TS 100 907 V6.1.0 (1999-03)

Technical Specification

Digital cellular telecommunications system (Phase 2+);
Man-Machine Interface (MMI) of the Mobile Station (MS)
(GSM 02.30 version 6.1.0 Release 1997)

GLOBAL SYSTEM FOR
MOBILE COMMUNICATIONS

ETSI

Reference
RTS/SMG-010230Q6R1 (8ec030c3.PDF)

Keywords
Digital cellular telecommunications system,
Global System for Mobile communications (GSM)

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Foreword

This Technical Specification (TS) has been produced by the Special Mobile Group (SMG).

The present document specifies the requirements for and gives guidelines on the MMI for calls on the GSM Mobile Station within the digital cellular telecommunications system (Phase 2+).

The contents of the present document is subject to continuing work within SMG and may change following formal SMG approval. Should SMG modify the contents of the present document it will be re-released by SMG with an identifying change of release date and an increase in version number as follows:

Version 6.x.y

where:

6   GSM Phase 2+ Release 1997

x   the second digit is incremented for changes of substance, i.e. technical enhancements, corrections, updates, etc.;

y   the third digit is incremented when editorial only changes have been incorporated in the specification.

Refer to annex D for information on changes introduced

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

Introduction

The present document includes references to features which are not part of the Phase 2+ Release 96 of the GSM Technical specifications. All subclauses which were changed as a result of these features contain a marker (see table below) relevant to the particular feature.

The following table lists all features that were introduced after Release 96.

Feature	Marker
CCBS	$(CCBS)$
SPNP	$(SPNP)$
CNAP	$(CNAP)$
MSP	(MNP)

0 Scope

The present document defines the requirements for and gives guidelines on the MMI for calls on the GSM Mobile Station (MS). 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.

The present document complements specifications GSM 02.07 [3], 02.11 [4], 02.17 [5], 02.40 [7], 03.01[11], 03.09 [12], 03.12 [13], 03.14 [14], 04.08 [16], 05.08 [18], and 11.10 [20] and deals with MMI items not covered by these specifications.

0.1 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, the latest version applies.

- A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

[1]	GSM 01.04: "Digital cellular telecommunication system (Phase 2+); Abbreviations and acronyms".
[2]	GSM 02.04: "Digital cellular telecommunication system (Phase 2+); General on supplementary services".
[3]	GSM 02.07: "Digital cellular telecommunication system (Phase 2+); Mobile Station (MS) features".
[4]	GSM 02.11: "Digital cellular telecommunication system (Phase 2+); Service accessibility".
[5]	GSM 02.17: "Digital cellular telecommunication system (Phase 2+); Subscriber identity modules Functional characteristics".
[6]	GSM 02.16: "Digital cellular telecommunications system (Phase 2+; International Mobile station Equipment Identities (IMEI)".
[7]	GSM 02.40: "Digital cellular telecommunication system (Phase 2+); Procedures for call progress indications".
[8]	GSM 02.83: "Digital cellular telecommunication system (Phase 2+); Call Waiting (CW) and Call Hold (HOLD) supplementary services - Stage 1".
[9]	GSM 02.84: "Digital cellular telecommunication system (Phase 2+); MultiParty (MPTY) supplementary services - Stage 1".
[10]	GSM 02.90: "Digital cellular telecommunication system (Phase 2+); "Stage 1 description of Unstructured Supplementary Service Data (USSD)".
[11]	GSM 03.01: "Digital cellular telecommunication system (Phase 2+); Network functions".
[12]	GSM 03.09: "Digital cellular telecommunication system (Phase 2+); Handover procedures".
[13]	GSM 03.12: "Digital cellular telecommunication system (Phase 2+); Location registration procedures".
[14]	GSM 03.14: "Digital cellular telecommunication system (Phase 2+); Support of Dual Tone Multi-Frequency signalling (DTMF) via the GSM system".

[15]   GSM 03.38: "Digital cellular telecommunication system (Phase 2+);"Alphabets and language-specific information".

[16]   GSM 04.08: "Digital cellular telecommunication system (Phase 2+); Mobile radio interface layer 3 specification".

[17]   GSM 04.80: "Digital cellular telecommunication system (Phase 2+); Mobile radio interface layer 3 supplementary services specification Formats and coding".

[18]   GSM 05.08: "Digital cellular telecommunication system (Phase 2+); Radio subsystem link control".

[19]   GSM 09.02: "Digital cellular telecommunication system (Phase 2+); Mobile Application Part (MAP) specification".

[20]   GSM 11.10: "Digital cellular telecommunication system (Phase 2+); Mobile Station (MS) conformity specification".

[21]   GSM 11.11: "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 the present document are listed in GSM 01.04 [1].

0.3   Definitions

Directory Number: a string consisting of one or more of the characters from the set {0, 1, 2, 3, 4, 5, 6, 7, 8, 9, *, #, a, b, c} associated with a nature of address indicator and number plan indicator. When using the public MMI for the control of supplementary services however, * and # cannot be part of any SC or SI field.

NOTE 1:   No such restriction on the SC and SI fields exists when using other (e.g. menu-driven) MMI for the control of supplementary services.

NOTE 2:   When using the public MMI, certain limitations on the use of one and two digit directory numbers may apply. The use of other MMI can remove these restrictions.

NOTE 3:   This definition is not intended to require the support of all these characters in the MMI itself.

1   General

1.1   Basic philosophy

The basic idea behind the present document 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 the present document.

The drawback of this approach is that the users of GSM Mobile Stations 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 the present document. This setting shall only apply when the same SIM is in use (see GSM 02.17 [5] for security policy), otherwise the ME shall enable the standard MMI.

1.2   Structure of the specification

The TS 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 [3] and language of announcements specified in GSM 02.40 [7]).

2   Physical user input features

2.1   General

This clause 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 [3] and GSM 02.40 [7].

2.2   MMI related to MS access

No requirements additional to those in other GSM specifications (Reference GSM 02.17 [5], 11.10 [20]).

2.3   MMI related to MS features

The three first issues are covered in GSM 02.07 [3]:

* 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 subclause 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 [17] 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 [17] table 10.50. (This is not 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 [22] 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 Mobile Stations offering only telephony (and emergency calls), the default BCIE shall be for telephony (or emergency call). For Mobile Stations 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 [7]:

* Selection of language of announcements:

No additional requirements are defined in the present document.

2.5 Other input features

No requirements additional to those in other GSM specifications (Reference GSM 03.14 [14] 11.10 [20]).

3 Indications and output features

3.1 General

This clause 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 [3] and GSM 02.40 [7].

3.2 MMI related to MS access

No requirements additional to those in other GSM specifications (ref. GSM 03.12 [13], GSM 04.08 [16], GSM 05.08 [18]).

3.3 MMI related to MS features

Country/PLMN Indication:

*   The country/PLMN Indication (see GSM 02.07 [3] 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 [3]. 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 [7]. 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 [11], 03.09 [12], 03.12 [13], 04.08 [16] and 05.08 [18]).

4 Procedures

4.1 General

This clause 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 [3], 02.11 [4], 02.17 [5] and 02.40 [7] have been included or are referenced. The mapping between the MMI procedures and the call control entity is specified in GSM 04.08 [16].

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 Mobile Stations. 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 subclause 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 [7] 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 Mobile Station 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 subclause 4.3.

END: Termination of the call.

4.4.2.2 Emergency calls

With Mobile Stations supporting Telephony, it shall be possible to place an emergency call by entering 112 followed by SEND in the manner specified in subclause 4.4.2.1. It may also be possible for a user to enter a preferred emergency MMI code of up to six digits (such as 999) followed by SEND to invoke an emergency call. In this latter case, the preferred code shall be stored in the SIM and the ME recognizes any dialled instance of this code to set up the emergency call. 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 "112" without a SIM 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" unless the ME recognizes the code as an emergency code as described above, 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 subclause 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 Mobile Stations with MMI shall be able to be controlled in this way, to minimize the confusion of users using different types of Mobile Station (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 Mobile Station. These procedures are based on those recommended by CEPT/SF and CCITT Recommendation E.131.

The specified MMI shall be supported by the L3 signalling between the MS and the MSC, see GSM 04.80 [17].

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 [17].

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 subclause 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.

The following procedures shall be used for application of supplementary services to the call set-up procedure:

*SCn*SI#DN SEND;

where SC is the service code defined in annex B and *SI is an optional field which may be applicable to service SC. The "n" is a single digit used to indicate the numbering plan, profile, priority, etc. according to the service being applied. For simplicity of presentation, the leading * is shown on the assumption that the action is to activate (switch on) the required service. However, for a deactivation (or switch off), this would become:

#SCn*SI#DN SEND;

It is assumed that the *# (interrogation) will not apply to call set-up.

Where more than one supplementary service is applicable to the call set-up, these shall be concatenated with any applicable supplementary information immediately following the applicable service code.

For example, if SCn and SI refer to one applicable supplementary service and scn and si to another, then the generic procedure becomes:

*SCn*SI#scn*si#DN SEND.

NOTE: The order of entry of SC and sc is a user option, provided that any supplementary information follows immediately after the relevant SC.

Where SI is not applicable according to the definition of the supplementary service, then *SI is omitted. Where its use is optional, but not selected for a particular call set-up, it may be omitted or entered as an extra * if this is necessary to avoid ambiguity of interpretation.

NOTE: By using the # as a separator, most cases are expected to be unambiguous.

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 [17]. 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 MS shall act in accordance with figure 4.5.3.2 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 may involve a mechanism, referred to as Unstructured SS Data, which allows the support of GSM SS services which are not implemented by means of the GSM specified functional signalling. See also GSM 02.90 [10].
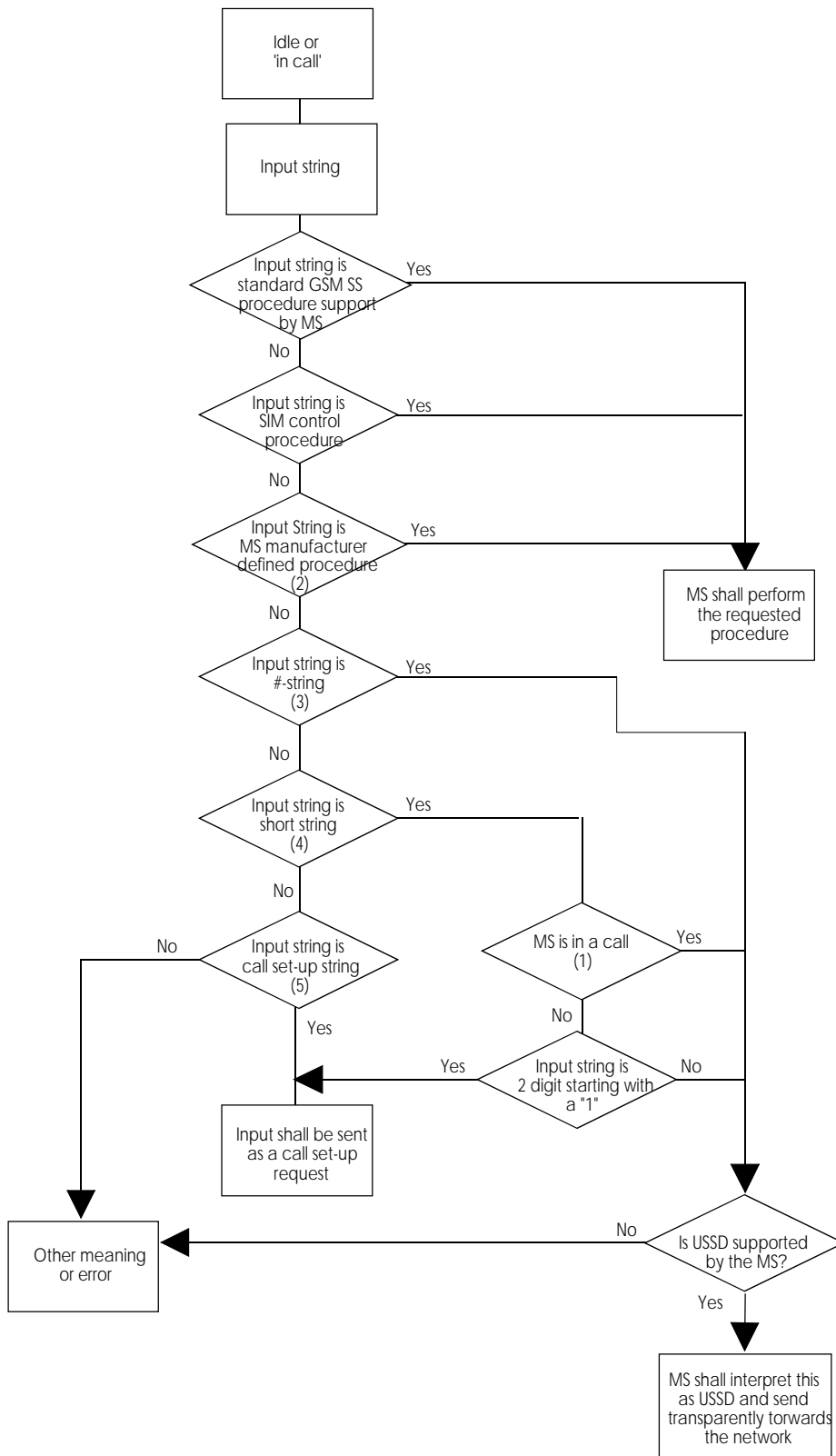
Figure 4.5.3.2

The following definitions are applicable to the interpretation of figure 4.5.3.2:

1) In a call:

   A MS is "in a call" from the time that signalling related to the establishment or attempted establishment of a MO or MT call commences and before the call or call attempt ends, and (if applicable) the ME has stopped generating tones related to this call to the user.

2) MS manufacturer defined procedure:

   The term "MS manufacturer defined procedure" shall not include the following two cases:

   (i) input which can be interpreted as being of the following form, whether or not in a call:

   CX [string]# followed by SEND;

where

string is any combination of numeric digits, *, #;

and

C comprises 1, 2 or 3 digits from the set (*,#);

and

X comprises 1, 2 or 3 numeric digits or the fourth numeric digit is non-zero;

   (ii) input of the following form in a call (as defined above):

   "Entry of 1 or 2 characters defined in the GSM 03.38 [15] Default Alphabet followed by SEND".

3) #-string:

   Input of the form.

   "Entry of any characters defined in the GSM 03.38 [15] Default Alphabet (up to the maximum defined in GSM 04.80 [17]), followed by #SEND".

4) Short string:

   "Entry of 1 or 2 characters defined in the GSM 03.38 [15] Default Alphabet followed by SEND".

5) Call setup string:

   MMI input in accordance with the call set-up procedures as defined in GSM 04.08 [16] and terminated by SEND.

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 subclause 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 [2] regarding repeated entry of incorrect password.

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

4.5.5 Handling of supplementary services within a call

4.5.5.1 Call Deflection, Call Waiting, Call Hold, MultiParty Services, Explicit Call Transfer and Completion of Calls to Busy Subscriber general principles

During a call, the following general procedures shall be available, where applicable, for the subscriber to control the operation of

- Call Deflection

- Call Waiting

- Call Hold

- MultiParty Services

- Explicit Call Transfer

- $(CCBS)$: Completion of Calls to Busy Subscriber

including their interactions. It should be noted that not all control procedures described in GSM 02.72, 02.83, 02.84, 02.91, and 02.93 are specified in this subclause.

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 (ECT).
Entering 4 * "Directory Number" followed by SEND	-	Redirect an incoming or a waiting call to the specified directory number.
Entering 5 followed by SEND	-	$(CCBS)$: Activates the Completion of Calls to Busy Subscriber Request.
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 time out 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 normal call within the time-out period.

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

To redirect the waiting call to another destination, enter 4 * "Directory Number" followed by SEND, within the time out 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.

4.5.5.7 Call Deflection

If informed about an incoming call this call may be redirected to an another destination by entering 4 * "Directory Number" followed by SEND.

4.5.5.8 Completion of calls to busy subscribers - $(CCBS)$

In a situation where a calling party A encounters busy of congestion on the B side, the network may offer the possibility to apply the CCBS supplementary service. If subscriber A, after being notified that CCBS is possible and during the period where the retention timer is running (minimum 15 seconds), enters 5 followed by SEND, this shall be interpreted as CCBS activation. Entering of 5 SEND by subscriber A in any other situation as described above shall not be interpreted as CCBS activation.

4.5.6 Other handling of supplementary services

4.5.6.1 Multiple Subscriber Profile - (MSP)

4.5.6.1.1 Registering an alternative profile

An alternative profile is registered by entering the profile ID of the new profile, as illustrated:

* 59n # SEND

Where n is the identity of the profile desired.

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

The ID of the registered profile and other provisioned profiles may be determined by interrogation on entering *#59# SEND

The profile so registered shall be used for all further MS originated activities and CISS operations unless another profile is selected, or an alternative profile is registered.

4.5.6.1.2 Selecting an alternative profile on a per call basis

An alternative profile to the registered profile is selected by entering the profile ID of the new profile along with the desired Directory Number, as illustrated:

> * 59n # DN SEND

> Where n is the identity of the profile desired

Continued processing of the call shall implicitly indicate that the selection was successful, there shall be no explicit indication given to the user concering successful execution this selection procedure.

It is assumed that *# (i.e. interrogation) will not apply to call set-up.

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 that 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 [21] clause "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 [6] (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 Mobile Stations intended for general use by the public to access voice services, the following additional specification is provided. Equipment which meets the present document may quote "Approved to 02.30-Section 5" in its specification.

This procedure is intended for Mobile Stations 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 clause 5 of the specification is not mandatory.

Use of "Approved to 02.30 section 5" is restricted to Mobile Stations which pass Type Approval testing in respect to this clause.

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

The present document 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 Recommendation E.121 [24] (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 subclause 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 subclause 4.5. of the present document.

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 subclause 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 [3]).

PLMN selection shall be in accordance with GSM 02.11 [4], but "automatic" shall be the default mode.

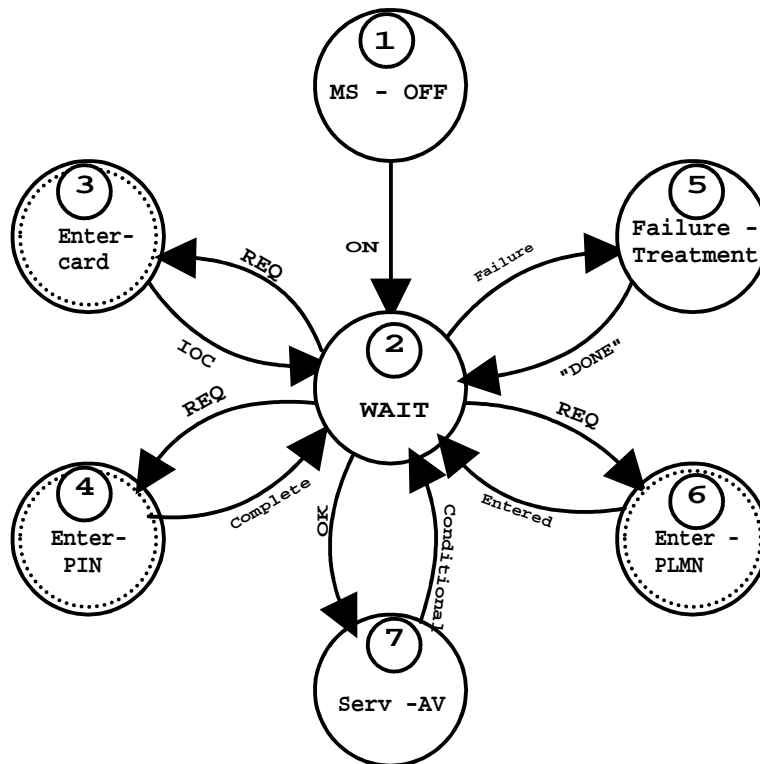# Annex A (normative): MS access mealy graph

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 [3], 02.11 [4], 02.17 [5] and 02.40 [7].

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

Table B.1: Input information for handling of defined Supplementary Services

	Supplementary Service	Service Code	SIA	SIB	SIC
02.67					
	eMLPP	75 and 75n		where n=0-4	
02.72					
	CD	66			
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			
02.87					
	UUS Service 1	361	R	-	-
	UUS Service 2	362	R	-	-
	UUS Service 3	363	R	-	-
	all UUS Services	360	R	-	-
	If UUS shall be activated when originating a call, enter: " * 36X * R # <called number> SEND" (X is indicating the requested UUS service)				

Table B.1(concluded): Input information for handling of defined Supplementary Services

Supplementary Service	Service Code	SIA	SIB	SIC
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	96		see section 4.5.5	
$(CCBS)$:				
02.93				
CCBS	37	n	See Section 4.5.5	
		where n=1-5		
$(SPNP)$:				
02.95				
SPNP	07n		where n=0-9	

$(CNAP)$:				
02.96				
CNAP	**300**	**-**	**-**	**-**

(MSP):				
02.97				
MSP	59n	PW	where n=1-4	

DN = Directory Number;
PW = Password (see subclause 4.5.4);
BS = Basic Service Group (if required) - see annex C;
T = No Reply Condition Timer (5-30 seconds);
R = UUS required option.
SI required   Y = Yes;
        N = No;
        - = Not applicable.

"UUS required" option

For the "UUS required" option two values are defined:

R = 0   UUS not required;
R = 1   UUS required.

NOTE: If the "UUS required" option is requested for a call, the call will only be established if the requested UUS capabilities are available.

If the "UUS required" option is not contained in an activation request UUS shall be activated without the UUS required option.

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 12	All tele and bearer services	no code required
	Teleservices	
1 to 6, 12	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, 12	All teleservices except SMS	19
12	Voice group services	
	Voice Group Call Service (VGCS)	17
	Voice Broadcast Service (VBS)	18
	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
13	All GPRS bearer services	99

   NOTE: See GSM 02.04 [2] 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 in GSM 09.02 [19]	Telecommunication Service	MMI Service 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
Code as defined in GSM 09.02 [19]	Telecommunication Service	MMI Service Code

Annex D (informative): Change Request History

	Change history				
SMG No.	**TDoc. No.**	**CR. No.**	**Section affected**	**New version**	**Subject/Comments**
SMG#14	235/95	Delta	4.5.5,Ann B	5.0.0	Provision for ECT
SMG#17	047/96 052/96	A005 A003r1	4.5.3.2 Ann C	5.1.0	Handling of user input by the ME Service group number for VGCS and VBS
SMG#18	219/96 222/96	A007 A006	4.5.1,4.5.5 Annex B Annex B	5.2.0	MMI for call associated SS control MMI for UUS
SMG#19	362/96 512/96 371/96	A010 A011 A008r1	4.5.5.1,4.5.5.2, 4.5.5.7 5.5 4.4.2.2	5.3.0	MMI for Call Deflection Clarification of the meaning of the MMI 5 SEND Support of Additional Call Set-up MMI Procedures
UAP				5.3.1	UAP 58: 1996-11-18 to 1997-03-14
SMG#21	168/97	A014 A015	Annex B 4.5.3.2	5.4.0	$(CCBS)$ Clarification of the MMI for CCBS Correction of the Handling of MMI by the MS
SMG#22	301/97	A016	4.5.5.1 Annex B	5.5.0	$(CCBS)$ is added to Title Call Transfer is renamed to explicit Call Transfer
SMG#22	306/97	A017	4.5.6 Added	5.5.0	Other Handling of Supplementary Services: Add MSP MMI
SMG#23	793/97 (same as 654/97)	A018	Annex B	5.6.0	$(CNAP)$: The Table of Codes for defined Supplementary Services in Annex B is modified. The change request has defined the CNAP MMI Code as 300. (Version used is 5.5.1 CR indicates V5.3.1 !!)
SMG#23	651/97	A019	4.5.6 and Annex B revised pages: 21 and 31	5.6.0	(MSP): Clarification of registration and selection procedures for MSP Correction of Table in Annex B: Codes for defined Supplementary Services
SMG#23	651/97	A020	Annex B, Revised page: 27	5.6.0	$(CCBS)$: MMI procedure to handle CCBS service is clarified. By indicating the # of an outstanding CCBS request the subscriber has the possibility to deactivate this specific CCBS request.
SMG#24	1149/97 (Replaced 974/97)	A021r1	Scope Section and 0.3 - Note 3 added.	5.6.1	This CR introduces an appropriate definition of the Directory Number.
SMG#25				6.0.0	Creation of version 6.0.0 as part of GSM release 1997
SMG#28	028/99	A024	Annex C	6.1.0	Separate MMI codes for VGCS and VBS: - UIC MORANE prefers a separate service code for both VBS and VGCS and not the combined one (17) as presently defined in GSM 02.30. The use of the group call reference is not sufficient.
SMG#28	031/99	A022	Annex C	6.1.0	Addition of Supplementary Service Code for GPRS

History

Document history		
V6.0.1	July 1998	Publication
V6.1.0	March 1999	Publication