

ETSI TC SMG  
Released by : ETSI PT12  
Release date: February 1992

**RELEASE NOTE**

**Recommendation GSM 04.10**

**Mobile radio interface layer 3  
Supplementary services specification  
General aspects**

Previously distributed version: 3.2.3 (updated release 1/90)  
New released version Febr 1992: 3.2.3 (release 92, phase 1)

**1. Reason for changes**

No changes since the previously distributed version.



UDC: 621.396.21

**Key words:** European Digital Cellular Telecommunications System, Global System for Mobile Communications (GSM)

**European digital cellular  
telecommunication system (phase 1);  
Mobile Radio Interface Layer 3  
Supplementary Services Specification  
General Aspects**

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## **PREFATORY NOTE**

ETSI has constituted stable and consistent documents which give specifications for the implementation of the European Cellular Telecommunications System. Historically, these documents have been identified as "GSM recommendations".

Some of these recommendations may subsequently become Interim European Telecommunications Standards (I-ETTs) or European Telecommunications Standards (ETTs), whilst some continue with the status of ETSI-GSM Technical Specifications. These ETSI-GSM Technical Specifications are for editorial reasons still referred to as GSM recommendations in some current GSM documents.

The numbering and version control system is the same for ETSI-GSM Technical Specifications as for "GSM recommendations".

**Mobile radio interface layer 3  
Supplementary services specification  
General aspects**

Date: 21 January 1991

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## SECTION 1

### GENERAL

In this recommendation the general aspects of the specification of supplementary services at the layer 3 radio interface are given.

Recommendations GSM 04.81 to 04.88 specify the procedures used at the radio interface (reference point Um as defined in recommendation GSM 04.02) for normal operation, registration, erasure, activation, deactivation, invocation and interrogation of 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.

Recommendation GSM 04.80 specifies the formats and coding for the supplementary services.

Definitions and descriptions of supplementary services are given in recommendations GSM 02.04 and GSM 02.81 to GSM 02.88.

Technical realization of supplementary services is described in recommendations GSM 03.11 and GSM 03.81 to GSM 03.88.

The procedures for Call Control, Mobility Management and Radio Resource management at the layer 3 radio interface are defined in recommendations GSM 04.07 and GSM 04.08.

The following supplementary services specification are described:

- \* Number identification supplementary services specification  
(Recommendation GSM 04.81)
  - Calling number identification presentation
  - Calling number identification restriction
  - Connected number identification presentation
  - Connected number identification restriction
  - Malicious call identification
  
- \* Call offering supplementary services specification  
(Recommendation GSM 04.82)
  - Call forwarding unconditional
  - Call forwarding on mobile subscriber busy
  - Call forwarding on no reply
  - Call forwarding on mobile subscriber not reachable
  - Call transfer
  - Mobile access hunting

- \* Call completion supplementary services specification  
(Recommendation GSM 04.83)
  - Call waiting
  - Call hold
  - Completion of calls to busy subscriber
  
- \* Multi-party supplementary services specification  
(Recommendation GSM 04.84)
  - Three party service
  - Conference calling
  
- \* Community of interest supplementary services specification  
(Recommendation GSM 04.85)
  - Closed user group
  
- \* Charging supplementary services specification  
(Recommendation GSM 04.86)
  - Advice of charge
  - Freephone service
  - Reverse charging
  
- \* Additional information transfer supplementary services specification  
(Recommendation GSM 04.87)
  - User-to-user signalling
  
- \* Call restriction supplementary services specification  
(Recommendation GSM 04.88)
  - Barring of all outgoing calls
  - Barring of outgoing international calls
  - Barring of outgoing international calls except those directed to the home PLMN country
  - Barring of all incoming calls
  - Barring of incoming calls when roaming outside the home PLMN country

Editorial note: GSM-21 decided to split recommendation GSM 04.10 into one general part (04.10), one for formats and coding (04.80) and for each family of supplementary services a separate recommendation (04.81 to 04.88). Not all families are already included in separate recommendations. The complete preliminary text can be found in version 1.4.0 of recommendation 04.10 which was presented at GSM-20.

## SECTION 2

### DEFINITIONS OF TERMS

In line with recommendations GSM 02.04 and GSM 03.11 the following terms are used:

- \* Normal operation  
Description of the normal operation of the supplementary service, the normal served subscriber's actions and the network response.
- \* Registration  
The programming by the network or subscriber of information to enable subsequent operation of a supplementary service.
- \* Erase  
The deletion by the subscriber or the network of information stored against a particular supplementary service by previous registration(s).
- \* Activation  
An action taken by the subscriber or the network to enable a process to run as and when required by the supplementary service concerned.
- \* Deactivation  
An action taken by the subscriber or the network to terminate the process started at the activation.



\* Invocation

An action to invoke the supplementary service required, taken by the subscriber or automatically by the network or terminal as a result of a particular condition.

\* Interrogation

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

- Status check;
- Data check;
- Data request.

\* Testing

The test procedure allows the subscriber to check whether or not the service is operating as desired. In some cases the use of the supplementary service is sufficient, for others a method of testing is included in the control procedure.

The full definitions of terms is included in recommendation GSM 02.04.

The definitions of all supplementary services are given in recommendations GSM 02.81 to 02.88. Also the description of the supplementary service and the terminology for that supplementary service is included in recommendations GSM 02.81 to 02.88.

## SECTION 3

### GENERIC PROCEDURES FOR THE CONTROL OF SUPPLEMENTARY SERVICES

#### 3.1 Overview of the generic protocol and its scope

One generic protocol is defined for the control of supplementary services at the radio interface. This protocol operates at layer 3 of the radio interface and assumes the use of layers 1 and 2 conform to recommendations GSM 05-series and recommendations GSM 04.04, GSM 04.05 and GSM 04.06. In addition, the generic protocol uses the acknowledged information transfer service available at the layer 2 - layer 3 interface. GSM recommendations define the Functional protocol only.

The Functional protocol is based on the use of the Facility information element and the FACILITY message as well as other specific functional messages specified in recommendation GSM 04.80. This protocol is symmetrical.

The protocol is functional in the sense that it requires the knowledge of the related supplementary service by the mobile equipment supporting it. This facilitates mobile equipment operation without human intervention by defining semantics for the protocol elements which the mobile equipment can process on its own.

Messages that are specific to a function are used to invoke supplementary services that require synchronization of resources at both sides of the interface. The common generic message (i.e. FACILITY message) is used to invoke supplementary services that do not require such resource synchronization.

#### 3.2 Functional procedures for the control of supplementary services

##### 3.2.1 General

This section specifies the functional signalling procedures for the control of supplementary services at the radio interface. The Functional protocol utilizes functions and services provided by recommendation GSM 04.08 basic call control procedures and the functions of the data link layer as defined in recommendation GSM 04.06.

The defined procedures specify the basic methodology for the control (e.g. registration, erasure, invocation, etc.) of supplementary services.

Two categories of procedures are defined for the functional signalling for supplementary services.

The first category, called the Separate Message Approach utilizes separate message types to indicate a desired function. The Hold and Retrieve families of messages are identified for this category.

The second category called the Common Information Element Procedure utilizes the Facility information element and applies only to supplementary services that do not require synchronization of resources between the mobile equipment and the network.

Both categories are specified in a symmetrical manner and can be signalled both in the mobile to network and the network to mobile directions.

The control of supplementary services by either the mobile station or the network includes the following cases:

- a) the invocation of supplementary services during the establishment of a call;
- b) the invocation of supplementary services during the clearing of a call;
- c) the invocation of call related supplementary services during the active state of a call;
- d) the invocation or registration of supplementary services independent from an active call;
- e) the invocation of multiple, different supplementary services within a single message;
- f) the invocation of supplementary services related to different calls;
- g) cancellation of invoked supplementary services and notification to the initiator of the supplementary service.

The correlation of a call related supplementary service and the call which it modifies is provided by use of the transaction identifier (cases a, b, c, e, f and g).

The correlation of call independent supplementary service invocations and their responses, is provided by the combination of the transaction identifier of the messages containing the Facility information element and the Invoke identifier present within the Facility information element itself (cases d, e, and g).

The identification of different supplementary service invocations within one single message is provided by the Invoke identifier of the corresponding Facility information element (cases e and g).

The identification of supplementary service invocations related to different calls is provided by different FACILITY messages with the corresponding transaction identifier of the appropriate call (case f), i.e., different transaction identifier values are used to identify each call individually.

### 3.2.2 Separate Messages Category

The messages defined in this section are specified as separate functional messages for invoking specific functions which require changes of resources and auxiliary state and also require synchronization of the peer to peer state machines. Therefore, these functions cannot be performed in conjunction with the call establishment and clearing procedures but may be used in conjunction with various supplementary services. The functions of these messages are not to be duplicated or overlapped by the ones of the Facility information element.

The following separate messages are defined:

HOLD	RETRIEVE
HOLD ACKNOWLEDGE	RETRIEVE ACKNOWLEDGE
HOLD REJECT	RETRIEVE REJECT.

#### 3.2.2.1 Hold and Retrieve functions

The Hold and Retrieve functions are performed on the same RR-connection.

The Hold function is used to put an existing call which is in the active phase in the Call held auxiliary state. By default, it retains the RR-connection in use and the transaction identifier of the held call for possible subsequent call retrieval.

Editorial note: The modification of the RR-connection together with Hold and Retrieve is for further study.

On receipt of a HOLD message the mobile station or the network shall return a HOLD ACKNOWLEDGE message, provided that the requested function can be performed. The network disconnects any user information path allocated to the active call when putting that call in the Call held auxiliary state. The mobile station disconnects any user information path to the active call and retains the transaction identifier and the RR-connection when putting that call in the Call held auxiliary state.

The HOLD ACKNOWLEDGE message puts the call in the Call held auxiliary state and indicates that the Hold function has been performed. The HOLD REJECT message indicates that the hold request was denied and returns the call to the condition it was in prior to the hold request. The HOLD REJECT message contains the Cause information element with e.g.:

- cause #29 "Facility rejected"
- cause #50 "Requested facility not subscribed"
- cause #69 "Requested facility not implemented".

The Retrieve function reconnects the mobile station to the requested user information path. The RETRIEVE message requests that a call be retrieved. The RETRIEVE ACKNOWLEDGE message indicates that the Retrieve function has been performed. The RETRIEVE REJECT message indicates that the retrieve request was denied. The RETRIEVE REJECT message contains the Cause information element with e.g.:

cause #34 "No channel available".

The Hold and Retrieve families of messages may be used in a symmetrical manner.

### **3.2.2.2 Hold procedures**

The Hold function should be invoked in association with an existing call (i.e. during the active phase of a call).

The invocation of the Hold function does not affect the existing recommendation GSM 04.08 call states, but does affect the auxiliary state. The request for placing a call on hold places the auxiliary state in the Hold request state. The responding entity will acknowledge this request with a HOLD ACKNOWLEDGE message if this operation was successful. This will result in the auxiliary state being put in the Call held state. If the requested Hold function cannot be obtained, then a HOLD REJECT message will be returned with the appropriate cause. This will result in the auxiliary state returning to the Idle state.

### **3.2.2.3 Retrieve procedures**

The Retrieve function is requested by sending a RETRIEVE message. This message may be sent while the auxiliary state is in the Call held state.

Upon the sending of the RETRIEVE message the auxiliary state of the initiator's terminal would be the Retrieve request state.

If the Retrieve request is successful, the RETRIEVE ACKNOWLEDGE message will be returned. The initiator should not assume that call retrieval has occurred until it receives this message. The auxiliary state would then return to the Idle state.

If the Retrieve request is not successful, the RETRIEVE REJECT message will be returned with an appropriate cause. The auxiliary state machine would then remain to the Call held state.

#### 3.2.2.4 Auxiliary states for Hold and Retrieve

It is possible to place a call on hold in the Active state. The concept of dimensioned state space is being introduced to ensure state synchronization between the mobile station and the network. This concept suggests dimensioning the call state machine into two dimensions. In other words, there would be two states associated with each call. The first would be a recommendation GSM 04.08 call state and the second would be an auxiliary state associated with Hold. Suppose the dimensioned state space is represented by two coordinates: one is a recommendation GSM 04.08 call state coordinate and the other is a Hold coordinate. If a recommendation GSM 04.08 call state transition occurs, the former coordinate is updated. If a call is put on hold, the hold coordinate is updated. When the held call is reconnected, the hold coordinate is again updated.

There are four auxiliary states associated with the Hold and Retrieve functions:

- \* Idle
- \* Hold request  
A request has been made for the Hold function.
- \* Call held  
The call is held and the user information path has been reserved.
- \* Retrieve request  
A request has been made for the Retrieve function.

#### 3.2.2.5 An example of dimensioned state space

Suppose a call is in the Active state.  
The dimensioned state space would be:  
(Active, Idle).

Now the mobile station requests the Hold function.  
The dimensioned state space would become:  
(Active, Hold request).

The call is then put on Hold.  
The mobile station becomes aware of this upon receiving the HOLD ACKNOWLEDGE message from the network.  
The dimensioned state space would now be:  
(Active, Call held).

Now the mobile station requests the Retrieve function. The dimensioned state space would become:  
(Active, Retrieve request).

When a call is reconnected, the dimensioned state space would be:  
(Active, Idle).

### **3.2.3 Common Information Element Category**

The Common Information Element Category applies only to supplementary services where no synchronization of resources is required between the two signalling entities. However, the mobile equipment is required to have the capability to track the operation of the supplementary service procedures through various recommendation GSM 04.08 call states. The procedures are symmetrical.

A REGISTER message, a FACILITY message or an existing recommendation GSM 04.08 Call Control message is used to carry the Facility information element which requests the desired supplementary service. This functional procedure provides a flexible and open ended approach to the provision of supplementary service protocols, and:

- \* allows new services to be easily introduced;
- \* allows multiple supplementary service invocations within one message;
- \* supports supplementary service with a large number of variants without a proliferation of new messages;
- \* supports non-call associated supplementary services.

In addition, the use of the FACILITY message allows the actions and events related to supplementary services to be clearly separated from those associated with basic call control, hence providing improved stability to the basic call control procedures of recommendation GSM 04.08.

### **3.2.4 Call related supplementary service procedures**

For call related supplementary service procedures initiated at call establishment or call clearing, the procedures for call control specified in recommendation GSM 04.08 are utilized. This enables, for example the originating mobile user to send a supplementary service invoke component within a SET UP message and to receive from the remote user a Return result, Return error, or Reject component type within an ALERTING message, CONNECT message, or any other appropriate message from the service provider in the Facility information element. If for some reason the network or mobile user is not able to process the call related invocation of a supplementary service contained in an outgoing SET UP message, then the following options apply:

- \* The network or mobile user may clear the call request and reject the supplementary service invocation by means of a RELEASE COMPLETE message which contains the Cause information element and a Return error or Reject component type with the appropriate parameter in the Facility information element.

- \* The network or mobile user may continue to process the call request according to normal recommendation GSM 04.08 call control procedures and reject the supplementary service invocation by means of a FACILITY message or any appropriate call control message containing a Return error or Reject component with an appropriate data element (Error or Invoke\_problem) in the Facility information element.
- \* The network or mobile user may continue to process the call request according to the recommendation GSM 04.08 call control procedures, and ignore the supplementary service invocation.

The option to be used depends on the individual supplementary service procedures which are the subject of recommendations GSM 04.81 to 04.88.

For call related supplementary service invocations during the active state of a call, the FACILITY message is used for the exchange of the Facility information elements over the existing signalling connection. This signalling connection is identified by the transaction identifier of the corresponding active call.

Note that the FACILITY message can also be used for this purpose in all states after the SETUP message has been sent

The transaction identifier provides the means to correlate FACILITY messages belonging to the same signalling transaction. In the case of call related invocations, the transaction identifier correlates with the appropriate call transaction. When a supplementary service affects more than one call, different transaction identifiers are used to identify each call individually. This implies the use of different FACILITY messages in order to manage each call separately.

If a call related FACILITY message is sent using the transaction identifier of a call in progress or of an active call, and this call is cleared due to call related causes, then the transaction identifier may not be cleared simultaneously in all cases. Depending upon the supplementary service invoked, one of the following will occur:

- \* The network or mobile user may retain both the connection and the transaction identifier association and may send a response within a Facility information element in a FACILITY message prior to the initiation of the normal call clearing procedures; or
- \* The network or mobile user may send a response with a Facility information element in the first clearing message (i.e. DISCONNECT, RELEASE or RELEASE COMPLETE message).



### 3.2.5 Call independent supplementary service procedures

For supplementary service procedures independent of an active call, the initiating side must establish a MM-connection between the network and the mobile station according to the rules given in recommendations GSM 04.06 and 04.08. The mobile station or the network starts the transaction by transferring a REGISTER message across the radio interface. This transaction is identified by the transaction identifier associated with the REGISTER message. Following the REGISTER message one or more FACILITY messages may be transmitted, all of them related to the same transaction. If the transaction is no longer used, it shall be released by sending a RELEASE COMPLETE message.

To assign a transaction identifier value and convey the supplementary service invocation, an optional Facility information element is used. The Facility information element present either in the REGISTER message or a subsequent message identifies the supplementary service involved and the type of component (i.e. Invoke, Return result, Return error or Reject component). One of the following will occur:

- \* When the REGISTER message contains a FACILITY information element and the requested service is available, a FACILITY message containing a Facility information element may be returned. One or more exchanges of FACILITY messages may subsequently occur. To terminate the service interaction and release the transaction identifier value, a RELEASE COMPLETE message is sent as specified for the specific supplementary service procedure. The RELEASE COMPLETE message may also contain the Facility information element.
- \* If the content of the Facility information element is not understood, then the FACILITY message or a RELEASE COMPLETE message with the Facility information element is returned with the Reject component type. Possible actions on the rejection will be treated as a new transaction.
- \* If the content of the Facility information element is understood, but the supplementary service request cannot be provided, then the FACILITY message or a RELEASE COMPLETE message with the Facility information element is returned with the component type Return error. When the error has been returned in a FACILITY message, the Facility information element can be re-sent in another FACILITY message or the request can be cleared and the transaction identifier value released with a RELEASE COMPLETE message.

### **3.2.6 Handling of future supplementary services**

All supplementary service requests will result in signalling on the radio path. This is to ensure that phase 1 mobiles can control supplementary services using enhanced operations provided by later phase networks.

The network shall handle unrecognized requests as defined elsewhere in this recommendation. Specifically, unrecognized contents of the "Process Unstructured SS Data" operation shall trigger a Return Error Component indicating the Unexpected Data Value Error (cause 29).

This Return Error may be sent in a RELEASE COMPLETE message or in any other suitable message that has to be sent to the mobile station.

### **3.2.7 Multiple supplementary service invocations**

#### **3.2.7.1 Call related supplementary service procedures**

The number of multiple supplementary service invocations is restricted according to the procedures used at the man-machine interface.

#### **3.2.7.2 Call independent supplementary service procedures**

Multiple operations may be performed on a single MM-connection. The handling of multiple MM-connections is defined in recommendation GSM 04.07. The handling defined in the recommendation makes it possible for the network to control the number of MM-connections allowed at the same time for call independent supplementary service support.

### **3.2.8 Recovery procedures**

#### **3.2.8.1 Call related supplementary service recovery procedures**

There are no additional recovery procedures for call related supplementary service signalling on the radio path. The recovery procedures as specified for the basic service apply.

#### **3.2.8.2 Call independent supplementary service recovery procedures**

In case a transaction is not terminated according to the normal procedure as described in recommendations GSM 04.81 to 04.88, the network side has to ensure that the transaction is terminated e.g. by a supervision timer.

## **SECTION 4**

### **SUPPLEMENTARY SERVICE SUPPORT PROCEDURES**

#### **4.1 General**

This section describes the supplementary service support procedures at the radio interface. These procedures are provided by the supplementary service support entity defined in recommendation GSM 04.07. The supplementary service support procedures provide the means to transfer messages for the call independent supplementary service procedures. These procedures are regarded as the user of the supplementary service support.

#### **4.2 Supplementary service support establishment**

At the beginning of each call independent supplementary service procedure a supplementary service support must be established.

##### **4.2.1 Supplementary service support establishment at the originating side**

If the user wants to send a REGISTER message the supplementary service support entity will request the establishment of an MM-connection first (see section 4.5.1 of recommendation GSM 04.08).

After establishment of the MM-connection the supplementary service support entity shall send the REGISTER message to its corresponding peer entity on the MM-connection and the supplementary service support shall be regarded as being established.

##### **4.2.2 Supplementary service support establishment at the terminating side**

At the terminating side an MM-connection is regarded as being established with the receipt of the first message, with a new transaction identifier, e.g. the REGISTER message.

#### **4.3 Supplementary service support information transfer phase**

Upon the establishment of the supplementary service support both users may exchange FACILITY messages by use of the supplementary service support.

#### 4.4 Supplementary service support release

At the end of each call independent supplementary service procedure the established supplementary service support is released.

The side closing the transaction shall release the transaction by sending the RELEASE COMPLETE message to its corresponding peer entity.

Both supplementary service support entities release the MM-connection locally.

#### 4.5 Recovery procedures

The supplementary service support does not provide recovery procedures, i.e the operations are transparent to the supplementary service support.

Recovery procedures concerning the handling of operations and transaction termination have to be provided by the user(s) of the supplementary service support.

#### 4.6 Message flow (single operation example)

##### 4.6.1 Mobile station initiated supplementary service transaction

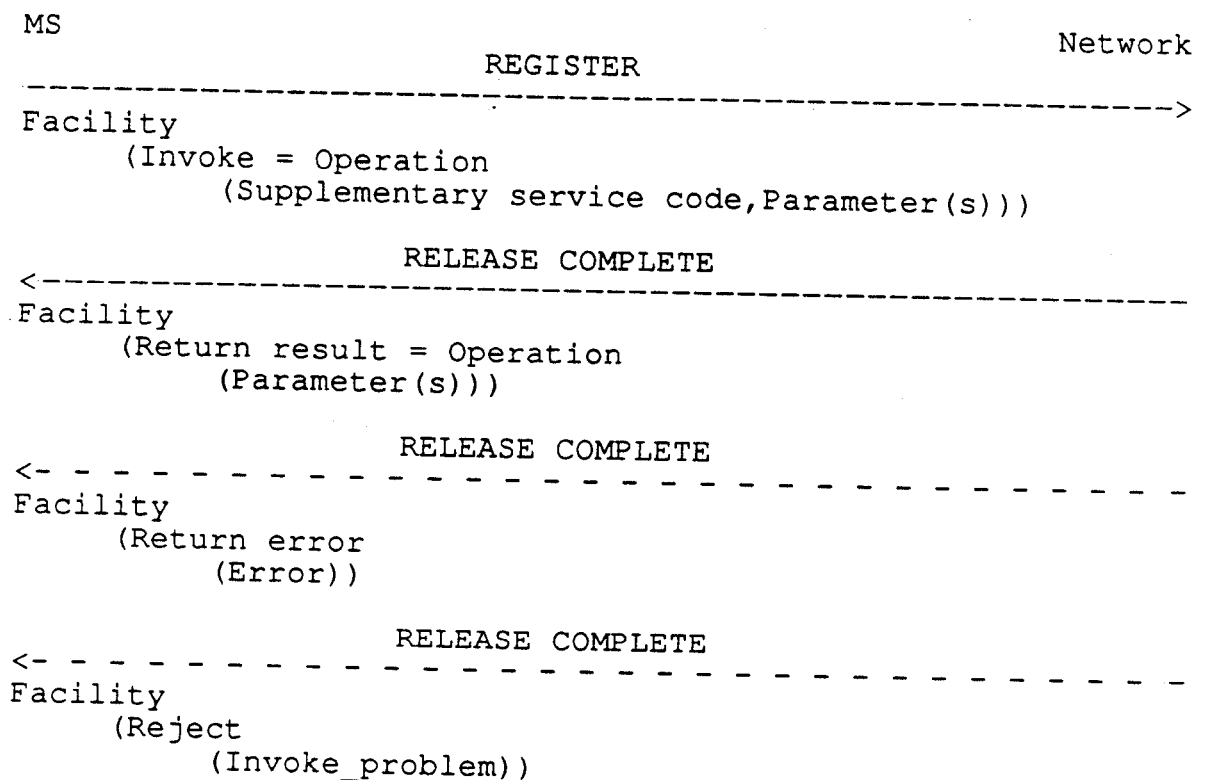


Figure 4.1/GSM 04.10  
Mobile station initiated supplementary service transaction

4.6.2 Network initiated supplementary service transaction

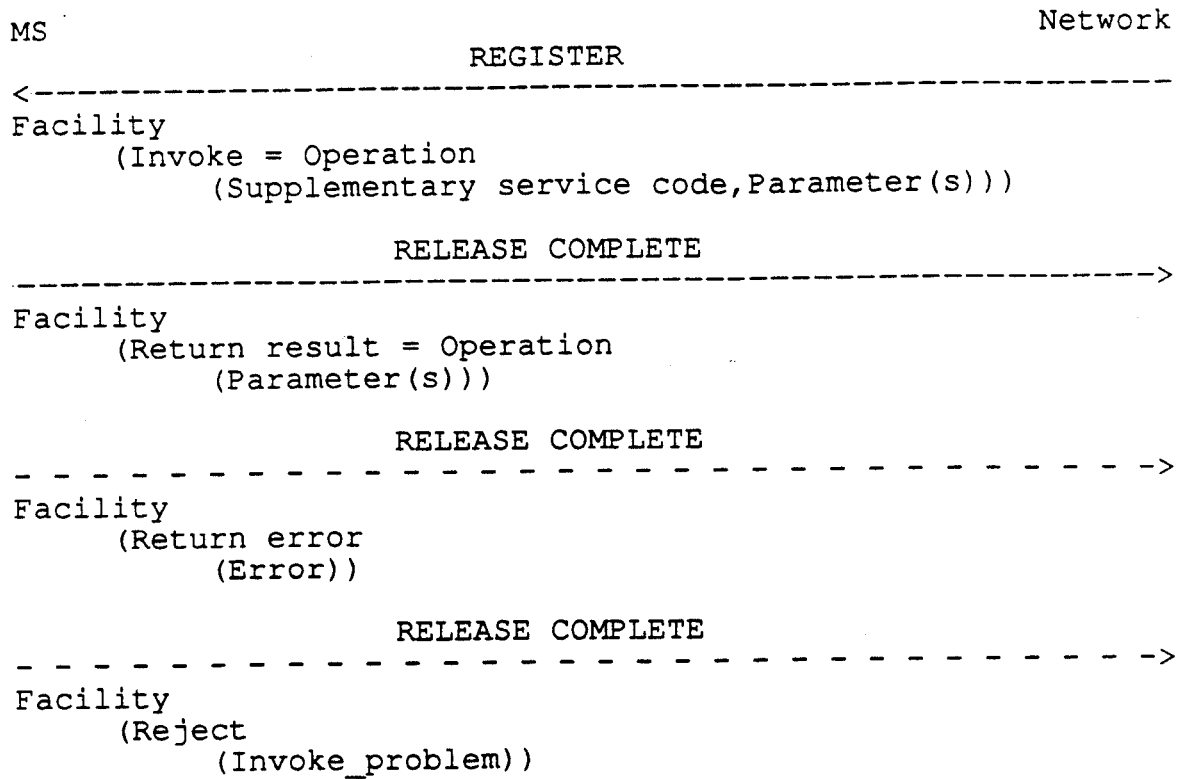


Figure 4.2/GSM 04.10  
Network initiated supplementary service transaction

**SECTION 6**  
**PASSWORD MANAGEMENT**

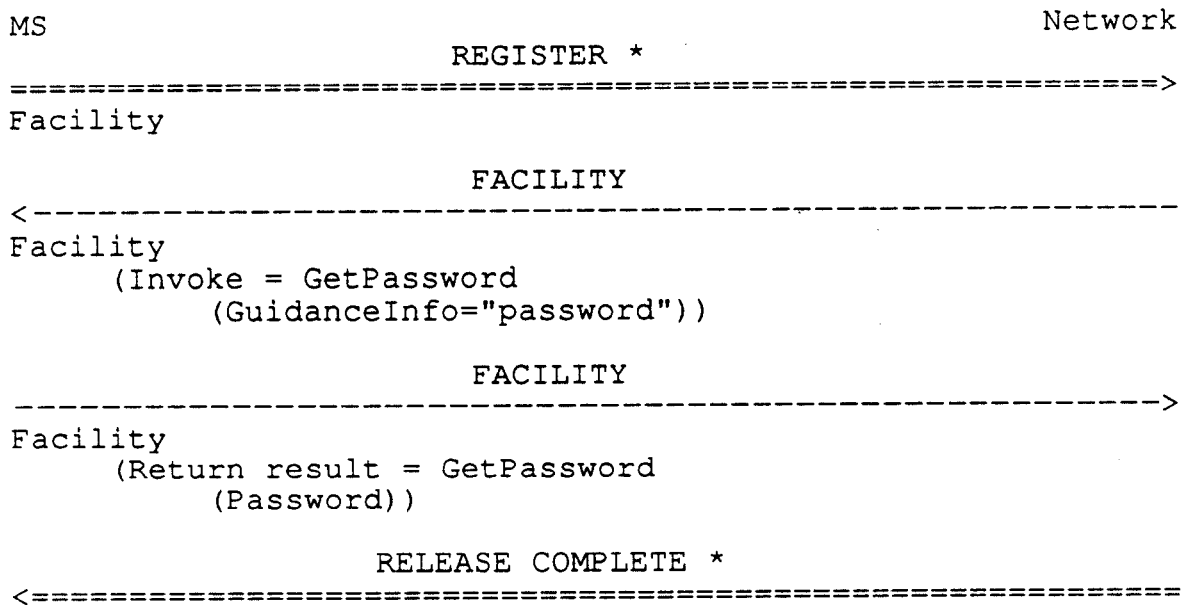
The password management procedures consist of two independent procedures:

- password check;
- password registration.

**6.1 Password check**

**6.1.1 Successful procedure**

When the password check procedure is invoked by a parent procedure (e.g. for service activation, service deactivation, password registration), the network sends to the MS an invoke component of the operation "get password" with "password" as the value of the mandatory GuidanceInfo information element. This invoke component is embedded in a FACILITY message, since the password check procedure is always invoked during an existing transaction. The MS will return to the network the required password in the return result component of the operation. This return result component is embedded in a FACILITY message, see figure 6.1. If the provided password is right the password check procedure returns to the parent procedure an indication of successful password check.



(\*): part of the initiating SS operation

Figure 6.1/GSM 04.10.  
Password check: successful procedure

### 6.1.2 Error cases

If no result is returned by the MS for the "Get password" operation invoked by the network, the password check procedure returns to the parent procedure an indication of negative password check. The password remains registered.

If the password value which is returned by the MS does not match the password value registered in the network, the network increments a counter and sends to the MS an invoke component of the "get password" operation with "bad password try again" as the value of the mandatory GuidanceInfo information element. The counter is reset as soon as the right password is returned.

If the served mobile subscriber enters a wrong call barring "password" three consecutive times, the subscription option "control of services" is set to "by the service provider" in the network: thus the network makes the use of password impossible for any subscriber operation. The password check procedure returns to the parent procedure an indication of negative password check. The password can be made valid by the service provider only.

### 6.2 Password registration

If the served mobile subscriber is given the possibility to control the service by the use of a password, the service provider has to register a password at provision time. Furthermore, the served mobile subscriber can change the call barring password at any time.

The password registration procedure is as follows:

When the mobile subscriber wants to register a new password the MS sends to the network an invoke component of the operation "register password".  
The common SS-code for call restriction services shall be used.

Note: For phase 1, during the password registration procedure, the network runs a timer (15-30 seconds) between reception of the RegisterPassword operation and completion of the procedure (including at least 3 GetPassword operations of maximum 15 seconds each). Mobile station manufacturers, should be aware of this timer.

### 6.2.1 Successful procedure

The successful procedure consists of three steps:

- the password registration procedure invokes first the password check procedure as it is described above.
- if the password check procedure has returned an indication of successful password check, the network sends secondly to the MS, in an invoke component of the operation "get password" with "new password?" as the value of the mandatory GuidanceInfo information element. This invoke component is embedded in a FACILITY message. The MS will return to the network the required new password in the return result component of the operation. This return result component is embedded in a FACILITY message.
- the network sends thirdly to the MS an invoke component of the operation "get password" with "new password again?" as the value of the mandatory GuidanceInfo information element. This invoke component is embedded in a FACILITY message. The MS will return again to the network the required new password in the return result component of the operation. This return result component is embedded in a FACILITY message.

If the two values of the provided passwords are identical, the network confirms the registration of the new password by sending to the MS the return result component of the operation "register password", with the new password as a mandatory information element, see figure 6.2.



### 6.2.2 Error cases

If the served mobile subscriber at provision time has selected "by the service provider" as the value of the subscription option "control of services", or if this option is set to "by the service provider" by the network because a bad password was entered three times, an attempt to register a password will be denied by the network. On receipt of the invoke component of the subscriber operation the network will return to the MS an error component with the error value "SS\_SubscriptionViolation".

If the password check procedure returns an indication of negative password check, the network will send to the MS a return error component of the operation "register password" with the error value "negativePasswordCheck".

If the new password is not repeated twice identically by the mobile subscriber, the network returns to the MS an error component of the "register password" operation with the error value "passwordRegistrationFailure". The diagnostic "newPasswordsMismatch" may be passed as an error parameter. The old password remains registered.

If no result is returned by the MS for the "Get password" operation invoked by the network and related to the new password, the network returns to the MS an error component of the "register password" operation with the error value "passwordRegistrationFailure". The diagnostic "invalidFormat" may be passed as an error parameter. The old password remains registered.

If the format of a new password which is returned by the MS is invalid (e.g. the value does not belong to the [0000-9999] range), the network sends to the MS an error component of the "register password" operation with the error value "passwordRegistrationFailure". The diagnostic "invalidFormat" may be passed as an error parameter. The old password remains registered.

MS	Network
	REGISTER
----->	
Facility (Invoke = Register Password (SS code))	
	FACILITY
<-----	
Facility (Invoke = GetPassword (GuidanceInfo="password"))	
	FACILITY
----->	
Facility (Return result = GetPassword (Password))	
	FACILITY
<-----	
Facility (Invoke = GetPassword (GuidanceInfo="bad password,try again"))	
	FACILITY
----->	
Facility (Return result = GetPassword (Password))	
	FACILITY
<-----	
Facility (Invoke = GetPassword (GuidanceInfo="new password"))	
	FACILITY
----->	
Facility (Return result = GetPassword (Password))	
	FACILITY
<-----	
Facility (Invoke = GetPassword (GuidanceInfo="new password again"))	
	FACILITY
----->	
Facility (Return result = GetPassword (Password))	
	RELEASE COMPLETE
<-----	
Facility (Return result = Register Password (Password))	
	RELEASE COMPLETE
<-----	
Facility (Return error (Error))	
	RELEASE COMPLETE
<-----	
Facility (Reject (Invoke_problem))	

Figure 6.2/GSM 04.10  
Password registration procedure