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Technical Specification

GEO-Mobile Radio Interface Specifications (Release 3);
Third Generation Satellite Packet Radio Service;
Part 3: Network specifications;
Sub-part 23: Radio Access Network;
Overall description - Stage 2;
GMR-1 3G 43.051

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- the third digit (n) is incremented when editorial only changes have been incorporated in the specification;
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The present document is part 3, sub-part 23 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":

Sub-part 1: "Network Functions";

Sub-part 2: "Network Architecture";

Sub-part 3: "Numbering, addressing and identification";

Sub-part 4: "Organization of Subscriber Data";

Sub-part 5: "Technical realization of Supplementary Services";

Sub-part 6: "Location Registration and Position Identification Procedures";

Sub-part 7: "Discontinuous Reception (DRX)";

Sub-part 8: "Support of Dual-Tone Multifrequency Signalling (DTMF)";

Sub-part 9: "Security related Network Functions";

Sub-part 10: "Functions related to Mobile Earth Station (MES) in idle mode";

Sub-part 11: "Technical realization of the Short Message Service (SMS) Point-to-Point (PP)";

Sub-part 12: "Technical realization of the Short Message Service Cell Broadcast (SMSCB)";

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Sub-part 13: "Technical realization of group 3 facsimile using transparent mode of transmission";

Sub-part 14: "Transmission Planning Aspects of the Speech Service in the GMR-1 system";

Sub-part 15: "Line Identification supplementary service - Stage 2";

Sub-part 16: "Call Barring (CB) supplementary services - Stage 2";

Sub-part 17: "Unstructured Supplementary Service Data (USSD) - Stage 2";

Sub-part 18: "Terminal-to-Terminal Call (TtT)";

Sub-part 19: "Optimal Routing technical realization";

Sub-part 20: "Technical realization of High-Penetration Alerting";

Sub-part 21: "Position Reporting services; Stage 2 Service description";

Sub-part 22: "Overall Description of the GMPRS-1 Radio Interface";

Sub-part 23: "Radio Access Network; Overall description - Stage 2";

Part 4: "Radio interface protocol specifications";

Part 5: "Radio interface physical layer specifications";

Part 6: "Speech coding specifications";

Part 7: "Terminal adaptor specifications".

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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.
- Release 2: GMPRS n xx.zyy.
- Release 3: GMR-1 3G xx.zyy

where:

xx.0yy (z = 0) is used for GMR specifications that have a corresponding GSM or 3GPP specification. In this case, the numbers xx and yy correspond to the GSM or 3GPP numbering scheme.

xx.2yy (z = 2) is used for GMR specifications that do not correspond to a GSM or 3GPP specification. In this case, only the number xx corresponds to the GSM or 3GPP 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 and 3GPP specifications as follows:

- If a GMR specification exists it takes precedence over the corresponding GSM or 3GPP specification (if any). This precedence rule applies to any references in the corresponding GSM or 3GPP specifications.

NOTE: Any references to GSM or 3GPP specifications within the GMR or 3GPP specifications are not subject to this precedence rule. For example, a GMR or 3GPP specification may contain specific references to the corresponding GSM or 3GPP specification.

- If a GMR specification does not exist, the corresponding GSM or 3GPP specification may or may not apply. The applicability of the GSM or 3GPP specifications is defined in GMR-1 3G 1 41.201 [7].

The clause numbering and the table numbering and figure numbering in the present document are aligned to the corresponding numbering of 3GPP 43.051 [i.1] as far as possible.

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1 Scope

The present document defines the stage 2 service description for the GMR-1 3rd Generation Satellite Radio Access Network. This 3rd Generation Satellite Radio Access Network is functionally equivalent to a GSM/EDGE Radio Network (GERAN). The term Satellite GERAN is used interchangeably with 3rd Generation Satellite Radio Access Network in the present document.

The present document illustrates how the services requested by a GSM/UMTS Core Network are realized by the 3rd Generation Satellite Radio Access Network.

The main focus of the present document is on functionality related to the Iu interfaces. The aim of the present document is not to describe functionality related to the A and Gb interfaces in details. There is no detailed description of the interfaces towards the core network and only references are given to the appropriate specifications.

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific.

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2.1 Normative references

The following referenced documents are indispensable for the application of the present document. For dated references, only the edition cited applies. For non-specific references, the latest edition of the referenced document (including any amendments) applies.

In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document.*

[1] 3GPP TS 25.410 (ETSI TS 125 410): "3rd Generation Partnership Project; Technical Specification Group Radio Access Network; UTRAN Iu Interface: General Aspects and Principles".

[2] 3GPP TS 25.411 (ETSI TS 125 411): "3rd Generation Partnership Project; Technical Specification Group Radio Access Network; UTRAN Iu interface Layer 1".

[3] 3GPP TS 25.412 (ETSI TS 125 412): "3rd Generation Partnership Project; Technical Specification Group Radio Access Network; UTRAN Iu interface signalling transport".

[4] 3GPP TS 25.413 (ETSI TS 125 413): "3rd Generation Partnership Project; Technical Specification Group Radio Access Network; UTRAN Iu interface RANAP signalling".

[5] 3GPP TS 25.414 (ETSI TS 125 414): "3rd Generation Partnership Project; Technical Specification Group Radio Access Network; UTRAN Iu interface data transport & transport signalling".

[6] 3GPP TS 25.415 (ETSI TS 125 415): "3rd Generation Partnership Project; Technical Specification Group Radio Access Network; UTRAN Iu interface user plane protocols".

[7] GMR-1 3G 41.201 (ETSI TS 101 376-1-2): "GEO Mobile Radio Interface Specifications (Release 3); Third Generation Satellite Packet Radio Service; Part 1: General specifications; Sub-part 2: Introduction to the GMR-1 family".

[8] 3GPP TS 21.905 ((ETSI TS 121 905) "3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Vocabulary for 3GPP Specifications".

[9] GMPRS-1 01.004 (ETSI TS 101 376-1-1): "GEO-Mobile Radio Interface Specifications (Release 2) General Packet Radio Service; Part 1: General specifications; Sub-part 1: Abbreviations and acronyms".

NOTE: This is a reference to a GMR-1 Release 2 specification. See the introduction for more details.

[10] GMR-1 05.001 (ETSI TS 101 376-5-1): "GEO-Mobile Radio Interface Specifications (Release 1); Part 5: Radio interface physical layer specifications; Sub-part 1: Physical Layer on the Radio Path: General Description".

NOTE: This is a reference to a GMR-1 Release 1 specification. See the introduction for more details.

[11] GMR-1 3G 45.002 (ETSI TS 101 376-5-2): "GEO Mobile Radio Interface Specifications (Release 3); Third Generation Satellite Packet Radio Service; Part 5: Radio interface physical layer specifications; Sub-part 2: Multiplexing and Multiple Access; Stage 2 Service Description".

[12] GMR-1 3G 45.003 (ETSI TS 101 376-5-3): "GEO Mobile Radio Interface Specifications (Release 3); Third Generation Satellite Packet Radio Service;Part 5: Radio interface physical layer specifications; Sub part 3: Channel Coding".

[13] 3GPP TS 23.110 (ETSI TS 123 110): 3rd Generation Partnership Project; Technical Specification Group Services and System Aspects Universal Mobile Telecommunications System (UMTS) access stratum; Services and functions".

[14] 3GPP TS 24.007 (ETSI TS 124 007): "3rd Generation Partnership Project; Technical Specification Group Core Network; Mobile radio interface signalling layer 3; General aspects".

[15] 3GPP TS 23.107 (ETSI TS 123 107): "3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; Quality of Service (QoS) concept and architecture".

[16] 3GPP TS 25.323 (ETSI TS 125 323): "3rd Generation Partnership Project; Technical Specification Group Radio Access Network; Packet Data Convergence Protocol (PDCP) Specification".

[17] 3GPP TS 33.102 (ETSI TS 133 102): "3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; 3G Security; Security architecture".

[18] GMR-1 3G 44.060: (ETSI TS 101 376-4-12): "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".

[19] GMR-1 3G 44.118 (ETSI TS 101 376-4-13): "GEO Mobile Radio Interface Specifications (Release 3); Third Generation Satellite Packet Radio Service; Part 4: Radio interface protocol specifications; Sub-part 13: Radio Resource Control (RRC) protocol; Iu Mode".

[20] GMR-1 3G 44.160 (ETSI TS 101 376-4-14): "GEO Mobile Radio Interface Specifications (Release 3); Third Generation Satellite Packet Radio Service; Part 4: Radio interface protocol specifications; Sub-part 14: Mobile Earth Station (MES) - Base Station System (BSS) interface; Radio Link Control/Medium Access Control (RLC/MAC) protocol; Iu Mode".

[21] GMR-1 3G 44.008 (ETSI TS 101 376-4-8): "GEO Mobile Radio Interface Specifications (Release 3); Third Generation Satellite Packet Radio Service; Part 4: Radio interface protocol specifications; Sub-part 8: Mobile Radio Interface Layer 3 Specifications".

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[22] GMR-1 3G 43.022 (ETSI TS 101 376-3-10): "GEO Mobile Radio Interface Specifications (Release 3); Third Generation Satellite Packet Radio Service; Part 3: Network specifications; Sub part 10: Functions related to Mobile Earth Station (MES) in idle mode". .

[23] GMR-1 3G 45.005 (ETSI TS 101 376-5-5): "GEO Mobile Radio Interface Specifications (Release 3); Third Generation Satellite Packet Radio Service; Part 5: Radio interface physical layer specifications; Sub part 5: Radio Transmission and Reception".

[24] 3GPP TS 44.018: "3rd Generation Partnership Project; Technical Specification Group GSM/EDGE Radio Access Network; Mobile radio interface layer 3 specification; Radio Resource Control (RRC) protocol".

[25] 3GPP TS 24.008 (ETSI TS 124 008): "3rd Generation Partnership Project; Technical Specification Group Core Network; Mobile radio interface Layer 3 specification; Core network protocols; Stage 3".

[26] 3GPP TS 23.060 (ETSI TS 123 060): "3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; General Packet Radio Service (GPRS); Service Description; Stage 2".

[27] GMR-1 3G 45.008: (ETSI TS 101 376-5-6): "GEO Mobile Radio Interface Specifications (Release 3); Third Generation Satellite Packet Radio Service; Part 5: Radio interface physical layer specifications; Sub part 6: Radio Subsystem Link Control; GMR-1 3G 45.008".

[28] 3GPP TS 23.003 (ETSI TS 123 003): "3rd Generation Partnership Project; Technical Specification Group Core Network; Numbering, Addressing and Identification (Release 6)".

[29] 3GPP TS 43.064 (ETSI TS 143 064): "3rd Generation Partnership Project; Technical Specification Group GERAN; Digital cellular telecommunications system (Phase 2+); General Packet Radio Service (GPRS); Overall description of the GPRS radio interface; Stage 2.

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2.2 Informative references

The following referenced documents are not essential to the use of the present document but they assist the user with regard to a particular subject area**.** For non-specific references, the latest version of the referenced document (including any amendments) applies.

[i.1] 3GPP TS 43.051 (ETSI TS 143 051): "3rd Generation Partnership Project; Technical Specification Group GSM/EDGE Radio Access Network; Overall description - Stage 2".

[i.2] ITU-R Recommendation M.1035: "Framework for the radio interface(s) and radio sub-system functionality for International Mobile Telecommunications-2000 (IMT-2000)".

3 Symbols and abbreviations

3.1 Symbols

For the purposes of the present document, the following symbols apply:

A	Interface between a Satellite BSS and a 2G MSC
Gb	Interface between a Satellite BSS and a 2G SGSN
GMR-1 3G	Interface between MES and Satellite BSS
Iu-cs	Interface between a Satellite BSS and a 3G MSC
Iu-ps	Interface between a Satellite BSS and a 3G SGSN
Iur-g	Interface between two Satellite BSSs

3.2 Abbreviations

For the purposes of the present document, the following abbreviations apply. Additional applicable abbreviations can be found in GMPRS-1 01.004 [9], 3GPP TS 21.905 [8] and 3GPP TS 43.064 [29].

AS	Access Stratum
BCCH	Broadcast Control CHannel
BSS	Base Station Subsystem
CBCH	Cell Broadcast CHannel
CC	Call Control
CN	Core Network
CS-i	GPRS Coding Scheme i
DC	Dedicated Control
DCH	Dedicated physical CHannel
EDGE	Enhanced Data rates for Global Evolution
E-FACCH	Enhanced FACCH
EGPRS	Enhanced GPRS
E-TCH	Enhanced TCH
FACCH	Fast Associated Control CHannel
FLO	Flexible Layer One
GC	General Control
GERAN	GSM/EDGE Radio Access Network
GPRS	General Packet Radio Service
GRA	GERAN Registration Area
G-RNTI	GERAN Radio Network Temporary Identity
GSM	Global System for Mobile Communications
IETF	Internet Engineering Task Force
IMSI	International Mobile Subscriber Identity
IP	Internet Protocol
MAC	Medium Access Control
MM	Mobility Management
MES	Mobile Earth Station
NAS	Non Access Stratum
NSAPI	Network layer SAPI
Nt	Notification
O-TCH	Octal TCH
PBCCH	Packet BCCH
PDCH	Packet Data physical CHannel
PDCP	Packet Data Convergence Protocol
PDP	Packet Data Protocol
PDTCH	Packet Data TCH
PDU	Packet Data Unit
PLMN	Public Land Mobile Network
P-TMSI	Packet TMSI
QoS	Quality of Service
RAB	Radio Access Bearer
RANAP	Radio Access Network Application Part
RB	Radio Bearer
RLC	Radio Link Control
RNSAP	Radio Network Subsystem Application Part
ROHC	RObust Header Compression
RRC	Radio Resource Control
RTP	Real Time Protocol
SACCH	Slow Associated Control CHannel
SAP	Service Access Point
SAPI	Service Access Point Identifier
Satellite BSS	Satellite Base Station Subsystem
SDU	Service Data Unit
Satellite GERAN	Satellite GSM/EDGE Radio Access Network
S-RNTI	Serving Radio Network Temporary Identity
TB	Transport Block

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Full standard:
https://standards.iteh.ai/catalog/standards/sist/f6cbc6c0-8858-46e7-91fa-459b107d57a5/etsi-ts-101-376-3-23-v3.1.1-2009-07