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GSM

**GLOBAL SYSTEM FOR
MOBILE COMMUNICATIONS**

Digital cellular telecommunications system (Phase 2+);
Man-Machine Interface (MMI) of the Mobile Station (MS)
(GSM 02.30)

ETSI

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New presentation - see History box

Contents

Foreword

This Global System for Mobile communications Technical Specification (GTS) has been produced by the Special Mobile Group (SMG) Technical Committee (TC) of the European Telecommunications Standards Institute (ETSI).

This GTS defines the requirements for and give guidelines on the MMI for calls on the GSM mobile station within the digital cellular telecommunications system (Phase 2/Phase 2+).

This GTS is a TC-SMG approved GSM technical specification version 5, which contains GSM Phase 2+ enhancements/features to the version 4 GSM technical specification. The European Telecommunications Standard from which this Phase 2+ GTS has evolved is Phase 2 GSM ETS 300 511 edition 2 (GSM 02.30 version 4.13.0).

GTS are produced by TC-SMG to enable the GSM Phase 2+ specifications to become publicly available, prior to submission for the formal ETSI standards approval procedure to become European Telecommunications Standards (ETS). This ensures the earliest possible access to GSM Phase 2+ specifications for all Manufacturers, Network operators and implementors of the Global System for Mobile communications.

The contents of this GTS are subject to continuing work within TC-SMG and may change following formal TC-SMG approval. Should TC-SMG modify the contents of this GTS it will then be republished by ETSI with an identifying change of release date and an increase in version number as follows:

Version 5.x.y

where:
- y   the third digit is incremented when editorial only changes have been incorporated in the specification;

- x   the second digit is incremented for all other types of changes, i.e. technical enhancements, corrections, updates, etc.

The specification from which this GTS has been derived was originally based on CEPT documentation, hence the presentation of this GTS may not be entirely in accordance with the ETSI rules.

Reference is made within this TS to GSM-TSs (note).

NOTE: TC-SMG has produced documents which give the technical specifications for the implementation of the digital cellular telecommunications system. Historically, these documents have been identified as GSM Technical Specifications (GSM-TSs). These TSs may have subsequently become I-ETSs (Phase 1), or ETSs/ETSI Technical Reports (ETRs) (Phase 2). TC-SMG has also produced ETSI GSM TSs which give the technical specifications for the implementation of Phase 2+ enhancements of the digital cellular telecommunications system. These version 5.x.x GSM Technical Specifications may be referred to as GTSs.

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0   Scope

The purpose of this specification is to define the requirements for and give guidelines on the MMI for calls on the GSM Mobile Station. This includes the requirements of the user procedures for call control and supplementary service control, the requirements on the physical input media and the output, such as indications and displayed information.

This specification complements specifications GSM 02.07, 02.11, 02.17, 02.40, 03.01, 03.09, 03.12, 03.14, 04.08, 05.08 11.01 and 11.10 and deals with MMI items not covered by these specifications.

0.1   Normative references

This ETS incorporates by dated and undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this ETS only when incorporated in it by amendment or revision. For undated references, the latest edition of the publication referred to applies.

[1]   GSM 01.04 (ETR 100): "European digital cellular telecommunication system (Phase 2); Abbreviations and acronyms".

[2]   GSM 02.04 (ETS 300 503): "European digital cellular telecommunication system (Phase 2); General on supplementary services".

[3]   GSM 02.07 (ETS 300 505): "European digital cellular telecommunication system (Phase 2); Mobile Station (MS) features".

[4]   GSM 02.11 (ETS 300 507): "European digital cellular telecommunication system (Phase 2); Service accessibility".

[5]   GSM 02.17 (ETS 300 509): "European digital cellular telecommunication system (Phase 2); Subscriber identity modules Functional characteristics".

[6]   GSM 02.30 (ETS 300 511): "European digital cellular telecommunication system (Phase 2); Man-Machine Interface (MMI) of the Mobile Station (MS)".

[7]   GSM 02.40 (ETS 300 512): "European digital cellular telecommunication system (Phase 2); Procedures for call progress indications".

[8]   GSM 02.83 (ETS 300 516): "European digital cellular telecommunication system (Phase 2); Call Waiting (CW) and Call Hold (HOLD) supplementary services - Stage 1".

[9]   GSM 02.84 (ETS 300 517): "European digital cellular telecommunication system (Phase 2); MultiParty (MPTY) supplementary services - Stage 1".

[10]   GSM 02.90 (ETS 300 625): "European digital cellular telecommunication system (Phase 2); Stage 1 description of Unstructured Supplementary Service Data (UUSD)".

[11]   GSM 03.01 (ETS 300 521): "European digital cellular telecommunication system (Phase 2); Network functions".

[12]   GSM 03.09 (ETS 300 527): "European digital cellular telecommunication system (Phase 2); Handover procedures".

[13]   GSM 03.12 (ETS 300 530): "European digital cellular telecommunication system (Phase 2); Location registration procedures".

[14]   GSM 03.14 (ETS 300 532): "European digital cellular telecommunication system (Phase 2); Support of Dual Tone Multi-Frequency signalling (DTMF) via the GSM system".

[15]   GSM 03.38 (ETS 300 628): "European digital cellular telecommunication system (Phase 2); Alphabets and language-specific information".

[16]   GSM 04.08 (ETS 300 557): "European digital cellular telecommunication system (Phase 2); Mobile radio interface layer 3 specification".

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

[18]   GSM 05.08 (ETS 300 578): "European digital cellular telecommunication system (Phase 2); Radio subsystem link control".

[19]   GSM 09.02 (ETS 300 599): "European digital cellular telecommunication system (Phase 2); Mobile Application Part (MAP) specification".

[20]   GSM 11.10 (ETS 300 607): "European digital cellular telecommunication system (Phase 2); Mobile Station (MS) conformity specification".

[21]   GSM 11.11 (ETS 300 608): "European digital cellular telecommunication system (Phase 2); Specification of the Subscriber Identity Module-Mobile Equipment (SIM-ME) interface".

[22]   CCITT Recommendation E.164: "Numbering plan for the ISDN era".

[23]   CCITT Recommendation E.131: "Subscriber control procedures for supplementary telephone services".

[24]   CCITT Recommendation E.121: "Pictograms and symbols to assist users of the telephone service".

0.2   Abbreviations

Abbreviations used in this specification are listed in GSM 01.04.

1   General

1.1   Basic philosophy

The basic idea behind this specification is that it should give a minimum level of requirements, with emphasis on items which are seen as important from a pan-european usage point of view. This means, that the requirements are mainly dealing with standardized control procedures of access to services i.e. call establishment, invocation of supplementary services and so on. This also includes standardized network information to the users such as tones and announcements.

The requirements on the physical layout of input and output features are kept to a minimum to allow for differentiated types of MSs and to ease the introduction of future developments in the area of MMI. The standardized control procedures describe the sequence of real actions to be taken by the users. However, since the requirements on the physical input features are minimal the control procedures may differ between MSs depending on the solution of the manufacturers. The "bridge" between these requirements is however that the same logical actions have to be taken by the user. That is, the user has to provide the same information for the call control and signalling no matter what the method is. This is also valid if an automatic device is used for carrying out the same actions. The logical procedures are therefore defined and standardized in this specification.

The drawback of this approach is that the users of GSM MSs may face a lot of different types of physical MMI which they have to learn. However, to deal with this problem the specification gives a definition of a basic public MMI. The basic public MMI allows non-experienced, casual users to make and receive a telephony call. This definition is directed to manufacturers of public mobile telephones.

Optionally, the user may set the ME to disable some or all of the MMI functions defined in this specification. This setting shall only apply when the same SIM is in use (see GSM 02.17 for security policy), otherwise the ME shall enable the standard MMI.

1.2 Structure of the specification

The specification is divided into sections describing respectively the control procedures, the input features and the output features. The final section defines the basic public MMI. For a lot of items for which no particular MMI specification is necessary there is a reference to the specifications where the basic requirements are to be found (i.e. MS features specified in GSM 02.07 and language of announcements specified in GSM 02.40).

2 Physical user input features

2.1 General

This section gives the requirements or guidelines for the MMI of the input related MS features. Basic requirements on these features are given in GSM 02.07 and GSM 02.40.

2.2 MMI related to MS access

No requirements additional to those in other GSM specifications (Ref. GSM 02.17, 11.10).

2.3 MMI related to MS features

The three first issues are covered in GSM 02.07:

* Country / PLMN selection:
>   The method is manufacturer optional.

* International Access Function ("+" key):

and

* Keypad:
>   The physical means of entering the characters 0-9, +, * and # (i.e. the SELECT function) may be keypad, voice input device, DTE or other, but there must be means to enter this information.
>
>   The relationship on the keypad between the numbers and letters (where used) is important when mnemonic dialling may be used. The following relationship is therefore preferred though optional.

1		6	MNO
2	ABC	7	PQRS
3	DEF	8	TUV
4	GHI	9	WXYZ
5	JKL	0	

>   See also section 5.2.1.

* ACCEPT, SEND and END functions:
>   The physical means to perform these functions may be keypad, voice input device, DTE or other, but there must be means to perform these functions. ACCEPT and SEND may use the same means.

* Setting of called Number Fields (Type of Number), use of the "+" key function:
>   Users may enter a called number in two formats, called here International or Open. The Type of Number (TON) may be set to other values if required, but the procedure for this is not defined here.

"International format"

>>> This is entered by starting with a "+" followed by country code, even for national calls. This method is preferred for roaming and international calls, and highly desirable for storage of short codes or for call-forwarding.

>>> This sets the TON to 'International' - see GSM 04.08 table 10.50.

"Open format"

>>> This is when the "+" is not entered, and the number is entered in the normal way for that network. The number may require a prefix or escape code as normal, for example for entering the international access code or national access code (often "0").

>>> This sets the TON to 'Unknown' - see GSM 04.08 table 10.50. (This is <u>not</u> the 'National' case, which does not permit prefix or escape digits).

>>> Care should be taken with this format, since the dialled number will only be correct in a given network, and may be wrong when roaming. Caution must be applied when using stored numbers or call-forwarding.

* Setting of Called Number Fields (Number Plan Indicator):

> The default Number Plan Identification (NPI) shall be CCITT E.164 if all the digits are in the range 0-9 and the NPI shall be "unknown" if other number information is included. However, if the user selects (or has selected) a particular NPI (procedure not defined) then that NPI shall be used.

* Entry of Bearer Capability Information Elements (BCIE):

>>> This is required in order to indicate information such as whether it is a voice or data call, facsimile, synchronous or asynchronous etc. The method for entering this information is of mobile manufacturer's option. For those MSs offering only telephony (and emergency calls), the default BCIE shall be for telephony (or emergency call). For MSs supporting non-voice services, there shall be means to set the BCIE required, by reading the appropriate field in the SIM and possibly otherwise. This field may be associated with or independent of the called number.

2.4 MMI related to user information

These issues are covered in GSM 02.40:

* Selection of language of announcements:

> No additional requirements are defined in this specification.

2.5 Other input features

No requirements additional to those in other GSM specifications (Ref. GSM 03.14, 11.10).

3 Indications and output features

3.1 General

This section gives the requirements and guidelines of the MMI aspects of the outputs such as displayed information, indications and tones. Basic requirements on these features are given in GSM 02.07 and GSM 02.40.

3.2 MMI related to MS access

No requirements additional to those in other GSM specifications (ref. GSM 03.12, 04.08, 05.08).

3.3   MMI related to MS features

Country/PLMN Indication:

*   The country/PLMN Indication (see GSM 02.07 for definition) should be displayed as such that the user can uniquely identify the country and PLMN e.g. by alpha or numeric means or other.

These issues are covered in GSM 02.07. No additional requirements are defined in this specification:

*   Indication of Call Progress Signals
*   Display of Called Number
*   Short Message
*   Call Charge Units Meter

3.4   MMI related to user information

These issues are covered in GSM 02.40. No additional requirements are defined in this specification:

* Selection of language of announcements
* Supervisory tones.

3.5   Other output features

No requirements additional to those in other GSM specifications (ref. GSM 03.01, 03.09, 03.12, 04.08 and 05.08).

4   Procedures

4.1   General

This section defines the MMI of the service access procedures, and supplementary service control procedures. These procedures are defined as logical procedures and in general no mandatory methods are specified. In order to make the descriptions continuous and clear requirements in GSM 02.07, 02.11, 02.17 and 02.40 have been included or are referenced. The mapping between the MMI procedures and the call control entity is specified in GSM O4.08.

4.2   MS access

The MS access procedure is comprised of the initial actions the user has to take before calls can be established or received. This procedure includes e.g. insertion of subscriber-card and entering the PIN-code.

As there exist different types of MS and as requirements in other GSM specifications allow different options the MS access procedure may differ between MSs. The method for describing the MS access procedures is by using a Mealy-graph, see Annex A.

The graph shows the MS access for simple MS e.g. hand-held and they may be different for more complex stations. It should also be noted that the exact sequences of events are not described, these may be chosen by the manufacturers. Nevertheless, the related requirements in the other GSM specifications referenced in section 4.1 are applicable.

4.3   Definition of functions

The following functions are applicable and mandatory for the logical procedures for Mobile originated and terminated calls and for the control of Supplementary Services:

ACCEPT: Acceptance of a mobile terminated call.

SELECT: Entry of information.

SEND: Transmission of the entered information to the network.

INDICATION: Requirements in GSM 02.40 are applicable. Other indications may be given in addition throughout the procedure.

END: Termination of or disconnection from the call. The execution of the END-function may be caused by either party involved in the call by e.g. termination, loss of coverage, invalidation of payment.

4.4   Call Control

4.4.1   General

Voice calls to and from a MS shall be controlled in accordance with the procedures described below. "Data calls" are expected to be controlled in a similar way but are not here specified.

4.4.2   Voice calls

The voice call is either a normal telephony call or an emergency call.

4.4.2.1   Mobile originated calls

The following sequence of functions shall be used:

SELECT: Entry of called address information.

SEND: Transmission of the called address.

INDICATION: See section 4.3.

END: Termination of the call.

4.4.2.2   Emergency calls

With MSs supporting Telephony, it shall be possible to place an emergency call by entering 112 followed by SEND in the manner specified in section 4.4.2.1. Additional means to place such a call are also allowed, e.g. provision of a dedicated button.

The MS must support the initiation of an emergency call to the above number without a SIM-module present in the MS regardless of the call being accepted or not by the network (national option to require IMSI).

> NOTE: In addition to the above procedure, calls to national emergency services may be made in the way standard for the country of the serving PLMN. However, with the exception of code "112", these are not treated within the PLMN as "Teleservice Emergency call", and would require a valid IMSI.

4.4.2.3   Mobile terminated calls

The following sequence of functions shall be used:

INDICATION: Alert to the user that she is being called.

ACCEPT: Acceptance of the incoming call by the user.

INDICATION: See section 4.3.

END: Termination of the call.

User Determined User Busy (UDUB): If, on being alerted by an incoming call, the called user enters "0 SEND", this shall set UDUB for that call, which shall either invoke call forwarding on busy, if active and operative, or else present BUSY to the calling party.

4.5   Supplementary Services Control

4.5.1   General

The supplementary services shall be controlled in accordance with the procedures described below. All MSs with MMI shall be able to be controlled in this way, to minimise the confusion of users using different types of MS (quite likely, due to the use of the SIM IC card) and to permit the introduction by a PLMN operator of new supplementary services, not defined at the time of the design of a MS. These procedures are based on those recommended by CEPT/SF and CCITT Reccomendation E.131.

The specified MMI shall be supported by the L3 signalling between the MS and the MSC, see GSM 04.80.

In addition to these specified MMI procedures, the MS may be equipped with additional enhanced MMI procedures (e.g. dedicated keys, menu procedures...), left to the discretion of the manufacturer. These procedures shall also be converted in accordance with GSM 04.80.

4.5.2   Structure of the MMI

The following sequence of functions shall be used for the control of Supplementary Services:

SELECT: Entry of the procedure information (may be a digit or a sequence of characters).

SEND: Transmission of the information to the network.

INDICATION: See section 4.3.

The MS shall support the MMI procedure specified as:

        Activation   :   *SC*SI#
        Deactivation   :   #SC*SI#
        Interrogation: *#SC*SI#
        Registration   :   *SC*SI# and **SC*SI#
        Erasure   :   ##SC*SI#

This structure consists of the following parts:

        -        Service Code, SC((2 or 3 digits)
        -        Supplementary Information, SI (variable length)

The procedure always starts with *, #, **, ## or *# and is finished by #. Each part within the procedure is separated by *.

The service code uniquely specifies the Supplementary Service, either as a defined GSM Supplementary Service or as a spare service code. All spare service codes shall be reserved for future use.

The MS shall determine from the context whether, an entry of a single *, activation or registration was intended.

For example, a call forwarding request with a single * would be interpreted as registration if containing a forwarded-to number, or an activation if not.

The supplementary information (SI) may comprise e.g. a PIN code or Directory Number. Where a particular service request does not require any SI, "*SI" is not entered, e.g. Activation becomes *SC#SEND. Where further supplementary information is required this is again entered as *SI, e.g. *SC*SIA*SIB#SEND. SIB may be used to specify the tele or bearer service expressed as a Basic Service Group to which this supplementary service request applies, SIC may be used to specify the value of the 'No Reply Condition Timer'.

Use of SIA, SIB, SIC for a particular procedure is optional. The procedure to be adopted where these are not all used is as follows:

*SI# shall be entered in any of the following formats:

> * SIA * SIB * SIC #
> * SIA * SIB #
> * SIA * * SIC #
> * SIA #
> * * SIb * SIC #
> * * SIB #
> * * * SIC #
> #

The denotation of the Supplementary Information and the order of entry are specified in Annex B. Supplementary Information Codes for the Teleservices and Bearer Services are given in Annex C.

4.5.3 Handling of supplementary services

4.5.3.1 Handling of defined GSM supplementary services

The MMI procedure for the defined GSM Supplementary Services shall be converted to the mobile radio interface Layer 3, as specified in GSM 04.80. An appropriate message should be given/displayed to the user in accordance with the "return result/error" from the network.

The service codes for the defined GSM Supplementary Services are given in Annex B.

4.5.3.2 Handling of not-implemented supplementary services

The procedures described below shall be used when digits are entered to the MS to determine whether to interpret these as call set-up requests or supplementary service control procedures etc.. This mechanism, referred to as Unstructured SS Data, may be used to support GSM SS services which are not implemented by means of the GSM specified functional signalling. See also GSM 02.90.

Action by the MS

If a)   the MS can interpret the MMI input as a:

> i)   defined GSM Supplementary Service,
> ii)   SIM control procedure or
> iii)   MS manufacturer-defined procedure,

> it shall perform the requested action.

If not, if the MMI input is in the form:

> b)   "Entry of any characters defined in the GSM 03.38 Default Alphabet (up to the maximum defined in GSM 04.80), followed by #SEND",

or in the form:

"Entry of 1 or 2 characters defined in the GSM 03.38 Default Alphabet followed by SEND",

it shall be interpreted by the MS as Unstructured SS Data and sent transparently towards the network, unless the MS is not engaged in a call and the first digit of the two character entry, followed by SEND, is a "1". In this case, the MS shall transmit this as a call set-up request.

If not, if it is:

c)   in accordance with the call set-up procedures as defined in GSM 04.08 and terminated by SEND,

it shall be sent as a call set-up request.

If the network has initiated an operation which explicitly (in the signalling) requires a response from the user, then the user shall be able to enter a response in the form of any string of characters followed by SEND. The mobile shall also provide an MMI command to terminate the dialogue with a NULL response.

The use of END shall release all calls in progress (see also section 4.5.5.2), terminate any outstanding unstructured SS operations, and release any connection used for unstructured SS operations.

4.5.4   Registration of new password

The following procedure permits the user to change the password relating to use of Supplementary Services. The only control procedure supported is Registration of a new password, which replaces any previous password for the same service. The password may not be Erased or Interrogated.

Procedure:

* 03 * ZZ * OLD_PASSWORD * NEW_PASSWORD * NEW_PASSWORD #
The MS shall also support the alternative procedure:
** 03 * ZZ * OLD_PASSWORD * NEW_PASSWORD * NEW_PASSWORD #

where, for Barring Services, ZZ = 330

for a common password for all appropriate services, delete the ZZ, entering:

* 03 ** OLD_PASSWORD * NEW_PASSWORD * NEW_PASSWORD #
The MS shall also support the alternative procedure:
** 03 ** OLD_PASSWORD * NEW_PASSWORD * NEW_PASSWORD #

the MS will then indicate to the user whether the new password request has been successful or not. If the new password request is rejected (e.g. due to entry of incorrect old password) the old password remains unchanged, until it is successfully changed by correctly repeating the procedure. Refer to GSM 02.04 regarding repeated entry of incorrect password.

NOTE: The procedures shall be followed by SEND as described in section 4.5.2.

4.5.5   Handling of supplementary services within a call

4.5.5.1   Call Waiting, call hold, multiparty services and call transfer general principles

During a call, the following general procedures shall be available, where applicable, for the subscriber to control the operation of Call Waiting, Call Hold, MultiParty Services and Explicit Call Transfer including their interactions. It should be noted that not all control procedures described in GSM 02.83, 02.84 and 02.91 are specified in this section.

Procedures:

Entering 0 followed by SEND   -   Releases all held calls or sets User Determined User Busy (UDUB) for a waiting call.

Entering 1 followed by SEND	-	Releases all active calls (if any exist) and accepts the other (held or waiting) call.
Entering 1X followed by SEND	-	Releases a specific active call X.
Entering 2 followed by SEND	-	Places all active calls (if any exist) on hold and accepts the other (held or waiting) call.
Entering 2X followed by SEND	-	Places all active calls on hold except call X with which communication shall be supported.
Entering 3 followed by SEND	-	Adds a held call to the conversation.
Entering 4 followed by SEND	-	Connects the two calls and disconnects the subscriber from both calls.
Entering "Directory Number" followed by SEND	-	Places all active calls (if any exist) on hold and sets up a new call to the specified Directory Number.
Entering END	-	Releases the subscriber from all calls (except a possible waiting call).

"X" is the numbering (starting with 1) of the call given by the sequence of setting up or receiving the calls (active, held or waiting) as seen by the served subscriber. Calls hold their number until they are released. New calls take the lowest available number.

Where both a held and a waiting call exist, the above procedures shall apply to the waiting call (i.e. not to the held call) in conflicting situation.

4.5.5.2 Call Waiting (CW)

During a call, provided this service is active for the called party, if a second call attempts to make contact, a "call waiting" indication will be presented to the called party.

To clear the current call and accept the waiting call, enter 1 followed by SEND, within the timeout period. Alternatively, either party in the existing, active, call may release that call. The call waiting indication then becomes an "alert", and the call may be accepted as a a normal call within the time-out period.

To hold the current call and accept the waiting call, enter 2 followed by SEND, within the timeout period.

To ignore the waiting call, take no action.

To set User Determined User Busy (UDUB) for the waiting call, enter 0 followed by SEND, within the timeout period.

4.5.5.3 Call hold

During a call, the initial call may be held while another call is made by entering the second directory number followed by SEND.

To shuttle between the two calls enter 2 followed by SEND irrespective of whether the second call was acquired using the Call Hold or acceptance of Call Waiting procedures.

If no waiting call exists, by entering 0 followed by SEND the held call is cleared.

To clear an active call and return to the held call enter 1 followed by SEND. This is only possible if no waiting call exists.

4.5.5.4 MultiParty

Having established calls to these two parties with one call active and the other on hold, enter 3 followed by SEND for a multiparty conversation.

To add another remote party, the same procedure applies. Another call is established and either this call or the existing multiparty call is placed on hold. Entering 3 followed by SEND brings all these parties together in an enlarged multiparty call.

To choose one party for a private communication, putting the rest of the multiparty on hold, enter 2X followed by SEND, where X defines the call with which communication shall be supported.

To return to the multiparty, with the previously active call placed on hold, enter 2 followed by SEND.

To release a specific party enter 1X followed by SEND, where X is defined as above.

If the served mobile subscriber enters END, all calls including the multiparty are released. The multiparty is terminated.

4.5.5.5 Explicit Call Transfer

Having established calls to these two parties with one call active and the other on hold, enter 4 followed by SEND to transfer the calls.

If a subscriber has one active, one held and one waiting call, and by entering 4 SEND the active and held call are connected, after the successful completion of the transfer, the served subscriber shall be offered the normal notification that there is a new waiting call, as for a normal terminating call.

4.5.5.6 Special case

Provided both Call Hold and Call Waiting is active, it is possible to have one active and one held call and then a third call attempting to make contact. In this case, to clear the active call and accepting the waiting call (the held call not affected) enter 1 followed by SEND (If entering 2 followed by SEND the call state shall not be affected).

Alternatively, either party in the active call may release that call. The held call will remain held. Within the time-out period the waiting call may then be accepted by entering 2 followed by SEND. It shall also be allowed to accept the waiting call by entering 1 followed by SEND.

As and additional alternative, the (controlling) subscriber B may enter END, in which case the active and the held calls are released. The call waiting indication then becomes an "alert" and the previously waiting call may be accepted as a normal call within the time-out period.

4.6   SIM interfaces

4.6.1   Entry of PIN and PIN2

After insertion of the IC card while the MS is switched on, or when the MS is switched on while the IC card is inserted, or when the MS is switched on in the case of a plug-in SIM, an indication is given to the user that the PIN must be entered, unless the PIN is not applicable.

If the user wishes to perform a function protected by PIN2, an indication shall be given to the user that PIN2 must be entered.

The PIN or PIN2 being entered is not revealed in any way. The PIN or PIN2 check is performed by entering the # function.

4.6.2   Change of PIN or PIN2

The following procedure permits the user to change the PIN or PIN2 in the SIM:

> PIN: **04*OLD_PIN*NEW_PIN*NEW_PIN#
> PIN2:   **042*OLD-PIN2*NEW_PIN2*NEW_PIN2#

> Note that the SEND function is not used in these procedures.

An indication is given to the user showing whether this procedure was successful.

4.6.3   Unblocking of PIN or PIN2

The following procedure permits the user to unblock the PIN or PIN2:

> PIN: **05*PIN_UNBLOCKING_KEY*NEW_PIN*NEW_PIN#
> PIN2:   **052*PIN2_UNBLOCKING_KEY*NEW_PIN2*NEW_PIN2#

> NOTE: The SEND function is not used in these procedures.

The new PIN or PIN2 must be entered whether or not it is intended to change the PIN or PIN2. An indication is given to the user showing whether this procedure was successful.

4.6.4   Reading the abbreviated dialling code

An abbreviated dialling code shall be able to be read using the following procedure:

> N(N)(N)#

Alternative additional procedures are also permitted.

4.6.5   Status information - return codes

The SIM gives status information, as responses to instructions, in two-byte codes (see GSM 11.11 section "Status Conditions Returned by the Card"). Some of the possible return codes are deeply related to the user's actions and should therefore be indicated to her.

It is mandatory to give the user the appropriate indication (respectively) when the following codes appear:

code		description
92 40	-	Memory Problem (eg. Update impossible)
98 04	-	Access conditions not fulfilled (eg. secret code verify rejected)
98 40	-	Unsuccessful CHV verification, no attempt left (eg. Secret code locked)
6F XX	-	Technical problem with no diagnostic given

The status information indication can be a dedicated lamp, text-string or others, as long as it is unambiguously made available to the user via the MMI.

As regards all other codes, it is left to the manufacturers' discretion whether and how the user shall be informed.

4.7 Presentation of IMEI

The following procedure shall instruct the ME to display its IMEI:

*#06#

The procedure shall be accepted and performed with and without an inserted SIM. The ME shall then display the 14 digits of the IMEI (not including the spare digit), the Check Digit and optionally the Software Version Number as defined in GSM 02.16 (as a single string, in that order).

5 The basic public MMI

5.1 General

In order to improve the standardization of the MMI for GSM MSs intended for general use by the public to access voice services, the following additional specification is provided. Equipment which meets this specification may quote "Approved to 02.30-Section 5" in its specification.

This procedure is intended for MSs used by unfamiliar users, where instructions will be limited, for example in fleet cars, hire cars and payphones (cash, credit card, smart card, prepaid card, etc...).

The organization providing the facility may require "Approved to 02.30-Section 5" as part of its procurement specification.

The use of this section 5 of the specification is not mandatory.

Use of "Approved to 02.30-Section 5" is restricted to MSs which pass Type Approval testing in respect to this section.

A manufacturer who wishes his equipment to be tested to this section for approval must declare his requirement on submission.

This specification covers the basic features of call origination and call termination. It specifies features which are mandatory for the Basic Public MMI. These are additional to the other clauses of GSM 02.30 which still apply and provision of additional features and facilities is not precluded unless otherwise stated.

Guidelines for the application and design of pictographic instructions and the use of the symbol for telephone are to be found in CCITT Reccommendation E.121 (Red Book, Vol. II - Fasc. II.2).

5.2   Basic public MMI specific features

5.2.1   Keyboard layout

- Layout of 12-keypad as per Figure 5.2.
- Layout of all other keys are optional.
- Control key functions: No additional functions standardized (exception: see 5.2.3).
- Control key symbols: No additional standardization.
- Control key positions: No requirements.

1	2	3
4	5	6
7	8	9
*	0	#

Figure 5.2

5.2.2   Number entry

- No restriction on number entry or editing.

5.2.3   Call control

- A hand-set shall be present to place and receive calls.
- SEND and END function keys are mandatory for execution of call initiation/termination respectively.

5.2.4   Call acceptance

- On receiving "Ring Alert", the user may lift the hand-set "Off Hook" or press the SEND-function key.

5.2.5   Call initiation

5.2.5.1   "Off Hook" call initiation

1)   Lift the hand-set "Off Hook" - Dial tone is presented.

2)   Enter number. Dial tone is cancelled after entry of the first digit (including * and #).

3)   Press SEND-function key.

4)   If the unit is "Off Hook" and the SEND-function key is not pressed, call set up may be automatically initiated after expiry of a time-out of 5 seconds. The time-out shall be restarted after every digit entry.

5)   The call initiation is stopped by replacing the hand-set "On Hook".

5.2.5.2   "On Hook" call initiation

Time-out dialling in "On Hook" - mode is not allowed for mobiles fitted with an "On Hook" dialling feature.

5.2.6 Call termination

- The call is terminated by replacing the hand-set "On Hook" or by pressing the END-function key.

- The call may also be terminated by e.g. replacing "On Hook" by B-party, radio path interruption and invalidation of payment.

5.2.7 Supplementary services control

The primary function of the * and # on the Basic Public MMI will be for control of supplementary services in accordance with the procedures defined in section 4.5. of this specification.

5.2.8 Payment

If the MS requires to be set up with some means of payment e.g. cash, prepaid card or credit card, a "payment indication" will be presented to the user when payment is required at the initial step (see 5.2.5., Call Initiation Steps).

When a call is in progress and payment which has been made is nearly used up, the payment indication shall be presented again inviting the user to make further payment.

When sufficient payment has been entered the payment indication shall be switched off.

The requirement for payment prior to the origination of an emergency call is not precluded.

5.2.9 Country/PLMN selection

(For definition, see GSM 02.07)

PLMN selection shall be in accordance with GSM 02.11, but "automatic" shall be the default mode.

Annex A (normative):   MS access mealy graph
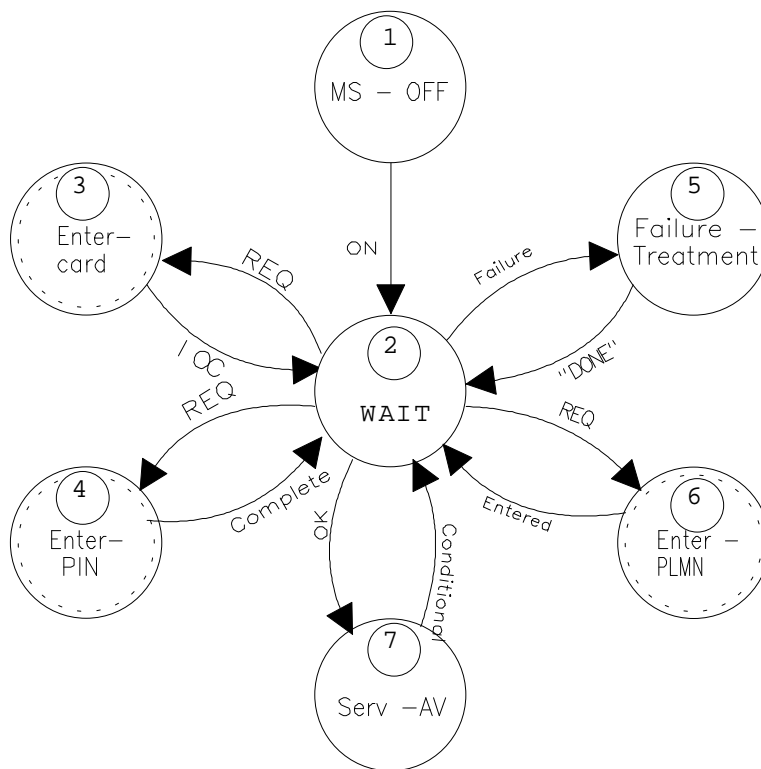
Figure A.1: Mealy-graph for the MS access procedure

Assumptions and requirements

1)   Emergency calls shall be possible in all states, except in state 1.

2)   Power-off should cause transition to state 1 from all other states.

3)   The actions to be taken in state 5 is not defined.

4)   Basic requirements concerning indications and procedures for the different states are given in specifications GSM 02.07, 02.11, 02.17 and 02.40.

5)   Additional indications to those in item 4 above may be given in all states and at all events.

6)   Realization of the dotted states (3, 4 and 6) depends upon the network requirements and the type of MS.

Description of the states of the MS access procedure

1) MS-OFF: The MS is in OFF-condition. This means that the equipment is not active as an MS in a GSM PLMN.

2) WAIT: Waiting for the completion of the MS access conditions, which are related to the type of MS and to the GSM PLMN, where in the MS is roaming (e.g. location updating).

3) ENTER CARD: Request for entering of the subscriber card, (e.g. when no built in SIM-module is available).

4) ENTER PIN: Request for entering of the correct PIN.

5) FAILURE TREATMENT: Waiting for removal the actual failure condition.

6) ENTER PLMN: Request for selection of PLMN.

7) SERV-AV: The MS is in a ready state. PLMN services are available to the user.

Description of the transitions between Ms access states

ON: The equipment becomes active as an MS in a GSM PLMN.

REQ: A request for user activity.

IOC: Insertion of a subscriber card with SIM-module.

COMPLETE: The PIN has been entered.

ENTERED: A PLMN choice has been done.

FAILURE: A failure condition has occurred in any other state during the MS access procedures.

CONDITIONAL: One of the conditions the MS is waiting for in WAIT state has been lost. The MS goes back to the WAIT state.

"DONE":   The MS access failure condition has been corrected.

OK: All the conditions the MS is waiting for in the WAIT state are accomplished.

Annex B (normative):   Codes for defined Supplementary Services

Input information for handling of defined Supplementary Services

Supplementary Service	Service Code	SIA	SIB	SIC
02.81				CLIP	30
-	-				
CLIR	31	-	-	-
COLP	76	-	-	-
COLR	77	-	-	-
In temporary mode, to suppress CLIR for a single call, enter: " * 31 # <called number> SEND"				
In temporary mode, to invoke CLIR for a single call enter: " # 31 # <called number> SEND "				
02.82					
CFU	21	DN	BS	-
CF Busy	67	DN	BS	-
CF No Reply	61	DN	BS	T
CF Not Reachable	62	DN	BS	-
all CF	002	DN	BS	T
all conditional CF	004	DN	BS	T
02.83					
WAIT	43	BS	-	-
	see section 4.5.5			
HOLD	see section 4.5.5			
02.84					
MPTY	see section 4.5.5			
02.88					
BAOC	33	PW	BS	-

BAOIC	331	PW	BS	-	
BAOIC exc home	332	PW	BS	-	
BAIC	35	PW	BS	-	
BAIC roaming	351	PW	BS	-	
all Barring Serv.	330	PW	BS	-	
Outg. Barr. Serv.	333	PW	BS		
Inc. Barr. Serv.	353	PW	BS		
02.91					
ECT	see section 4.5.5				

DN = Directory Number
PW = Password (see section 4.5.4)
BS = Basic Service Group (if required) - see Annex C
T = No Reply Condition Timer (5-30 seconds)

SI required   Y   =   Yes
             N   =   No
             -   =   Not applicable

Annex C (normative):   Codes for Tele- and bearer services

Tele- and Bearer Service Supplementary Information codes (SIb)

Alternate and speech/data services are included with the equivalent data service.

Basic Service group number (NOTE)	Telecommunication Service	MMI Service Code
1 to 11	All tele and bearer services	no code required
	Teleservices	
1 to 6	All teleservices	10
1	Telephony	11
2 to 6	All data teleservices	12
6	Facsimile services	13
2	Short Message Services	16
1, 3 to 6	All teleservices except SMS	19
	Bearer Service	
7 to 11	All bearer services	20
7, 9	All async services	21
8, 10	All sync services	22
8	All data circuit sync	24
7	All data circuit async	25
10	All dedicated packet access	26
9	All dedicated PAD access	27

NOTE: See GSM 02.04 for definition of Basic Service groups.

The grouping implies that if e.g. code 25 is used, the Supplementary Service procedure concerned applies to all Asynchronous Data Circuit mode Bearer Services subscribed to.

Tele- and Bearer Service Supplementary Information Codes (SIb) for services not defined by GSM

Code as defined	Telecommunication Service	MMI Service
in GSM 09.02		Code
PLMN specific teleservices:		
11010000	All PLMN specific teleservices	50
11010001	PLMN specific teleservice 1	51
11010010	PLMN specific teleservice 2	52
11010011	PLMN specific teleservice 3	53
11010100	PLMN specific teleservice 4	54
11010101	PLMN specific teleservice 5	55
11010110	PLMN specific teleservice 6	56
11010111	PLMN specific teleservice 7	57
11011000	PLMN specific teleservice 8	58
11011001	PLMN specific teleservice 9	59
11011010	PLMN specific teleservice 10	60
11011011	PLMN specific teleservice 11	61
11011100	PLMN specific teleservice 12	62
11011101	PLMN specific teleservice 13	63
11011110	PLMN specific teleservice 14	64
11011111	PLMN specific teleservice 15	65
PLMN specific bearer services		

11010000	All PLMN specific bearer services	70
11010001	PLMN specific bearer service 1	71
11010010	PLMN specific bearer service 2	72
11010011	PLMN specific bearer service 3	73
11010100	PLMN specific bearer service 4	74
11010101	PLMN specific bearer service 5	75
11010110	PLMN specific bearer service 6	76
11010111	PLMN specific bearer service 7	77
11011000	PLMN specific bearer service 8	78
11011001	PLMN specific bearer service 9	79
11011010	PLMN specific bearer service 10	80
11011011	PLMN specific bearer service 11	81
11011100	PLMN specific bearer service 12	82
11011101	PLMN specific bearer service 13	83
11011110	PLMN specific bearer service 14	84
11011111	PLMN specific bearer service 15	85

History

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