interface	GSM applies
	04.12	Short Message Service Cell Broadcast (SMSCB) Support on the Mobile Radio Interface	GSM applies
04.013		Performance Requirements on Mobile Radio Interface	Replaces GSM
04.021		Rate Adaptation on the Mobile Station - Base Station System (MS-BSS) Interface	Replaces GSM
04.022		Radio Link Protocol (RLP) for Data and Telematic Services on the (MS-BSS) Interface and the Base Station System - Mobile-services Switching Centre (BSS-MSC) Interface	Replaces GSM
	04.80	Mobile Radio Interface Layer 3 - Supplementary Services Specification Formats and Coding	GSM applies
	04.81	Line Identification Supplementary Services - Stage 3	GSM applies
	04.82	Call Forwarding (CF) Supplementary Services - Stage 3	GSM applies
	04.83	Call Waiting (CW) and Call Hold (HOLD) Supplementary Services - Stage 3	GSM applies
	04.84	Multi Party (MPTY) Supplementary Services - Stage 3	GSM applies
	04.85	Closed User Group (CUG) Supplementary Services - Stage 3	GSM applies
	04.88	Call Barring (CB) Supplementary Services - Stage 3	GSM applies
	04.90	Unstructured Supplementary Service Data (USSD)	GSM applies

A.5 Contents of the 05-series

GMR number	GSM number	Short title	Comment
05.001		Physical Layer on the Radio Path (General Description)	Replaces GSM
05.002		Multiplexing and Multiple Access on the Radio Path	Replaces GSM
05.003		Channel Coding	Replaces GSM
05.004		Modulation	Replaces GSM
05.005		Radio Transmission and Reception	Replaces GSM
05.008		Radio Subsystem Link Control	Replaces GSM
05.010		Radio Subsystem Synchronization	Replaces GSM

A.6 Contents of the 06-series

GMR number	GSM number	Short title	Comment
06.001		Speech Processing Functions	Replaces GSM
06.010		Vocoder: Speech Transcoding	Replaces GSM
06.011		Vocoder: Substitution and Muting of Lost Frames	Replaces GSM
06.012		Vocoder: Comfort Noise Aspects	Replaces GSM
06.031		Vocoder: Discontinuous Transmission (DTX)	Replaces GSM
06.032		Vocoder: Voice Activity Detection (VAD)	Replaces GSM

A.7 Contents of the 07-series

GMR number	GSM number	Short title	Comment
07.001		General on Terminal Adaptation Functions (TAF) for Mobile Earth Stations (MES)	Replaces GSM
07.002		Terminal Adaptation Functions (TAF) for Services Using Asynchronous Bearer Capabilities	Replaces GSM
07.003		Terminal Adaptation Functions (TAF) for Services Using Synchronous Bearer Capabilities	Replaces GSM

Annex B (informative): Contents of Release 2 of the GMR-1 family (GMPRS-1)

B.1 Contents of the 01-series

GMR number	GSM number	Short title	Comment
	01.04	Abbreviations and acronyms	GSM applies (see note)
01.201		Introduction to the GMR-1 family	GMPRS specific
	01.60	GPRS Requirements	GSM applies
	01.61	GPRS Ciphering Algorithm Requirements	GSM applies
NOTE: GMR-1 specific abbreviations are contained in GMR-1 01.004 (Release 1 specification)			

B.2 Contents of the 02-series

GMR number	GSM number	Short title	Comment
	02.09	Security Aspects	GSM applies
	02.16	International Mobile Station Equipment Identities (IMEI)	GSM applies
	02.17	Subscriber Identity Modules, Functional Characteristics	GSM applies
	02.60	General Packet Radio Service Stage 1 Description	GSM applies

B.3 Contents of the 03-series

GMR number	GSM number	Short title	Comment
	03.01	Network functions	GSM applies
	03.02	Network architecture	GSM applies
03.003		Numbering, addressing and identification	Replaces GSM
	03.20	Security related network functions	GSM applies
03.022		Functions Related to the Mobile Earth Station (MES) in Idle Mode	Replaces GSM
	03.60	General Packet Radio Service (GPRS) Service description; Stage 2	GSM applies
03.064		General Packet Radio Service (GPRS); Overall description of the GPRS radio interface; Stage 2	Replaces GSM

B.4 Contents of the 04-series

GMR number	GSM number	Short title	Comment
04.007		Mobile Radio Interface Signalling Layer 3 - General Aspects	Replaces GSM
04.008		Mobile Radio Interface - Layer 3 Specification	Replaces GSM
04.060		General Packet Radio Service (GPRS); Mobile Station (MS) - Base Station System (BSS) interface; Radio Link Control/ Medium Access Control (RLC/MAC) protocol	Replaces GSM
	04.64	General Packet Radio Service (GPRS); Mobile Station - Serving GPRS Support Node (MS-SGSN) Logical Link Control (LLC) layer specification	GSM applies
	04.65	General Packet Radio Service (GPRS); Mobile Station (MS) - Serving GPRS Support Node (SGSN); Subnetwork Dependent Convergence Protocol (SNDCP)	GSM applies

B.5 Contents of the 05-series

GMR number	GSM number	Short title	Comment
05.002		Multiplexing and Multiple Access on the Radio Path	Replaces GSM
05.003		Channel Coding	Replaces GSM
05.004		Modulation	Replaces GSM
05.005		Radio Transmission and Reception	Replaces GSM
05.008		Radio Subsystem Link Control	Replaces GSM
05.010		Radio Subsystem Synchronization	Replaces GSM

B.6 Contents of the 07-series

GMR number	GSM number	Short title	Comment
	07.60	General Packet Radio Service (GPRS); Mobile Station (MS) supporting GPRS	GSM applies

B.7 Contents of the 08-series

GMR number	GSM number	Short title	Comment
	08.14	General Packet Radio Service (GPRS); Base Station System (BSS) - Serving GPRS Support Node (SGSN) interface; Gb Interface Layer 1	GSM applies
	08.16	General Packet Radio Service (GPRS); Base Station System (BSS) - Serving GPRS Support Node (SGSN) Interface; Network Service	GSM applies
	08.18	General Packet Radio Service (GPRS); Base Station System (BSS) - Serving GPRS Support Node (SGSN); BSS GPRS Protocol	GSM applies

B.8 Contents of the 09-series

GMR number	GSM number	Short title	Comment
	09.60	General Packet Radio Service (GPRS); GPRS Tunnelling Protocol GPT) across the Gn and Gp Interface	GSM applies

History

Document history		
V1.1.1	March 2001	Publication
V2.1.1	March 2003	Publication