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Technical Specification

**GEO-Mobile Radio Interface Specifications;
Part 4: Radio interface protocol specifications;
Sub-part 14: Call Barring Supplementary Services;
GMR-2 02.088**



Reference

DTS/SES-002-04088

Keywords

GMR, MSS, MES, Satellite, GSO, S-PCN, GSM,
CB, interface, mobile, radio,
supplementary service

ETSI

650 Route des Lucioles
F-06921 Sophia Antipolis Cedex - FRANCE

Tel.: +33 4 92 94 42 00 Fax: +33 4 93 65 47 16

Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
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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

IPR Owner: Digital Voice Systems Inc
One Van de Graaff Drive Burlington,
MA 01803
USA

Contact: John C. Hardwick
Tel.: +1 781-270-1030
Fax: +1 781-270-0166

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

IPR Owner: Ericsson Mobile Communications (UK) Limited
The Keytech Centre, Ashwood Way
Basingstoke
Hampshire RG23 8BG
United Kingdom

Contact: John Watson
Tel.: +44 1256 864821

Project	Company	Title	Country of Origin	Patent n°	Countries Applicable
TS 101 377 V1.1.1	Hughes Network Systems		US	Pending	US

IPR Owner: Hughes Network Systems
11717 Exploration Lane
Germantown, Maryland 20876
USA

Contact: John T. Whelan
Tel: +1 301-428-7172
Fax: +1 301-428-2802

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 Throughput Cellular 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

IPR Owner: Lockheed Martin Global Telecommunications, Inc.
900 Forge Road
Norristown, PA. 19403
USA

Contact: R.F. Franciose
Tel.: +1 610.354.2535
Fax: +1 610.354.7244

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 4, sub-part 14 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";

Part 4: "Radio interface protocol specifications";

Sub-part 1: "GMR-2 Mobile Earth Station-Network Interface; General Aspects and Principles; GMR-2 04.001";

Sub-part 2: "GMR-2 Mobile Earth Station-Network Interface; Channel Structures and Access capabilities; GMR-2 04.003";

Sub-part 3: "Layer 1 General requirements; GMR-2 04.004";

Sub-part 4: "Data Link Layer General Aspects; GMR-2 04.005";

Sub-part 5: "GMR-2 Mobile Earth Station - Network Interface; Data Link (DL) layer Specifications; GMR-2 04.006";

Sub-part 6: "Mobile Radio Interface Signalling Layer 3; General Aspects; GMR-2 04.007";

Sub-part 7: "Mobile radio interface Layer 3 Specifications; GMR-2 04.008";

Sub-part 8: "Point-to-Point Short Message Services; GMR-2 04.011";

Sub-part 9: "Performance requirements on the mobile radio interface; GMR-2 04.013";

Sub-part 10: "Rate Adaptation on the Mobile Earth Station (MES) - Gateway System Interface; GMR-2 04.021";

Sub-part 11: "Call Waiting (CW) and Call Holding (HOLD) Supplementary Services; GMR-2 04.083";

Sub-part 12: "Multiparty Supplementary Services (MPTY); GMR-2 04.084";

Sub-part 13: "Technical Realisation of the Early Flag Technique; GMR-2 04.201";

Sub-part 14: "Call Barring Supplementary Services; GMR-2 02.088";

Part 5: "Radio interface physical layer specifications";

Part 6: "Speech coding specifications".

Introduction

GMR stands for GEO (Geostationary Earth Orbit) Mobile Radio interface, which is used for mobile satellite services (MSS) utilizing geostationary satellite(s). GMR is derived from the terrestrial digital cellular standard GSM and supports access to GSM core networks.

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 specifies the procedures used at the radio interface (reference point Um as defined in technical specification GSM 04.02 [4]) for normal operation, registration, erasure, activation, deactivation, invocation and interrogation of call offering supplementary services. Provision and withdrawal of supplementary services is an administrative matter between the mobile subscriber and the service provider and cause no signalling on the radio interface.

In technical specification GSM 04.10 [7], the general aspects of the specification of supplementary services at the layer 3 radio interface are given.

Technical specification GSM 04.80 [8] specifies the formats and coding for the supplementary services.

Definitions and descriptions of supplementary services are given in technical specifications GMR-2 02.004 [2], GSM 02.8x and 02.9x-series.

Technical realization of supplementary services is described in technical specifications GSM 03.11 [3], GSM 03.8x and 03.9x-series.

The procedures for Call Control, Mobility Management and Radio Resource management at the layer 3 radio interface are defined in technical specifications GMR-2 04.007 [5] and GMR-2 04.008 [6].

The following supplementary services belong to the call restriction supplementary services and are described in the present document:

- Barring of all outgoing calls (BAOC) – (Barring program 1) (See clause 4);
- Barring of all incoming calls (BAIC) – (Barring program 1) (See clause 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, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, subsequent revisions do apply.

- [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; GMR-2 01.004".
- [2] GMR-2 02.004 (ETSI TS 101 377-2-2): "GEO-Mobile Radio interface specifications; Part 2: Service specifications; Sub-part 2: General on Supplementary Services; GMR-2 02.004".
- [3] GSM 03.11 (ETSI ETS 300 529 Edition 3): "Digital cellular telecommunications system (Phase 2); Technical realization of supplementary services (GSM 03.11 version 4.10.1)".
- [4] GSM 04.02 (ETSI ETS 300 551): "European digital cellular telecommunications system (Phase 2); GSM Public Land Mobile Network (PLMN) access reference configuration (GSM 04.02 version 4.0.4)".
- [5] GMR-2 04.007 (ETSI TS 101 377-4-6): "GEO-Mobile Radio Interface Specifications; Part 4: Radio interface protocol specifications; Sub-part 6: Mobile Radio Interface Signalling Layer 3; General Aspects; GMR-2 04.007".
- [6] GMR-2 04.008 (ETSI TS 101 377-4-7): "GEO-Mobile Radio Interface Specifications; Part 4: Radio interface protocol specifications; Sub-part 7: Mobile radio interface Layer 3 Specifications; GMR-2 04.008".

- [7] GSM 04.10 (ETSI ETS 300 558 Edition 2): "Digital cellular telecommunications system (Phase 2); Mobile radio interface layer 3; Supplementary services specification; General aspects (GSM 04.10 version 4.10.1)".
- [8] GSM 04.80 (ETS 300 564 Edition 3): "Digital cellular telecommunications system (Phase 2); Mobile radio interface layer 3; Supplementary services specification; Formats and coding (GSM 04.80 version 4.11.1)".

3 Definitions and abbreviations

3.1 Definitions

For the purposes of the present document, the following terms and definitions apply:

Cross phase compatibility

For the following supplementary services, a number of changes exist between the present document and the Phase 1 specification:

- Barring of outgoing calls;
- Barring of incoming calls.

The main body of the present document assumes that all network entities comply with this version of the service. In each case an additional clause (i.e., 4.7 and 5.7) defines the additional requirements for when one or more network entities or the MES complies with the Phase 1 specifications for the supplementary service procedures.

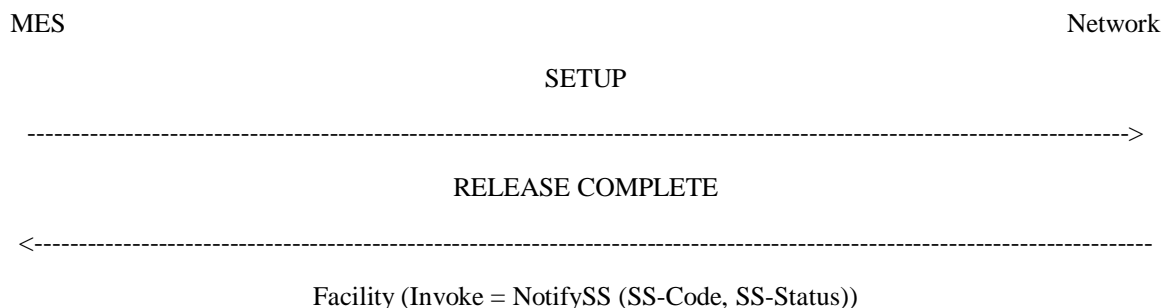
3.2 Abbreviations

Abbreviations used in the present document are listed in GMR-2 01.004 [1].

4 Barring of outgoing calls

4.1 Normal operation

When a barring program relating to outgoing calls is active and operative for a basic service, each call set up related to that basic service and not allowed by the barring program will be refused by the network. In this case a NotifySS operation containing the SS-Status indicating that a barring program relating to outgoing calls is currently active and operative will be sent to the served mobile subscriber, see figure 4.1.



NOTE: The SS-Code will be the common code for outgoing barring services.

Figure 4.1: Notification to the served mobile subscriber that barring of outgoing calls is active

When a barring program is active (operative or quiescent), the ability of the served mobile subscriber to set up emergency calls is not affected, irrespective of the basic service to which the barring program applies.

When a barring program relating to outgoing calls is active (operative or quiescent), the ability of the served mobile subscriber to receive calls is not affected.

4.2 Registration

If the served mobile subscriber at provision time has selected the subscription option "control of barring service: by subscriber using password", the subscriber has to register a call barring password at provision time. Furthermore the served mobile subscriber can change the call barring password by a registration procedure at any time.

If the served mobile subscriber at provision time has selected the subscription option "control of barring service: by service provider", an attempt to register a new call barring password will be denied.

The procedure to register a new password is specified in GSM 04.10 [7].

4.3 Activation

If the served mobile subscriber at provision time has selected the subscription option "control of barring service: by subscriber using password", the supplementary service is activated for a basic service if the subscriber has requested so by means of an activation procedure for that basic service. If the subscriber does not indicate a specific basic service, the activation applies to all basic services. The subscriber may use the call barring password at activation, see figure 4.2.

If the activation is successful, the service will be activated. The network will then send a return result indicating acceptance of the request. The result is formatted according to the options shown below:

- The result includes the Basic Service group Code(s) to which the service is activated. The result may also contain an SS-Code and SS-Status parameter. If the MES does not send an SS Version Indicator in the invocation request then these parameters shall be presented in the result. If the MES does send an SS Version Indicator in the invocation request then these parameters are optional in the result. If the SS-Status is included the network shall set it to reflect the state of the service. If the SS-Code is included then it shall contain the SS-Code of the service which has been activated. The MES shall ignore the contents of the SS-Code and SS-Status parameters if they are received.

Note that the use of SS-Code and SS-Status is to provide backwards compatibility with phase 1.

- If the request did not include a BasicServiceCode, and the activation was successful for all basic services, the network may send an empty return result to the MES. This option applies whether or not an SS Version Indicator is received from the MES.

If the served mobile subscriber at provision time has selected the subscription option "control of barring service: by service provider", an attempt to activate the service will be denied and the served mobile subscriber receives an error indication, see figure 4.2.

Error values are specified in GSM 04.80 [8].

MES

Network

REGISTER

----->

Facility (Invoke = ActivateSS (SS-Code, BasicServiceCode))

Password procedure according to ETS GSM 04.10 [7]

RELEASE COMPLETE

<-----

Facility (Return result = ActivateSS (SS-Code, BasicServiceCode, SS-Status))

RELEASE COMPLETE

<-----

Facility (Return error (Error))

RELEASE COMPLETE

<-----

Facility (Reject (Invoke_problem))

NOTE: The SS-Code will be one of the specific outgoing barring codes. If BasicServiceCode is not included it applies to all basic services. The SS-Code and SS-Status may not be included in the result in all cases, see text.

Figure 4.2: Activation of a barring program

4.4 Deactivation

If the served mobile subscriber at provision time has selected the subscription option "control of barring service: by subscriber using password", the supplementary service is deactivated for a basic service if the subscriber has requested deactivation by means of a deactivation procedure for that basic service. The subscriber may use the call barring password at deactivation, see figure 4.3.

The deactivation request of a barring program may specify the basic service. If the subscriber does not indicate a specific basic service, the deactivation applies to all basic services, see figure 4.3.

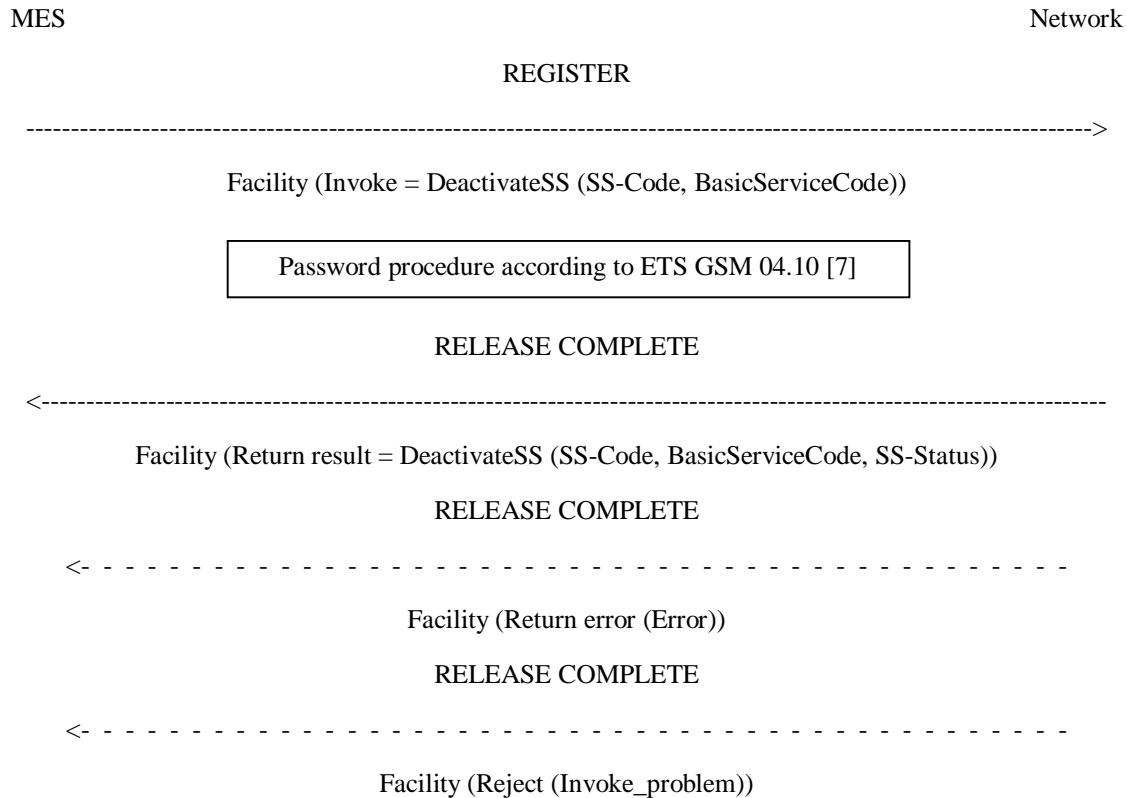
If the deactivation is successful, the service will be deactivated. The network will then send a return result indicating acceptance of the request. The result is formatted according to the options shown below:

- The result includes the Basic Service group Code(s) to which the service is deactivated. The result may also contain an SS-Code and SS-Status parameter. If the MES does not send an SS Version Indicator in the invocation request then these parameters shall be presented in the result. If the MES does send an SS Version Indicator in the invocation request then these parameters are optional in the result. If the SS-Status is included, the network shall set it to reflect the state of the service. If the SS-Code is included then it shall contain the SS-Code of the service which has been deactivated. The MES shall ignore the contents of the SS-Code and SS-Status parameters if they are received.

Note that the use of SS-Code and SS-Status is to provide backwards compatibility with phase 1.

- If the request did not include a BasicServiceCode, and the deactivation was successful for all basic services, the network may send an empty return result to the MES. This option applies whether or not an SS Version Indicator is received from the MES.

If the served mobile subscriber at provision time has selected the subscription option "control of barring service: by service provider", an attempt to deactivate the supplementary service will be denied and the served mobile subscriber receives an error indication, see figure 4.3. Error values are specified in GSM 04.80 [8].



NOTE: The SS-Code may be one of the specific outgoing barring codes, the common code for the outgoing barring services, or the SS-Code for all call barring services. If BasicServiceCode is not included it applies to all basic services. The SS-Code and SS-Status may not be included in the result in all cases, see text.

Figure 4.3: Deactivation of barring of outgoing calls

4.5 Interrogation

The interrogation procedure enables the mobile subscriber to obtain information about data stored in the PSMN. After having requested this procedure the network shall return a list of all basic service groups for which the service is active, see figure 4.4.

If there is no basic service group for which the service is active, an SS-Status will be returned indicating that the service is "deactivated".

4.6 Invocation and erasure

Invocation and erasure are not applicable to barring programs.

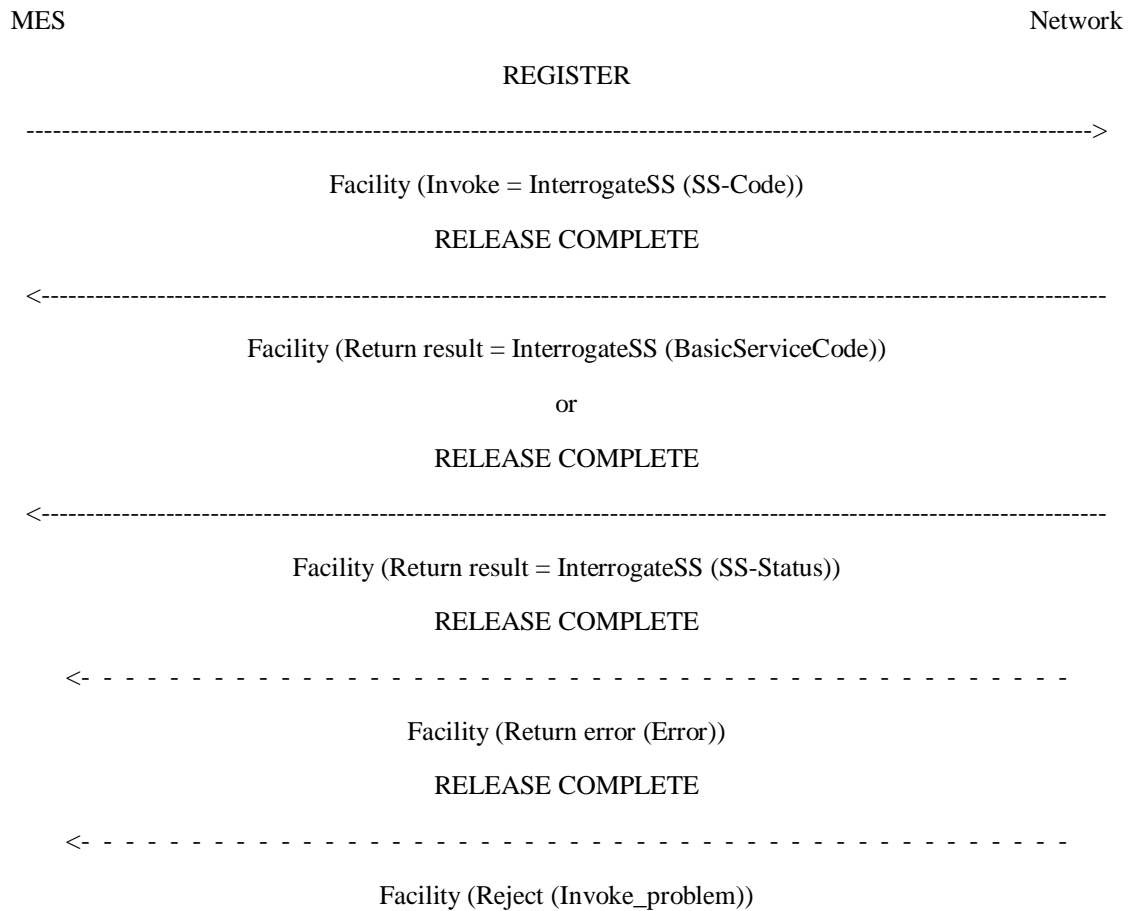
4.7 Cross phase compatibility

4.7.1 Network only supports phase 1 control of SS by the subscriber

In this case there is no relevant cross phase compatibility problem.

4.7.2 MES only supports phase 1 control of SS by the subscriber

In this case there is no relevant cross phase compatibility problem.



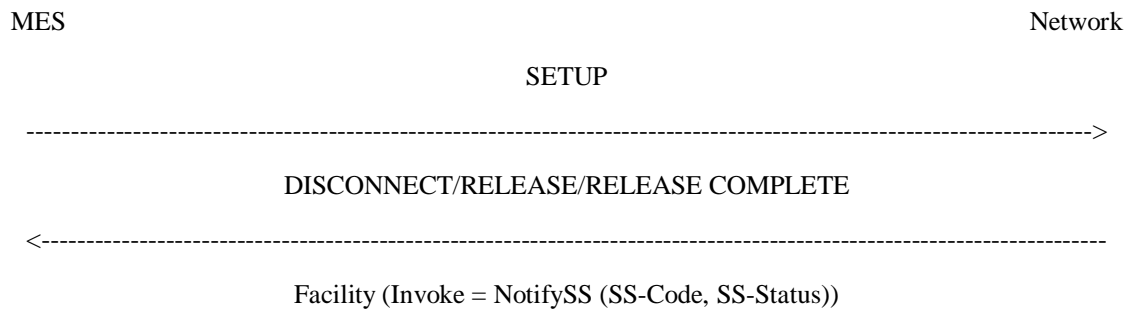
NOTE: The SS-Code may be one of the specific outgoing barring codes.

Figure 4.4: Interrogation of a barring program

5 Barring of incoming calls

5.1 Normal operation

When a barring program relating to incoming calls is active and operative for a basic service, each incoming call set-up related to that basic service and not allowed by the barring program will be refused by the network. In this case a NotifySS operation containing the SS-Status indicating that a barring program relating to incoming calls is currently active and operative will be sent to the calling mobile subscriber in a clearing message, see figure 5.1.



NOTE: The SS-Code will be the common code for incoming barring services.

Figure 5.1: Notification to the calling mobile subscriber that at the called subscriber side barring is active

When barring of incoming calls is active (operative or quiescent), the ability of the served mobile subscriber to originate calls is not affected.

5.2 Registration

If the served mobile subscriber at provision time has selected the subscription option "control of barring service: by subscriber using password", the subscriber has to register a call barring password at provision time. Furthermore the served mobile subscriber can change the call barring password by a registration procedure at any time.

If the served mobile subscriber at provision time has selected the subscription option "control of barring service: by service provider", an attempt to register a new call barring password will be denied.

The procedure to register a new password is specified in GSM 04.10 [7].

5.3 Activation

If the served mobile subscriber at provision time has selected the subscription option "control of barring service: by subscriber using password", the supplementary service is activated for a basic service if the subscriber has requested so by means of an activation procedure for that basic service. If the subscriber does not indicate a specific basic service, the activation applies to all basic services. The subscriber may use the call barring password at activation, see figure 5.2.

If the activation is successful, the service will be activated. The network will then send a return result indicating acceptance of the request. The result is formatted according to the options shown below:

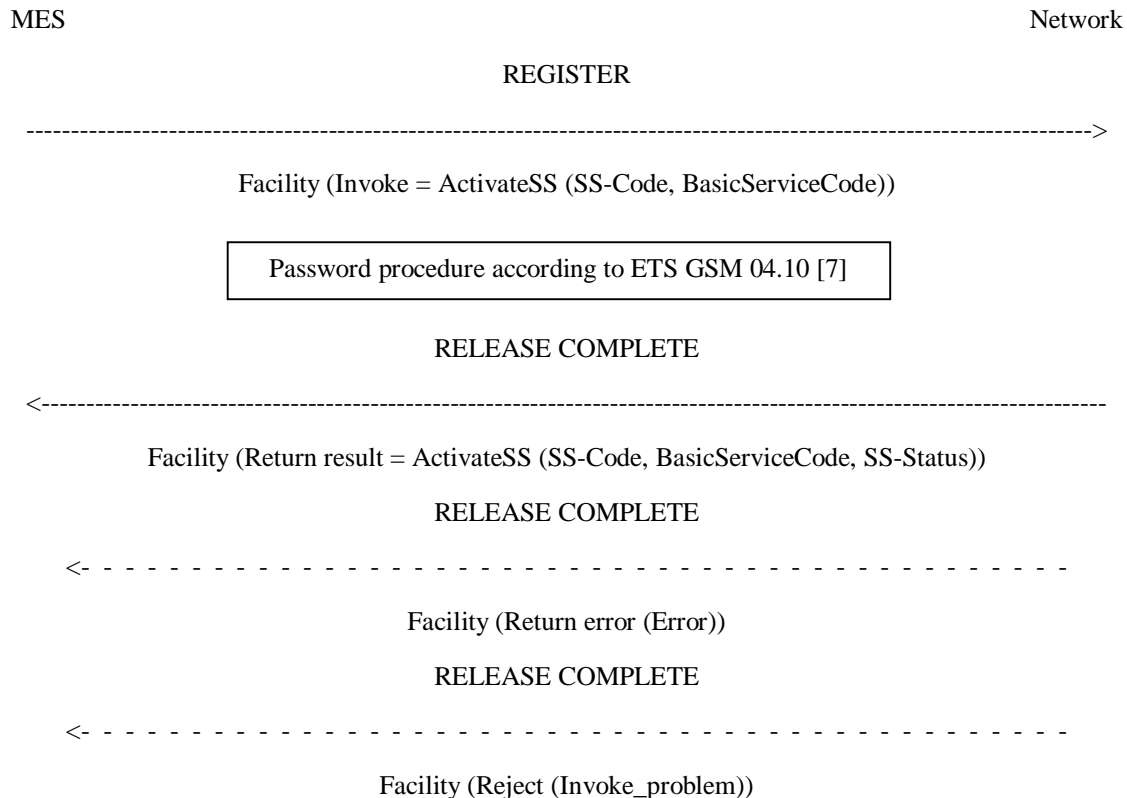
- The result includes the Basic Service group Code(s) to which the service is activated. The result may also contain an SS-Code and SS-Status parameter. If the MES does not send an SS Version Indicator in the invocation request then these parameters shall be presented in the result. If the MES does send an SS Version Indicator in the invocation request then these parameters are optional in the result. If the SS-Status is included, the network shall set it to reflect the state of the service. If the SS-Code is included then it shall contain the SS-Code of the service which has been activated. The MES shall ignore the contents of the SS-Code and SS-Status parameters if they are received.

Note that the use of SS-Code and SS-Status is to provide backwards compatibility with phase 1.

- If the request did not include a BasicServiceCode, and the activation was successful for all basic services, the network may send an empty return result to the MES. This option applies whether or not an SS Version Indicator is received from the MES.

If the served mobile subscriber at provision time has selected the subscription option "control of barring service: by service provider", an attempt to activate the service will be denied and the served mobile subscriber receives an error indication, see figure 5.2.

Error values are specified in GSM 04.80 [8].



NOTE: The SS-Code will be one of the specific incoming barring codes. If BasicServiceCode is not included it applies to all basic services. The SS-Code and SS-Status may not be included in the result in all cases, see text.

Figure 5.2: Activation of a barring program

5.4 Deactivation

If the served mobile subscriber at provision time has selected the subscription option "control of barring service: by subscriber using password", the supplementary service is deactivated for a basic service if the subscriber has requested deactivation by means of a deactivation procedure for that basic service. The subscriber may use the call barring password at deactivation, see figure 5.3.

If the deactivation is successful, the service will be deactivated. The network will then send a return result indicating acceptance of the request. The result is formatted according to the options shown below:

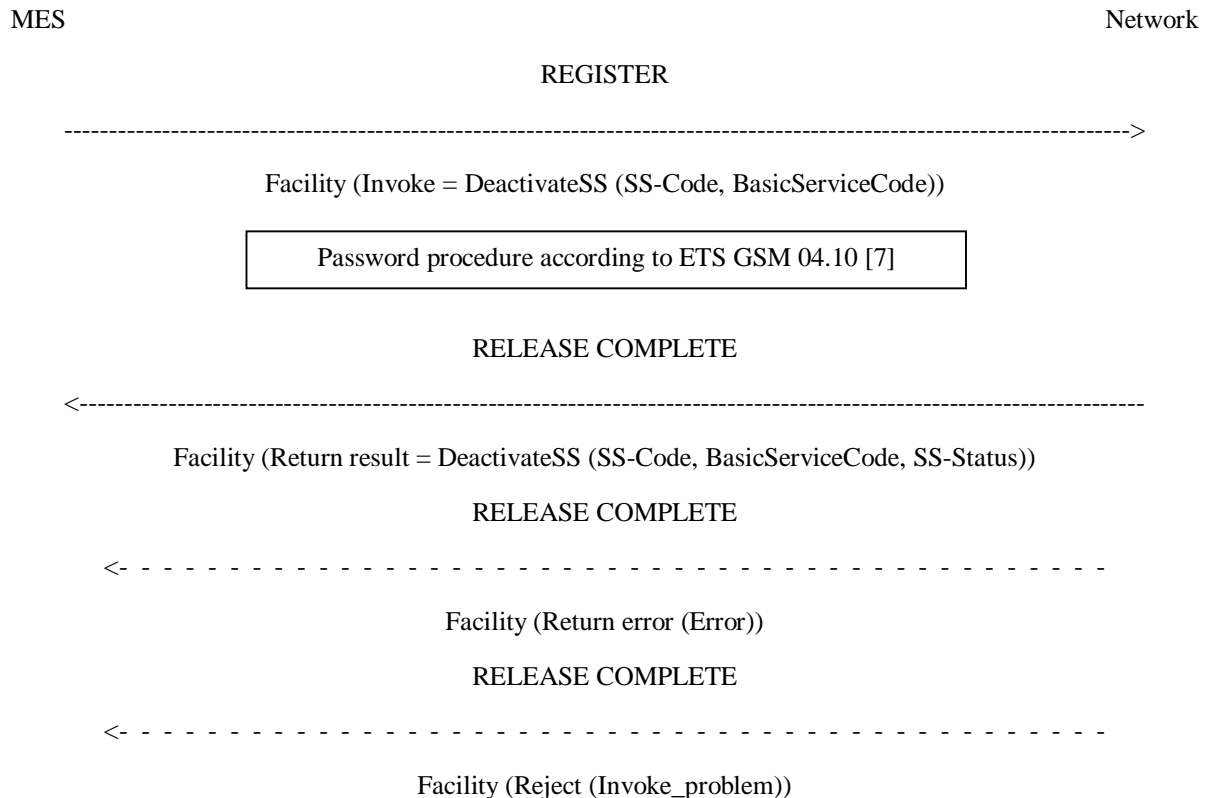
- The result includes the Basic Service group Code(s) to which the service is deactivated. The result may also contain an SS-Code and SS-Status parameter. If the MES does not send an SS Version Indicator in the invocation request then these parameters shall be presented in the result. If the MES does send an SS Version Indicator in the invocation request then these parameters are optional in the result. If the SS-Status is included, the network shall set it to reflect the state of the service. If the SS-Code is included then it shall contain the SS-Code of the service which has been deactivated. The MS shall ignore the contents of the SS-Code and SS-Status parameters if they are received.

Note that the use of SS-Code and SS-Status is to provide backwards compatibility with phase 1.

- If the request did not include a BasicServiceCode, and the deactivation was successful for all basic services, the network may send an empty return result to the MES. This option applies whether or not an SS Version Indicator is received from the MES.

If the served mobile subscriber at provision time has selected the subscription option "control of barring service: by service provider", an attempt to deactivate the supplementary service will be denied and the served mobile subscriber receives an error indication, see figure 5.3.

Error values are specified in GSM 04.80 [8].



NOTE: The SS-Code may be one of the specific incoming barring codes, the common code for the incoming barring services, or the SS-Code for all call barring services. If BasicServiceCode is not included it applies to all basic services. The SS-Code and SS-Status may not be included in the result in all cases, see text.

Figure 5.3: Deactivation of barring of incoming calls

5.5 Interrogation

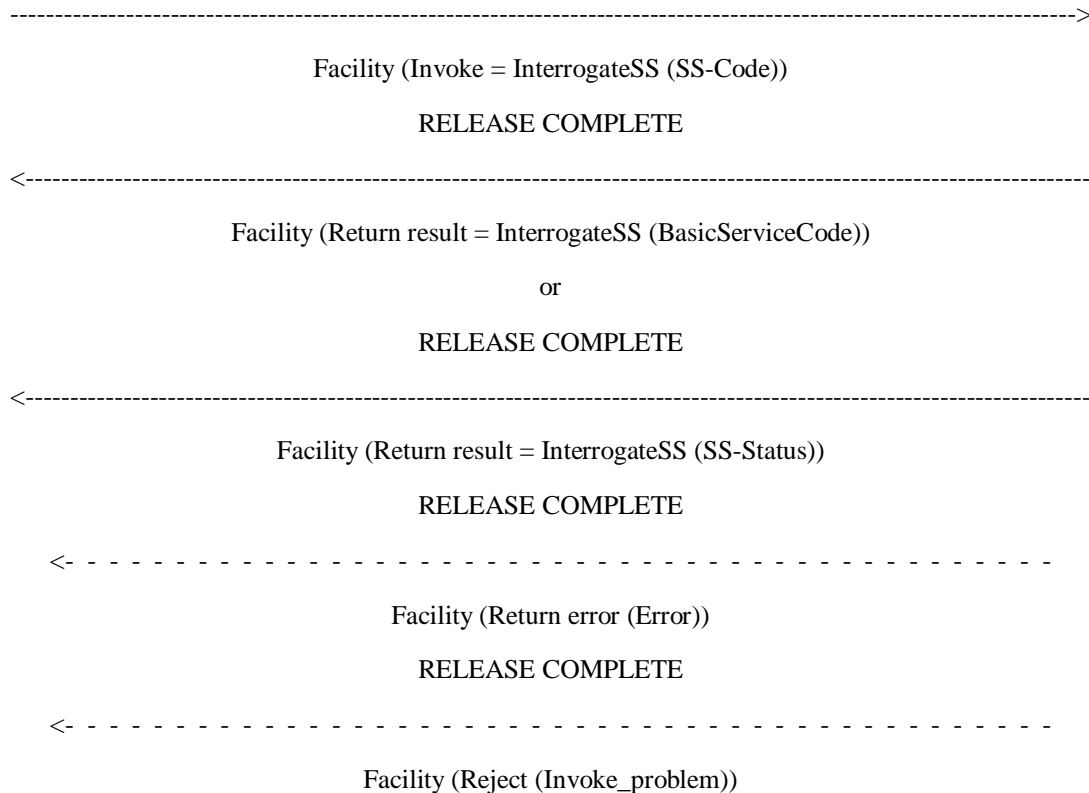
The interrogation procedure enables the mobile subscriber to obtain information about the data stored in the PSMN. After having requested this procedure the network shall return a list of all basic service groups for which the service is active, see figure 5.4.

If there is no basic service group for which the service is active, an SS-Status will be returned indicating that the service is "deactivated".

MES

Network

REGISTER



NOTE: The SS-Code may be one of the specific incoming barring codes.

Figure 5.4: Interrogation of a barring program

5.6 Invocation and erasure

Invocation and erasure are not applicable to barring programs.

5.7 Cross phase compatibility

5.7.1 Network only supports phase 1 control of SS by the subscriber

In this case there is no relevant cross phase compatibility problem.

5.7.2 MES only supports phase 1 control of SS by the subscriber

The NotifySS operation containing the SS-Status indicating that a barring program relating to incoming calls is currently active and operative shall be sent to the calling subscriber only in the RELEASE COMPLETE message, if the MES only supports phase 1.

History

Document history		
V1.1.1	March 2001	Publication