3GPP TSG-T (Terminals) Meeting #8
Düsseldorf, Germany, 21 - 23 June, 2000

Tdoc TP-000096

Source: T3

Title: Change Requests to TS 31.111 "USIM application toolkit"

Agenda item: 6.3.3

Document for: Approval

This document contains several change requests to TS 31.111 v3.0.0 agreed by T3.

T3 Doc	Spec	CR	Rv	Rel	Subject
T3-000257	31.111	001		R99	Release 99 alignement of 31.111 with GSM 11.14
T3-000321	31.111	003		R99	Correction of SAT commands for using GPRS in bearer independent protocol feature
T3-000322	31.111	004		R99	Clarification of ME/SIM interface for bearer independent protocol feature

3GPP TSG-T3 (USIM) Meeting #14
Visby, Sweden, 24-26 05 2000

Document T3-000257
e.g. for 3GPP use the format TP-99xxx
or for SMG, use the format P-99-xxx

CHANGE REQUEST

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

31.111	CR	001	Current Version:	3.0.0

GSM (AA.BB) or 3G (AA.BBB) specification number ↑ *↑ CR number as allocated by MCC support team*

For submission to:	TSG-T #8	for approval	X	Strategic		(for SMG use only)
list expected approval meeting # here ↑		for information		non-strategic	X	

Form: CR cover sheet, version 2 for 3GPP and SMG *The latest version of this form is available from: ftp://ftp.3gpp.org/Information/CR-Form-v2.doc*

Proposed change affects: *(at least one should be marked with an X)*	(U)SIM	X	ME		UTRAN / Radio		Core Network	

Source: 3GPP T3 **Date:** 2000.05.24

Subject: Release 99 alignement of 31.111 with GSM 11.14

Work item: USAT

Category: *(only one category shall be marked with an X)*

F	Correction	X	**Release:**	Phase 2	
A	Corresponds to a correction in an earlier release			Release 96	
B	Addition of feature			Release 97	
C	Functional modification of feature			Release 98	
D	Editorial modification			Release 99	X
				Release 00	

Reason for change: The purpose of this CR is to align the release 99 of TS 31.111 with GSM 11.14 by removing the facility to request with Provide Local Information proactive command the display parameters, soft key, and channel number.

Clauses affected: §5.2, §6.4.15, §6.8, §6.8.7, §8.6, §8.59, §8.60, §9.3, Annex A

Other specs affected:

Other 3G core specifications		→ List of CRs:	
Other GSM core specifications		→ List of CRs:	
MS test specifications		→ List of CRs:	
BSS test specifications		→ List of CRs:	
O&M specifications		→ List of CRs:	

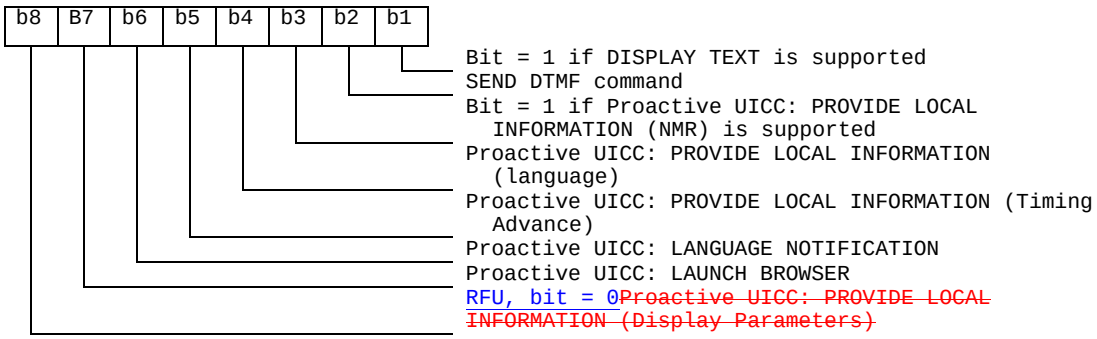
Other comments:


help.doc

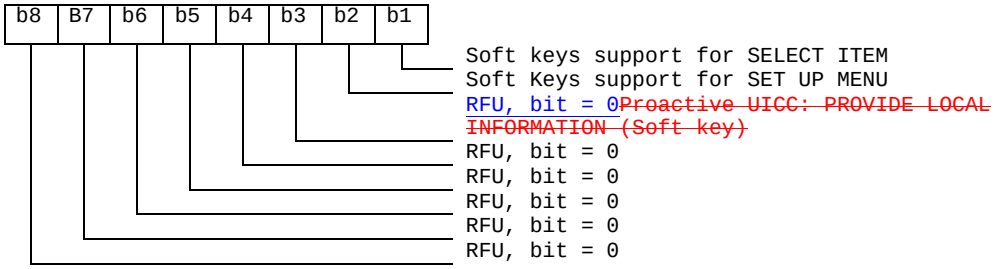
5.2 Structure and coding of TERMINAL PROFILE

[…]

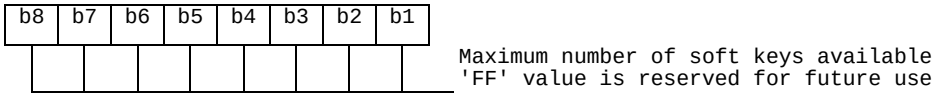
Ninth byte:



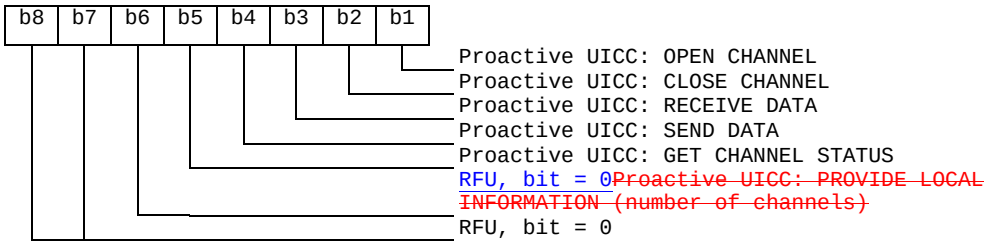
Tenth byte (Soft keys support) for class "d":



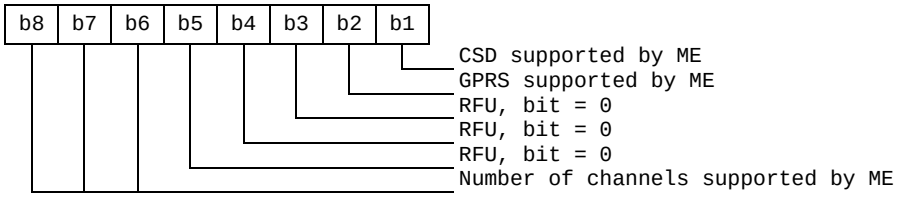
Eleventh byte: (Soft keys information)



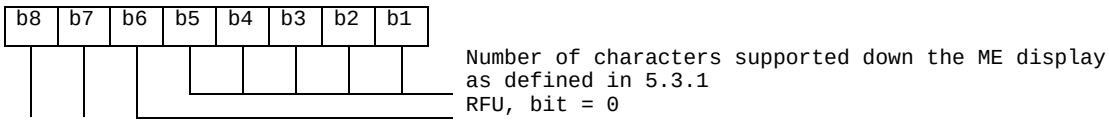
Twelfth byte: (Bearer independent protocol proactive commands) for class "e":



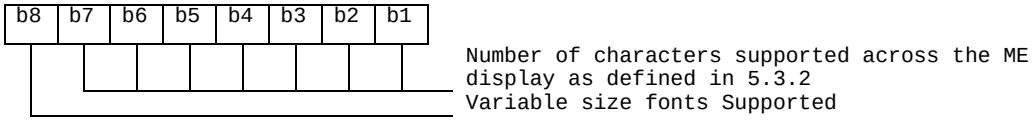
Thirteenth byte (Bearer Independent protocol supported bearers (class "e")):



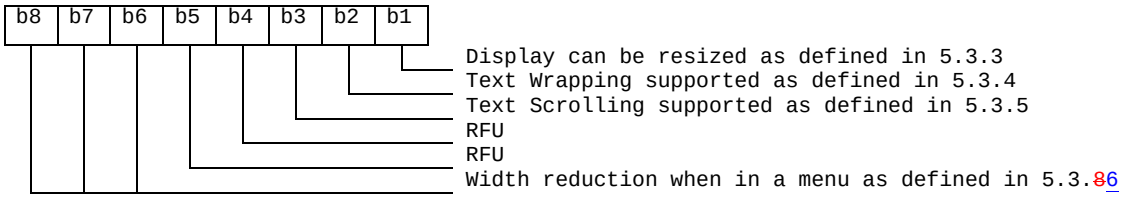
Fourteenth byte: (Screen height)



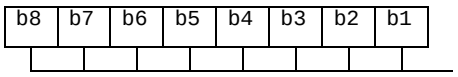
Fifteenth byte: (Screen width)



Sixteenth byte: (Screen effects)



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.

[…]

6.4.15 PROVIDE LOCAL INFORMATION

Editor's note: NMR, BCCH channel list and Timing Advance needs to be redefined for UTRAN.

This command requests the ME to send current local information to the UICC. At present, this information is restricted to:

- location information: the mobile country code (MCC), mobile network code (MNC), location area code (LAC) and cell ID of the current serving cell;
- the IMEI of the ME;
- (the Network Measurement Results and the BCCH channel list, suitable only for GSM access network);
- the current date, time and time zone;
- the current ME language setting;
- (the Timing Advance, suitable only for GSM access network)~~;~~

~~— the number of possible open channels available for bearer independent protocol (see note 1);~~

~~— the number of soft keys available on the ME (see note 1);~~

~~— the display parameters currently supported by the ME (see note 1).~~

~~NOTE 1: Health warning! The means by which the UICC can determine this information is different in GSM 11.14~~.

The ME shall return the requested local information within a TERMINAL RESPONSE. Where location information or Network Measurement Results has been requested and no service is currently available, then the ME shall return TERMINAL RESPONSE (ME currently unable to process command - no service). Where location information or Network Measurement Results has been requested and the ME is on limited service (e.g. emergency calls only), the ME shall return the data requested in the TERMINAL RESPONSE with the general result (Limited Service).

If the NMR are requested and a call is in progress, the value of all the returned parameters provided by the ME in the response to the command will be valid. The NMR returned when a call is in progress from MEs supporting multiband operation, shall be according to the value of the multiband reporting parameter as defined in 3G 24.008 [9]. If a call is not in progress (i.e. ME is in idle mode) some of the returned parameters (e.g. RXQUAL) may be invalid. In idle mode, MEs supporting multiband operation shall ignore the value of the multiband reporting parameter and the NMR returned shall be as defined in 3G 24.008 [9] when the multiband reporting parameter equals zero.

NOTE 2: When in idle mode, the only information element on which it is possible to rely on is the RXLEV-FULL-SERVING-CELL, which contains the value of the received signal strength on the BCCH of the current serving cell.

NOTE 3: Network Measurement Results are defined in 3G 24.008 [9] as Measurement Results.

The ME shall return the current date and time as set by the user. If available, the ME shall also return the time zone known from the network with the NITZ feature (see 3G 22.042 [3]). If the time zone information is not available, the ME shall return 'FF' for this element.

If language setting is requested, the ME shall return the currently used language.

If the Timing Advance is requested, the ME shall return the timing advance value that was received from the BTS during the last active dedicated connection (e.g. for call or SMS). Timing advance is defined in 3G 24.008 [9]. An ME supporting the Timing Advance feature shall be able to store the last value of timing advance. In addition to the timing advance value, the ME shall return its current status (i.e. ME is in idle mode or not) in order for the application to be aware of potential misinterpretation of the timing advance value. Caution should be taken if using the Timing Advance value for distance measurement as reflections from the external environment (buildings etc.) may affect the accuracy.

[…]

6.8 Structure of TERMINAL RESPONSE

Direction: ME to UICC.

The command header is specified in TS 31.101 [13]. Length (A+B+ … +V) is indicated by P3 of the header.

Command parameters/data.

Description	Subclause	M/O/C	Min	Length
Command details	8.6	M	Y	A
Device identities	8.7	M	N	B
Result	8.12	M	Y	C
Duration (only required in response to a POLL INTERVAL proactive command)	8.8	C	N	D
Text string (only required in response to a GET INKEY or GET INPUT or SEND USSD proactive command)	8.15	C	N	E
Item identifier (only required in response to SELECT ITEM proactive command)	8.10	C	N	F
Local information (only required in response to PROVIDE LOCAL INFORMATION proactive command)	8.19, 8.20, 8.22, 8.29, 8.39, 8.45, 8.46~~, 8.59, 8.60~~	C	N	G
Call control requested action (only required if call control by USIM has modified a proactive command SET UP CALL, SEND SS or SEND USSD in another type of request).	8.30	C	N	H
Result data object 2 (only required if call control by USIM has modified a proactive command SET UP CALL, SEND SS or SEND USSD in another type of request).	8.12	C	N	I
Card reader status (only required in response to GET READER STATUS command). According to the requested information, one Card reader status object or one Card reader identifier object is required for each card interface reported.	8.32, 8.58	C	N	$J_0 + … + J_n$
Card ATR (only required in response to POWER ON CARD).	8.33	C	N	K
R-APDU (only required in response to PERFORM CARD APDU).	8.36	C	N	L
Timer identifier (only required in response to a TIMER MANAGEMENT proactive command)	8.37	C	N	M
Timer value (only required in response to a TIMER MANAGEMENT proactive command)	8.38	C	N	N
AT Response (only required in response to RUN AT COMMAND proactive command)	8.41	C	N	P
Text string2 (only required if call control by USIM has modified the proactive command SET UP CALL or SEND SS into a USSD request)	8.15	C	N	Q
Channel data (only required in response to RECEIVE DATA)	8.54	C	N	R
Channel status (only required in response to GET CHANNEL STATUS or OPEN CHANNEL proactive command)	8.57	C	N	$S_0 + … + S_n$
Channel data length (only required in response to RECEIVE DATA or SEND DATA proactive command)	8.55	C	N	T

Description	Subclause	M/O/C	Min	Length
Bearer description (only required in response to OPEN CHANNEL proactive command)	8.53	C	N	U
Buffer size (only required in response to OPEN CHANNEL proactive command)	8.56	C	N	V

Under no circumstances shall the UICC wait indefinitely for a TERMINAL RESPONSE.

For all the Conditional (C) SIMPLE-TLV objects, the ME should not include them in the response to non-applicable situations. However, if one is present, the UICC shall ignore it.

For all SIMPLE-TLV objects with Min=N, the ME should set the CR flag to comprehension not required. Any future additional SIMPLE-TLV objects will be included as Min = N and comprehension not required. This will ensure that any proactive command will end in a predictable way.

Response parameters/data: None.

[…]

6.8.7 Local information

When the ME issues a successful TERMINAL RESPONSE for a PROVIDE LOCAL INFORMATION command, it shall supply the requested local information.

- Where the UICC has requested location information, TERMINAL RESPONSE shall contain the location information data object.
- Where the UICC has requested the IMEI, TERMINAL RESPONSE shall contain the IMEI data object.
- Where the UICC has requested the Network Measurement Results the TERMINAL RESPONSE shall contain the NMR data object and the BCCH channel list data object.
- Where the UICC has requested the date, time and time zone the TERMINAL RESPONSE shall contain the Date-Time and Time zone data object.
- Where the UICC has requested the currently used language, the TERMINAL RESPONSE shall contain the Language data object.
- Where the UICC has requested the Timing Advance, the TERMINAL RESPONSE shall contain the Timing Advance data object.
- ~~Where the UICC has requested the Number of possible open channels for bearer independent protocol, the TERMINAL RESPONSE shall contain the Quantity data object, where the Quantity value indicates the number of channels.~~
- ~~Where the UICC has requested the Number of Softkeys, the TERMINAL RESPONSE shall contain the Quantity data object, where the Quantity value indicates the number of soft keys.~~
- ~~Where the UICC has requested the Display Parameters, the TERMINAL RESPONSE shall contain the Display Parameters data object.~~

[…]

8.6 Command details

[…]

- 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' = Language setting;
  - '05' = Timing Advance;
  - ~~'06' = Number of possible open channels;~~
  - ~~'07' = Number of soft keys;~~
  - ~~'08' = Display parameters;~~
  - '0~~9~~6' to 'FF' = Reserved.

[…]

~~8.59 Quantity~~

~~Byte(s)~~	~~Description~~	~~Length~~
~~1~~	~~Quantity tag~~	~~1~~
~~2~~	~~Length (x)~~	~~1~~
~~3 to x+2~~	~~Quantity value~~	~~x~~

~~Contents:~~

~~the quantity value is an unsigned integer.~~

~~Coding:~~

~~hexadecimal big-endian (i.e. the most significant byte is the 1st byte of the value).~~

~~8.60 Display parameters~~

~~Byte(s)~~	~~Description~~	~~Length~~
~~1~~	~~Display Parameters tag~~	~~1~~
~~2~~	~~Length = '04'~~	~~1~~
~~3~~	~~Screen height~~	~~1~~
~~4~~	~~Screen width~~	~~1~~
~~5~~	~~Width reduction when in a menu~~	~~1~~
~~6~~	~~Screen effects~~	~~1~~

~~8.60.1 Screen height~~

~~Contents: Number of characters supported down the ME display.~~

~~This is the guaranteed number of characters supported down the ME display without scrolling (using the default character set specified in TS 23.038 [4]) as a result of a DISPLAY TEXT proactive command.~~

If the screen can be resized as defined in the Screen effects field then this value shall reflect the current screen settings.

Coding: binary.

8.60.2 Screen width

Contents: Number of characters supported across the ME display.

This is the guaranteed number of characters supported across the ME display without scrolling (using the default character set specified in TS 23.038 [4]) as a result of a DISPLAY TEXT proactive command that can be viewed in one instance.

If the screen can be resized as defined in the Screen effects field then this value shall reflect the current screen settings.

Coding: binary.

8.60.3 Width reduction when in a menu

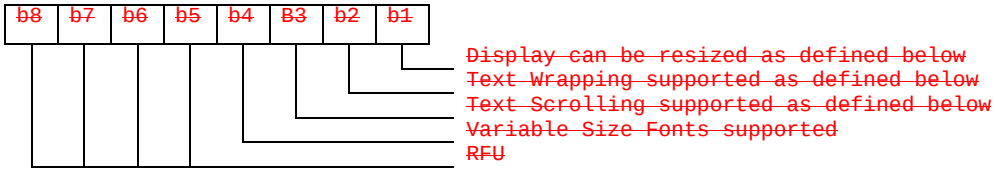
Contents: This value is the number of characters available across the display due to a DISPLAY TEXT proactive command without scrolling, minus the number of characters available across the display due to a SELECT ITEM proactive command without scrolling (where both commands are using the default character set specified in TS 23.038 [4]).

If the screen can be resized as defined in the Screen effects field then this value shall reflect the current screen settings.

Coding: binary.

8.60.4 Screen effects

Contents and coding:



Display can be resized if either:

- the user can change the number of characters supported across the display, down the display or both;
- the ME can dynamically change the number of characters supported across the display, down the display or both.

Text wrapping is supported if the ME puts words that would be split across two lines, due to the display size, at the beginning of the next line down.

Text scrolling is supported if the ME scrolls, on one line, words that would be split across two lines, due to the display size.

[…]

9.3 SIMPLE-TLV tags in both directions

[…]

Description	Length of tag	Tag value, bits 1-7 (Range: '01' - '7E')	Tag (CR and Tag value)
[…]			
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	1	'20'	'20' or 'A0'
Card ATR tag	1	'21'	'21' or 'A1'
C-APDU tag	1	'22'	'22' or 'A2'
R-APDU tag	1	'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	1	'28'	'28' or 'A8'
AT Response tag	1	'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'
AID tag	1	'2F'	'2F' or 'AF'
Browser Identity tag	1	'30'	'30' or 'B0'
URL tag	1	'31'	'31' or 'B1'
Bearer tag	1	'32'	'32' or 'B2'
Provisioning Reference File tag	1	'33'	'33' or 'B3'
Browser Termination Cause tag	1	'34'	'34' or 'B4'
Bearer description tag	1	'35'	'35' or 'B5'
Channel data tag	1	'36'	'36' or 'B6'
Channel data length tag	1	'37'	'37' or 'B7'
Buffer size tag	1	'38'	'38' or 'B8'
Channel status tag	1	'39'	'39' or 'B9'
Card reader identifier tag	1	'3A'	'3A' or 'BA'
~~Quantity tag~~	~~1~~	~~'3B'~~	~~'3B' or 'BB'~~
~~Display parameters tag~~	~~1~~	~~'3C'~~	~~'3C' or 'BC'~~

[…]

Annex A (normative): Support of USAT by Mobile Equipment

Support of USAT is optional for Mobile Equipment. However, if an ME states conformancy with a specific 3G release, it is mandatory for the ME to support all functions of that release.

The support of letter classes, which specify mainly ME hardware dependent features, is optional for the ME and may supplement the USAT functionality described in the present document. If an ME states conformancy to a letter class, it is mandatory to support all functions within the respective letter class.

The table below indicates the commands and functions of the the optional letter classes.

Command/function description	Letter classes
GET READER STATUS	a
PERFORM CARD APDU	a
POWER ON CARD	a
POWER OFF CARD	a
RUN AT COMMAND	b
LAUNCH BROWSER	c
Browser termination event	c
Soft key support	d
~~PROVIDE LOCAL INFORMATION (Soft key)~~	~~d~~
OPEN CHANNEL	e
CLOSE CHANNEL	e
RECEIVE DATA	e
SEND DATA	e
GET CHANNEL STATUS	e
~~PROVIDE LOCAL INFORMATION (number of channels)~~	~~e~~
Data available event	e
Channel status event	e

3GPP T3 Post Meeting #14
Visby, Sweden, 24 - 26 May, 2000

Tdoc T3-000321

CHANGE REQUEST No : **003**

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

Technical Specification GSM: 31.111 Version: 3.0.0

Submitted to SMG TSG-T #8 *list SMG plenary meeting no. here ↑*

For approval **X** for information

without presentation ("non-strategic") **X**
with presentation ("strategic")

PT SMG CR cover form. Filename: crf26_3.doc

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

Work item: bearer independent

Source: Bouygues Telecom **Date:** 5/06/2000

Subject: correction of SAT commands for using GPRS in bearer independent protocol feature

Category: *(one category and one release only shall be marked with an X)*

F	Correction	X
A	Corresponds to a correction in an earlier release	
B	Addition of feature	
C	Functional modification of feature	X
D	Editorial modification	

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X

Reason for change: This CR brings some precision and corrections on GPRS case
"Open channel" command does not work for GPRS case: no address available, parameters format is not clear.
For structured transmission as GPRS, SIM/ME interface of "send data" and "receive data" commands should take account service data unit structure (packet data interface)

Clauses affected:

Other specs affected:

Other releases of same spec	X	→ List of CRs:
Other core specifications		→ List of CRs:
MS test specifications / TBRs		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments: If SIM may send protocol configuration options, it shall be able to receive protocol configuration. These options are not supported by AT command (not available to a TE)

In case of TE service data unit structure is garantie using a PPP link between ME and TE

Other CR presents:

- Ability to specify SIM/ME transport interface in order to use ME transport layer


help.doc

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

3 3 Definitions, abbreviations and symbols

3.1 Definitions

For the purposes of the present document, the following terms and definitions given in 3G TS 21.905 and the following apply:

application: application consists of a set of security mechanisms, files, data and protocols (excluding transmission protocols).

application protocol: set of procedures required by the application.

bearer independent protocol: mechanism by which the ME provides the UICC with access to the data bearers supported by the ME and the network.

card session: link between the card and the external world starting with the ATR and ending with a subsequent reset or a deactivation of the card.

card x: additional card.

card reader x: electrical interface to support additional card.

data channel: allow the UICC and the network to exchange data using a selected bearer.

data object: information seen at the interface for which are defined a tag (identifier), a length and a value. Data objects can be either BER-TLV (objects that conform to the Basic Encoding Rules of ASN.1) or SIMPLE-TLV. In the present document, all BER-TLV data objects are "primitive": the value part consists only of SIMPLE-TLV data objects.

link: radio resource.

padding: one or more bits appended to a message in order to cause the message to contain the required number of bits or bytes.

proactive UICC: UICC which is capable of issuing commands to the ME.

proactive UICC session: sequence of related USAT commands and responses. A proactive UICC session starts with the status response '91 xx' (proactive command pending) and ends with a status response of '90 00' (normal ending of command) after Terminal Response.

Rx buffer: dedicated memory used to temporarily store data to be retrieved.

Service data unit (SDU): In layered systems, a set of data that is sent by a user of the services of a given layer, and is transmitted to a peer service user semantically unchanged. A Protocol Control Information (PCI) header is attached to the Service Data Unit (SDU) by the layer to form a Protocol Data Unit (PDU).

Tx buffer: dedicated memory used to temporarily store data to be sent.

UICC application session: execution of a sequence of commands internal to the UICC that can result in the performance of one or several proactive UICC sessions. The UICC application session can be started by any event in the card session, and can execute for the duration of the card session. Processing of the UICC application session will not interfere with normal 3G operation.

USAT: set of applications and related procedures that may be used during a 3G session.

3.2 Abbreviations

For the purpose of the present document, the following abbreviations apply:

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
CSD	Circuit Switched Data
DTMF	Dual Tone Multiple Frequency
EF	Elementary File
EGPRS	EDGE General Packet Radio Service
ETSI	European Telecommunications Standards Institute
etu	elementary time unit
FDN	Fixed Dialling Number
GPRS	General Packet Radio Service
GSM	Global System for Mobile communications
ID	IDentifier
IEC	International Electrotechnical Commission
IMEI	International Mobile Equipment Identity
IMUI	International Mobile User Identity
ISO	International Organization for Standardization
lgth	The (specific) length of a data unit
LND	Last Number Dialled
ME	Mobile Equipment
MMI	Man Machine Interface
NMR	Network Measurement Results (see also 3G 24.008 [9])
NPI	Numbering Plan Identifier
PDP	Packet Data Protocol, e.g., Ip or X25 or PPP
PDU	Protocol Data Unit
RAND	A RANDom challenge issued by the network
R-APDU	Response Application Protocol Data Unit
RFU	Reserved for Future Use
SDU	Service Data Unit
SMS	Short Message Service
SRES	Signed RESponse calculated by a UICC
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
UE	User Equipment
UICC	USIM Integrated Circuit Card
UMTS	Universal Mobile Telecommunication System
URL	Uniform Resource Location
USAT	USIM Application Toolkit
USIM	Universal Subscriber Identity Module
USSD	Unstructured Supplementary Service Data

3.3 Symbols

For the purposes of the present document, the following symbols apply:

'0' to '9' and 'A' to 'F' The sixteen hexadecimal digits

4 Overview of USAT

The USAT provides mechanisms which allow applications, existing in the UICC, to interact and operate with any ME which supports the specific mechanism(s) required by the application.

If class "a" is supported, a UICC supporting USAT shall be able to communicate with the additional card(s) and get information about the additional reader(s) via the ME.

The following mechanisms have been defined. These mechanisms are dependent upon the commands and protocols relevant to USAT in TS 31.101 [13].

…

4.11 Bearer Independent Protocol

This subclause applies if class "e" is supported.

The set of proactive commands (OPEN CHANNEL, CLOSE CHANNEL, SEND DATA, RECEIVE DATA and GET CHANNEL STATUS) and events (Data available, Channel status) allows the UICC to establish a data channel with the ME, and through the ME to a remote Server in the Network. The UICC provides information for the ME to select an available bearer at the time of channel establishment. The ME then allows the UICC and the Server to exchange data on this channel, transparently. The SIM uses service of ME lower layer to send data by providing Service Data Unit to ME. The default lower layer is the higher layer of selected bearer.

…

6 Proactive UICC

6.4.29 RECEIVE DATA

This subclause applies only if class "e" is supported.

This command requests the ME to return data from a dedicated Channel identifier according to the number of bytes specified by the UICC.

Upon receiving this command, the ME shall return the data available in the Rx buffer corresponding to the Channel identifier. Examples are given below, but the list is not exhaustive.

If the ME is unable to process the command:

- if the command is rejected because the requested channel is already closed the ME informs the UICC using TERMINAL RESPONSE (Bearer independent protocol error);

- if the user has indicated the need to end the proactive UICC session, the ME informs the UICC using TERMINAL RESPONSE (Proactive UICC session terminated by the user).

If the ME is able to process the command:

- if the requested number of bytes is available in the buffer, the ME shall inform the UICC that the command has been successfully executed, using TERMINAL RESPONSE and return the requested data and the number of bytes remaining in the channel buffer (or FF if more than ~~255~~ maximum bytes remains);

- if the requested number of bytes is not yet available in the buffer, the ME shall NOT wait for the requested number of bytes to arrive. The ME shall inform the UICC, using TERMINAL RESPONSE (Command performed with missing information) and returns the data currently available in the channel buffer;

- In case of structured transmission, the structure of the service data unit received by the ME must be kept intact and must be fully respected while receiving. So the size of service data unit included in the packet PDU is limited to the maximum size of “channel data” in “receive data” response. ME shall put only one complete service data unit in RX buffer at one time and wait for the RX buffer being empty before putting next user data unit. Then the SIM shall receive all “channel data” in one “receive data” command. So the SDU is limited to the maximum size of channel data string in terminal response.

- if the alpha identifier is provided by the UICC, the ME shall use it to inform the user. The ME may also use it to inform the user during data transfer. If an icon is provided by the UICC, the icon indicated in the command may be used by the

ME to inform the user, in addition to, or instead of the alpha identifier, as indicated with the icon qualifier (see subclause 6.5.4).

6.4.30 SEND DATA

This subclause applies only if class "e" is supported.

This command requests the ME to send data through a previously set up data channel corresponding to a dedicated Channel identifier. The UICC informs the ME if the data is:

- to be sent immediately;
- or to be stored in a Tx buffer. Then it is up to the ME to manage the data sending in order to use the bearer in an optimised way.

Upon receiving this command, the ME shall either immediatly send data or store provided data into the Tx buffer corresponding to the Channel identifier. Examples are given below, but the list is not exhaustive.

If the ME is unable to process the command:

- if the command is rejected because the requested channel is already closed the ME informs the UICC using TERMINAL RESPONSE (Bearer Independent Protocol error);
- if the command is rejected because the channel is temporarily unavailable the ME informs the UICC using TERMINAL RESPONSE (ME currently unable to process command);
- if the requested number of bytes of empty space is not yet available in the buffer the ME informs the UICC using TERMINAL RESPONSE (Bearer Independent Protocol error);
- if the user has indicated the need to end the proactive UICC session, the ME informs the UICC using TERMINAL RESPONSE (Proactive UICC session terminated by the user).

If the ME is able to process the command:

- if the requested number of bytes of empty space is available in the buffer the ME shall inform the UICC that the command has been successfully executed, using TERMINAL RESPONSE and return the number of bytes of empty space available in the Tx buffer (or FF if more then 255 bytes are available);
- In case of structured transmission , the structure of the service data unit sent by the application must be kept intact and must be fully respected while sending. So the size of service data unit in the packet PDU is limited to the size of “channel data” in send data command. SIM application shall send user data unit in one send data command. Then the ME shall send “channel data” in one packet PDU. . So the SDU is limited to the maximum size of channel data string in data send command.
- if the alpha identifier is provided by the UICC, the ME shall use it to inform the user. The ME may also use it to inform the user during data transfer. If an icon is provided by the UICC, the icon indicated in the command may be used by the ME to inform the user, in addition to, or instead of the alpha identifier, as indicated with the icon qualifier (see subclause 6.5.4).

6.6.27 OPEN CHANNEL

Description	Subclause	M/O/C	Min	Length
Proactive UICC command Tag	9.2	M	Y	1
Length (A+B+C+D+E+F+G+H+I+J+K+L+M+N)	-	M	Y	1 or 2
Command details	8.6	M	Y	A
Device identities	8.7	M	Y	B
Alpha identifier	8.2	O	N	C
Icon identifier	8.31	O	N	D
Address	8.1	M	Y	E
Called party subaddress	8.3	O	N	F
Duration 1	8.8	C	N	G
Duration 2	8.8	O	N	H
Bearer description	8.53	M	Y	I
Buffer size	8.56	M	N	J
~~Text String (Optional Bearer parameters)~~	~~8.15~~	~~O~~	~~N~~	~~K~~
URL (Access Point address)	8.48	O	N	K
Other address (local address)	8.xx	O	N	L
Text String (User login)	8.15	O	N	M
Text String (User password)	8.15	O	N	N
~~File List(Optional Bearer parameters)~~	~~8.18~~	~~O~~	~~N~~	~~L~~

The Address is requested for CS bearer, ~~the Address may also be used to provide X121 local address in case of GPRS bearer (see local address)~~ for other bearer it is ignored~~.~~ If parameter is not present, the mobile uses the default address mobile configuration if any.

The Subaddress may be requested for CS bearer only, for other bearer it is ignored. If the called party subaddress is not present, the ME shall not provide a called party subaddress to the network.

Duration 1 indicates the duration of reconnection tries. If Duration 1 is not present, the SIM imposes no restrictions on the ME.

Duration 2 indicates the timeout value before the ME releases the link if there is no data exchanged on the link.If duration 2 is not present the link is never released automatically by the ME.

~~Optional Bearer parameters is a text string (cf. subclause 12.15) which provides additional information to the ME necessary to establish a link. (For GPRS, it provides the name/address of the requested Packet Data Protocol address)~~

The Access point address may be requested for GPRS bearer only, for other bearer it is ignored. Access point address parameter is a URL (cf. 12.48) which provides information to the ME necessary to identify the entity which provides interworking with an external network. If parameter is not present, the mobile uses the default access point address mobile configuration or subscription value.

Local address parameter (cf. 12.xx) provides information to the ME necessary to identify the local device. (it provides IP address). If local address length is null, dynamic local address is required. If parameter is not present, the mobile uses the mobile default local address configuration

User login parameter is a text string (cf. 12.15) which provides information to the ME necessary to answer authentication challenge by supplying access login (it may provide PPP login,). If parameter is not present, the mobile uses default login configuration if any. If no authentication challenge is requested, user login shall be ignored.

User password parameter is a text string (cf. 12.15) which provides information to the ME necessary to answer authentication challenge by supplying access password (it may provide PPP password,). If parameter is not present, the mobile uses default password configuration if any. If no authentication challenge is requested, user password shall be ignored.

Author note : This parameter should be removed.

~~If File List data object is present in the command then the ME shall use this file containing a set of ME transparent parameters required to make the connection.~~

- ~~(For GPRS it could contain optional parameters such as the Access point name or the additional Protocol configuration options.)~~ ~~Each file content one protocol configuration option coding according to GSM 4.08 specification : protocol identifier, length of protocol content, protocol content from first to last octet.~~

8 SIMPLE-TLV data objects

This clause specifies the coding of the SIMPLE-TLV data objects, which are contained in a BER-TLV data object. SIMPLE-TLV data objects may be transferred across the interface in either direction. A SIMPLE-TLV data object consists of a tag of length one byte, a length indicator, which gives the number of bytes in the value field, and a value part of variable length, whose contents, meaning and coding are given below.

Tag codings are given in subclause 9.3 for all SIMPLE-TLV data objects.

'00' and 'FF' are never used as tag values for SIMPLE-TLVs. This is in alignment with ISO/IEC 7816-6 [18]. Padding characters are not allowed.

For some of the SIMPLE-TLV data objects described, the length field shall be coded on 1 or 2 bytes (Y value) according to annex C, depending on the value of byte 1.

All bits and bytes indicated as RFU within all SIMPLE-TLV data objects shall be respectively set to 0 and '00' by the sending entity.

The handling of reserved values and RFU bits or bytes within all SIMPLE-TLV data objects at the receiving entity is described in subclause 6.10.

8.12 Result

Byte(s)	Description	Length
1	Result tag	1
2 to (Y-1)+2	Length (X)	Y
(Y-1)+3	General result	1
(Y-1)+4 to (Y-1)+X+2	Additional information on result	X-1

- General result

Contents: General result specifies the result and indicates appropriate SIM action:

…

8.12.11 Additional information for Bearer Independent Protocol

This subclause applies only if class "e" is supported.

For the general result " Bearer Independent Protocol error ", it is mandatory for the ME to provide additional information, the first byte of which is defined below:

- '00' = No specific cause can be given;
- '01' = No channel available;
- '02' = Channel closed;
- '03' = Channel identifier not valid;
- '04' = Requested buffer size not available.
- '0x' = Security error (unsuccessful authentication)

All other values shall be interpreted by the UICC as '00'.

The coding '00' shall only be used by the ME if no others apply.

8.xx Other Address

Byte(s)	Description	Length
1	Other address tag	1
2	Length (X)	1
3	Type of address	1
4 to (4 + X-1)	Address	X

A null Local address shall be coded with Length = '00', and no Value part. In that case, the ME shall request a dynamic address.

Coding of Type of address: according to packet data protocol address in 4.08
'21' = IPv4 address
'97' = IPv6 address
'others' = reserved

Coding of address: according to packet data protocol address in 4.08
If type of address indicates IPv4, the Address information in octet 4 to octet 7 contains the IPv4 address. Bit 8 of octet 4 represents the most significant bit of the IP address and bit 1 of octet 7 the least significant bit .

If type of address indicates IPv6, the Address information in octet 4 to octet 19 contains the IPv6 address. Bit 8 of octet 4 represents the most significant bit of the IP address and bit 1 of octet 19 the least significant bit.

9 Tag values

This clause specifies the tag values used to identify the BER-TLV and SIMPLE-TLV data objects used in the present document.

9.1 BER-TLV tags in ME to UICC direction

Description	Length of tag	Value
SMS-PP download tag	1	'D1'
Cell Broadcast download tag	1	'D2'
Menu Selection tag	1	'D3'
Call control tag	1	'D4'
MO Short message control tag	1	'D5'
Event download tag	1	'D6'
Timer expiration	1	'D7'

9.2 BER-TLV tags in UICC TO ME direction

Description	Length of tag	Value
Proactive UICC command tag	1	'D0'

9.3 SIMPLE-TLV tags in both directions

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	1	'20'	'20' or 'A0'
Card ATR tag	1	'21'	'21' or 'A1'
C-APDU tag	1	'22'	'22' or 'A2'
R-APDU tag	1	'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	1	'28'	'28' or 'A8'
AT Response tag	1	'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'
AID tag	1	'2F'	'2F' or 'AF'
Browser Identity tag	1	'30'	'30' or 'B0'
URL tag	1	'31'	'31' or 'B1'
Bearer tag	1	'32'	'32' or 'B2'
Provisioning Reference File tag	1	'33'	'33' or 'B3'
Browser Termination Cause tag	1	'34'	'34' or 'B4'
Bearer description tag	1	'35'	'35' or 'B5'
Channel data tag	1	'36'	'36' or 'B6'
Channel data length tag	1	'37'	'37' or 'B7'
Buffer size tag	1	'38'	'38' or 'B8'
Channel status tag	1	'39'	'39' or 'B9'
Card reader identifier tag	1	'3A'	'3A' or 'BA'
Quantity tag	1	'3B'	'3B' or 'BB'
Display parameters tag	1	'3C'	'3C' or 'BC'
Text String (User password)	1	'xx'	'xx' or 'xx'

9.4 Type of Command and Next Action Indicator

The table below shows the values which shall be used for Type of Command coding (see subclause 8.6) and Next Action Indicator coding (see subclause 8.24).

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	
'15'	LAUNCH BROWSER	X	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	X	X
'31'	POWER ON CARD	X	X
'32'	POWER OFF CARD	X	X
'33'	GET READER STATUS	X	X
'34'	RUN AT COMMAND	X	
'35'	LANGUAGE NOTIFICATION	X	
'40'	OPEN CHANNEL	X	X
'41'	CLOSE CHANNEL	X	X
'42'	RECEIVE DATA	X	X
'43'	SEND DATA	X	X
'44'	GET CHANNEL STATUS	X	X
'81'	End of the proactive session	not applicable	X

3GPP T3 post Meeting #14
Visby, Sweden, 24 - 26 May, 2000

Tdoc T3-000322

CHANGE REQUEST No : **004** (was incorrectly marked 005)

Please see embedded help file at the bottom of this page for instructions on how to fill in this form correctly.

Technical Specification GSM: 31.111 Version: 3.0.0

Submitted to SMG TSG-T #8
list SMG plenary meeting no. here ↑

For approval **X**
for information

without presentation ("non-strategic") **X**
with presentation ("strategic")

PT SMG CR cover form. Filename: crf26_3.doc

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

Work item: bearer independent protocol

Source: Bouygues Telecom **Date:** 5/06/2000

Subject: CR clarification of ME/SIM interface for bearer independent protocol feature

Category: *(one category and one release only shall be marked with an X)*

F	Correction	X
A	Corresponds to a correction in an earlier release	
B	Addition of feature	
C	Functional modification of feature	
D	Editorial modification	

Release:

Phase 2	
Release 96	
Release 97	
Release 98	
Release 99	X
UMTS	

Reason for change: This CR brings some clarification to bearer independent protocol set of proactive commands in order to provide the SIM an access to transport layer supplied by the ME.

Clauses affected:

Other specs affected:

Other releases of same spec	X	→ List of CRs:
Other core specifications		→ List of CRs:
MS test specifications / TBRs		→ List of CRs:
BSS test specifications		→ List of CRs:
O&M specifications		→ List of CRs:

Other comments: This CR is independent of the bearer used for transmission


help.doc

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

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.

[1] 3G TS 22.002: "3rd Generation Partnership Project (3GPP); Bearer Services supported by a GSM PLMN".

[2] 3G TS 22.030: "3rd Generation Partnership Project (3GPP); Man-Machine Interface (MMI) of the Mobile Station (MS)".

[3] 3G TS 22.042: "3rd Generation Partnership Project (3GPP); Network identity and timezone (NITZ); Stage 1".

[4] 3G TS 23.038: "3rd Generation Partnership Project (3GPP); Alphabets and language-specific information".

[5] 3G TS 23.040: "3rd Generation Partnership Project (3GPP); Technical realization of the Short Message Service (SMS); Point-to-Point (PP)".

[6] 3G TS 23.041: "3rd Generation Partnership Project (3GPP); Technical realization of Short Message Service Cell Broadcast (SMSCB)".

[7] 3G TS 23.122: "3rd Generation Partnership Project (3GPP); Non Access Stratum functions related to Mobile Station (MS) in idle mode".

[8] 3G TS 24.007: "3rd Generation Partnership Project (3GPP); Mobile radio interface signalling layer 3; General aspects".

[9] 3G TS 24.008: "3rd Generation Partnership Project (3GPP); Mobile radio interface layer 3 specification".

[10] 3G TS 24.011: "3rd Generation Partnership Project (3GPP); Point-to-Point (PP) Short Message Service (SMS) support on mobile radio interface".

[11] 3G TS 24.080: "3rd Generation Partnership Project (3GPP); Mobile radio interface layer 3 supplementary services specification; Formats and coding".

[12] 3G TS 27.007: "3rd Generation Partnership Project (3GPP); AT command set for 3G User Equipment (UE)".

[13] 3G TS 31.101: "3rd Generation Partnership Project (3GPP); UICC / Terminal Interface; Physical and Logical Characteristics".

[14] 3G TS 31.102: "3rd Generation Partnership Project (3GPP); Characteristics of the USIM application".

[15] 3G TS 31.110: "3rd Generation Partnership Project (3GPP); Numbering system for telecommunication IC card applications".

[16] ISO/IEC 7816-3 (1997): "Identification cards - Integrated circuit(s) cards with contacts, Part 3: Electronic signals and transmission protocols".

[17] ISO/IEC 7816-4 (1995): "Identification cards - Integrated circuit(s) cards with contacts, Part 4: Inter-industry commands for interchange".

[18] ISO/IEC 7816-6 (1995): "Identification cards - Integrated circuit(s) cards with contacts, Part 6 Inter-industry data elements".

[19] ISO 639 (1988): "Code for the representation of names of languages".

[20] GSM 02.07: "Digital cellular telecommunications system (Phase 2+); Mobile Stations (MS) features".

[21] GSM 02.17: "Digital cellular telecommunications system (Phase 2+); Subscriber Identity Modules (SIM) Functional characteristics".

[22] GSM 02.40: "Digital cellular telecommunications system (Phase 2+); Procedures for call progress indications".

[23] GSM 03.48: "Digital cellular telecommunications system (Phase 2+); Security Mechanisms for the SIM application toolkit ".

[24] "Uniform Resource Locators (URL) : T. Berners-Lee, et al., December 1994. ftp://ds.internic.net/rfc/rfc1738.txt

[xx] GSM 07.07: "Digital cellular telecommunications system (Phase 2+); AT command set for GSM Mobile Equipment (ME)".

[xx] "User Datagram Protocol (UDP)", RFC 768

[xx] "Transmission Control Protocol (TCP)", RFC 793

3 Definitions, abbreviations and symbols

3.1 Definitions

For the purposes of the present document, the following terms and definitions given in 3G TS 21.905 and the following apply:

application: application consists of a set of security mechanisms, files, data and protocols (excluding transmission protocols).

application protocol: set of procedures required by the application.

bearer independent protocol: mechanism by which the ME provides the UICC with access to the data bearers supported by the ME and the network.

card session: link between the card and the external world starting with the ATR and ending with a subsequent reset or a deactivation of the card.

card x: additional card.

card reader x: electrical interface to support additional card.

data channel: allow the UICC and the network to exchange data using a selected bearer.

data object: information seen at the interface for which are defined a tag (identifier), a length and a value. Data objects can be either BER-TLV (objects that conform to the Basic Encoding Rules of ASN.1) or SIMPLE-TLV. In the present document, all BER-TLV data objects are "primitive": the value part consists only of SIMPLE-TLV data objects.

link: radio resource.

padding: one or more bits appended to a message in order to cause the message to contain the required number of bits or bytes.

proactive UICC: UICC which is capable of issuing commands to the ME.

proactive UICC session: sequence of related USAT commands and responses. A proactive UICC session starts with the status response '91 xx' (proactive command pending) and ends with a status response of '90 00' (normal ending of command) after Terminal Response.

Rx buffer: dedicated memory used to temporarily store data to be retrieved.

Service data unit (SDU): In layered systems, a set of data that is sent by a user of the services of a given layer, and is transmitted to a peer service user semantically unchanged. A Protocol Control Information (PCI) header is attached to the Service Data Unit (SDU) by the layer to form a Protocol Data Unit (PDU).

Tx buffer: dedicated memory used to temporarily store data to be sent.

UICC application session: execution of a sequence of commands internal to the UICC that can result in the performance of one or several proactive UICC sessions. The UICC application session can be started by any event in the card session, and can execute for the duration of the card session. Processing of the UICC application session will not interfere with normal 3G operation.

USAT: set of applications and related procedures that may be used during a 3G session.

3.2 Abbreviations

For the purpose of the present document, the following abbreviations apply:

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
CSD	Circuit Switched Data
DTMF	Dual Tone Multiple Frequency
EF	Elementary File
EGPRS	EDGE General Packet Radio Service
ETSI	European Telecommunications Standards Institute
etu	elementary time unit
FDN	Fixed Dialling Number
GPRS	General Packet Radio Service
GSM	Global System for Mobile communications
ID	IDentifier
IEC	International Electrotechnical Commission
IMEI	International Mobile Equipment Identity
IMUI	International Mobile User Identity
ISO	International Organization for Standardization
lgth	The (specific) length of a data unit
LND	Last Number Dialled
ME	Mobile Equipment
MMI	Man Machine Interface
NMR	Network Measurement Results (see also 3G 24.008 [9])
NPI	Numbering Plan Identifier
RAND	A RANDom challenge issued by the network
R-APDU	Response Application Protocol Data Unit
RFU	Reserved for Future Use
SDU	Service Data Unit
SMS	Short Message Service
SRES	Signed RESponse calculated by a UICC
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)
TCP	Transmission Control Protocol
TLV	Tag, length, value
TON	Type Of Number
TP	Transfer layer Protocol
TS	Technical Specification
UCS2	Universal two byte coded Character Set
UDP	User Datagram Protocol
UE	User Equipment
UICC	USIM Integrated Circuit Card
UMTS	Universal Mobile Telecommunication System
URL	Uniform Resource Location
USAT	USIM Application Toolkit
USIM	Universal Subscriber Identity Module
USSD	Unstructured Supplementary Service Data

3.3 Symbols

For the purposes of the present document, the following symbols apply:

'0' to '9' and 'A' to 'F' The sixteen hexadecimal digits

4 Overview of USAT

The USAT provides mechanisms which allow applications, existing in the UICC, to interact and operate with any ME which supports the specific mechanism(s) required by the application.

If class "a" is supported, a UICC supporting USAT shall be able to communicate with the additional card(s) and get information about the additional reader(s) via the ME.

The following mechanisms have been defined. These mechanisms are dependent upon the commands and protocols relevant to USAT in TS 31.101 [13]. 4 Overview of SIM Application Toolkit

…

4.11 Bearer Independent Protocol

This subclause applies if class "e" is supported.

The set of proactive commands (OPEN CHANNEL, CLOSE CHANNEL, SEND DATA, RECEIVE DATA and GET CHANNEL STATUS) and events (Data available, Channel status) allows the SIM to establish a data channel with the ME, and through the ME to a remote Server in the Network. The SIM provides information for the ME to select an available bearer at the time of channel establishment. The ME then allows the SIM and the Server to exchange data on this channel, transparently. The SIM uses service of ME lower layer to send data by providing Service Data Unit to ME. The default lower layer is the higher layer of selected bearer.

5 Profile download

5.1 Procedure

The profile download instruction is sent by the ME to the UICC as part of the UICC initialization procedure. This procedure is specified in TS 31.101 [13]. The profile sent by the ME shall state the facilities relevant to USAT that are supported by the ME.

This procedure is important, as it is by this that the UICC knows what the ME is capable of, and the UICC can then limit its instruction range accordingly. If no command is sent by the ME, the UICC shall assume that the ME does not support USAT.

5.2 Structure and coding of TERMINAL PROFILE

Direction: ME to UICC.

The command header is specified in TS 31.101 [13].

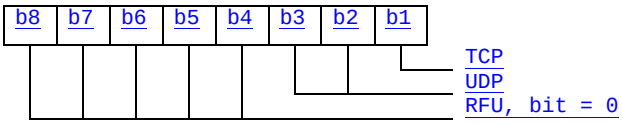
Command parameters/data:

Description	Subclause	M/O/C	Length
Profile	-	M	lgth

- Profile:
  Contents: The list of USAT 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

…

xxxxxxxth byte: (Bearer independent protocol supported transport interface) for class "e":



6 Proactive UICC

…

6.6.27 OPEN CHANNEL

Description	Subclause	M/O/C	Min	Length
Proactive UICC command Tag	9.2	M	Y	1
Length (A+B+C+D+E+F+G+H+I+J+K+L+M+N+O)	-	M	Y	1 or 2
Command details	8.6	M	Y	A
Device identities	8.7	M	Y	B
Alpha identifier	8.2	O	N	C
Icon identifier	8.31	O	N	D
Address	8.1	M	Y	E
Called party subaddress	8.3	O	N	F
Duration 1	8.8	C	N	G
Duration 2	8.8	O	N	H
Bearer description	8.53	M	Y	I
Buffer size	8.56	M	N	J
Text String (Optional Bearer parameters)	8.15	O	N	K
File List(Optional Bearer parameters)	8.18	O	N	L
SIM/ME interface transport level	8.xx	O	N	M
URL (data destination address)	8.48	C	Y	N
Other address (data destination address)	8.xx	C	Y	O

If the called party subaddress is not present, the ME shall not provide a called party subaddress to the network.

Duration 1 indicates the duration of reconnection tries. If Duration 1 is not present or is null, the UICC imposes no restrictions on the ME. Duration 1 shall be present if Duration 2 is present.

Duration 2 indicates the timeout value before the ME releases the link if there is no data exchanged on the link. If duration 2 is not present the link is never released automatically by the ME.

Optional Bearer parameters is a text string which provides additional information to the ME necessary to establish a link. (For GPRS, it provides the name/address of the requested Packet Data Protocol address).

If File List data object is present in the command then the ME shall use this file containing a set of parameters required to make the connection. (For GPRS it could contain optional parameters such as the Access point name or the Protocol configuration options).

If SIM/ME interface transport level is present in the command then the ME shall provide the requested transport layer protocols under the channel and shall use this object containing a set of parameters required to make the transport connection. If parameter is not present, the SIM/ME interface is the bearer level (serial link or packet link as AT command [33]). The data that will be received/sent from the SAT to the transport layer is a SDU that will be received/transmitted in the Transport-PDU.

Data destination address is the end point destination address of sent data. This data destination address is requested when a SIM/ME interface transport is present, , otherwise it is ignored. The data destination address may be a URL or a data network address. If URL and data network address are present, URL is ignored.

8 SIMPLE-TLV data objects

This clause specifies the coding of the SIMPLE-TLV data objects, which are contained in a BER-TLV data object. SIMPLE-TLV data objects may be transferred across the interface in either direction. A SIMPLE-TLV data object consists of a tag of length one byte, a length indicator, which gives the number of bytes in the value field, and a value part of variable length, whose contents, meaning and coding are given below.

Tag codings are given in subclause 9.3 for all SIMPLE-TLV data objects.

'00' and 'FF' are never used as tag values for SIMPLE-TLVs. This is in alignment with ISO/IEC 7816-6 [18]. Padding characters are not allowed.

For some of the SIMPLE-TLV data objects described, the length field shall be coded on 1 or 2 bytes (Y value) according to annex C, depending on the value of byte 1.

All bits and bytes indicated as RFU within all SIMPLE-TLV data objects shall be respectively set to 0 and '00' by the sending entity.

The handling of reserved values and RFU bits or bytes within all SIMPLE-TLV data objects at the receiving entity is described in subclause 6.10.

…

8.12 Result

Byte(s)	Description	Length
1	Result tag	1
2 to (Y-1)+2	Length (X)	Y
(Y-1)+3	General result	1
(Y-1)+4 to (Y-1)+X+2	Additional information on result	X-1

- General result

Contents: General result specifies the result and indicates appropriate SIM action:

…

8.12.11 Additional information for Bearer Independent Protocol

This subclause applies only if class "e" is supported.

For the general result " Bearer Independent Protocol error ", it is mandatory for the ME to provide additional information, the first byte of which is defined below:

- '00' = No specific cause can be given;
- '01' = No channel available;
- '02' = Channel closed;
- '03' = Channel identifier not valid;
- '04' = Requested buffer size not available.
- '0x' = Requested SIM/ME interface transport level not available

All other values shall be interpreted by the UICC as '00'.

The coding '00' shall only be used by the ME if no others apply.

8.53 Bearer description

Byte(s)	Description	Length
1	Bearer description tag	1
2	Length (X+1)	1
3	Bearer type	1
4 to (3+X)	Bearer parameters	X

- Bearer Type coding:
  - '01' = CSD;
  - '02' = GPRS.
  - '03' = default bearer for requested transport layer

All other values are reserved.

8.53.1 Bearer parameters for CSD

Contents: parameters specific to the bearer.

In this case X=3.

NOTE: The default values of the subparameters are manufacturer specific since they depend on the purpose of the device and data services provided by it. Not all combinations and values of these subparameters are supported by GSM (refer TS 22.002 [1]).

- Coding : The following values are as defined in the TS 27.007 [12]. They are coded in hexadecimal.
- Coding of Byte 4 - Data rate:
  - '00' = autobauding (automatic selection of the speed; this setting is possible in case of 3.1 kHz modem and non-transparent service);
  - '01' = 300 bps (V.21);
  - '02' = 1200 bps (V.22);
  - '03' = 1200/75 bps (V.23);
  - '04' = 2400 bps (V.22bis);
  - '05' = 2400 bps (V.26ter);
  - '06' = 4800 bps (V.32);
  - '07' = 9600 bps (V.32);
  - '0C' = 9600 bps (V.34);
  - '0E' = 14400 bps (V.34);
  - '0F' = 19200 bps (V.34);
  - '10' = 28800 bps (V.34);
  - '22' = 1200 bps (V.120);
  - '24' = 2400 bps (V.120);
  - '26' = 4800 bps (V.120);
  - '27' = 9600 bps (V.120);

- '2B' = 14400 bps (V.120);
- '2F' = 19200 bps (V.120);
- '30' = 28800 bps (V.120);
- '31' = 38400 bps (V.120);
- '32' = 48000 bps (V.120);
- '33' = 56000 bps (V.120);
- '41' = 300 bps (V.110);
- '42' = 1200 bps (V.110);
- '44' = 2400 bps (V.110 or X.31 flag stuffing);
- '46' = 4800 bps (V.110 or X.31 flag stuffing);
- '47' = 9600 bps (V.110 or X.31 flag stuffing);
- '4B' = 14400 bps (V.110 or X.31 flag stuffing);
- '4F' = 19200 bps (V.110 or X.31 flag stuffing);
- '50' = 28800 bps (V.110 or X.31 flag stuffing);
- '51' = 38400 bps (V.110 or X.31 flag stuffing),
- '52' = 48000 bps (V.110 or X.31 flag stuffing);
- '53' = 56000 bps (V.110 or X.31 flag stuffing);
- '73' = 56000 bps (bit transparent);
- '74' = 64000 bps (bit transparent);
- also all other values are reserved.

- Coding of byte 5 - bearer service:
  - '00' = data circuit asynchronous (UDI or 3.1 kHz modem);
  - '01' = data circuit synchronous (UDI or 3.1 kHz modem);
  - '02' = PAD Access (asynchronous) (UDI);
  - '03' = Packet Access (synchronous) (UDI);
  - '04' = data circuit asynchronous (RDI);
  - '05' = data circuit synchronous (RDI);
  - '06' = PAD Access (asynchronous) (RDI);
  - '07' = Packet Access (synchronous) (RDI);
  - also all other values are reserved.
- Coding of Byte 6 - connection element:
  - '00' = transparent;
  - '01' = non-transparent;
  - '02' = both, transparent preferred;
  - '03' = both, non-transparent preferred;

- also all other values are reserved.

8.53.2 Bearer parameters for GPRS

In this case X=8.

- Coding of Byte 4 - Precedence class:
  - '01' = 1 (High priority);
  - '02' = 2 (Normal priority);
  - '03' = 3 (Low priority);
  - all other values are reserved.
- Coding of Byte 5 - Delay class:
  - '01' = 1;
  - '02' = 2;
  - '03' = 3;
  - '04' = 4;
  - all other values are reserved.
- Coding of Byte 6 - Reliability class:
  - '01' = 1;
  - '02' = 2;
  - '03' = 3;
  - '04' = 4;
  - '05' = 5;
  - all other values are reserved.
- Coding of Byte 7 - Peak throughput class:
  - '01' = 1 (up to 8 kbit/s);
  - '02' = 2 (up to 16 kbit/s);
  - '03' = 3 (up to 32 kbit/s);
  - '04' = 4 (up to 64 kbit/s);
  - '05' = 5 (up to 128 kbit/s);
  - '06' = 6 (up to 256 kbit/s);
  - '07' = 7 (up to 512 kbit/s);
  - '08' = 8 (up to 1024 kbit/s);
  - '09' = 9 (up to 2048 kbit/s);
  - all other values are reserved.
- Coding of Byte 8 - Mean throughput class:
  - '01' = 1 (~0.22 bit/s);
  - '02' = 2 (~0.44 bit/s);

- '03' = 3 (~1.11 bit/s);
- '04' = 4 (~2.2 bit/s);
- '05' = 5 (~4.4 bit/s);
- '06' = 6 (~11.1 bit/s);
- '07' = 7 (~22 bit/s);
- '08' = 8 (~44 bit/s);
- '09' = 9 (~111 bit/s);
- '0A' = 10 (~0.22 kbit/s);
- '0B' = 11 (~0.44 kbit/s);
- '0C' = 12 (~1.11 kbit/s);
- '0D' = 13 (~2.2 kbit/s);
- '0E' = 14 (~4.4 kbit/s);
- '0F' = 15 (~11.1 kbit/s);
- '10' = 16 (~22 kbit/s);
- '11' = 17 (~44 kbit/s);
- '12' = 18 (~111 kbit/s);
- '13' = 31 (best effort);
- all other values are reserved.

- Coding of Byte 9 - Packet data protocol type:
  - '01' = X25 (ITU-T/CCIT X.25 layer 3);
  - '02' = IP (Internet Protocol, IETF STD 5);
  - '03' = OSPIH (Internet Hosted Octet Stream Protocol);
  - '05' = PPP (Point to Point Protocol, IETF STD 51);
  - all other values are reserved.
- Coding of Byte 10 - Data compression:
  - '00' - off;
  - '01' - on;
  - all other values are reserved.
- Coding of Byte 11 - TCP/IP header Compression:
  - '00' = off;
  - '01' = on;
  - all other values are reserved.

8.53.3 Default bearer

Contents: parameters specific to the bearer.

When the default bearer is present, the ME shall provide its default available bearer parameter configuration.

X (length of parameters) = 0.

8.xx SIM/ME interface transport level

This subclause applies only if class "e" is supported.

Byte(s)	Description	Length
1	SIM/ME interface transport level tag	1
2	Length (X+1)	1
3	Transport protocol type	1
4..5	Port number	2

- Transport protocol type coding :

  - '01' : UDP [34]
  - '02' : TCP [35]

  all other value are reserved

- Port number coding : integer

9 Tag values

This clause specifies the tag values used to identify the BER-TLV and SIMPLE-TLV data objects used in the present document.

9.1 BER-TLV tags in ME to UICC direction

Description	Length of tag	Value
SMS-PP download tag	1	'D1'
Cell Broadcast download tag	1	'D2'
Menu Selection tag	1	'D3'
Call control tag	1	'D4'
MO Short message control tag	1	'D5'
Event download tag	1	'D6'
Timer expiration	1	'D7'

9.2 BER-TLV tags in UICC TO ME direction

Description	Length of tag	Value
Proactive UICC command tag	1	'D0'

9.3 SIMPLE-TLV tags in both directions

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	1	'20'	'20' or 'A0'
Card ATR tag	1	'21'	'21' or 'A1'
C-APDU tag	1	'22'	'22' or 'A2'
R-APDU tag	1	'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	1	'28'	'28' or 'A8'
AT Response tag	1	'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'
AID tag	1	'2F'	'2F' or 'AF'
Browser Identity tag	1	'30'	'30' or 'B0'
URL tag	1	'31'	'31' or 'B1'
Bearer tag	1	'32'	'32' or 'B2'
Provisioning Reference File tag	1	'33'	'33' or 'B3'
Browser Termination Cause tag	1	'34'	'34' or 'B4'
Bearer description tag	1	'35'	'35' or 'B5'
Channel data tag	1	'36'	'36' or 'B6'
Channel data length tag	1	'37'	'37' or 'B7'
Buffer size tag	1	'38'	'38' or 'B8'
Channel status tag	1	'39'	'39' or 'B9'
Card reader identifier tag	1	'3A'	'3A' or 'BA'
Quantity tag	1	'3B'	'3B' or 'BB'
Display parameters tag	1	'3C'	'3C' or 'BC'
SIM/ME interface transport level	1	'xx'	'xx' or 'xx'
URL (data destination address)	1	'xx'	'xx' or 'xx'

Other address (data destination address)	1	'xx'	'xx' or ‘xx’