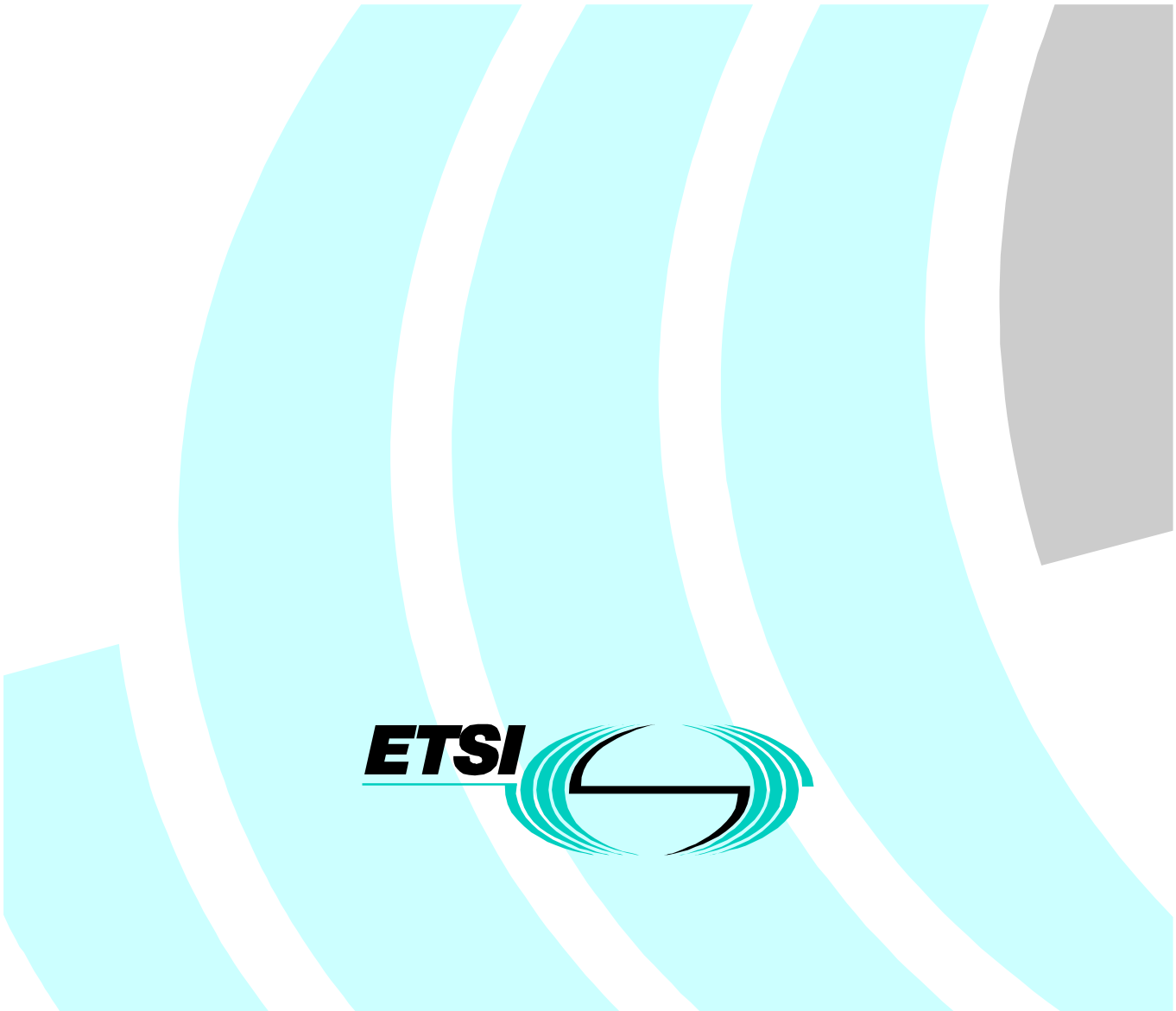
# ETSI TS 101 377-2-2 V1.1.1 (2001-03)

*Technical Specification*

**GEO-Mobile Radio Interface Specifications;**
**Part 2: Service specifications;**
**Sub-part 2: General on Supplementary Services;**
**GMR-2 02.004**



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**IPRs:**

| Project | Company | Title | Country of Origin | Patent n° | Countries Applicable |
|---|---|---|---|---|---|
| TS 101 377 V1.1.1 | Digital Voice Systems Inc | | US | US 5,715,365 | US |
| TS 101 377 V1.1.1 | Digital Voice Systems Inc | | US | US 5,754,974 | US |
| TS 101 377 V1.1.1 | Digital Voice Systems Inc | | US | US 5,226,084 | US |
| TS 101 377 V1.1.1 | Digital Voice Systems Inc | | US | US 5,701,390 | US |
| TS 101 377 V1.1.1 | Digital Voice Systems Inc | | US | US 5,826,222 | US |

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| Project | Company | Title | Country of Origin | Patent n° | Countries Applicable |
|---|---|---|---|---|---|
| TS 101 377 V1.1.1 | Ericsson Mobile Communication | Improvements in, or in relation to, equalisers | GB | GB 2 215 567 | GB |
| TS 101 377 V1.1.1 | Ericsson Mobile Communication | Power Booster | GB | GB 2 251 768 | GB |
| TS 101 377 V1.1.1 | Ericsson Mobile Communication | Receiver Gain | GB | GB 2 233 846 | GB |
| TS 101 377 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 101 377 V1.1.1 | Hughes Network Systems | | US | Pending | US |

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| Project | Company | Title | Country of Origin | Patent n° | Countries Applicable |
|---|---|---|---|---|---|
| TS 101 377 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 101 377 V1.1.1 | Lockheed Martin Global Telecommunic. Inc | Cellular Spacecraft TDMA Communications System with Call Interrupt Coding System for Maximizing Traffic ThroughputCellular Spacecraft TDMA Communications System with Call Interrupt Coding System for Maximizing Traffic Throughput | US | US 5,717,686 | US |
| TS 101 377 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 101 377 V1.1.1 | Lockheed Martin Global Telecommunic. Inc | Spacecraft Cellular Communication System | US | US 5,974,314 | US |
| TS 101 377 V1.1.1 | Lockheed Martin Global Telecommunic. Inc | Spacecraft Cellular Communication System | US | US 5,974,315 | US |
| TS 101 377 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 101 377 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 present document is part 2, sub-part 2 of a multi-part deliverable covering Geo-Mobile Radio Interface Specification, as identified below:

Part 1: "General specifications";

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

Sub-part 1: "Teleservices supported by a GMR-2 Public Satellite Mobile Network (PSMN); GMR-2 02.003";

**Sub-part 2: "General on Supplementary Services; GMR-2 02.004";**

Sub-part 3: "Security Aspects; GMR-2 02.009";

Sub-part 4: "Call Waiting (CW) and Call Hold (HOLD) Supplementary Services - Stage 1; GMR-2 02.083";

Sub-part 5: "Multiparty (MPTY) Supplementary Services; GMR-2 02.084";

Sub-part 6: "Service Accessibility; GMR-2 02.001";

Sub-part 7: "Operator Determined Barring (ODB); GMR-2 02.041";

Sub-part 8: "Call Barring Supplementary Services; GMR-2 02.088";

Sub-part 9: "Bearer Services (BS) supported by a GMR-2 Public Satellite Mobile Network (PSMN); GMR-2 02.002".

Part 3: "Network specifications";

Part 4: "Radio interface protocol specifications";

Part 5: "Radio interface physical layer specifications";

Part 6: "Speech coding specifications".

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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.

# 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-n 01.201.

# 1 Scope

The present document defines a recommended set of supplementary services, to the Teleservices and Bearer services, to be supported by a GMR-2 PSMN for interworking with other networks. The network capability requirements to support these services are also specified.

The descriptions of the different supplementary services are contained in specifications GMR-2 02.080 and GSM 02.80-series.

Supplementary services not covered in GMR-2 02.004, GMR-2 02.080 or GSM 02.80-series cannot be introduced unilaterally in any GMR-2 PSMN if they require modification of the GMR-2 signalling specifications.

Technical realization of supplementary services is described in specifications GSM 03.11 [4] and 04.10 [5].

# 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-2 01.004 (ETSI TS 101 377-1-1): "GEO-Mobile Radio Interface Specifications; Part 1: General specifications; Sub-part 1: Abbreviations and acronyms".

[2] GMR-2 02.003 (ETSI TS 101 377-02-01): "GEO-Mobile Radio interface specifications; Teleservices supported by a GMR-2 Public Satellite Mobile Network (PSMN) GMR 2-02.003".

[3] GSM 02.30 (ETSI ETS 300 511 Edition 2): "Digital cellular telecommunication system (Phase 2); Man-Machine Interface (MMI) of the Mobile Station (MS) (GSM 02.30 version 4.13.0)".

[4] GSM 03.11 (ETSI ETS 300 529 Edition 3): "Digital cellular telecommunication system (Phase 2); Technical realization of supplementary services (GSM 03.11 version 4.10.1)".

[5] GSM 04.10 (ETSI ETS 300 558 Edition 2): "Digital cellular telecommunication system (Phase 2); Mobile radio interface layer 3 Supplementary services specification General aspects (GSM 04.10 version 4.10.1)".

[6] GSM 04.80 (ETSI ETS 300 564): "European digital cellular telecommunication system (Phase 2); Mobile radio interface layer 3 supplementary services specification Formats and coding; (GSM 04.80 version 4.9.2)".

[7] ITU-T Recommendation I.210: "Principles of telecommunication services supported by an ISDN and the means to describe them".

[8] GMR-2 02.002 (ETSI TS 101 377-2-9): "GEO-Mobile Radio Interface Specifications; Part 2: Service specifications; Sub-part 9: Bearer Services (BS) supported by a GMR-2 Public Satellite Mobile Network (PSMN)".

[9] GSM 02.01 ( ETS 300 500 Edition 2): "Digital cellular telecommunication system (Phase 2); Principles of telecommunication services supported by a GSM Public Land Mobile Network (PLMN) (GSM 02.01 version 4.6.0)".

# 3 Abbreviations

For the purposes of the present document, the abbreviations given in GMR-2 01.004 [1] apply.

# 4 General

## 4.1 Supplementary service

A supplementary service modifies or supplements a basic Telecommunication service.

NOTE 1: Provision of supplementary services by PSMN operators may be considered as essential (E) or additional (A). E-supplementary services shall be made available in all GMR-2 PSMNs. A-supplementary services may be offered by GMR-2 PSMN operators for national service and can be made available internationally on the basis of bilateral agreement.

NOTE 2: Offered supplementary services may be used by subscribers/users at their discretion.

## 4.2 Concepts associated with supplementary services

For the purpose of the present document the following terms are defined:

Provision

An action to make a service available to a subscriber. The provision may be:

- general: where the service is made available to all subscribers (subject to compatibility restrictions enforced) without prior arrangements being made with the service provider;
- pre-arranged: where the service is made available to an individual subscriber only after the necessary arrangements have been made with the service provider.

Withdrawal

An action taken by the service provider to remove an available service from a subscriber's access. The withdrawal may be:

- general: where the service is removed from all subscribers provided with the service;
- specific: where the service is removed on an individual basis from subscribers provided with the service.

Registration

The programming by the service provider or subscriber of information to enable subsequent operation of a service. The programming action involves input of specific supplementary information. For certain services the registration procedure may cause activation whilst for others the service may already be in the action phase.

Erasure

The deletion by the service provider, the subscriber or the system of information stored against a particular service by a previous registration(s).

Activation

An action taken by either the service provider, the subscriber or the system to enable a process to run as and when required by the service concerned, resulting in the active phase. Some services can be either "operative" or "quiescent" (not operative) during the active phase according to whether or not the system would be able to invoke or use the service.

Deactivation

An action taken by either the service provider, the subscriber or the system to terminate the process started at the activation.

Invocation

An action to invoke the service required, taken by the subscriber (e.g. pressing a specific button) or automatically by the network or terminal as a result of a particular condition (e.g. calling number identification for each incoming call).

Normal operation with successful outcome

Description of the normal operation of the service, the normal served subscriber's actions and the system response. Decision points, timing and call progress signals would be some of the aspects defined for the service if they can be perceived by the subscriber.

Interrogation

The request by the subscriber to the PSMN to provide information about a specific supplementary service. This information can be requested by a:

- status check.

  The following values can be returned by the PSMN:

  - not supported;
  - active and operative;
  - active and quiescent;
  - not active.

- not all values are applicable to all supplementary services;
- data check;
- this interrogation function compares the data input by the subscriber during an interrogation procedure with the information stored in the PSMN. The PSMN signals an appropriate indication (e.g. "check is positive" or "check is negative");
- data request;

  this interrogation function enables the subscriber to obtain confirmation of her input data. The PSMN signals an appropriate indication (e.g. "the forwarded-to number is etc."). The response to a data request may comprise the status of the service (e.g. not active).

Exceptional operation or unsuccessful outcome

Abnormal situations not described in "normal operation with successful outcome". Procedures on time-out, unexpected signalling response and other such events would be defined.

Interaction with other supplementary services

When more than one supplementary service is active, new logical situations, decisions, priorities, etc., may arise. This clause would identify and define the resolution of such situations as they affect subscriber perception of the service. Special procedures may therefore be required, e.g. to allow, where possible, the simultaneous use of different supplementary services by one mobile subscriber.

Interworking considerations

Identification of subscriber perceptions when a call exits from an ISDN/PSMN to another network or enters an ISDN/PSMN from another network (e.g. PSTN).

Unstructured SS Operations

These operations are characterized by:

- in the mobile to network direction the transparent transport of MMI strings entered by the user to the network;
- in the network to mobile direction the transparent transport of text strings that are displayed by the mobile for user information.

These operations provide capabilities that can either be used as part of operator specified services, or to facilitate the early introduction of GMR-2 specified services.

NOTE 1: The present document does not distinguish between subscriber, user and customer, since all three do not fully cover the textual needs. Generally the term "subscriber" is used, even if this person is not having the subscription.

NOTE 2: The terms "she" and "her" are used as abbreviation of "she/he" and "her/his, her/him" respectively.

# 5 Categories and framework of supplementary services

## 5.1 Framework for the description of supplementary services

Specification GSM 02.01 [9] describes the principles of the Telecommunication services provided in a GMR-2 PSMN. It also defines the concepts of Telecommunication services and describes their characterization by appropriate attributes. Bearer services and Teleservices, which are offered by a GMR-2 PSMN in connection with other networks, are respectively defined in Specification GMR-2 02.002 [8] and 02.003 [2]. Besides these basic Telecommunication services, their enhancement or modification by supplementary services need also to be offered.

A supplementary service modifies or enhances a basic Telecommunication service and, hence, cannot be offered to a subscriber on a stand-alone basis. It must be offered together with or in association with a basic Telecommunication service. The same supplementary service may be offered with a number of different Telecommunication services. For applicability of a Supplementary Service to a Telecommunication service refer to annex A.

Table 1 (identical to table 1/GSM 02.01 and to table 1 of ITU-T Recommendation I.210 [7]) illustrates the description of Telecommunication services.

**Table 1: Categorization of Telecommunication services**

| TELECOMMUNICATION SERVICE | | | |
|---|---|---|---|
| BEARER SERVICE | | TELESERVICE | |
| Basic Bearer Service | Basic Bearer service + supplementary services | Basic Teleservice | Basic Teleservice + supplementary service |

Provision and withdrawal of a supplementary service, with the exception of Closed User Group, shall apply to all basic services the subscriber subscribes to.

Registration, erasure, activation and deactivation of a supplementary service shall apply to one or more group of basic services. The groups of basic services are defined to avoid handling of many basic service codes.

An operation is effective on the basic services, within the basic service group, which have been provisioned and for which the supplementary service is applicable. The fact that a basic service is provisioned but is not supplied by the network shall not lead to reject the request. The request shall be accepted since there is one basic service within the group(s) which is provisioned and for which the supplementary service is applicable. For applicability of a Supplementary Service to a basic service or service group refer to annex A.

The basic service groups are define in table 2.

**Table 2: List of basic service groups**

| Basic service group | | Basic service (see note 1) | |
|---|---|---|---|
| **Number** | **Name** | **Number (see note 2)** | **Name** |
| 1 | Speech | TS 11<br>TS 12 | Telephony<br>Emergency call |
| 2 | Short message service | TS 21<br>TS 22 | Short message MT/PP<br>Short message MO/PP |
| 3 - 5 | Not allocated | | |
| 6 | Facsimile services | TS 62 | Automatic facsimile group 3 |
| 7 | All Data circuit asynchronous | BS 24<br>BS 25<br>BS 26 | Data circuit duplex asynch. 2 400 bit/s<br>Data circuit duplex asynch. 4 800 bit/s<br>Data circuit duplex asynch. 9 600 bit/s |
| 8 | All Data circuit synchronous | BS 31<br>BS 32<br>BS 33<br>BS 34 | <br>Data circuit duplex synch. 2 400 bit/s<br>Data circuit duplex synch. 4 800 bit/s<br>Data circuit duplex synch. 9 600 bit/s |
| | | | |
| | | | |

NOTE 1: Basic services are defined in specifications GMR-2 02.002 [8] and 02.003 [2].

NOTE 2: TS: Teleservice
BS: Bearer service.

## 5.2 Categories of supplementary services

Below follows a list of the possible categories of supplementary services related to provision, withdrawal, registration, erasure, activation, deactivation, invocation and interrogation.

Provision of a supplementary service can be made on a subscription basis, i.e. after pre-arrangement with the service provider, or the supplementary service can be made generally available to all mobile subscribers having access to GMR-2 PSMNs.

Withdrawal of a supplementary service can be as a result of a subscriber's request or for administrative reasons. Both withdrawal actions are performed by the service provider.

Registration of a supplementary service is only applicable to those supplementary services in which specific data is required to enable subsequent operation of the service. This registration can be the result of provision or it can be a subscriber-controlled procedure. Registration of a supplementary service may mean simultaneous activation of that service.

Erasure of a supplementary service is only applicable to those supplementary services for which registration is necessary. It can be the result of withdrawal, it can be the result of a new registration overruling, and thus effectively erasing the previous registration, or it can be a subscriber-controlled procedure. Erasure of a Supplementary Service may mean simultaneous deactivation of that service.

Activation of a supplementary service can be the result of provision. In some cases the supplementary service is only activated if the conditions in the subscription options are met. A supplementary service can also be activated by means of a procedure controlled either by the mobile subscriber or the service provider. Some supplementary services may also be activated as a result of registration.

Deactivation of a supplementary service can be the result of withdrawal or erasure of the service. In some cases the supplementary service is deactivated if the conditions in the subscription options are not met. A supplementary service can also be deactivated by means of a procedure controlled either by the mobile subscriber or the service provider. A supplementary service can be automatically deactivated at the end of a call if the supplementary service was specifically activated for that call. Finally, a supplementary service may be automatically deactivated by the network as a consequence of activation of another supplementary service if it conflicts with the other activated supplementary service.

Invocation of a supplementary service can take place by means of a subscriber controlled procedure or automatically by the network as a result of a particular condition.

Interrogation of a supplementary service is only applicable for a few supplementary services for which it is useful to get information from the network about the status or relevant data concerning the supplementary service.

# 6 Supported supplementary services

Table 3 gives a list of possible supplementary services implemented in the GMR-2 PSMN, the definitions of which are given in the GMR-2 02.080 and GSM 02.80-series of specifications.

For the recommended provision of services classified as Additional or Essential (A, E1, E2, or E3), see relevant GSM/PCN MoU documents.

NOTE: All supplementary services in this table are implemented in the PSMN. Subscribers can use these supplementary services for calls within the PSMN, but also in interworking situations with the PSTN (if supported) and the ISDN. In interworking situations with CSPDN these supplementary services can only be used during call set up (e.g. call forwarding services). When a call is established between an MES and a PDN, the MES acts as a data network terminal and can consequently only use the supplementary services that are supported by the relevant PDN. The PDN supplementary services are not described in the present document; they can be found in the relevant PDN Specifications. However, the interworking situations with PDNs still require further study.

It has been identified as a requirement that the man-machine interface in GMR-2 PSMNs regarding supplementary services should be compatible as much as possible with the man-machine interface in the fixed networks as defined in CEPT groups, e.g. the same use of keypad information or function keys.

Table 3 lists the categories for all supported supplementary services. Below the abbreviations used are listed.

Registration:

p = as a result of provision;

a = service provider controlled procedure;

s = subscriber controlled procedure;

- = not applicable.

Erasure:

w = as a result of withdrawal;

s = subscriber controlled procedure;

r = due to new registration;

- = not applicable.

Activation:

p = as a result of provision;

r = as a result of registration;

s = subscriber controlled procedure;

a = service provider controlled procedure;

c = when the conditions in the subscription options are met;

- = not applicable.

Deactivation:

w = as a result of withdrawal;

s = subscriber controlled procedure;

a = service provider controlled procedure;

e = as a result of erasure;

n = when the conditions in the subscription options are not met;

c = at the end of a per call basis activation;

- = not applicable.

Invocation:

n = automatic invocation by the network as a result of a particular condition;

u = user invocation, by means of a control procedure;

- = not applicable.

Interrogation:

s = status check;

dr = data request;

- = not applicable.

**Table 3 Supported Supplementary Services**

| Supplementary Service | | | | | | | |
|---|---|---|---|---|---|---|---|
| GSM Spec/clause | | Reg | Eras | Act | Deact | Inv | Int |
| 02.81. Number Identif. SS | | | | | | | |
| | CLIP | - | - | p | w | n | s |
| | CLIR | - | - | p | w | n | dr |
| | CoLP | - | - | p | w | n | s |
| | CoLR | - | - | p | w | n | s |
| 02.82. Call Offering SS | | | | | | | |
| | CFU | a/s | w/r/s | r/s | e/s | n | dr |
| | CFB | a/s | w/r/s | r/s | e/s | n | dr |
| | CFNRy | a/s | w/r/s | r/s | e/s | n | dr |
| | CFNRc | a/s | w/r/s | r/s | e/s | n | dr |
| 02.83. Call Completion SS | | | | | | | |
| | CW | - | - | a/s | a/s | n | s |
| | HOLD | - | - | p | w | u | - |
| 02.84. Multi Party SS | | | | | | | |
| | MPTY | - | - | - | - | u | - |
| 02.85. Comm. of Interest SS | | | | | | | |
| | CUG | - | - | p | w | u/n | - |
| | | | | | | | |
| 02.88. Call Restriction SS | | | | | | | |
| | BAOC | a/s | w/r | a/s | s/a | n | dr |
| | BOIC | a/s | w/r | a/s | s/a | n | dr |
| | BOIC-exHC | a/s | w/r | a/s | s/a | n | dr |
| | BAIC | a/s | w/r | a/s | s/a | n | dr |
| | BAIC-Roam | a/s | w/r | a/s | s/a | n | dr |

Abbreviations used for the Supplementary Services:

| | |
|---|---|
| BAIC | Barring of All Incoming Calls |
| BAOC | Barring of All Outgoing Calls |
| BIC-Roam | Barring of Incoming Calls when Roaming Outside the Home PLMN Country |
| BOIC | Barring of Outgoing International Calls |
| BOIC-exHC | Barring of Outgoing International Calls except those directed to the Home PLMN Country |
| CFB | Call Forwarding on Mobile Subscriber Busy |
| CFU | Call Forwarding Unconditional |
| CFNRc | Call Forwarding on Mobile Subscriber Not Reachable |
| CFNRy | Call Forwarding on No Reply |
| CLIP | Calling Line Identification Presentation |
| CLIR | Calling Line Identification Restriction |
| CoLP | Connected Line Identification Presentation |
| CoLR | Connected Line Identification Restriction |
| CUG | Closed User Group |
| CW | Call Waiting |
| HOLD | Call Hold |
| MPTY | Multi Party Service |

## 6.1 Support of Line identity services

A PSMN which supports the GMR-2 CLIP service shall also support the CLIR service. A PSMN which supports CoLP service shall also support the CoLR service.

A PSMN which does not support the GMR-2 CLIR service shall ensure that the line identity of a subscriber shall not be displayed to the called party unless the called party has CLIR override capability. A PSMN which does not support the GMR-2 CoLR service shall ensure that the line identity of a subscriber shall not be displayed to the calling party unless the calling party has CoLR override capability.

# 7 Use of a password option in relation to supplementary services

## 7.1 Definition

Some Supplementary Services (e.g. Call Barring) can be offered to a subscriber with the subscription option of using a password to control the service. When this option is selected every action (related to that Supplementary Service), such as registration, erasure, activation or deactivation is performed by the mobile subscriber with the concurrent entry of the password.

## 7.2 Description

When the subscription option "Control of a Supplementary Service by the subscriber using a password" is provided, password handling is supported by the network.

The password will consist of four digits in the range 0000 to 9999.

## 7.3 Management-normal procedures and successful outcome

### 7.3.1 Provision of password option

Each Supplementary Service for which the control by the subscriber usage of a password is relevant may be offered with the subscription option "Control of the Supplementary Service". The values of this option will be:

- by the subscriber using a password;
- by the service provider.

NOTE: A service provider needs not to offer this option to its subscribers. However, the support of the password facility is mandatory in the networks for visiting subscribers.

### 7.3.2 Withdrawal of the password option

The password option may be withdrawn for administrative reasons or due to subscription modification.

### 7.3.3 Registration of password

If a mobile subscriber selects at provision time the option of using a password for any given Supplementary Service, the password have to be registered at the same time.

Furthermore, the subscriber can change the password by an appropriate control procedure at any time. The control procedure is described in GSM 02.30 [3].

### 7.3.4 Erasure of password

A password can be erased in two ways:

1) registration of a new password erases the previous one; or
2) withdrawal of the password option.

### 7.3.5 Password checking

If the mobile subscriber in an attempt to control a Supplementary Service requiring a password enters a correct password, the corresponding request is then considered by the network.

## 7.4 Management-exceptional procedures or unsuccessful outcome

If the mobile subscriber in an attempt to control a Supplementary Service requiring a password, or in an attempt to register a new password, enters an incorrect password, the corresponding request will be rejected by the network and the subscriber will be notified.

If the mobile subscriber enters incorrect password more than three consecutive times, all control procedures related to the use of the password are made impossible until the service provider instructs the network to again accept password-related requests from this subscriber.

# 8 Void

# 9 Processing of supplementary service operations

## 9.1 Processing of operations containing basic service information

The network shall process a registration/erasure/activation/deactivation request indicating basic service information independent of the previous registration/activation status. As a result the network will process these requests for the indicated basic service information only, whereas other registration/activation status information remains unchanged.

Basic service information received by the network within the above supplementary service operations is defined in the GSM 04.80-series. According to this definition the network may receive a combined basic service indication, e.g. for all basic services. As a result the combined basic service indication may be dissolved (see note 1). This has to be taken into account when an interrogation procedure is performed.

In case the operation contains a combined basic service indication (e.g. for all bearer services) the interactions specified in the GSM 02.80-series have to be checked subsequently for each member of the combined service indication. As a result a supplementary service request may be partly rejected due to the interaction requirements (see note 2). This has to be taken into account in the acknowledgement to the supplementary service request from the mobile earth station, i.e. the network shall send a notification to the MES that the SS operation request was only partially successful.

NOTE 1: Explanatory example

1) Operation:

Registration of CFU for "all basic services" to number 1.

2) Operation:

Registration of CFU for "Speech" to number 2.

Result:

Registration status for:

"Speech": CFU active to number 2.

All other basic service groups: CFU active to number 1.

NOTE 2: Explanatory examples:

1) Operation:

Registration of CFB for "Speech" to number 1.

2) Operation :

Activation of BAOC for "Facsimile services".

3) Operation:

Registration of CFU for "all basic services" to number 2.

Result :

Registration status for

- "Speech": CFU active to number 2, CFB "quiescent" to number 1;
- "Facsimile services": BAOC Active, CFU rejected;
- All other basic service groups: CFU active to number 2.

## 9.2 Processing of operations involving multiple Supplementary Services

Normally, SS operations relate to one single Supplementary Service at a time. The network reaction on such operations are described in the GSM 02.80-series-clauses x.3 (Normal Procedures), x.4 (Exceptional Procedures) and x.6 (Interaction). Clause 9.1 of the present document also contains information related to this area.

In addition, some groups of Supplementary Services may be controlled collectively, such as Call Forwarding and Barring services. The information contained in such "global" operation (e.g. Forwarded-to-number, Password, Basic Service group(s)) then applies generally to all SS concerned by the operation.

The reaction of the network when receiving such control requests is generally the same as when receiving a number of subsequent single operations to the corresponding Supplementary Services. However, in some cases the action to be taken by the network may be regarded as "exceptional", and therefore the following clarifies the only allowed operations on groups of Supplementary Services:

- if the group "all Call Forwarding services" is subject for a Registration or an Activation request, CFU shall become Active and Operative whilst the conditional CFs (CFC) will become Active and quiescent for the Basic Service groups concerned by the operation. I.e. the network behaviour is the same as if the CFCs were Registered/Activated first, followed by Registration/Activation of CFU;
- the No Reply Timer may be a part of this general operation;
- if the Basic Service information provided in the request is not relevant to one or more of the SS involved, the principles in clause 9.1 of the present document apply, i.e. the network ignores these parts of the request;
- if the group "all Conditional Call Forwarding services" is subject for a Registration or an Activation request, all CFCs shall become Active and Operative for the Basic Service groups concerned by the operation;
- the No Reply Timer may be a part of this general operation;
- if the Basic Service information provided in the request is not relevant to one or more of the SS involved, the principles in clause 9.1 of the present document apply, i.e. the network ignores these parts of the request;
- if the group "all Call Forwarding services" or the group "all Conditional Call Forwarding services" is subject for a Deactivation or an Erasure request, the network shall act as normal, i.e. as if a number of subsequent Deactivations/Erasures were requested. If the Basic Service information provided in the request is not relevant to one or more of the SS involved, the principles in clause 7.1 of the present document apply, i.e. the network ignores these parts of the request;

- if any of the groups "all Barring services", "all Outgoing Barring Services" or "all Incoming Barring Services" is subject to a Deactivation request, the network shall act as normal, i.e. as if a number of subsequent Deactivations were requested;
- if the Basic Service information provided in the request is not relevant to one or more of the SS involved, the principles in clause 7.1 of the present document apply, i.e. the network ignores these parts of the request;
- if the user requests Password Registration for any other single or group of Barring Services than "all Barring Services" the request will be denied (as only one [common] password for the Barring services per subscriber is allowed);
- interrogation of groups of Supplementary Services is not supported.

## 9.3 Compatibility Information and Supplementary Services

Within the Single Numbering Scheme it is possible that an incoming call (e.g. PSTN call) do not have an allocated Bearer Capability Information Element. The network cannot at this stage determine the Basic Service requirement and shall, for Supplementary Service purposes, handle the call based on a "default basic service" for the call. If the subscriber has a subscription to telephony then the network shall use telephony as the "default basic service". If the subscriber does not have a subscription to telephony the HLR shall choose a Basic Service from the set provisioned to the subscriber as the "default basic service".

When an incoming call is subject to Call Forwarding, no modifications or additions to the original BC-IE information, present or not, received by the PSMN shall be sent with the forwarded call.

# 10 Format of description

The supplementary services are described according to the following format:

0. GENERAL

x.1 DEFINITION

x.2 DESCRIPTION

x.2.1 Description

x.2.2 Applicability to telecommunication services

x.2.3 Terminology

x.3 NORMAL PROCEDURES WITH SUCCESSFUL OUTCOME

x.3.1 Provision

x.3.2 Withdrawal

x.3.3 Registration

x.3.4 Erasure

x.3.5 Activation

x.3.6 Deactivation

x.3.7 Invocation

x.3.8 Normal operation with successful outcome

x.3.9 Quality of service

x.3.10 Testing

x.3.11 Interrogation

x.3.12 Charging requirements

x.4 EXCEPTIONAL PROCEDURES OR UNSUCCESSFUL OUTCOME

x.4.1 Exceptional operation or unsuccessful outcome

x.4.2 Registration

x.4.3 Erasure

x.4.4 Activation

x.4.5 Deactivation

x.4.6 Invocation

x.4.7 Testing

x.4.8 Interrogation

x.4.9 Charging requirements

x.4.10 Roaming in non-supporting networks

x.5 ALTERNATE PROCEDURES

x.6.y.z INTERACTIONS WITH OTHER SUPPLEMENTARY SERVICES

x.7 INTERWORKING CONSIDERATIONS

x.8 DYNAMIC DESCRIPTION OF SERVICE

x.9 OUTSTANDING ISSUES

The letter "x" denominates the supplementary service described in clause "x" of the GSM 02.80-series of specifications. The letter "y" denominates the specification (GSM 02.y) in which the supplementary service denominated by the letter "z" is described and which interacts with the supplementary service that is described in clause "x".

Every supplementary service is described according to this format. If a subheading is not included in the text, it means:

- not applicable (e.g. in cases where "registration", "erasure", "activation", etc., do not apply);
- none identified (e.g. no exceptional procedure for "invocation");
- no interaction (in cases where no interaction appears between two supplementary services in clause 6).

# Annex A (normative): Applicability of Supplementary Services to Telecommunication Services

Table A.1 gives the applicability of GSM Supplementary Services to telecommunication services.

**Table A.1: Applicability of SSs to telecommunication services**

| SS | Telephony | Emergency Call | SMS PTP | | Fax | cct Data |
|---|---|---|---|---|---|---|
| | TS11 | TS12 | TS21 | TS22 | TS 6x | BS2x, BS3x |
| CLIP | Yes | | | | Yes | Yes |
| CLIR | Yes | | | | Yes | Yes |
| COLP | Yes | | | | Yes | Yes |
| COLR | Yes | | | | Yes | Yes |
| CFU | Yes | | | | Yes | Yes |
| CFB | Yes | | | | Yes | Yes |
| CFNRy | Yes | | | | Yes | Yes |
| CFNRc | Yes | | | | Yes | Yes |
| CW[1] | Yes | | | | Yes | Yes |
| HOLD[2] | Yes | | | | | |
| MPTY | Yes | | | | | |
| CUG | Yes | | | | Yes | Yes |
| | | | | | | |
| | | | | | | |
| BAOC | Yes | | Yes (see note 3) | Yes | Yes | Yes |
| BOIC | Yes | | Yes (see note 3) | Yes | Yes | Yes |
| BOIC- exHC | Yes | | Yes (see note 3) | Yes | Yes | Yes |
| BIC | Yes | | Yes | Yes (see note3) | Yes | Yes |
| BIC-Roam | Yes | | Yes | Yes (see note 3) | Yes | Yes |
| ECT | Yes | | | | | |
| CCBS | Yes | | | | Yes | Yes |

NOTE 1: The applicability of Call Waiting refers to the telecommunication service of the active call and not of the waiting call. The incoming, waiting, call may be of any kind.

NOTE 2: If the served mobile subscriber has a call on hold, she may set up another call using the same or a different telecommunication service.

NOTE 3: The SS is applicable, but generally will not be invoked.

# Annex B (informative): Bibliography


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# History

| Document history | | |
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