

# ETSI TS 101 376-2-1 V1.1.1 (2001-03)

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*Technical Specification*

**GEO-Mobile Radio Interface Specifications;  
Part 2: Service specifications;  
Sub-part 1: Service Accessibility;  
GMR-1 02.011**

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**Reference**

DTS/SES-001-02011

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**Keywords**

GMR, MSS, MES, satellite, GSO, S-PCN, GSM,  
access, interface, location, mobile, radio, service,  
user

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

Part 1: "General specifications";

**Part 2: "Service specifications";**

**Sub-part 1: "Service Accessibility; GMR-1 02.001";**

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".

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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 describes the service access procedures of the GMR-1 Mobile Satellite System as they are presented to the user.

The technical realization of service accessibility in terms of registration, handover, roaming and system selection is defined in the 03 series of GMR-1 Specifications.

Definitions and procedures are provided in the present document for international roaming, national roaming and regionally provided service. These are mandatory in relation to the technical realization of the Mobile Earth Station.

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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] GMR-1 03.002 (ETSI TS 101 376-3-2): "GEO-Mobile Radio Interface Specifications; Part 3: Network specifications; Sub-part 2: Network Architecture; GMR-1 03.002".
- [4] GMR-1 03.012 (ETSI TS 101 376-3-6): "GEO-Mobile Radio Interface Specifications; Part 3: Network specifications; Sub-part 6: Location Registration and Position Identification Procedures; GMR-1 03.012".
- [5] GMR-1 03.022 (ETSI TS 101 376-3-10): "GEO-Mobile Radio Interface Specifications; Part 3: Network specifications; Sub-part 10: Functions related to Mobile Earth station (MES) in idle mode; GMR-1 03.022".
- [6] 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".
- [7] GMR-1 05.008 (ETSI TS 101 376-5-6): "GEO-Mobile Radio Interface Specifications; Part 5: Radio interface physical layer specifications; Sub-part 6: Radio Subsystem Link Control; GMR-1 05.008".
- [8] 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 (V4.21.1))".



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## 3 Definitions

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

### **GMR-1 PLMN**

A Public Land Mobile Network (PLMN) is a network established and operated by an Administration or RPOA for the specific purpose of providing land mobile communication services to the public. It provides communication possibilities for mobile users. For communications between mobile and fixed users, interworking with a fixed network is necessary.

A GMR-1 PLMN is a PLMN which is in accordance with the GMR-1 Specifications. A GMR-1 PLMN may provide service in the frequency band in the GMR-1 Specifications.

A GMR-1 PLMN may or may not be limited by the borders of a country. It is common that the coverage of GMR-1 PLMNs spans several countries. There may be more than one GMR-1 PLMN spanning a particular country.

A relationship exists between each subscriber and his home PLMN (HPLMN). If communications are handled over another PLMN, this PLMN is referred to as the visited GSM PLMN (VPLMN). The HPLMN may be either a GMR-1 PLMN or a GSM PLMN.

### **GMR-1 Access Area**

The GMR-1 Access Area (GAA) is the geographical area in which a GMR-1 Gateway provides communication services according to the GMR-1 specifications to mobile users. Several Gateways may share a PLMN ID or may have unique PLMNs. In the GAA, the mobile user can set up calls to a user of a terminating network. The terminating network may be a fixed network, the same or different GMR-1 PLMN, or other types of PLMN.

Terminating network users can also set up calls to the GMR-1 PLMN.

A GAA may span a large geographic region, such as several countries. A GAA may span a complete country or may have a region of coverage within a country. A GAA may have a border which approximates the international boundary of one or more of the countries which comprise the GAA. Multiple GAAs may cover mutually exclusive regions of service coverage or they may overlap.

### **GMR-1 Service Area**

A GMR-1 Service Area is defined as a geographic region of coverage of permanent signalling resources. The signalling resources are useable by an MES from a signal strength perspective. An MES can camp on a Gateway when it is in the Service Area of the Gateway.

A GMR-1 Service Area can be smaller than a Gateway Access Area if the Gateway is allowed to provide service in a region into which it does not broadcast permanent signalling channels for camp-on. In this instance, the Gateway can provide temporary resources as necessary to provide service in areas where the boundary of the Access Area exceeds boundary of the Service Area.

A GMR-1 Service Area can be larger than a GMR-1 Access Area if the Gateway is restricted from providing service in a region into which it broadcasts permanent signalling channels. This case arises due to the broad propagation properties of signals broadcast from a satellite.

In general, an MES camps on a Gateway when in the GMR-1 Service Area, but gives preference to a Gateway for which the MES is within the Gateway's Access Area over a Gateway for which it is outside the Access Area.

### **GMR-1 Regionally Provided Service**

Regionally Provided Service is defined as a service entitlement to only certain geographical part(s) of an Access Area. Determination of service entitlement is based upon evaluation of the HPLMN of the MES in combination with the geographic location of the MES.

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## 4 Roaming

### 4.1 General requirements

An MES with a valid IMSI may roam and access service in the area authorized by the entitlement of the subscription.

If a communication has been established, the MES will in principle not suffer an interruption within the GMR-1 Access Area (provided the entitlement of the subscription allows it). Exceptions are possible if no network resources or radio coverage are available locally.

### 4.2 Roaming

Roaming is a service whereby an MES of a given PLMN is able to obtain service from any other PLMN.

The availability of Roaming is subject to inter-PLMN agreements.

### 4.3 National Roaming

Void.

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## 5 Provisions for providing continuity of service

### 5.1 Location registration

GMR-1 PLMNs shall provide a location registration function with the main purpose of providing continuity of service to mobile earth stations over the whole GSM system area. The location registration function shall be such as to allow:

- Fixed subscribers to call an MES by only using the directory number of the MES irrespective of where the MES is located in the GMR-1 system area at the time of the call.
- Mobile Earth Stations (MES) to access the system irrespective of the location of the MES.
- Mobile Earth Stations (MES) to identify when a change in location area has taken place in order to initiate automatic location updating procedures.

The system architecture enabling implementation of the above requirements is defined in Specification GMR-1 03.002 [3]. The technical realization of location registration is defined in GMR-1 03.012 [4].

GMR-1 03.012 [4] also gives the conditions when a location updating has to take place.

### 5.2 Network selection

#### 5.2.1 General

The MES shall support both manual and automatic network selection mechanisms (modes). The MES shall select the last mode used, as the default mode, at every switch-on.

**NOTE:** By defaulting to the last mode used, e.g. manual network selection, the undesired automatic selection of an adjacent PLMN instead of the desired HPLMN in border areas, can be avoided at switch-on.

The user shall be given the opportunity to change mode at any time.

Except as defined below, the MMI shall be at the discretion of the MES manufacturer.

## 5.2.2 Procedures

### 5.2.2.1 General

In the following procedures the MES selects and attempts registration on PLMNs.

In the present document, the term "PLMN Selection" defines an MES based procedure, whereby candidate PLMNs are chosen, one at a time, for attempted registration.

If registration on a PLMN is successful, the MES shall indicate this PLMN (the "registered PLMN") and be capable of making and receiving calls on it. The identity of the registered PLMN shall be stored on the SIM. However, if registration is unsuccessful, the MES shall ensure that there is no registered PLMN stored in the SIM.

If a registration is unsuccessful because the IMSI is unknown in the home network, or the MES is illegal, then the MES shall not allow any further registration attempts on any network, until the MES is next powered-up or a SIM is inserted.

If the registration is unsuccessful due to the lack to service entitlement, specific behaviour by the mobile earth station may be required, see 5.2.2.4.

To avoid unnecessary registration attempts, lists of forbidden PLMNs and LAs are maintained in the mobile earth station, see 5.2.2.4 and GMR-1 03.022 [5].

Registration attempts shall not be made by MES-MEs (MES without a SIM inserted).

An MES which has not successfully registered shall nevertheless be able to make emergency call attempts on an available PLMN, without the need for the user to select a PLMN. An available PLMN is determined by radio characteristics (see GMR-1 03.022 [5] and GMR-1 05.008 [7]).

### 5.2.2.2 At switch-on or recovery from lack of coverage

If the MES is within coverage (at switch-on) or returns to coverage of the PLMN on which it is already registered (as indicated by the registered PLMN stored in the SIM), the MES shall perform a location update to a new location area if necessary.

If there is no registered PLMN stored in the SIM, or if this PLMN is unavailable, or the attempted registration fails, the MES shall follow one of the following two procedures depending on its network selection mode, automatic or manual:

#### A) Automatic network selection mode

The MES shall select and attempt registration on PLMNs, if available and allowable and the location area is not in the list of "forbidden LAIs for roaming" (see GMR-1 03.022 [5]), in the following order:

- i) HPLMN;
- ii) each PLMN in the "PLMN Selector" data field in the SIM (in priority order);
- iii) the registered PLMN;
- iv) other PLMNs with sufficient received signal level (see GMR-1 03.022 [5]) in random order.

An allowable PLMN is one which is not in the "Forbidden PLMN" data field in the SIM (see 3.2.2.4).

If successful registration is achieved, the MES shall indicate the selected PLMN.

If registration cannot be achieved on any PLMN, the MES shall indicate "no service" to the user, wait until a new PLMN is detected, or new location areas of an allowed PLMN are found which are not in the forbidden LA list(s), and then repeat the procedure. When registration cannot be achieved, different (discontinuous) PLMN search schemes may be used in order to minimize the access time while maintaining battery life, e.g. by prioritizing the search in favour of BCCH carriers which have a high probability of belonging to an available and allowable PLMN.

### **B) Manual network selection mode**

The MES shall indicate whether there are any PLMNs, including "Forbidden PLMNs", which are available. If there are none, this shall also be indicated.

Any available PLMNs shall be presented in the following order:

- i) HPLMN;
- ii) PLMNs contained in the "PLMN Selector" data field in the SIM (in priority order);
- iii) Other PLMNs with sufficient received signal level (see GMR-1 03.022 [5]) in random order.

The user may select his desired PLMN and the MES shall attempt registration on this PLMN. (This may take place at any time during the presentation of PLMNs).

If the registration cannot be achieved on the selected PLMN, the MES shall indicate "No Service". The user may then select and attempt to register on another or the same PLMN following the above procedure. The MES shall not attempt to register on a PLMN which has not been selected by the user.

If a PLMN is selected but the MES cannot register on it because registration is rejected with the cause "PLMN not allowed", the MES shall not re-attempt to register on that network unless the same PLMN is selected again by the user.

If a PLMN is selected but the MES cannot register on it for other reasons, the MES shall, upon detection of a new LA (not in a forbidden LA list) of the selected PLMN, attempt to register on the PLMN.

If the MES is registered on a PLMN but loses coverage, different (discontinuous) carrier search schemes may be used to minimize the time to find a new valid BCCH carrier and maintain battery life, e.g. by prioritizing the search in favour of BCCH carriers of the registered PLMN.

#### **5.2.2.3 User reselection**

At any time, the user may request the MES to initiate reselection and registration onto an alternative available PLMN, according to the following procedures, dependent upon the operating mode.

##### **A) Automatic Network Selection Mode**

The MES shall select the HPLMN. If the HPLMN is not available, the MES shall select the PLMNs in the "PLMN Selector" list in order of priority and, if necessary, other available and allowable PLMNs according to the procedure defined in GMR-1 03.022 [5].

##### **B) Manual Network Selection Mode**

The procedure of 5.2.2.2 B) above is followed.

#### **5.2.2.4 Mobile Earth Station reactions to indications of service restriction from the network**

Different types of mobile earth station behaviour is required to support, for example, regionally provided service and temporary international roaming restrictions. The behaviour to be followed by the mobile earth station is indicated by the network.

##### **5.2.2.4.1 "Permanent" PLMN restriction**

When a registration attempt by the mobile earth station is rejected by a network with an indication of "permanent" PLMN restriction. The PLMN identity shall be written to a list of "Forbidden PLMNs" stored in a data field in the SIM.

The structure of this data field is given in GSM 11.11 [8].

If a successful registration (whilst in manual mode) is achieved on a PLMN in the "Forbidden PLMN" list, the PLMN shall be deleted from the list.

When in automatic mode, the MES may indicate any PLMNs which will not be selected due to their presence in the "Forbidden PLMN" list.

#### 5.2.2.4.2 "Partial" and "temporary" PLMN restrictions

When a registration attempt by the mobile earth station is rejected by a network due to a "partial" or a "temporary" PLMN restriction, the MES shall perform one of the following procedures determined by the indication in the location update reject cause sent by the network (see GMR-1 03.022 [5]):

- i) The MES shall store the location area identity in the list of "forbidden LAs for regional provision of service" and shall enter the limited service state and remain in that state until it moves to a cell in a location area where service is allowed.
- ii) The MES shall store the location area identity in the list of "forbidden LAs for roaming" and shall use one of the following procedures according to the PLMN selection Mode:
  - A) Automatic network selection mode
    - the procedure of 5.2.2.2 A).
  - B) Manual network selection mode
    - the procedure of 5.2.2.2 B).

#### 5.2.2.5 Timer for return to HPLM

Void.

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## 6 Access control

### 6.1 Purpose

Under certain circumstances, it will be desirable to prevent MES users from making access attempts (including emergency call attempts) or responding to pages in specified areas of a GMR-1 PLMN. Such situations may arise during states of emergency, or where 1 of 2 or more co-located PLMNs has failed.

Broadcast messages should be available on a cell by cell basis indicating the class(es) of subscribers barred from network access.

The use of this facility allows the network operator to prevent overload of the access channel under critical conditions.

It is not intended that access control be used under normal operating conditions.

### 6.2 Allocation

All MESs are members of one out of ten randomly allocated mobile populations, defined as Access Classes 0 to 9. The population number is stored in the SIM. In addition, mobiles may be members of one or more out of 5 special categories (Access Classes 11 to 15), also held in the SIM. These are allocated to specific high priority users as follows. (The enumeration is not meant as a priority sequence):

- Class 15 - PLMN Staff;
- "- 14 - Emergency Services;
- "- 13 - Public Utilities (e.g. water/gas suppliers);
- "- 12 - Security Services;
- "- 11 - For PLMN Use.

## 6.3 Operation

If the MES is a member of at least one Access Class which corresponds to the permitted classes as signalled over the air interface, and the Access Class is applicable in the serving network, access attempts are allowed. Otherwise access attempts are not allowed.

Access Classes are applicable as follows:

- |                    |   |   |
|--------------------|---|---|
| Classes 0 - 9      | - | Home and Visited PLMNs;                           |
| Classes 11 and 15  | - | Home PLMN only;                                   |
| Classes 12, 13, 14 | - | Home PLMN and visited PLMNs of home country only. |

Any number of these classes may be barred at any one time.

## 6.4 Emergency calls

An additional control bit known as "Access Class 10" is also signalled over the air interface to the MES. This indicates whether or not network access for Emergency Calls is allowed for MESs with access classes 0 to 9 or without an IMSI. For MESs with access classes 11 to 15, Emergency Calls are not allowed if both "Access class 10" and the relevant Access Class (11 to 15) are barred. (see GMR-1 04.008 [6]). Otherwise, Emergency Calls are allowed.

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## Annex A (informative): Bibliography

- 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".
- GMR-1 03.003 (ETSI TS 101 376-3-3): "GEO-Mobile Radio Interface Specifications; Part 3: Network specifications; Sub-part 3: Numbering, Addressing and identification; GMR-1 03.003".
- 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 03.011 (ETSI TS 101 376-3-5): "GEO-Mobile Radio Interface Specifications; Part 3: Network specifications; Sub-part 5: Technical realization of Supplementary Services; GMR-1 03.011".
- GMR-1 03.013 (ETSI TS 101 376-3-7): "GEO-Mobile Radio Interface Specifications; Part 3: Network specifications; Sub-part 7: Discontinuous Reception (DRX); GMR-1 03.013".
- GMR-1 03.014 (ETSI TS 101 376-3-8): "GEO-Mobile Radio Interface Specifications; Part 3: Network specifications; Sub-part 8: Support of Dual-Tone Multifrequency Signalling (DTMF); GMR-1 03.014".
- 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 03.041 (ETSI TS 101 376-3-12): "GEO-Mobile Radio Interface Specifications; Part 3: Network specifications; Sub-part 12: Technical realisation of the Short Message Service Cell Broadcast (SMSCB); GMR-1 03.041".
- GMR-1 03.045 (ETSI TS 101 376-3-13): "GEO-Mobile Radio Interface Specifications; Part 3: Network specifications; Sub-part 13: Technical realisation of group 3 facsimile using transparent mode of transmission; GMR-1 03.045".
- GMR-1 03.050 (ETSI TS 101 376-3-14): "GEO-Mobile Radio Interface Specifications; Part 3: Network specifications; Sub-part 14: Transmission Planning Aspects of the Speech Service in the GMR-1 system; GMR-1 03.050".
- GMR-1 03.081 (ETSI TS 101 376-3-15): "GEO-Mobile Radio Interface Specifications; Part 3: Network specifications; Sub-part 15: Line Identification supplementary service - Stage 2; GMR-1 03.081".
- GMR-1 03.088 (ETSI TS 101 376-3-16): "GEO-Mobile Radio Interface Specifications; Part 3: Network specifications; Sub-part 16: Call Barring (CB) supplementary services - Stage 2; GMR-1 03.088".
- GMR-1 03.090 (ETSI TS 101 376-3-17): "GEO-Mobile Radio Interface Specifications; Part 3: Network specifications; Sub-part 17: Unstructured Supplementary Service Data (USSD) - Stage 2; GMR-1 03.290".
- GMR-1 03.297 (ETSI TS 101 376-3-19): "GEO-Mobile Radio Interface Specifications; Part 3: Network specifications; Sub-part 19: Optimal Routing technical realisation; GMR-1 03.297".
- GMR-1 03.299 (ETSI TS 101 376-3-21): "GEO-Mobile Radio Interface Specifications; Part 3: Network specifications; Sub-part 21: Position Reporting services; Stage 2 Service description; GMR-1 03.299".
- GSM 03.04 (ETSI ETS 300 524): "European digital cellular telecommunications system (Phase 2); Signalling requirements relating to routing of calls to mobile subscribers (GSM 03.04 (V4.0.4))".
- GSM 03.07 (ETSI ETS 300 525): "European digital cellular telecommunications system (Phase 2); Restoration procedures (GSM 03.07 (V4.3.1))".
- GSM 03.10 (ETSI ETS 300 528): "European digital cellular telecommunications system (Phase 2); GSM Public Land Mobile Network (PLMN) connection types (GSM 03.10 (V4.3.1))".
- GSM 03.38 (ETSI ETS 300 628): "European digital cellular telecommunications system (Phase 2); Alphabets and language-specific information (GSM 03.38 (V4.0.1))".
- GSM 03.40 (ETSI ETS 300 536): "Digital cellular telecommunications system (Phase 2); Technical realization of Short Message Service (SMS) Point-to-Point (PP) (GSM 03.40 (V4.13.0))".

GSM 03.82 (ETSI ETS 300 543): "Digital cellular telecommunications system (Phase 2); Call Forwarding (CF) supplementary services; Stage 2 (GSM 03.82 (V4.8.1))".

GSM 03.83 (ETSI ETS 300 544): "European digital cellular telecommunications system (Phase 2); Call Waiting (CW) and Call Hold (HOLD) supplementary services; Stage 2 (GSM 03.83 (V4.4.1))".

GSM 03.84 (ETSI ETS 300 545): "European digital cellular telecommunications system (Phase 2); Multi Party (MPTY) supplementary services; Stage 2 (GSM 03.84 (V4.4.1))".

GSM 03.85 (ETSI ETS 300 546): "Digital cellular telecommunications system (Phase 2); Closed User Group (CUG) supplementary services; Stage 2 (GSM 03.85 (V4.2.1))".



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## History

<b>Document history</b>		
V1.1.1	March 2001	Publication