
Source: Gemplus
Title: Around Auto-answer
Document for: Discussion
Agenda Item: 6.2

Around Auto-answer :

1 - General scope around:

This feature already exists in TDMA networks which implies that GSM operators who have to compete with TDMA need this mechanism to offer the same level of service. Especially in the ability to provide prepaid in a foreign country.

This function already exists in most GSM mobiles when using a headset. The mobile can be set to auto answer an incoming call. The only thing we are asking is that this be extended to the SIM ToolKit application.

Furthermore we can notice that the use of this feature in a SAT context compared to WAP enables the operator to have a control on what may happen, especially the list of servers that would be stored in the SIM.

The Global Rate application that utilizes this feature can be used to offer a discounted roaming to their top end business users (it usually requires new phone and SIM card so this service will not be offered to all subscribers). Global Rate is currently being used by several carriers to answer the European Union's inquiry on Roaming Rates. The benefit of Global Rate is it allows a discounted roaming to the high end subscribers while still maintaining the existing roaming settlement rates for the 'casual roamer'. Global Rate does not disrupt the normal roaming settlement rates or processes.

Although the amount paid for a minute of mobile originated roaming may go down. The visited carrier total revenue may actually increase. This is due to the increased volume of calls and the dramatic increase in the average talk time driven by the Global Rate application.

2 – Security concerns:

Some operators have raised some concerns about the fact that this new STK feature could be used to listen to people conversations without them noticing it.

In fact this is not the case, because we can mandate the following procedure in the standard: first the Calling Line Identifier (CLI) has to be validated by the MS to authorize the Set Up Call.

second in the case the CLI is not known for example in a roaming case, the phone plays a loud tone to warn the end user that the procedure is on-going. We could add a display message that states that the call has been answered. This would enable the subscriber to

look at the screen to see that the phone has been auto answered. Although this is not usually the case when the user has auto-answer using a headset.

If operator is not still not confident we could try to add a timer constraint (held by the ME) which would not allow auto-answer without CLI recognition after 30 seconds or a minute which would definitely exclude the case of someone putting its ME in a bag and wouldn't hear the ringing. The Global Rate application does not require the support of Auto-Answer without CLI identification for an undefined period of time. Auto-Answer without CLI have to be supported only for "the next incoming call" and only under a time-out defined within the handset. Having the phone ring is not a good idea, as the customer (which initiates the application) usually has the handset at the ear when he is called back by the platform. The application uses the Playtone proactive command to warn the user of the incoming call (soft tone).

Source : Gemplus

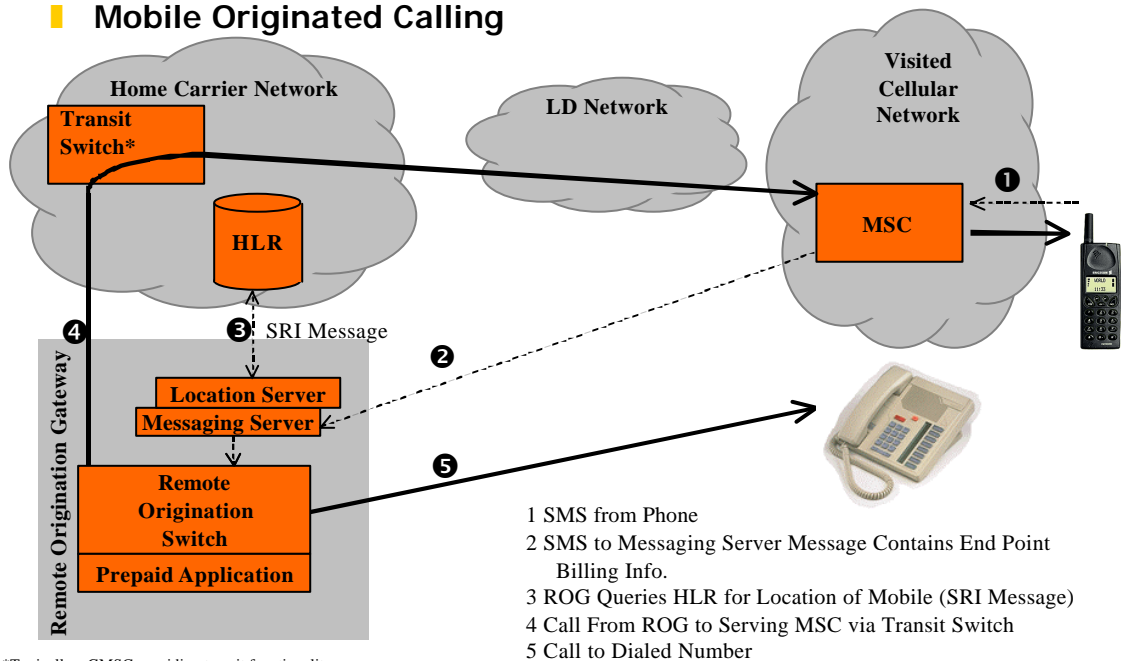
Proposition of Auto-Answer and Mute-ringing STK feature

We are proposing to SMG9 to add an “Auto-Answer and Mute-ringing” functionality to the SIM Toolkit GSM 11.14 specification. The aim of these change requests is to allow the implementation of a seamless “World-Wide Prepaid” service that is network based but automated using SIM Toolkit. This service does not require special network capabilities (see figure 1 hereunder) and offers all the advantages of a network-based prepaid solution without the complexities of more traditional solutions.

FIGURE 1 – WORLDWIDE PREPAID

Architecture - Worldwide Prepaid (WPP)

■ Mobile Originated Calling



*Typically a GMSC providing transit functionality

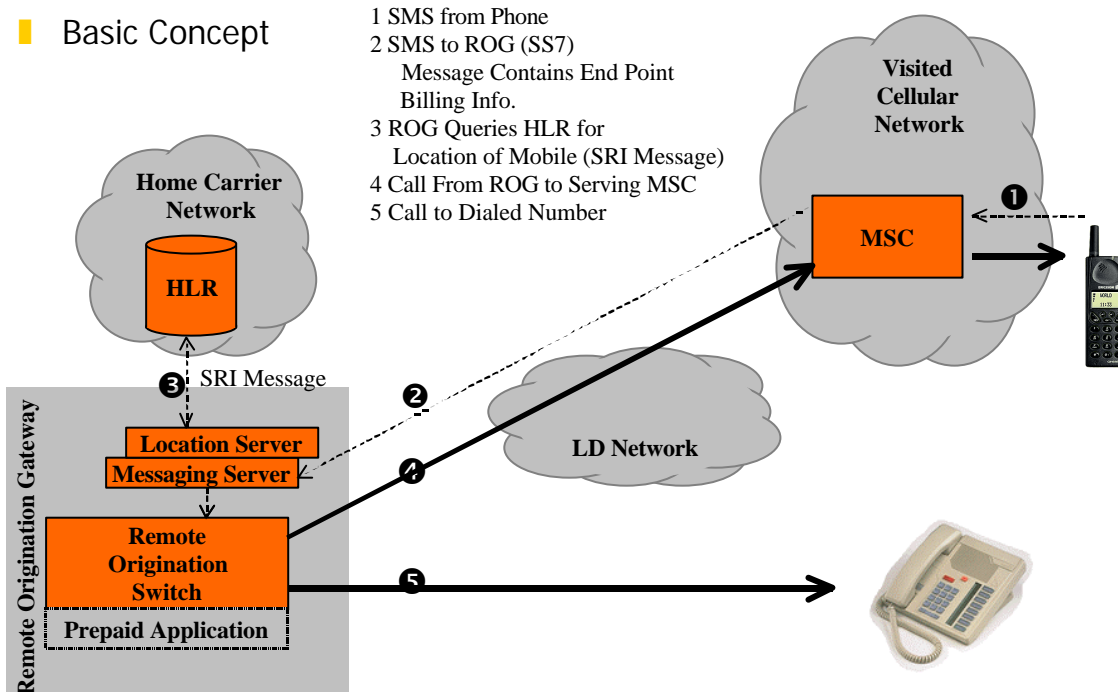
The functionality will also make possible the implementation of a “Home Carrier Control” service that will allow a home cellular carrier to control and route all traffic for its customers while they are roaming (see figure 2).

FIGURE 2 – HOME CARRIER CONTROL

Architecture - Home Carrier Control (HCC)

Basic Concept

- 1 SMS from Phone
- 2 SMS to ROG (SS7)
Message Contains End Point
Billing Info.
- 3 ROG Queries HLR for
Location of Mobile (SRI Message)
- 4 Call From ROG to Serving MSC
- 5 Call to Dialed Number



Without this functionality, users of the “World-wide Prepaid” and “Home Carrier Control” services will be required to answer an incoming call after they have dialed a phone number in order to complete a call.

Please find attached the corresponding CR on GSM 11.14 and GSM 11.11.

CHANGE REQUEST No : **Axxx** Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

Technical Specification GSM / UMTS: **11.14** Version: **8.0.1**

Submitted to SMG **#31** For approval **X** without presentation ("non-strategic")
list SMG plenary meeting no. here ↑ for information with presentation ("strategic")

PT SMG CR cover form. Filename: crf26_3.doc

Proposed change affects: SIM ME Network
(at least one should be marked with an X)

Work item: **TEI**

Source: **Gemplus** **Date:** **December 1999**

Subject: **Addition of an auto-answer and mute-ringing STK feature**

Category:	F Correction	<input type="checkbox"/>	Release:	Phase 2	<input type="checkbox"/>
	A Corresponds to a correction in an earlier release	<input type="checkbox"/>		Release 96	<input type="checkbox"/>
<small>(one category and one release only shall be marked with an X)</small>	B Addition of feature	<input checked="" type="checkbox"/>		Release 97	<input type="checkbox"/>
	C Functional modification of feature	<input type="checkbox"/>		Release 98	<input type="checkbox"/>
	D Editorial modification	<input type="checkbox"/>		Release 99	<input checked="" type="checkbox"/>
				UMTS	<input type="checkbox"/>

Reason for change: **The aim of this CR is to introduce an additional SAT feature that allows auto-answer with or without mute-ringing.**

Clauses affected: **3.2, 4.2, 5.2, 6.1, 6.4.25 (new), 6.6.25 (new), 11.9 (new), 12.6, 12.47 (new), 12.48 (new), 13.3, 13.4, 14 and Annex A**

Other specs affected:	Other releases of same spec	<input type="checkbox"/>	→ List of CRs:	<input type="text"/>
	Other core specifications	<input type="checkbox"/>	→ List of CRs:	<input type="text"/>
	MS test specifications / TBRs	<input type="checkbox"/>	→ List of CRs:	<input type="text"/>
	BSS test specifications	<input type="checkbox"/>	→ List of CRs:	<input type="text"/>
	O&M specifications	<input type="checkbox"/>	→ List of CRs:	<input type="text"/>

Other comments:



<----- double-click here for help and instructions on how to create a CR.

3.2 ABBREVIATIONS

For the purpose of the present document, the following abbreviations apply, in addition to those listed in GSM 01.04 [2]:

A3	Algorithm 3, authentication algorithm; used for authenticating the subscriber
A5	Algorithm 5, cipher algorithm; used for enciphering/deciphering data
A8	Algorithm 8, cipher key generator; used to generate K_c
A38	A single algorithm performing the functions of A3 and A8
ADN	Abbreviated Dialling Number
APDU	Application Protocol Data Unit
ATR	Answer To Reset
BCD	Binary Coded Decimal
BDN	Barred Dialling Number
BER	Basic Encoding Rules of ASN.1
C-APDU	Command Application Protocol Data Unit
CB	Cell Broadcast
CBMI	Cell Broadcast Message Identifier
CCP	Capability/Configuration Parameter
CLI	Calling Line Identity
DCS	Digital Cellular System
DTMF	Dual Tone Multiple Frequency
EF	Elementary File
ETSI	European Telecommunications Standards Institute
etu	elementary time unit
FDN	Fixed Dialling Number
GSM	Global System for Mobile communications
ID	Identifier
IEC	International Electrotechnical Commission
IMEI	International Mobile Equipment Identity
IMSI	International Mobile Subscriber Identity
ISO	International Organization for Standardization
K_c	Cryptographic key; used by the cipher A5
K_i	Subscriber authentication key; the cryptographic key used by the authentication algorithm, A3, and cipher key generator, A8
lgth	The (specific) length of a data unit
LND	Last Number Dialed
ME	Mobile Equipment
MMI	Man Machine Interface
MS	Mobile Station
NMR	Network Measurement Results (see also GSM 04.08 [8])
NPI	Numbering Plan Identifier
R-APDU	Response Application Protocol Data Unit
RAND	A RANDom challenge issued by the network
RFU	Reserved for Future Use
SAT	SIM Application Toolkit
SIM	Subscriber Identity Module
SMS	Short Message Service
SRES	Signed RESponse calculated by a SIM
SS	Supplementary Service
SSC	Supplementary Service Control string
SW1/SW2	Status Word 1 / Status Word 2
TE	Terminal Equipment (e.g. an attached personal computer)
TLV	Tag, length, value
TON	Type Of Number

TP Transfer layer Protocol
 TS Technical Specification
 UCS2 Universal two byte coded Character Set
 USSD Unstructured Supplementary Service Data

4.2 PROACTIVE SIM

Proactive SIM gives a mechanism whereby the SIM can initiate actions to be taken by the ME. These actions include:

- displaying text from the SIM to the ME;
- sending a short message;
- setting up a voice call to a number held by the SIM;
- setting up a data call to a number and bearer capabilities held by the SIM;
- sending a SS control or USSD string;
- playing tone in earpiece;
- initiating a dialogue with the user;
- SIM initialization request and notification of changes to EF(s);
- providing local information from the ME to the SIM;
- communicating with the additional card(s) (if class "a" is supported);
- providing information about the additional card reader(s) (if class "a" is supported);
- managing timers running physically in the ME;
- running an AT command received from the SIM, and returning the result to the SIM (if class "b" is supported);
- sending DTMF;
- ~~configuring the ME to automatically answer a call.~~

For each command involved in the dialog with the user, a help information may be available, either for each item of a list of items proposed to the user, or with each command requesting a response from the user. If a proactive command involved in the dialog with the user indicates the availability of the help feature, the support of this feature is optional for the ME.

5.2 STRUCTURE AND CODING OF TERMINAL PROFILE

Direction: ME to SIM

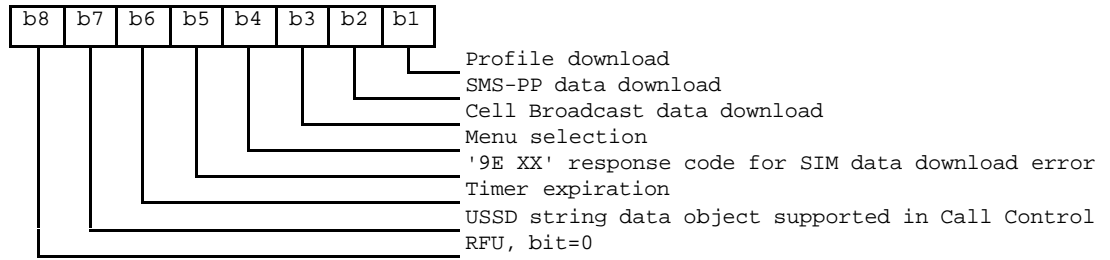
The command header is specified in GSM 11.11 [20].

Command parameters/data:

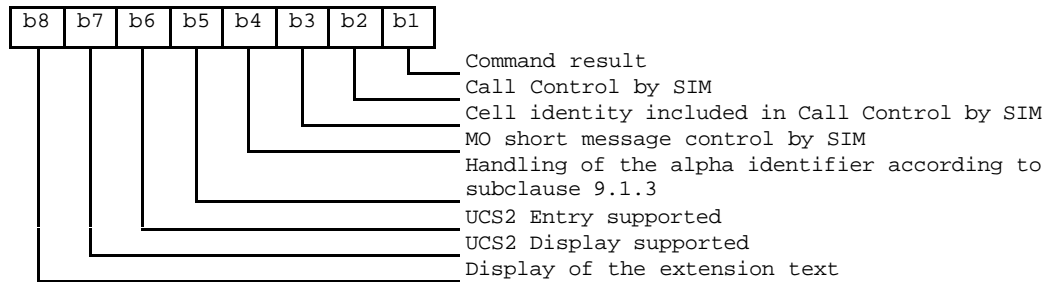
Description	Section	M/O	Length
Profile	-	M	lgth

- Profile:
 - Contents: The list of SIM Application Toolkit facilities that are supported by the ME.
 - Coding:
 - 1 bit is used to code each facility:
 - bit = 1: facility supported by ME
 - bit = 0: facility not supported by ME

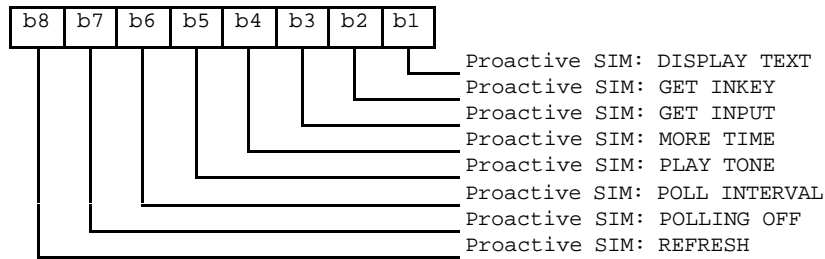
First byte (Download):



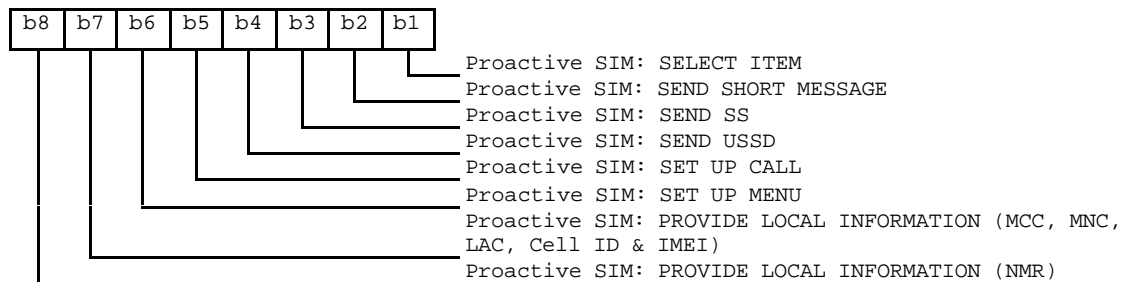
Second byte (Other):



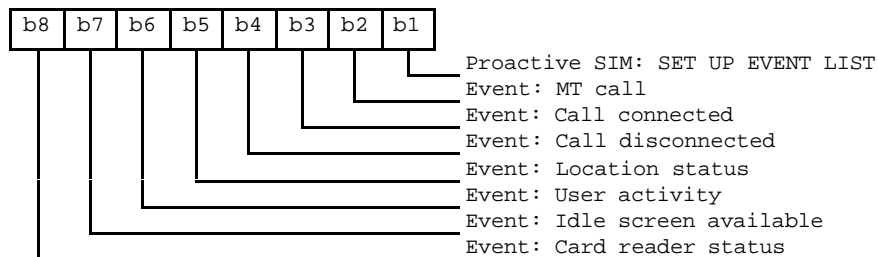
Third byte (Proactive SIM):



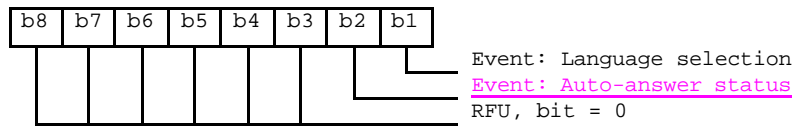
Fourth byte (Proactive SIM):



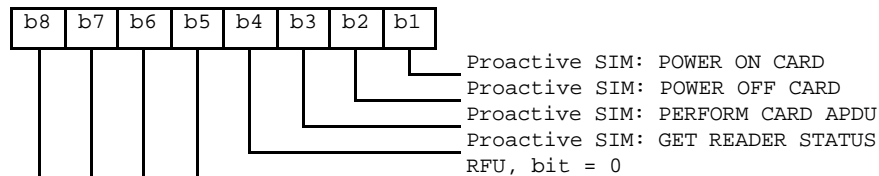
Fifth byte (Event driven information):



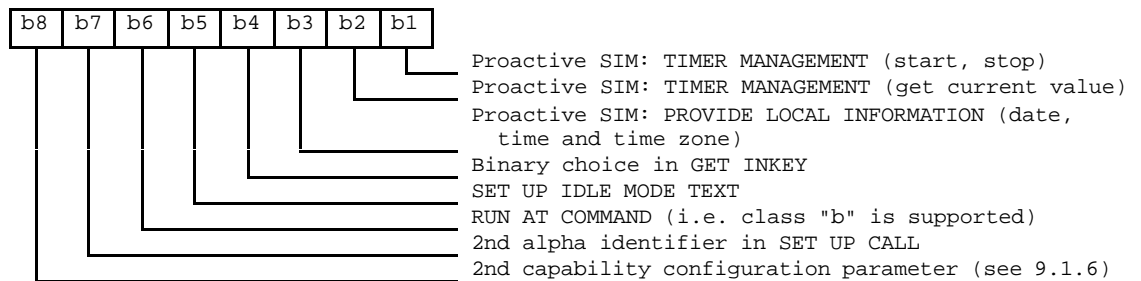
Sixth byte (Event driven information extensions):



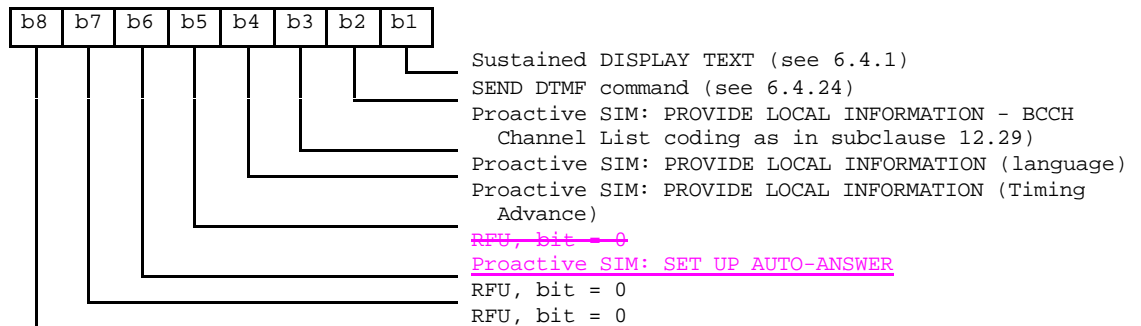
Seventh byte (Multiple card proactive commands) for class "a"



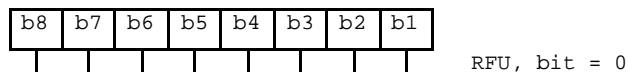
Eighth byte (Proactive SIM):



Ninth byte:



Subsequent bytes:



RFU bits, and all bits of subsequent bytes, are reserved to indicate future facilities. A SIM supporting only the features of SIM Application Toolkit defined here shall not check the value of RFU bits.

Response parameters/data: None.

6.1 INTRODUCTION

GSM 11.11 [20] defines that the ME communicates to the SIM using the T=0 protocol, which is specified in ISO/IEC 7816-3 [16]. The ME is always the "master" and initiates commands to the SIM, and therefore there is no mechanism for the SIM to initiate a communication with the ME. This limits the possibility of introducing new SIM features requiring the support of the ME, as the ME needs to know in advance what actions it should take.

The proactive SIM service provides a mechanism which stays within the protocol of T=0, but adds a new status response word SW1. This status response has the same meaning as the normal ending ('90 00'), and can be used with most of the commands that allow the normal ending, but it also allows the SIM to say to the ME "I have some information to send to you". The ME then uses the FETCH function to find out what this information is.

To avoid cross-phase compatibility problems, these functions shall only be used between a proactive SIM and an ME that supports the proactive SIM feature.

The SIM can issue a variety of commands through this mechanism, given in alphabetical order:

- **DISPLAY TEXT**, which displays text or an icon on screen. A high priority is available, to replace anything else on screen.
- **GET INKEY**, which sends text or an icon to the display and requests a single character response in return. It is intended to allow a dialogue between the SIM and the user, particularly for selecting an option from a menu.
- **GET INPUT**, which sends text or an icon to the display and requests a response in return. It is intended to allow a dialogue between the SIM and the user.
- **GET READER STATUS**, which gives information about the additional reader(s) and inserted card(s) (Card x state, e.g. powered on or not, Card x Presence), if class "a" is supported.
- **MORE TIME**, which does not request any action from the ME. The ME is required to respond with TERMINAL RESPONSE (OK) as normal - see below. The purpose of the MORE TIME command is to provide a mechanism for the SIM Application Toolkit task in the SIM to request more processing time.
- **PERFORM CARD APDU**, which requests the ME to send an APDU command to the additional card, if class "a" is supported. This command is compatible with any protocol between the ME and the additional card.
- **PLAY TONE**, which requests the ME to play a tone in its earpiece, ringer, or other appropriate loudspeaker.
- **POLL INTERVAL**, which negotiates how often the ME sends STATUS commands to the SIM during idle mode. Polling is disabled with POLLING OFF. Use of STATUS for the proactive SIM is described in GSM 11.11 [20].
- **POWER OFF CARD**, which closes the session with the additional card, if class "a" is supported.
- **POWER ON CARD**, which initiates a session with the additional card and returns all the ATR bytes, if class "a" is supported.
- **PROVIDE LOCAL INFORMATION** which requests the ME to pass local information to the SIM, for example the mobile country and network codes (MCC + MNC) of the network on which the user is registered.
- **REFRESH** which requests the ME to carry out a SIM initialization according to GSM 11.11 subclause 12.2.1, and/or advises the ME that the contents or structure of EFs on the SIM have been changed. The command also makes it possible to restart a card session by resetting the SIM.

- **RUN AT COMMAND**, which will convey an AT Command to the ME, and cause the response to the AT Command to be returned to the SIM.
- **SELECT ITEM**, where the SIM supplies a list of items, and the user is expected to choose one. The ME presents the list in an implementation-dependent way.
- **SEND DTMF**, which requests the ME to send DTMF tone(s) during an established call.
- **SEND SHORT MESSAGE**, which sends a short message or SMS-COMMAND to the network.
- **SEND SS**, which sends an SS request to the network.
- **SEND USSD**, which sends a USSD string to the network.
- **SET UP AUTO-ANSWER**, which allows the ME to answer automatically an incoming call.
- **SET UP CALL**, of which there are three types:
 - set up a call, but only if not currently busy on another call;
 - set up a call, putting all other calls (if any) on hold;
 - set up a call, disconnecting all other calls (if any);
- **SET UP EVENT LIST** where the SIM supplies a list of events which it wants the ME to provide details of when these events happen.
- **SET UP IDLE MODE TEXT**, which supplies a text string to be used by the ME as stand-by mode text.
- **SET UP MENU**, where the SIM supplies a list of items to be incorporated into the ME's menu structure.
- **TIMER MANAGEMENT**, which requests the ME to manage a timer in a way described in the command (start, deactivate and get the current value) and, in the case of starting a timer, for a duration indicated in the command.

The ME tells the SIM if the command was successful or not using the command result procedure defined in subclause 6.7. Responsibility for what happens after that (whether to repeat the command, try another one immediately, try again sometime later, or not to try again at all) lies with the SIM application. However, the SIM application needs to know why the command failed, so the ME provides the SIM with the result of the command.

Results are grouped into three main types:

- OK.
- Temporary problem. These results are further broken down into types of temporary problems, and specific causes. Generally, they indicate to the SIM that it may be worth trying again.
- Permanent problem. These results are again further broken down into types of permanent problems, and specific causes. Generally, they indicate to the SIM that it is not worth trying again during this GSM session.

If the SIM issues an instruction to the ME to initiate a Mobile Originated transaction (e.g. SEND SMS, SEND USSD or SEND DTMF), then unless explicitly stated elsewhere in the present document or in GSM 11.11 [14], the content supplied by the SIM for onward transmission by the ME shall not be altered by the ME.

6.4 PROACTIVE SIM COMMANDS AND PROCEDURES

6.4.25 SET UP AUTO-ANSWER

The SIM shall use this command to supply the ME with a list of Calling Line Identities (CLI) and the associated auto-answer parameters. This command instructs the ME whether to mute the ringing for all incoming calls from the specified CLIs and/or automatically answer the call as soon as possible.

Any subsequent SET UP AUTO-ANSWER command replaces the current list of CLIs and associated auto-answer parameters supplied in the previous SET UP AUTO-ANSWER command. The SET UP AUTO-ANSWER command can also be used to the auto-answer configuration to the original state: see sub-clause 6.6.25. The list of CLIs and associated auto-answer parameters provided by the SIM in the last SET UP AUTO-ANSWER command shall be removed if the ME is powered off or the SIM is removed or electrically reset.

The ME shall send the TERMINAL RESPONSE (Command performed successfully) as soon as possible after execution of the AUTO-ANSWER command.

When the ME has successfully accepted or removed the list CLIs, it shall send TERMINAL RESPONSE (OK) to the SIM.

When the ME is not able to successfully accept or remove the list of events, it shall send TERMINAL RESPONSE (Command beyond ME's capabilities).

Upon receiving this command, the ME shall mute the ringing for all the incoming calls from the specified CLIs and/or shall automatically answer the calls as soon as possible.

6.6 STRUCTURE OF PROACTIVE SIM COMMANDS

6.6.25 SET UP AUTO-ANSWER

<u>Description</u>	<u>Section</u>	<u>M/O</u>	<u>Min</u>	<u>Length</u>
<u>Proactive SIM command Tag</u>	<u>13.2</u>	<u>M</u>	<u>Y</u>	<u>1</u>
<u>Length (A+B+C1+...+Cn)</u>	<u>:</u>	<u>M</u>	<u>Y</u>	<u>1 or 2</u>
<u>Command details</u>	<u>12.6</u>	<u>M</u>	<u>Y</u>	<u>A</u>
<u>Device Identities</u>	<u>12.7</u>	<u>M</u>	<u>Y</u>	<u>B</u>
<u>Address for CLI 1</u>	<u>12.1</u>	<u>M/O</u>	<u>N</u>	<u>D</u>
<u>Called party subaddress for CLI 1</u>	<u>12.3</u>	<u>M/O</u>	<u>N</u>	<u>E</u>
<u>Auto-answer parameters for CLI 1</u>	<u>12.47</u>	<u>M</u>	<u>Y</u>	<u>C1</u>
<u>...</u>				
<u>Address for last CLI</u>	<u>12.1</u>	<u>M/O</u>	<u>N</u>	<u>D</u>
<u>Called party subaddress for last CLI</u>	<u>12.3</u>	<u>M/O</u>	<u>N</u>	<u>E</u>
<u>Auto-answer parameter for last CLI</u>	<u>12.47</u>	<u>O</u>	<u>Y</u>	<u>Cn</u>

If the CLI list is a null data object (i.e. length = '00' and no value part), this is an indication to the ME to remove the existing list of CLIs in the ME. If the address for a CLI is set to "FF ... FFh", this is an indication to the ME that all calls must be auto-answered, whatever the CLI.

11 EVENT DOWNLOAD

A set of events for the ME to monitor can be supplied by the SIM using the proactive command SET UP EVENT LIST. If the SIM has sent this command, and an event which is part of the list subsequently occurs, the ME informs the SIM using the procedure below, relevant for that event.

Processing within the ME resulting from this event shall proceed as normal, independent of sending the ENVELOPE command to the SIM.

Where events occur while the SIM-ME interface is already busy, the ME shall queue events and send event download messages to the SIM in the order in which they occurred.

11.9 AUTO-ANSWER STATUS EVENT

11.9.1 Procedure

If the auto-answer status event is part of the current event list (as set up by the last SET UP EVENT LIST command, see subclause 6.4.16), then when the ME detects one of the following changes:

- a MT call has been automatically answered, or
- the auto-answer time-out delay has expired without the ME receiving a call,

the ME shall inform the SIM that this has occurred, by using the ENVELOPE (EVENT DOWNLOAD – auto-answer status) command as defined below.

11.9.2 Structure of ENVELOPE (EVENT DOWNLOAD – auto-answer status)

Direction: ME to SIM

The command header is specified in GSM 11.11 [20].

Command parameters/data:

<u>Description</u>	<u>Section</u>	<u>M/O</u>	<u>Min</u>	<u>Length</u>
<u>Event download tag</u>	<u>13.1</u>	<u>M</u>	<u>Y</u>	<u>1</u>
<u>Length (A+B+C)</u>	<u>:</u>	<u>M</u>	<u>Y</u>	<u>1 or 2</u>
<u>Event list</u>	<u>12.25</u>	<u>M</u>	<u>Y</u>	<u>A</u>
<u>Device identities</u>	<u>12.7</u>	<u>M</u>	<u>Y</u>	<u>B</u>
<u>Auto-answer status</u>	<u>12.48</u>	<u>M</u>	<u>Y</u>	<u>C</u>

- Event list: the event list object shall contain only one event (value part of length 1 byte), and ME shall set the event to:
 - Auto-answer status
- Device identities: the ME shall set the device identities to:
 - Source: ME
 - Destination: SIM
- Auto-answer status: the auto-answer status data object shall contain status byte for the current auto-answer configuration

Response parameters/data: None for this type of ENVELOPE command.

12.6 COMMAND DETAILS

Byte(s)	Description	Length
1	Command details tag	1
2	Length = '03'	1
3	Command number	1
4	Type of command	1
5	Command Qualifier	1

- Command number

For contents and coding, see subclause 6.5.1.

- Type of command:

Contents: The Type of Command specifies the required interpretation of the data objects which follow, and the required ME procedure.

Coding:

See section 13.4

The ME shall respond to reserved values (i.e. values not listed) with the result "Command type not understood".

- Command Qualifier:

Contents: Qualifiers specific to the command.

Coding:

- REFRESH;

'00' = SIM Initialization and Full File Change Notification;

'01' = File Change Notification;

'02' = SIM Initialization and File Change Notification;

'03' = SIM Initialization;

'04' = SIM Reset;

'05' to 'FF' = reserved values.

- MORE TIME;

This byte is RFU.

- POLL INTERVAL;

This byte is RFU.

- POLLING OFF;

This byte is RFU.

- SET UP CALL;

'00' = set up call, but only if not currently busy on another call;

'01' = set up call, but only if not currently busy on another call, with redial;

'02' = set up call, putting all other calls (if any) on hold;

'03' = set up call, putting all other calls (if any) on hold, with redial;

'04' = set up call, disconnecting all other calls (if any);

'05' = set up call, disconnecting all other calls (if any), with redial;

'06' to 'FF' = reserved values.

- SEND DTMF;

This byte is RFU.

- SET UP EVENT LIST;

This byte is RFU.

- SEND SS;
This byte is RFU.
- SEND USSD;
This byte is RFU.
- SEND SHORT MESSAGE;
bit 1: 0 = packing not required
1 = SMS packing by the ME required
bits 2-8: = 0 RFU.
- PLAY TONE;
This byte is RFU.
- DISPLAY TEXT,
bit 1: 0 = normal priority
1 = high priority
bits 2-7: = RFU
bit 8: 0 = clear message after a delay
1 = wait for user to clear message
- GET INKEY,
bit 1: 0 = digits (0-9, *, # and +) only
1 = alphabet set;
bit 2: 0 = SMS default alphabet
1 = UCS2 alphabet
bit 3: 0 = character sets defined by bit 1 and bit 2 are enabled
1 = character sets defined by bit 1 and bit 2 are disabled and the "Yes/No" response is requested
bits 4-7: = RFU
bit 8: 0 = no help information available
1 = help information available
- GET INPUT,
bit 1: 0 = digits (0-9, *, #, and +) only
1 = alphabet set
bit 2: 0 = SMS default alphabet
1 = UCS2 alphabet
bit 3: 0 = ME may echo user input on the display
1 = user input shall not be revealed in any way (see note)
bit 4: 0 = user input to be in unpacked format
1 = user input to be in SMS packed format
bits 5 to 7: = RFU
bit 8: 0 = no help information available
1 = help information available

NOTE: Where user input is not to be revealed, the ME may provide an indication of key entries, such as by displaying "*"s. See sub-clause 6.4.3 for more information on the character set available in this mode.

- SELECT ITEM.
bit 1: 0 = presentation type is not specified
1 = presentation type is specified in bit 2
bit 2: 0 = presentation as a choice of data values if bit 1 = '1'
1 = presentation as a choice of navigation options if bit 1 is '1'
bits 3 to 7: = RFU
bit 8: 0 = no help information available
1 = help information available

- SET UP MENU.
 - bits 1 to 7: = RFU
 - bit 8: 0 = no help information available
1 = help information available
- PROVIDE LOCAL INFORMATION
 - '00' = Location Information (MCC, MNC, LAC and Cell Identity)
 - '01' = IMEI of the ME
 - '02' = Network Measurement results
 - '03' = Date, time and time zone
 - '04' to 'FF' = Reserved
- SET UP IDLE MODE TEXT
 - This byte is RFU.
- PERFORM CARD APDU (if class "a" is supported)
 - This byte is RFU.
- POWER OFF CARD (if class "a" is supported)
 - This byte is RFU.
- POWER ON CARD (if class "a" is supported)
 - This byte is RFU.
- GET READER STATUS (if class "a" is supported)
 - This byte is RFU.
- TIMER MANAGEMENT
 - bits 1 to 2 00 = start
01 = deactivate
10 = get current value
11 = RFU
 - bits 3 to 8 RFU
- RUN AT COMMAND (if class "b" is supported)
 - This byte is RFU.
- SET UP AUTO-ANSWER
 - bit 1: 0 = Auto-answer only the next call, if received before a certain amount of time.
This amount of time is left at the ME manufacturer's decision.
 - 1 = Auto-answer all calls with the specified CLIs, until the CLI list is removed
 - bits 2 to 8: RFU

The ME shall respond to reserved values with the result "Command type not understood".

12.25 EVENT LIST

Byte(s)	Description	Length
1	Event list tag	1
2 to Y+1	Length (X) of bytes following	Y
Y+2 to X+Y+1	Event list	X

- Event list

Contents: A list of events, of variable length. Each byte in the list defines an event. Each event type shall not appear more than once within the list.

Coding: Each byte in the event list shall be coded with one of the values below:

- '00' = MT call
- '01' = Call connected
- '02' = Call disconnected
- '03' = Location status
- '04' = User activity
- '05' = Idle screen available
- '06' = Card reader status (if class "a" is supported)
- '07' = Language selection
- '08' = Auto-answer status

12.47 AUTO-ANSWER PARAMETERS

<u>Byte(s)</u>	<u>Description</u>	<u>Length</u>
<u>1</u>	<u>Auto-answer parameters tag</u>	<u>1</u>
<u>2</u>	<u>Length (X) of bytes following = 1</u>	<u>1</u>
<u>3</u>	<u>Auto-answer parameters</u>	<u>1</u>

- Auto-answer parameters:

Contents: The auto-answer parameters indicates to the ME whether to mute the ringing for all incoming calls from the specified CLIs and/or automatically answer the call as soon as possible.

Coding:

bit 1: 0 = user's confirmation is requested to answer the call

 1 = Auto-answer the call

bit 2: 0 = ring the call

 1 = Mute ringing

bits 3-8 0 = RFU.

12.48 AUTO-ANSWER STATUS

Byte(s)	Description	Length
<u>1</u>	<u>Auto-answer status tag</u>	<u>1</u>
<u>2</u>	<u>Length (X) of bytes following = 1</u>	<u>1</u>
<u>3</u>	<u>Auto-answer status byte</u>	<u>1</u>

- Auto-answer status byte:

Contents: The auto-answer status byte indicates the current configuration of the ME auto-answer.

Coding:

'00' = Mobile Terminated call auto-answered

'01' = Auto-answer time-out delay expired

13.3 SIMPLE-TLV TAGS IN BOTH DIRECTIONS

8	7	6	5	4	3	2	1
CR							
Tag value							

CR: Comprehension required for this object.

Unless otherwise stated, for SIMPLE-TLV data objects it is the responsibility of the SIM application and the ME to decide the value of the CR flag for each data object in a given command.

Handling of the CR flag at the receiving entity is described in subclause 6.10.

CR	Value
Comprehension required	1
Comprehension not required	0

Description	Length of tag	Tag value, bits 1-7 (Range: '01' - '7E')	Tag (CR and Tag value)
Command details tag	1	'01'	'01' or '81'
Device identity tag	1	'02'	'02' or '82'
Result tag	1	'03'	'03' or '83'
Duration tag	1	'04'	'04' or '84'
Alpha identifier tag	1	'05'	'05' or '85'
Address tag	1	'06'	'06' or '86'
Capability configuration parameters tag	1	'07'	'07' or '87'
Called party subaddress tag	1	'08'	'08' or '88'
SS string tag	1	'09'	'09' or '89'
USSD string tag	1	'0A'	'0A' or '8A'
SMS TPDU tag	1	'0B'	'0B' or '8B'
Cell Broadcast page tag	1	'0C'	'0C' or '8C'
Text string tag	1	'0D'	'0D' or '8D'
Tone tag	1	'0E'	'0E' or '8E'
Item tag	1	'0F'	'0F' or '8F'
Item identifier tag	1	'10'	'10' or '90'
Response length tag	1	'11'	'11' or '91'
File List tag	1	'12'	'12' or '92'
Location Information tag	1	'13'	'13' or '93'
IMEI tag	1	'14'	'14' or '94'
Help request tag	1	'15'	'15' or '95'
Network Measurement Results tag	1	'16'	'16' or '96'
Default Text	1	'17'	'17' or '97'
Items Next Action Indicator tag	1	'18'	'18' only
Event list tag	1	'19'	'19' or '99'
Cause tag	1	'1A'	'1A' or '9A'
Location status tag	1	'1B'	'1B' or '9B'
Transaction identifier tag	1	'1C'	'1C' or '9C'
BCCH channel list tag	1	'1D'	'1D' or '9D'
Icon identifier	1	'1E'	'1E' or '9E'
Item Icon identifier list	1	'1F'	'1F' or '9F'
Card reader status tag	class "a" only	'20'	'20' or 'A0'
Card ATR tag	class "a" only	'21'	'21' or 'A1'
C-APDU tag	class "a" only	'22'	'22' or 'A2'
R-APDU tag	class "a" only	'23'	'23' or 'A3'
Timer identifier tag	1	'24'	'24' or 'A4'
Timer value tag	1	'25'	'25' or 'A5'
Date-Time and Time zone tag	1	'26'	'26' or 'A6'
Call control requested action tag	1	'27'	'27' or 'A7'
AT Command tag	class "b" only	'28'	'28' or 'A8'
AT Response tag	class "b" only	'29'	'29' or 'A9'
BC Repeat Indicator tag	1	'2A'	'2A' or 'AA'
Immediate response tag	1	'2B'	'2B' or 'AB'
DTMF string tag	1	'2C'	'2C' or 'AC'
Language tag	1	'2D'	'2D' or 'AD'
Timing Advance tag	1	'2E'	'2E' or 'AE'
Auto-answer parameters	1	'2F'	'2F' or 'AF'
Auto-answer status	1	'30'	'30' or 'B0'

13.4 TYPE OF COMMAND AND NEXT ACTION INDICATOR

The table below shows the values which shall be used for Type of Command coding (see subclause 12.6) and Next Action Indicator coding (see subclause 12.24).

Value	Name	used for Type of Command coding	used for Next Action Indicator coding
'00'		-	-
'01'	REFRESH	X	
'02'	MORE TIME	X	
'03'	POLL INTERVAL	X	
'04'	POLLING OFF	X	
'05'	SET UP EVENT LIST	X	
'10'	SET UP CALL	X	X
'11'	SEND SS	X	X
'12'	SEND USSD	X	X
'13'	SEND SHORT MESSAGE	X	X
'14'	SEND DTMF	X	
'20'	PLAY TONE	X	X
'21'	DISPLAY TEXT	X	X
'22'	GET INKEY	X	X
'23'	GET INPUT	X	X
'24'	SELECT ITEM	X	X
'25'	SET UP MENU	X	X
'26'	PROVIDE LOCAL INFORMATION	X	
'27'	TIMER MANAGEMENT	X	
'28'	SET UP IDLE MODEL TEXT	X	X
'30'	PERFORM CARD APDU class "a" only	X	X
'31'	POWER ON CARD class "a" only	X	X
'32'	POWER OFF CARD class "a" only	X	X
'33'	GET READER STATUS class "a" only	X	X
'34'	RUN AT COMMAND class "b" only	X	
'35'	SET UP AUTO-ANSWER	X	
'81'	End of the proactive session	not applicable	X

14 ALLOWED TYPE OF COMMAND AND DEVICE IDENTITY COMBINATIONS

Only certain types of commands can be issued with certain device identities. These are defined below:

Command description	Source	Destination
CALL CONTROL	ME	SIM
CELL BROADCAST DOWNLOAD	Network	SIM
COMMAND RESULT	ME	SIM
DISPLAY TEXT	SIM	Display
EVENT DOWNLOAD		
- MT call	Network	SIM
- Call connected at near end (MT call)	ME	SIM
- Call connected at far end (MO call)	Network	SIM
- Call disconnected at near end	ME	SIM
- Call disconnected at far end	Network	SIM
- Location status	ME	SIM
- User activity	ME	SIM
- Idle screen available	Display	SIM
- Card reader status class "a" only	ME	SIM
- Auto-answer status	ME	SIM
GET INKEY	SIM	ME
GET INPUT	SIM	ME
GET READER STATUS class "a" only	SIM	ME
MENU SELECTION	Keypad	SIM
MO SHORT MESSAGE CONTROL	ME	SIM
MORE TIME	SIM	ME
PERFORM CARD APDU class "a" only	SIM	Card reader x
PLAY TONE	SIM	Earpiece (see note)
POLLING OFF	SIM	ME
POLL INTERVAL	SIM	ME
POWER ON CARD class "a" only	SIM	Card reader x
POWER OFF CARD class "a" only	SIM	Card reader x
PROFILE DOWNLOAD	ME	SIM
PROVIDE LOCAL INFORMATION	SIM	ME
REFRESH	SIM	ME
RUN AT COMMAND class "b" only	SIM	ME
SELECT ITEM	SIM	ME
SEND DTMF	SIM	Network
SEND SHORT MESSAGE	SIM	Network
SEND SS	SIM	Network
SEND USSD	SIM	Network
SET UP CALL	SIM	Network
SET UP EVENT LIST	SIM	ME
SET UP IDLE MODE TEXT	SIM	ME
SET UP MENU	SIM	ME
SMS-PP DOWNLOAD	Network	SIM
TIMER MANAGEMENT	SIM	ME
TIMER EXPIRATION	ME	SIM
SET UP AUTO-ANSWER	SIM	ME

NOTE: The ME may route the tone to other loudspeakers (external ringer, car kit) if more appropriate.

Annex A (normative): Support of SIM Application Toolkit by Mobile Equipment

Support of SIM Application Toolkit is optional for Mobile Equipment. However, any ME claiming to support SIM Application Toolkit need not support all toolkit functions from all numerical classes, but, support of all functions within a class is mandatory. It should be noted that the classes less than class 3 were used in GSM 11.14 releases prior to release 98.

Letter classes may supplement any appropriate numerical class.

Initially, all new commands, that are not allocated to the latest numerical class, will become a letter class. These will be allocated the identifier Lc, and will be differentiated by their Command Descriptions. They will be entered into the latest numerical class column.

When a new numerical class is finalised, all of the Lc Commands will be reviewed and either included in a numerical class or allocated a specific lower case letter. At this time, letter classes may be combined to form capital letter classes, support of all functions within a capital letter class is mandatory.

The table below indicates whether the command belongs to class 3, to one of the the optional letter classes, or to class 4. Class 4 is still under discussion within ETSI SMG9 and new functionality is likely to be added.

Command description	Class 3	Class 4	Letter classes
CALL CONTROL	X		
CELL BROADCAST DOWNLOAD	X		
DISPLAY TEXT	X		
EVENT DOWNLOAD (except language selection)	X		
EVENT DOWNLOAD		X	
GET INKEY	X		
GET INPUT	X		
GET READER STATUS			a
MENU SELECTION	X		
MO SHORT MESSAGE CONTROL	X		
MORE TIME	X		
PERFORM CARD APDU			a
PLAY TONE	X		
POLLING OFF	X		
POLL INTERVAL	X		
POWER ON CARD			a
POWER OFF CARD			a
PROVIDE LOCAL INFORMATION (except language and timing advance features)	X		
PROVIDE LOCAL INFORMATION		X	
REFRESH	X		
RUN AT COMMAND			b
SELECT ITEM	X		
SEND DTMF	X		
SEND SHORT MESSAGE	X		
SEND SS	X		
SEND USSD	X		
SET UP AUTO-ANSWER	X		
SET UP CALL	X		
SET UP EVENT LIST	X		
SET UP IDLE MODE TEXT	X		
SET UP MENU	X		
SMS-PP DOWNLOAD	X		
TIMER MANAGEMENT	X		
TIMER EXPIRATION	X		