

# ETSI TS 101 376-3-3 V1.1.1 (2001-03)

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*Technical Specification*

**GEO-Mobile Radio Interface Specifications;  
Part 3: Network specifications;  
Sub-part 3: Numbering, Addressing and identification;  
GMR-1 03.003**

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**Reference**

DTS/SES-001-03003

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**Keywords**addressing, GMR, GSM, GSO, ID, interface,  
MES, mobile, MSS, radio, satellite, S-PCN**ETSI**

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### IPRs:

Project	Company	Title	Country of Origin	Patent n°	Countries Applicable
TS 101 376 V1.1.1	Digital Voice Systems Inc		US	US 5,226,084	US
TS 101 376 V1.1.1	Digital Voice Systems Inc		US	US 5,715,365	US
TS 101 376 V1.1.1	Digital Voice Systems Inc		US	US 5,826,222	US
TS 101 376 V1.1.1	Digital Voice Systems Inc		US	US 5,754,974	US
TS 101 376 V1.1.1	Digital Voice Systems Inc		US	US 5,701,390	US

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Project	Company	Title	Country of Origin	Patent n°	Countries Applicable
TS 101 376 V1.1.1	Ericsson Mobile Communication	Improvements in, or in relation to, equalisers	GB	GB 2 215 567	GB
TS 101 376 V1.1.1	Ericsson Mobile Communication	Power Booster	GB	GB 2 251 768	GB
TS 101 376 V1.1.1	Ericsson Mobile Communication	Receiver Gain	GB	GB 2 233 846	GB
TS 101 376 V1.1.1	Ericsson Mobile Communication	Transmitter Power Control for Radio Telephone System	GB	GB 2 233 517	GB

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Project	Company	Title	Country of Origin	Patent n°	Countries Applicable
TS 101 376 V1.1.1	Hughes Network Systems		US	Pending	US

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Project	Company	Title	Country of Origin	Patent n°	Countries Applicable
TS 101 376 V1.1.1	Lockheed Martin Global Telecommunic. Inc	2.4-to-3 KBPS Rate Adaptation Apparatus for Use in Narrowband Data and Facsimile Communication Systems	US	US 6,108,348	US
TS 101 376 V1.1.1	Lockheed Martin Global Telecommunic. Inc	Cellular Spacecraft TDMA Communications System with Call Interrupt Coding System for Maximizing Traffic Throughput Cellular Spacecraft TDMA Communications System with Call Interrupt Coding System for Maximizing Traffic Throughput	US	US 5,717,686	US
TS 101 376 V1.1.1	Lockheed Martin Global Telecommunic. Inc	Enhanced Access Burst for Random Access Channels in TDMA Mobile Satellite System	US	US 5,875,182	
TS 101 376 V1.1.1	Lockheed Martin Global Telecommunic. Inc	Spacecraft Cellular Communication System	US	US 5,974,314	US
TS 101 376 V1.1.1	Lockheed Martin Global Telecommunic. Inc	Spacecraft Cellular Communication System	US	US 5,974,315	US
TS 101 376 V1.1.1	Lockheed Martin Global Telecommunic. Inc	Spacecraft Cellular Communication System with Mutual Offset High-argin Forward Control Signals	US	US 6,072,985	US
TS 101 376 V1.1.1	Lockheed Martin Global Telecommunic. Inc	Spacecraft Cellular Communication System with Spot Beam Pairing for Reduced Updates	US	US 6,118,998	US

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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:

Version 1.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 3, sub-part 3 of a multi-part deliverable covering the GEO-Mobile Radio Interface Specifications, as identified below:

Part 1: "General specifications";

Part 2: "Service specifications";

**Part 3: "Network specifications";**

Sub-part 1: "Network Functions; GMR-1 03.001";

Sub-part 2: "Network Architecture; GMR-1 03.002";

**Sub-part 3: "Numbering, Addressing and identification; GMR-1 03.003";**

Sub-part 4: "Organization of Subscriber Data; GMR-1 03.008";

Sub-part 5: "Technical realization of Supplementary Services; GMR-1 03.011";

Sub-part 6: "Location Registration and Position Identification Procedures; GMR-1 03.012";

Sub-part 7: "Discontinuous Reception (DRX); GMR-1 03.013";

Sub-part 8: "Support of Dual-Tone Multifrequency Signalling (DTMF); GMR-1 03.014";

Sub-part 9: "Security related Network Functions; GMR-1 03.020";

Sub-part 10: "Functions related to Mobile Earth station (MES) in idle mode; GMR-1 03.022";

Sub-part 11: "Technical realization of the Short Message Service (SMS) Point-to-Point (PP); GMR-1 03.040";

Sub-part 12: "Technical realization of the Short Message Service Cell Broadcast (SMSCB); GMR-1 03.041";

Sub-part 13: "Technical realization of group 3 facsimile using transparent mode of transmission; GMR-1 03.045";

Sub-part 14: Transmission Planning Aspects of the Speech Service in the GMR-1 system; GMR-1 03.050";

Sub-part 15: "Line Identification supplementary service - Stage 2; GMR-1 03.081";

Sub-part 16: "Call Barring (CB) supplementary services - Stage 2; GMR-1 03.088";

Sub-part 17: "Unstructured Supplementary Service Data (USSD) - Stage 2; GMR-1 03.290";

Sub-part 18: "Terminal-to-Terminal Call (TtT); GMR-1 03.296";

Sub-part 19: "Optimal Routing technical realization; GMR-1 03.297";

Sub-part 20: "Technical realization of High-Penetration Alerting; GMR-1 03.298";

Sub-part 21: "Position Reporting services; Stage 2 Service description; GMR-1 03.299";

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.

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 as follows:

GMR-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 GMR-1 01.201 [2].

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# 1 Scope

The present document defines:

- a) an identification plan for mobile subscribers in the GeoMobile Radio (GMR-1) Mobile Satellite System;
- b) principles of assigning telephone and ISDN numbers to mobile earth stations;
- c) principles of assigning mobile station roaming numbers to visiting mobile earth stations;
- d) an identification plan for location areas and ground stations in the GMR-1 system;
- e) an identification plan for MSCs and location registers in the GMR-1 system;
- f) principles of assigning international mobile equipment identities;
- g) principles of assigning zones for regional subscription.

The present document is based on GSM 03.03 [3].

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# 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.

- [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 01.201 (ETSI TS 101 376-1-2): "GEO-Mobile Radio Interface Specifications; Part 1: General specifications; Sub-part 2: Introduction to the GMR-1 Family; GMR-1 01.201".
- [3] GSM 03.03 (ETSI EN 300 523): "European digital cellular telecommunications system (Phase 2); Numbering, addressing and identification (GSM 03.03 version 4.10.1)".
- [4] ITU-T Recommendation E.164/I.331: "The international public telecommunication numbering plan".
- [5] ITU-T Recommendation E.212: "Identification plan for land mobile stations".
- [6] ITU-T Recommendation E.213: "Telephone and ISDN numbering plan for land mobile stations in public land mobile networks (PLMN)".
- [7] ITU-T Recommendation X.121: "International numbering plan for public data networks".



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## 3 Abbreviations

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

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## 4 General comments to references

The identification plan for mobile subscribers defined below is that defined in ITU-T Recommendation E.212 [5].

The ISDN numbering plan for mobile earth stations and the allocation of mobile station roaming numbers is that defined in ITU-T Recommendation E.213 [6]. Only one of the principles for allocating ISDN numbers is proposed for GMR-1 satellite Network. Only the method for allocating mobile station roaming numbers contained in the main text of ITU-T Recommendation E.213 [6] is recommended for use in GMR-1 Satellite Network. If there is any difference between the present document and the ITU-T Recommendations, the former shall take precedence.

For terminology, see also ITU-T Recommendations E.164/I.131 [4] and X.121 [7].

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## 5 Conventions on bit ordering

Same as clause 1.5 of GSM 03.03 [3].

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## 6 Identification of mobile subscribers

### 6.1 General

Same as clause 2.1 of GSM 03.03 [3].

### 6.2 Composition of IMSI

Same as clause 2.2 of GSM 03.03 [3].

### 6.3 Allocation principles

Same as clause 2.3 of GSM 03.03 [3].

### 6.4 Structure of TMSI

Same as clause 2.4 of GSM 03.03 [3].

### 6.5 Structure of LMSI

Same as clause 2.5 of GSM 03.03 [3].

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## 7 Numbering plan for mobile earth stations

### 7.1 General

Same as clause 3.1 of GSM 03.03 [3].

### 7.2 Numbering plan requirements

Same as clause 3.2 of GSM 03.03 [3].

### 7.3 Structure of mobile station international PSTN/ISDN number (MSISDN)

Same as clause 3.3 of GSM 03.03 [3].

### 7.4 Mobile station roaming number (MSRN) for PSTN/ISDN routing

Same as clause 3.4 of GSM 03.03 [3].

### 7.5 Structure of mobile station international data number

Same as clause 3.5 of GSM 03.03 [3].

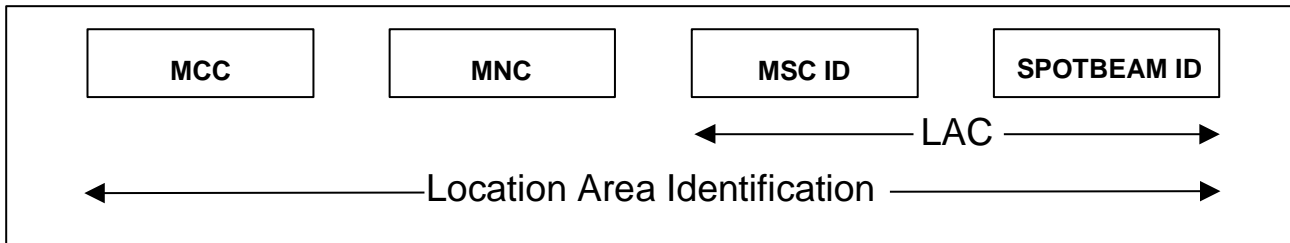
### 7.6 Handover number

Not applicable.

## 8 Identification of location areas and gateway stations

### 8.1 Composition of the location area identification (LAI)

The Location Area Identification shall be composed as shown in figure 8.1:



**Figure 8.1: Structure of Location Area Identification**

The LAI is composed of the following elements:

- Mobile Country Code (MCC) identifies the country in which the GMR-1 Satellite Network is located. The value of the MCC is the same as the three digits, MCC contained in international mobile subscriber identity (IMSI);
- Mobile Network Code (MNC) is a code identifying the GMR-1 Satellite Network in that country. The MNC takes the same value as the two digit MNC contained in IMSI;
- Location Area Code (LAC) which is a fixed length code (of 2 octets) identifying a location area within a GMR-1 Satellite Network. LAC is composed of two parts:
  - 1) Mobile Switching Centre ID (MSCID) which identifies a Mobile Switching Centre (MSC) within GMR-1 Satellite Network. Its length is sixbits.
  - 2) Spot beam ID (spot beam ID) which identifies a spot beam within GMR-1 Satellite Network. Its length is tenbits.

### 8.2 Gateway station identification

#### 8.2.1 Cell identity (CI) and cell global identification (CGI)

Same as clause 4.2.1 of GSM 03.03 [3].

#### 8.2.2 Base station identify code (BSIC)

Same as clause 4.2.2 of GSM 03.03 [3].

### 8.3 Regional subscription zone identity (RSZI)

Same as clause 4.3 of GSM 03.03 [3].

### 8.4 Location number

Same as clause 4.4 of GSM 03.03 [3].

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## 9 Identification of MSCs and location registers

### 9.1 Identification for routing purpose

Same as clause 5.1 of GSM 03.03 [3].

### 9.2 Identification of HLR for HLR restoration application

Same as clause 5.2 of GSM 03.03 [3].

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## 10 International mobile station equipment identity and software version number

### 10.1 General

Same as clause 6.1 of GSM 03.03 [3].

### 10.2 Composition of IMEI and IMEISV

#### 10.2.1 Composition of IMEI

Same as clause 6.2.1 of GSM 03.03 [3].

#### 10.2.2 Composition of IMEISV

Same as clause 6.2.2 of GSM 03.03 [3].

### 10.3 Allocation principles

Same as clause 6.3 of GSM 03.03 [3].

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## Annex A (informative): Colour codes

### A.1 Utilization of the BSIC

Same as A.1 of GSM 03.03 [3].

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### A.2 Guidance for planning

Same as A.2 of GSM 03.03 [3].

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### A.3 Example of PLMN colour codes (NCCs) for the European region

Not applicable.

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## Annex B (informative): Bibliography

GMR-1 03.008 (ETSI TS 101 376-3-4): "GEO-Mobile Radio Interface Specifications; Part 3: Network specifications; Sub-part 4: Organization of Subscriber Data; GMR-1 03.008".

GMR-1 03.020 (ETSI TS 101 376-3-9): "GEO-Mobile Radio Interface Specifications; Part 3: Network specifications; Sub-part 9: Security related Network Functions; GMR-1 03.020".

GMR-1 04.008 (ETSI TS 101 376-4-8): "GEO-Mobile Radio Interface Specifications; Part 4: Radio interface protocol specifications; Sub-part 8: Mobile Radio Interface Layer 3 Specifications; GMR-1 04.008".

GSM 03.70 (ETSI ETS 300 541): "European digital cellular telecommunications system (Phase 2); Routeing of calls to/from Public Data Networks (PDN) (GSM 03.70 V4.0.3)".

GSM 09.03 (ETSI ETS 300 600): "European digital cellular telecommunications system (Phase 2); Signalling requirements on interworking between the Integrated Services Digital Network (ISDN) or Public Switched Telephone Network (PSTN) and the Public Land Mobile Network (PLMN) (GSM 09.03 V4.0.3)".

GSM 11.11 (ETSI ETS 300 608): "Digital cellular telecommunications system (Phase 2); Specification of the Subscriber Identity Module - Mobile Equipment (SIM - ME) interface (GSM 11.11 version 4.20.1)".

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## History

Document history		
V1.1.1	March 2001	Publication