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Technical Specification

Digital cellular telecommunications system (Phase 2+); Universal Mobile Telecommunications System (UMTS); Man-Machine Interface (MMI) of the User Equipment (UE) (3GPP TS 22.030 version 5.0.0 Release 5)

GLOBAL SYSTEM FOR MOBILE COMMUNICATIONS

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Foreword

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Contents

Foreword

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1 Scope

The present document defines the requirements for and gives guidelines on the MMI on the User Equipment (UE). 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 included requirements only to UE connected to CS Domain. See 3GPP TS 22.101 [18]; for overall service principles and 3GPP TS 22.001 [19] for Circuit telecommunication services.

2 References

The following documents contain provisions which, through reference in this text, constitute provisions of the present document.

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.

- For a specific reference, subsequent revisions do not apply.

- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

[1]   3GPP TR 21.905: "Vocabulary for 3GPP Specifications".

[2]   3GPP TS 22.004: "General on supplementary services".

[3]   3GPP TS 22.011: "Service accessibility".

[4]   3GPP TS 22.016: "International Mobile station Equipment Identities (IMEI)".

[5]   3GPP TS 22.083: "Call Waiting (CW) and Call Hold (HOLD) supplementary services - Stage 1".

[6]   3GPP TS 22.084: "MultiParty (MPTY) supplementary services - Stage 1".

[7]   3GPP TS 22.090: "Stage 1 description of Unstructured Supplementary Service Data (USSD)".

[8]   3GPP TS 23.038: "Alphabets and language".

[9]   3GPP TS 24.008: "Mobile radio interface layer 3 specification; Core Network Protocols – Stage 3".

[10]   3GPP TS 24.080: "Mobile radio interface layer 3 supplementary services specification Formats and coding".

[11]   3GPP TS 29.002: "Mobile Application Part (MAP)".

[12]   3GPP TS 22.081: "Line Identification Supplementary Services – Stage 1".

[13]   ITU-T Recommendation E.164: "Numbering plan for the ISDN era".

[14]   ITU-T Recommendation E.121: "Pictograms and symbols to assist users of the telephone service".

[15]   3GPP TS 22.072: "Call Deflection; Stage 1".

[16]   3GPP TS 22.091: "Explicit Call Transfer Supplementary Service; Stage 1".

[17]   3GPP TS 22.093: "Call Completion to Busy Subscriber (CCBS); Stage 1".

[18]   3GPP TS 22.101: "Service principles".

[19]   3GPP TS 22.001: "Principles of circuit telecommunication services supported by a Public Land Mobile Network (PLMN)".

[20]   3GPP TS 22.094: "Follow Me Service description - Stage 1".

[21]   3GPP TS 22.135: "Multicall supplementary service Stage 1".

3   Definitions and abbreviations

3.1   Definitions

For the purposes of the present document, the following definition applies:

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.

3.2   Abbreviations

For the purposes of the present document, the abbreviations listed in 3GPP TR 21.905 [18] apply.

4   General

4.1   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 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.

The requirements on the physical layout of input and output features are kept to a minimum to allow for differentiated types of UEs 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 UEs 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.

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/USIM is in use otherwise the ME shall enable the standard MMI.

5   Physical user input features

5.1   General

This clause gives the requirements or guidelines for the MMI of the input related UE features. Basic requirements on these features are given in 3GPP TS 22.101 [18].

5.2 MMI related to UE features

* 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	

* 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 3GPP TS 24.008 [9].

"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 3GPP TS 24.008 [9]. (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 ITU-T E.164 [13] 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 User Equipment offering only telephony (and emergency calls), the default BCIE shall be for telephony (or

emergency call). For User Equipment supporting non-voice services, there shall be means to set the BCIE required, by reading the appropriate field in the SIM/USIM and possibly otherwise. This field may be associated with or independent of the called number.

6 Procedures

6.1 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 3GPP TS 22.101 [18] have been included or are referenced. The mapping between the MMI procedures and the call control entity is specified in 3GPP TS 24.008 [9].

6.2 UE access

The UE 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 UE and as requirements in other 3GPP specifications allow different options the UE access procedure may differ between User Equipment. The method for describing the UE access procedures is by using a Mealy-graph, see annex A.

The graph shows the UE access for simple UE 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.

6.3 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:	Call progress indications. 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.

6.4 Call Control

6.4.1 General

Voice calls to and from a User Equipment 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.

6.4.2 Voice calls

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

6.4.2.1 Mobile originated calls

The following sequence of functions shall be used:

SELECT: Entry of called address information.

SEND: Transmission of the called address.

INDICATION: Call progress indications.

END: Termination of the call.

6.4.2.2   Emergency calls

With User Equipment supporting Telephony, it shall be possible to place an emergency call as specified in 3GPP TS 22.101 [18].

6.4.2.3   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: Call progress indications.

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.

6.5   Supplementary Services Control

6.5.1   General

The supplementary services shall be controlled in accordance with the procedures described below. All User Equipment with MMI shall be able to be controlled in this way, to minimize the confusion of users using different types of User Equipment (quite likely, due to the use of the SIM IC card or UICC) and to permit the introduction by a PLMN operator of new supplementary services, not defined at the time of the design of a User Equipment. These procedures are based on those recommended by ETSI/HF and ITU-T Recommendation E.131.

The specified MMI shall be supported by the L3 signalling between the UE and the MSC, see 3GPP TS 24.080 [10].

In addition to these specified MMI procedures the UE 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 3GPP TS 24.080 [10].

6.5.2   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: Call progress indications.

The UE 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 Supplementary Service or as a spare service code. All spare service codes shall be reserved for future use.

The UE 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.

6.5.3   Handling of supplementary services

6.5.3.1   Handling of defined supplementary services

The MMI procedure for the defined Supplementary Services (see 3GPP TS 22.004 [2]) shall be converted to the mobile radio interface Layer 3, as specified in 3GPP TS 24.080 [10]. 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 Supplementary Services are given in annex B.

6.5.3.2   Handling of not-implemented supplementary services

The UE shall act in accordance with figure 3.5.3.2 when digits are entered to the UE 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 SS services which are not implemented by means of the specified functional signalling. See also 3GPP TS 22.090 [7].
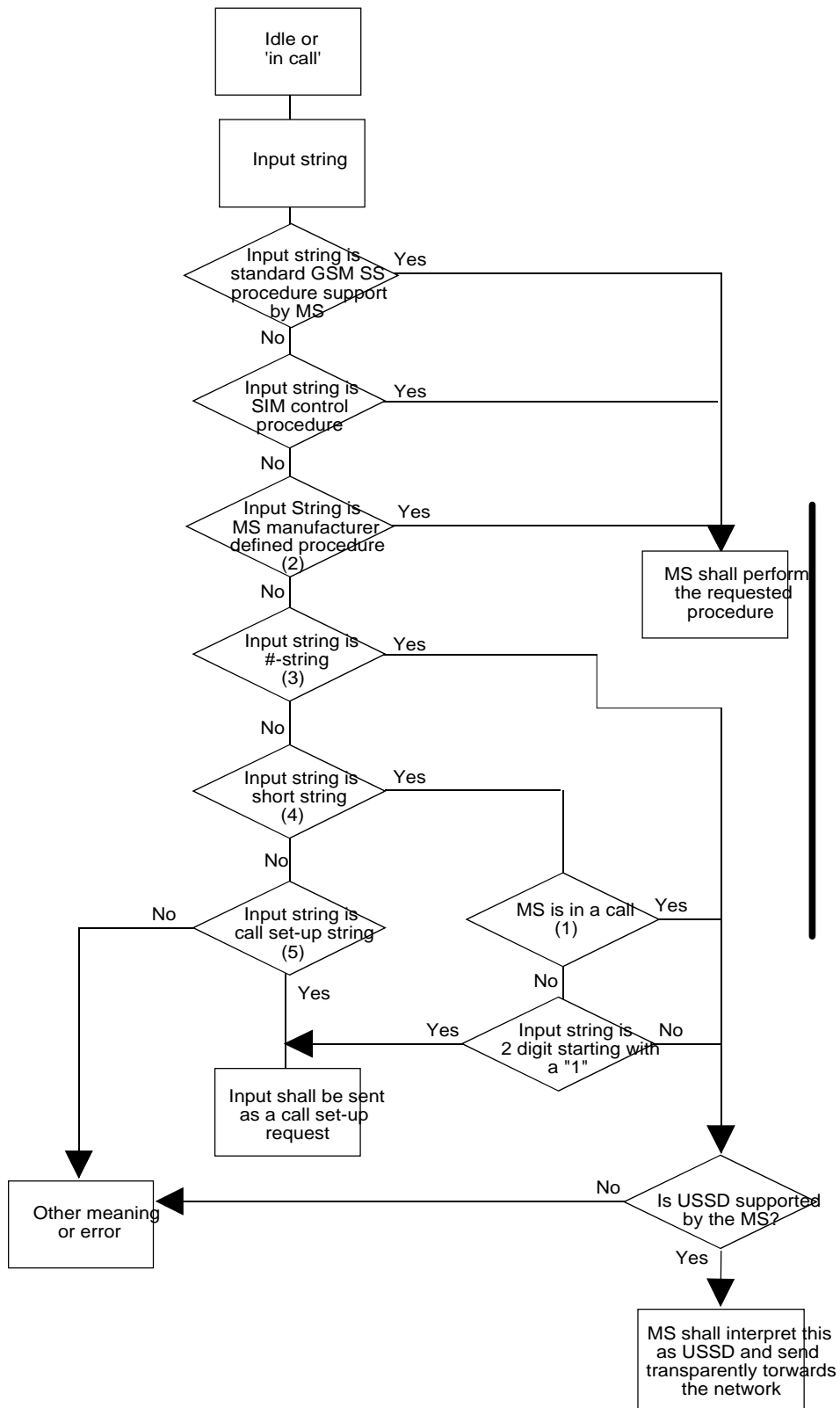
Figure 3.5.3.2

The following definitions are applicable to the interpretation of figure 3.5.3.2:

1) In a call:

   A UE 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) UE manufacturer defined procedure:

   The term "UE 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 3GPP TS 23.038 [8] Default Alphabet followed by SEND".

3) #-string:

   Input of the form.

   "Entry of any characters defined in the 3GPP TS 23.038 [8] Default Alphabet (up to the maximum defined in 3GPP TS 24.080 [10]), followed by #SEND".

4) Short string:

   "Entry of 1 or 2 characters defined in the 3GPP TS 23.038 [8] Default Alphabet followed by SEND".

5) Call setup string:

   MMI input in accordance with the call set-up procedures as defined in 3GPP TS 24.008 [9] 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 3.5.5.2), terminate any outstanding unstructured SS operations, and release any connection used for unstructured SS operations.

6.5.4 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 UE 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 UE shall also support the alternative procedure:

** 03 ** OLD_PASSWORD * NEW_PASSWORD * NEW_PASSWORD #

The UE 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 3GPP TS 22.004 [2] regarding repeated entry of incorrect password.

NOTE: The procedures shall be followed by SEND as described in subclause 3.5.2.

6.5.5 Handling of supplementary services within a call

6.5.5.1 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;

- Completion of Calls to Busy Subscriber,

including their interactions. It should be noted that not all control procedures described in 3GPP TS 22.072 [15], 3GPP TS 22.083 [5], 3GPP TS 22.084 [6], 22.091 [16], and 22.093 [17] 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"	-	Redirect an incoming or a waiting call to the specified followed by SEND directory number.
Entering 5 followed by SEND	-	Activates the Completion of Calls to Busy Subscriber Request.
Entering "Directory Number"	-	Places all active calls (if any exist) on hold and sets up a followed by SEND 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.

6.5.5.2 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.

6.5.5.3 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.

6.5.5.4 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.

6.5.5.5 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.

6.5.5.6 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.

6.5.5.7 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.

6.5.5.8 Completion of calls to busy subscribers

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.

6.5.6 Other handling of supplementary services

6.5.6.1 Multiple Subscriber Profile

6.5.6.1.1 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 UE originated activities and CISS operations unless another profile is selected, or an alternative profile is registered.

6.5.6.1.2 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:

DN *59n# 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 concerning successful execution this selection procedure.

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

6.5.6.2 Calling Line Identification Presentation (CLIP)

The CLIP Supplementary Service is defined in 3GPP TS 22.081[12]

6.6.6.2.1 Presentation of Information

If CLIP has been provisioned for the subscriber and the UE is capable of displaying the line identification then for each MT call the UE should either:

display the calling line identity; or

display the reason why the line identity is not available as indicated by the Presentation Indicator.

6.5.6.3 Follow Me (FM)

The Follow Me Feature is defined in 3GPP TS 22.094 [20]. FM control procedures make use of USSD.

6.6 SIM/USIM interfaces

6.6.1 Entry of PIN and PIN2

After insertion of the IC card while the UE is switched on, or when the UE is switched on while the IC card is inserted, or when the UE 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.

6.6.2 Change of PIN or PIN2

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

    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.

6.6.3   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.

6.6.4   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.

6.6.5   Status information - return codes

The SIM/USIM gives status information, as responses to instructions. 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:

    description;

    Memory Problem (eg. Update impossible);

    Access conditions not fulfilled (eg. secret code verify rejected);

    Unsuccessful CHV verification, no attempt left (eg. Secret code locked);

    Technical problem with no diagnostic given. However, if this code is returned by the SIM/USIM in response to an ENVELOPE (SMS-PP DOWNLOAD) or ENVELOPE (CELL BROADCAST DOWNLOAD) or similar message, then no indication shall be given to the user, since in this case the code is not related to a user action.

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.

6.7   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/USIM. 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 3GPP TS 22.016 [4] (as a single string, in that order).

Annex A (normative):
UE access mealy graph
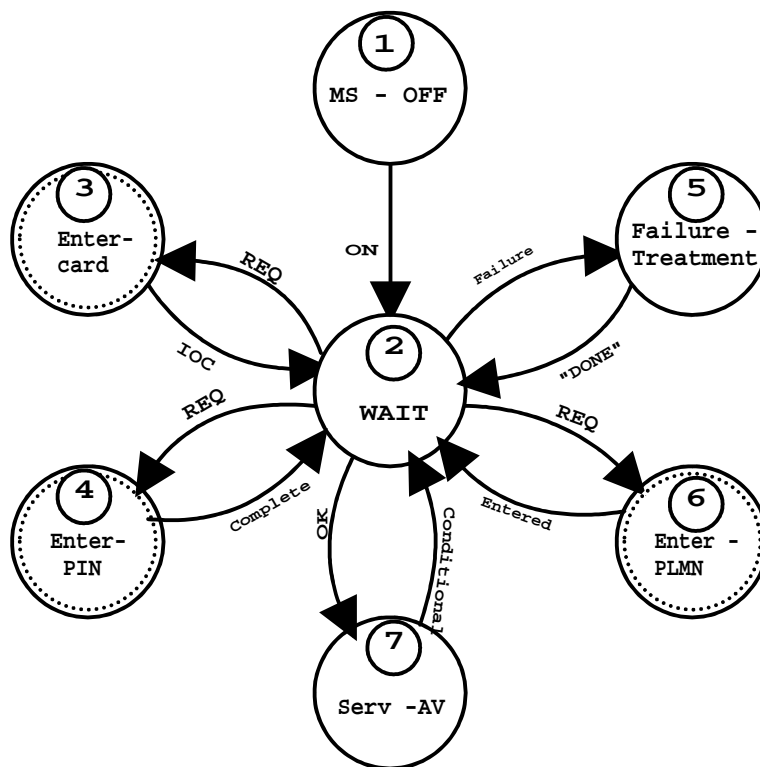

Figure A.1: Mealy-graph for the UE access procedure

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

Description of the states of the UE access procedure

1)	UE-OFF:	The UE is in OFF-condition. This means that the equipment is not active as an UE in a PLMN.
2)	WAIT:	Waiting for the completion of the UE access conditions, which are related to the type of UE and to the PLMN, where in the UE 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 UE is in a ready state. PLMN services are available to the user.

Description of the transitions between UE access states

ON:	The equipment becomes active as an UE in a PLMN.
REQ:	A request for user activity.
IOC:	Insertion of a subscriber card with SIM/USIM-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 UE access procedures.
CONDITIONAL:	One of the conditions the UE is waiting for in WAIT state has been lost. The UE goes back to the WAIT state.
"DONE":	The UE access failure condition has been corrected.
OK:	All the conditions the UE 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
22.067					
	eMLPP	75 and 75n		where n=0-4	
22.072					
	CD	66			
22.081					
	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 "

	Supplementary Service	Service Code	SIA	SIB	SIC
22.082					
	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
22.083					
	WAIT	43	BS	-	-
		see section 4.5.5			
	HOLD	see section 4.5.5			
22.084					
	MPTY	see section 4.5.5			
22.087					
	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
22.088				
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	
22.091				
ECT	96		see section 4.5.5	
22.093				
CCBS	37	n	See Section 4.5.5	
		where n=1-5		
22.094				
FM	214		See Section 6.5.6.3	
22.096				
CNAP	300	**-**	**-**	**-**
22.097				
MSP	59n	PW	where n=1-4	
22.135				
MC	88		Nbr_user	
			Where Nbr_user=1-Nbr_SB	

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.

Nbr_user = maximum number of simultaneous CS bearers as defined by the within the limits given by Nbr_SB.

Nbr_SB = maximum number of simultaneous CS bearers defined by Multicall subscription.

The value for N_{br}_SB shall in the range from 2 up to 7.

Details about Nbr_user and Nbr_SB specified in 3GPP TS22.135 Multicall. [21]

"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	All async services	21
8	All sync services	22
8	All data circuit sync	24
7	All data circuit async	25
13	All GPRS bearer services	99

NOTE: See 3GPP TS 22.004 [2] for definition of Basic Service groups.

NOTE: "All GPRS bearer services" are not included in "All tele and bearer services" and "All bearer services".

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 3GPP

Code as defined in 3GPP TS 29.002 [11]	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

Annex D (informative):
Change history

Change history											
TSG SA#	**SA Doc.**	**SA1 Doc**	**Spec**	**CR**	**Rev**	**Rel**	**Cat**	**Subject/Comment**	**Old**	**New**	**Work Item**
Jun 1999			02.30					Transferred to 3GPP SA1	7.1.0	3.0.0	
SP-05	SP-99479	S1-99614	22.030	001		R99	D	Editorial changes for alignment	3.0.0	3.1.0	
SP-05	SP-99447	S1-99744	22.030	002		R99	C	Data services streamlining	3.0.0	3.1.0	
SP-05	SP-99447	S1-99664	22.030	003		R99	C	Support for Anonymous Call Rejection	3.0.0	3.1.0	
SP-05	SP-99439	S1-99847	22.030	004		R99	F	Indication to user in case of an error during Data Download	3.0.0	3.1.0	
SP-06	SP-99519	S1-991029	22.030	006		R99	C	Mainly an editorial update for GSM/3GPP use.	3.1.0	3.2.0	
SP-07	SP-000056	S1-000166	22.030	007		R99	B	Introduction of Service Code 214 for "Follow Me"	3.2.0	3.3.0	
SP-07	SP-000056	S1-000172	22.030	008		R99	B	MMI(Man-Machine interface) of Multicall	3.2.0	3.3.0	
SP-09	SP-000376	S1-000501	22.030	009		R99	F	Codes for defined Supplementary Services	3.3.0	3.4.0	
SP-11	SP-010065	S1-010258	22.030			Rel-4		Transferred to 3GPP Release 4	3.4.0	4.0.0	
SP-15	SP-020045	S1-020457	22.030	010	-	Rel-4	F	Editorial CR to correct terms and references	4.0.0	4.1.0	CORRECT
SP-16	SP-020267	S1-021043	22.030			Rel-5		Updated from Rel-4 to Rel5	4.1.0	5.0.0	

History

Document history		
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