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CHANGE REQUEST

⌘ **22.038** **CR** **009** ⌘ **1** ⌘ Current version: **3.2.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ [X] ME [X] Radio Access Network [ ] Core Network [X]

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Date:	⌘	14/02/2003
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	Some of the requirements from USAT stage 1 have not been implemented in stage 3.
Summary of change:	⌘	Modifications or suppressions of some requirements
Consequences if not approved:	⌘	Inconsistency with other specifications

Clauses affected:	⌘	All

		Y	N		
Other specs affected:	⌘		X	Other core specifications	⌘
			X	Test specifications	
			X	O&M Specifications	

Other comments:	⌘	Related specifications: 31.111, 42.019

3G TS 22.038 V3.2.0 (2000-06)

Technical Specification

3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; (U)SIM ~~SIM/USIM~~ Application Toolkit (USAT/SAT); Service description; Stage 1 (3G TS 22.038 Release 1999)

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Foreword

This Technical Specification has been produced by the 3GPP.

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

Version x~~3~~.y.z

where:

x the first digit:

1 presented to TSG for information;

2 presented to TSG for approval;

3 or greater i~~I~~ndicates TSG approved document under change control.

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

z the third digit is incremented when editorial only changes have been incorporated in the specification;

1 Scope

This ~~ETSI~~ 3GPP Technical Specification defines the stage one description of the ~~USIM/SIM~~(U)SIM application Toolkit (SAT/USAT). Stage one is an overall service description, primarily from the subscriber's and serving environment's points of view, and does not deal with the details of the human interface itself.

This TS includes information applicable to network operators, serving environments and terminal, switch and database manufacturers.

This TS contains the core requirements for a ~~USIM/SIM~~(U)SIM application Toolkit (SAT/USAT) which are sufficient to provide a complete service.

It is highly desirable however, that technical solutions for a ~~USIM/SIM~~(U)SIM application Toolkit (SAT/USAT) ~~should be~~are sufficiently flexible to allow for possible enhancements. Additional functionalities not documented in this TS may implement requirements which are considered outside the scope of this TS. This additional functionality may be on a network-wide basis, nation-wide basis or particular to a group of users. Such additional functionality shall not compromise conformance to the core requirements of the service.

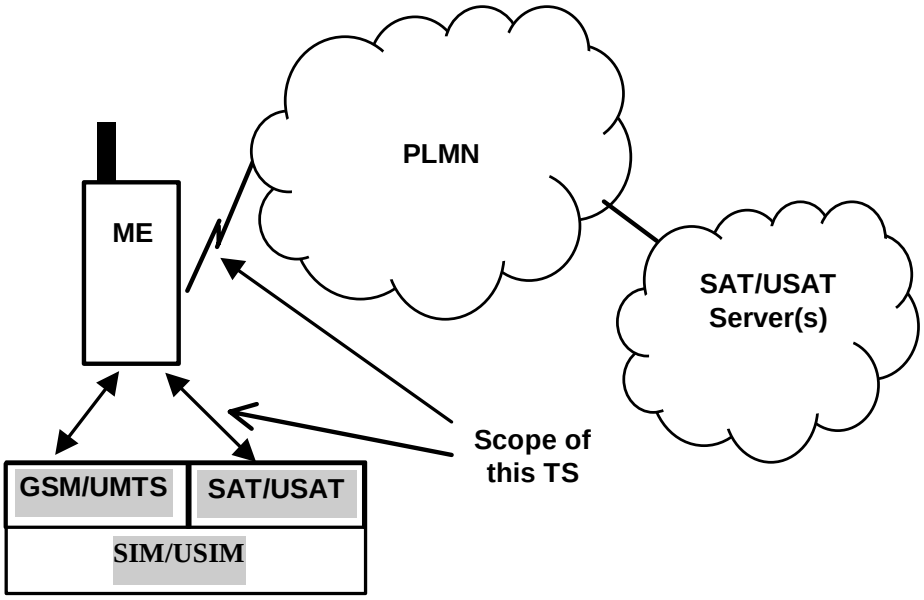

Figure 1: Scope of this TS

As indicated in Figure 1, the scope of this TS encompasses the SAT/USAT functionality in the UE/MS (comprising ~~USIM/SIM~~(U)SIM and ME) and the interaction with ~~the PLMN~~the PLMN environment. The SAT/USAT Server is not necessarily a separate entity as shown in the figure; nodes providing SAT/USAT services may also exist within the PLMN. The functionalities of the SAT/USAT servers (such as charging aspects, security level classification etc.) are not covered by this specification.

The requirements are considered to be applicable to both GSM and UMTS systems.

2 References

References may be made to:

a) specific versions of publications (identified by date of publication, edition number, version number, etc.), in which case, subsequent revisions to the referenced document do not apply; or

b) all versions up to and including the identified version (identified by "up to and including" before the version identity); or

c) all versions subsequent to and including the identified version (identified by "onwards" following the version identity); or

d) publications without mention of a specific version, in which case the latest version applies.

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

2.1 Normative references

[1] ~~GSM 01.04 (ETR 350): Digital cellular telecommunications system (Phase 2+); Abbreviations and acronyms~~

[1] 3GPP TS 31.101: UICC-Terminal Interface; Physical and Logical Characteristics

[2] ~~GSM 02.48: Security mechanisms for the (U)SIM Application Toolkit; Stage 1~~Void

[3] ~~GSM 03.48: Security mechanisms for the SIM Application Toolkit; Stage 2~~Void

[4] GSM 11.11: Specification of the Subscriber Identity Module - Mobile Equipment interface

[5] GSM 11.14: Specification of the SIM Application Toolkit for the Subscriber Identity Module - Mobile Equipment interface.

[6] GSM 02.19: Subscriber Identity Module Application Programming Interface (SIM API)

[7] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications"

[8] 3GPP TS 24.008: Mobile radio interface Layer 3 specification; Core network protocols; Stage 3~~GSM 04.08: Mobile radio interface layer 3 specification~~

[9] ~~GSM~~ 3GPP TS 23.060~~03.60~~: General Packet Radio Service (GPRS) Service description; Stage 2~~GPRS service description stage 2~~

[10] Void ~~GSM 03.64: GPRS overall description of the GPRS radio interface stage 2~~

[11] ~~GSM 07.60: GPRS mobile station supporting GPRS~~3GPP TS 27.060: Packet domain; Mobile Station (MS) supporting Packet Switched services

[12] ~~GSM 02.90~~3GPP TS 22.090: Unstructured Supplementary Service Data (USSD) Stage 1

[13] ~~GSM 03.90~~3GPP TS 23.090: Unstructured Supplementary Service Data (USSD) Stage 2

[14] 3GPP TS 31.111: USIM Application Toolkit (USAT)

3 Definitions and abbreviations

3.1 Definitions

For the purposes of this TS the following definitions apply:

applet: a small program that is intended not to be run on its own, but rather to be embedded inside another application

application: SAT/USAT information in the form of software, applications, associated resources (e.g. libraries) and/or data

bearer independent protocol: Mechanism at the interface between the (U)SIM and the ME which provide access to the data bearers supported by the ME.

buffer: A dedicated memory used to temporarily store data to be sent and/or retrieved.

content: data and/or information associated with, or independent of, a particular application which may be presented to or collected from a user

data channel: allow the (U)SIM and the network to exchange data using a selected bearer

link: radio resource

SAT/USAT service: a service enhanced (or made possible) by SAT/USAT technology

SAT/USAT execution environment: the SAT/USAT execution environment provides the mechanisms to operate single or multiple SAT/USAT-applications

SAT/USAT serving environment: an entity which delivers SAT/USAT services to the subscriber. This is normally the PLMN operator, but could be an entity with SAT/USAT responsibility (which may have been delegated by the PLMN operator)

SAT/USAT subscriber: the owner of a PLMN subscription who has entered into an agreement with a SAT/USAT serving environment for SAT/USAT services. Access to SAT/USAT services though other types of networks is out of scope of this specification

SAT/USAT server: a node supporting SAT/USAT services in the SAT/USAT service environment

user: the user of a SAT/USAT UE/MS , who may or may not be the subscriber

(U)SIM: SIM and/or USIM.

3.2 Abbreviations

For the purposes of this TS the following abbreviations apply:

API	Application Programming Interface
CAMEL	Customized Applications for Mobile network Enhanced Logic
CS	Circuit Switched
CSE	CAMEL Service Environment
IN	Intelligent Network
ME	Mobile Equipment
MExE	Mobile ~~Station (Application)~~ Execution Environment
MMI	Man Machine Interface
MS	Mobile Station
NO	Network Operator
PLMN	Public Land Mobile Network
SAT	SIM Application Toolkit
SCI	Subscriber Controlled Input
SIM	Subscriber Identity Module
UE	User Equipment
USAT	USIM Application Toolkit
USIM	Universal Subscriber Identity Module

Further abbreviations are given in ~~GSM 01.04 [1] and~~ TS 21.905 [7].

4 Description

SAT/USAT provides a standardised execution environment for applications stored on the ~~USIM/SIM~~(U)SIM card and the ability to utilize certain functions of the supporting mobile equipment. SAT/USAT provides mechanisms which allow applications, existing in the ~~USIM/SIM~~(U)SIM, to interact and operate with any ME which supports the specified mechanism(s) thus ensuring interoperability between a ~~USIM/SIM~~(U)SIM and an ME, independent of the respective manufacturers and operators. A transport mechanism is provided enabling applications to be down-loaded and/or updated.

A significant aspect of SAT/USAT is the highly secure environment provided by the ~~USIM/SIM~~(U)SIM card. This is further enhanced by the fact that the subscriber and the issuer of the ~~USIM/SIM~~(U)SIM and also the SAT/USAT applications have a "trusted relationship" (e.g. the subscriber trusts the issuer of the card to charge correctly for the resources used). This allows certain features, such as call control, to be implemented with a degree of freedom which would not be acceptable in a "non-trusted relationship".

The introduction of the SAT/USAT execution environment into UE/MSs (i.e. ME+~~USIM/SIM~~(U)SIM) is a significant step forward in their evolution. The ability of UE/MSs to support SAT/USAT represents an extension of the UE/MS's and PLMN capabilities. In order to allow current and future technologies to exploit and benefit from this, a standardized means of exchanging the MEs' and ~~USIM/SIM~~(U)SIMs capability profiles is supported.

This Technical Specification defines an enhancement of the ~~USIM/SIM~~(U)SIM/ME interface.

5 High level SAT/USAT requirements

The high level requirements of SAT/USAT are as follows:-

- provide the user with additional user interface functionalities to control and invoke services (e.g. menus, icons, etc.) ;
- to provide means for the user to personalize applications by means of parameters, if such parameters are made available by the application;
- provide support of a wide variety of applications;
- provide the means for SAT/USAT to interact with the user via the input and output devices of the ME;
- the means to transfer applications automatically or on demand to the ~~USIM/SIM~~(U)SIM from a SAT/USAT server, and upgrade existing applications via the PLMN;
- the means to transfer content automatically or on demand to or from the ~~USIM/SIM~~(U)SIM from or to a SAT/USAT server;
- the means to transfer content directly from one SAT/USAT application to a second UE/MS with a SAT/USAT application via the PLMN;
- the need for an inherent security architecture such that it shall be possible for both the SAT/USAT and SAT/USAT server sides of a connection to be authenticated (possibly implicitly by the use of digital signature or ciphering). The SAT/USAT server shall maintain security of ~~subscribers~~subscribers' personal data and PLMN data;
- it shall be possible to charge subscribers for the use of PLMN or third party SAT/USAT services;
- the means for SAT/USAT applications on the ~~USIM/SIM~~(U)SIM to communicate with other PLMN nodes;
- the means for the ME and ~~USIM/SIM~~(U)SIM to exchange SAT/USAT capability information;
- provision of SAT/USAT API(s) to facilitate the development and downloading of SAT/USAT applications;
- ~~CategoriSAT/USATsation of applications in either "Mandatory" or "Conditional" shall allow application management. For conditional applications the means for the user to manage (i.e. identify version, delete, modify,~~

~~save etc.) the applications and content on the SAT/USAT UE/MS shall be possible. Modification of the application by the user is, however, explicitly not allowed;~~

- ~~It shall~~ may be possible for the user to activate and deactivate the USIM/SIM application execution environment; in this case the ME shall initiate a new (U)SIM session.

- the means for the network operator to provide and manage the SAT/USAT execution environment resources and also to provide and manage (i.e. identify version, activate, de-activate, delete, modify, download etc.) ~~those services of the management control class "mandatory";~~the applications;

- ~~the means to trace (e.g. for billing and customer care purposes) the source of origin of a particular communication activity;~~

- the means for the SAT/USAT application to fully control the display of all actions and network-responses related to the operation of the application. Optionally under user control the ME may display the individual actions/responses;

- the means for the SAT/USAT application to control the PLMN services/supplementary services via the standardized MMI. Only the originator (i.e. either user or SAT/USAT application) of the action shall directly receive the results/responses of that action (e.g. network response to an SCI). Optionally under user control the ME may display the individual actions/responses.

Some of the above requirements are subsequently elaborated.

6 SAT/USAT/ME interface requirements

6.1 SAT~~/USAT~~ API~~s~~

The ~~SAT/USAT~~SIM-API is defined in GSM 02.19 [6]. This API is valid for SAT and is referred to in this TS as SAT API.

The SAT~~/USAT~~ API for the ~~GSM USIM~~/SIM card shall allow application programmers easy access to the functions and data described in GSM 11.11 [4] and GSM 11.14 [5] , such that ~~USIM/~~SIM based services can be developed and loaded onto ~~USIM/~~SIMs (independent of the ~~USIM/~~SIM manufacturer), quickly and, if necessary, remotely, after the card has been issued. The SAT~~/USAT~~ API shall support pro-active functions as described in GSM 11.14 [5] and transport functions as described in GSM 11.11 [4].

6.2 SAT/USAT proactive capability

The SAT/USAT proactive capability is a mechanism whereby the ~~USIM/SIM~~(U)SIM can request specific actions to be taken by the ME by issuing "proactive commands" thus establishing and maintaining an interactive dialogue with the user and/or communicating with the network.

The ME shall inform the ~~USIM/SIM~~(U)SIM of the success or otherwise of each command issued to it by the ~~USIM/SIM~~(U)SIM, and also indicate the command details and if applicable add more specific information.

The proactive command set allows the SAT/USAT to instruct the ME to:

1 display text supplied by the USAT/SAT on the ME's display, with an indication of priority (normal or high), and a defined action (user activity or timeout) to terminate the text display.

2 display a text string and obtain the response in the form of a single user keystroke or a string of keys entered by the user and pass the response to the (U)SIM~~/SIM~~. If the response is designated as private by the (U)SIM~~/SIM~~ the ME shall not display the users response on the screen.

3 set up a voice call to an address with a specific priority as indicated by the (U)SIM ~~USIM/SIM~~ with all parameters indicated by the (U)SIM.

4 set up a data call to an address with specific bearer capability and priority, all parameters are indicated by the ~~USIM/SIM~~(U)SIM.

5 set up and manage a data channel (e.g. using a CSD, GPRS, SMS or USSD bearer) between the (U)SIM and an address using information provided by the (U)SIM~~SIM~~.

6 send data through a previously set up data channel. The (U)SIM ~~SIM~~ informs the ME if the data is to be sent immediately.

7 ~~7~~ retrieve data from the ME that has previously been received via a data channel set up using (5) above. The (U)SIM ~~SIM~~ informs the ME as to how much data it expects to retrieve.

8 ~~8~~ send a short message to the network. The short message text is supplied by the ~~USIM/SIM~~(U)SIM to the ME in either packed or unpacked SMS 7-bit alphabet, or UCS2 alphabet.

9 send a SS control, SS MMI string or USSD string, indicating which alphabet is used where applicable.

10 play a tone in the appropriate audio device.

11 negotiate, within reasonable tolerances, a periodic "polling" of the ~~USIM/SIM~~(U)SIM Toolkit.

12 refresh the image (if applicable) of the ~~USIM/SIM~~(U)SIM data contained in the ME memory, either entirely, or partially, or instruct the ME to re-initialize completely.

13 set up an event list in the ME such that the ~~USIM/SIM~~(U)SIM is informed by the ME when a ~~USIM/SIM~~(U)SIM indicated event has occurred.

14 set up an additional menu in the ME, by issuing the ME with a menu list, and allow indication back to the ~~USIM/SIM~~(U)SIM of the user selected menu item.

15 provide requested information from the ME to the ~~USIM/SIM~~(U)SIM, for example the MCC, MNC and IMEI.

16 communicate bi-directionally with an auxiliary device, e.g. a second card reader.

17 set up, refresh and interrogate several timers, and inform the ~~USIM/SIM~~(U)SIM when these expire, within reasonable tolerances.

18 display additional MMI information such as display information or tones with commands that employ network resources, with an indication to the ME as to the required level of ME generated MMI as a result of the interaction with the network.

19 allow the ME to display help information with the commands, by providing the associated text, related to the user action (e.g. menu selection).

Unless otherwise stated the following shall apply:

- The format of text to be displayed is designated by the ~~USIM/SIM~~(U)SIM and is either SMS default alphabet (packed or unpacked) or UCS2 alphabet.
- The format of the response from the ME is designated by the ~~USIM/SIM~~(U)SIM and is either keypad digit (0-9, *, #, +), SMS default alphabet characters or UCS2 alphabet characters.

6.3 ~~-~~ME Capability for support of bearer independent protocol

The ME supporting bearer independent protocol shall provide to the (U)SIM a common interface for any type of data bearer. This interface is in addition to dedicated commands (eg SMS, SS and USSD) for SAT/USAT application to exchange data with the network.

The communication is initiated by the (U)SIM. The ME negotiates with the (U)SIM and the network to establish the optimum channel considering the (U)SIM request, the network and ME capabilities.

The ME is responsible for maintaining and restoring the link should there be a link error.

7 SAT/USAT User Interface requirements

7.1 Data presentation requirements (e.g. Display)

In order to be able to create and operate applications with a homogeneous display(s) SAT/USAT shall fully control the display of all actions and all network-responses concerned with the operation of the application. SAT/USAT shall, upon completion/closure of the application, return full control to the ME.

The display of information shall be either in the form of text (i.e. alphanumeric characters) or in graphical form or both.

Optionally under user control the ME may display the individual actions/network responses.

7.2 Data acquisition requirements (e.g. Keypad)

In order to be able to create and operate applications with a homogeneous user interface SAT/USAT shall fully control the function associated with the user input for example via the keypad of the ME. Exceptions to this are keys which are "dedicated ME keys" such as the ON/OFF key. SAT/USAT shall, upon completion/closure of the application, return full control to the ME.

7.3 Access requirements (e.g. Menu)

A simple, powerful method for the user to access and interact with certain SAT/USAT applications shall be provided.

It shall be possible for the SAT/USAT-Application to set up a user interface (e.g. menu, icons) via the capabilities provided by the ME to allow the user to interact with a SAT/USAT application using, for example, the display and keypad.

7.4 Menu capability

7.4.1 Set up capability

The menu set up capability is a mechanism whereby the menu items (menu entries/structure etc.) required by the SAT/USAT is indicated to the ME by means of a proactive ~~USIM/SIM~~(U)SIM command(s). The menu set up capability is not directly available to the user. As an option this may include "help information" items.

7.4.2 Selection capability

The menu selection capability is a mechanism whereby the menu item selected by the user is indicated to the SAT/USAT by the ME via the ~~USIM/SIM~~(U)SIM interface. As an option this may include "help information" items.

7.5 Soft-key capability

The soft-key allocation capability is a mechanism whereby the ~~USIM/SIM~~(U)SIM indicates to the ME the text to be displayed and the SAT/USAT function which is to be assigned to a ME soft-key.

7.6 User control of the SAT/USAT execution environment

The user ~~shall~~may be able to ~~enable/disable~~control the SAT/USAT execution environment via the ME ~~as~~in accordance with the follow~~s~~ing cases:

i) the SAT/USAT execution environment is enabled/disabled

ii) the SAT/USAT execution environment is not allowed to make automatic calls

iii) the SAT/USAT execution environment is allowed to make automatic calls but only with user confirmation

iv) the SAT/USAT execution environment is allowed to make automatic calls without user confirmation.

In addition it shall be possible for the user to independently enable/disable the AT command feature.

~~The ME shall inform the SAT/USAT execution environment of the current status each time the status is changed and at power up.~~

Note that for ease of reading the term "automatic call" is used but this shall be taken to mean any network interaction initiated by SAT/USAT including SMS, USSD etc. but excluding user initiated interactions modified by SAT/USAT.

The user shall be notified by the ME if service access is prevented as the result of partially ~~or completely~~ disabling the SAT/USAT execution environment. It shall be possible to enable the SAT/USAT execution environment if service access has been prevented.

8 Network interface requirements

8.1 SAT/USAT SIM/Network interaction

SAT/USAT/Network interaction is required such that the SAT/USAT and the network can bi-directionally exchange data through the ME, employing any of the transport mechanisms defined in the section "SAT/USAT bearer requirements".

8.2 Communication control capability

The communication control capability is a mechanism whereby the use of communication resources is either initiated by the SAT/USAT application or modified by the SAT/USAT application subsequent to a user action. If supported by the ME, the ME shall, at the time of the user initiated communication request, inform the (U)SIM of the current cell location identity. The ~~USIM/SIM~~(U)SIM shall indicate to the ME if the presentation of information (display, tones etc.) shall be restricted to the explicit presentation of SAT/USAT supplied information or if it is required to present standard PLMN information (e.g. network responses) in addition to the SAT/USAT supplied information.

It shall be possible for:

- the ~~USIM/SIM~~(U)SIM to initiate and terminate a (~~USIM/SIM~~(U)SIM initiated) communication request with or without explicit confirmation by the user
- the ~~USIM/SIM~~(U)SIM to allow, bar or modify a communication request initiated by the user
- the ~~USIM/SIM~~(U)SIM to replace a user initiated communication request by another communication request (e.g. replace call request by an SS action etc.).

It shall be possible for the SAT/USAT serving environment to enable/disable the communication control capability. As an option, dependant on the subscribers subscription and the application, the user may enable/disable the communication control capability via a SAT/USAT serving environment and/or under the control of the Network Operator. The user shall be notified by the ME in case network service is lost as the result of disabling the communication control capability.

The communication control capability applies to all mobile originated requests independent of the applicable bearer service. Explicitly it applies to voice calls and to all services listed in the section "SAT/USAT bearer requirements" (e.g. SMS, supplementary service, circuit switched connection etc.) except for GPRS.

~~The source of the communication request shall be indicated to the network as defined in section "security, traceability requirements".~~

8.3 Service Interworking requirements

The SAT/USAT application shall be able to use all PLMN services and supplementary services (SS) including those functions available to the user via the standardized MMI (e.g. 2 SEND for Call Hold). Only the originator (i.e. either user

or SAT/USAT application) of the action shall directly receive the results/responses of that action (e.g. network response to an SCI). Optionally under user control the ME may display the individual actions/responses.

9 SAT/USAT bearer requirements

9.1 Bearers supported

SAT/USAT shall support the transmission (mobile originated) and the reception (mobile terminated) of data by means of one of the following bearers, either using dedicated commands or managed by the ME (using the Bearer independent protocol) ;

BEARER	Dedicated commands	Bearer independent protocol
SMS	Yes	YesNo
CSD	No	Yes
GPRS	No	Yes
SS	Yes (MO only)	No
USSD	Yes (MO only)	NoYes
Cell Broadcast (mobile originated excluded)(only when the ME is connected to a GSM access network)	Yes (MT only)	No
SMS via GPRS	Yes	YesNo

10 Charging requirements

It shall be possible to charge the subscriber for the use of SAT/USAT applications.

It shall be possible to charge for the following activities:-

- subscription:

  the subscriber's registration to use SAT/USAT services

- application transfer (download):

  the transfer of applications and/or information to a subscriber's SAT/USAT UE/MS

- application upgrading (download):

  the upgrading of previously transferred applications to a subscriber's SAT/USAT UE/MS

- application use:

  the use of applications by a subscriber's SAT/USAT UE/MS

- content:

  the provision of content within a SAT/USAT application

- roaming:

  the use of SAT/USAT applications by a subscriber when roaming

- transport:

the use of a transport/bearer service (e.g. SMS)

11 Security requirements

The integrity of the ~~USIM/SIM~~(U)SIM and existing security mechanisms shall not be compromised with the introduction of SAT/USAT services.

The security of the PLMN, the ~~USIM/SIM~~(U)SIM and the SAT/USAT applications shall not be able to be compromised by an external execution environment.

Applications running within an external execution environment are considered "non-trusted" until a secure authentication and identification procedure has been successfully performed. MExE is considered to be an external execution environment. MExE is not covered by this specification.

Applications designed using the features in this specification may require additional methods to provide additional data confidentiality, data integrity, and data sender validation, or any subset thereof.

11.1 Secure Environment requirements

A major aspect of the ~~USIM/SIM~~(U)SIM ~~card~~ is the security provided by the chip technology combined with the encryption and challenge/response procedures. The enhancement of the ~~USIM/SIM~~(U)SIM ~~card~~ by SAT/USAT shall not reduce nor endanger the current security. In addition, the SAT/USAT environment shall maintain (or improve) the same high levels of security. Adequate (future) measures shall be taken to ensure the fulfilment of this requirement also with future advances in technologies/services (either network-centric and/or UE/MS-centric).

12 ~~Traceability requirements~~Void

~~It shall be possible for the network operator to trace (i.e. identify) the source of following transactions:~~

- ~~Call set up;~~
- ~~Mobile initiated Short Messages;~~
- ~~GPRS session set up;~~
- ~~Control messages for Supplementary Services;~~
- ~~Mobile initiated USSD messages.~~

~~It shall be possible to differentiate between the following categories:~~

- ~~user initiated;~~
- ~~SAT/USAT initiated;~~
- ~~SAT/USAT modified,~~

~~and also to indicate the degree of user involvement:~~

- ~~confirmation by user;~~
- ~~indication to user;~~
- ~~no knowledge by user.~~

~~The SAT/USAT application ID shall be provided where applicable.~~

~~Note: traceability is required, for example, for customer care and charging purposes.~~

13 Roaming

Provided a roaming agreement for the necessary transport/bearer service(s) (e.g. SMS, GPRS) is currently valid, ~~T~~then the SAT/USAT execution environment shall be supported when roaming. ~~providing a roaming agreement for the necessary transport/bearer service(s) (e.g. SMS, GPRS) is currently valid.~~

14 Interaction with supplementary services

14.1 General

This subclause defines the interaction between PLMN supplementary services and the SAT/USAT feature. PLMN supplementary services shall not have any knowledge of SAT/USAT based services.

14.2 Line Identification

14.2.1 Calling Line Identification Presentation (CLIP)

No interaction.

~~SAT/USAT shall be able to modify the calling number that is displayed to the user.~~

14.2.2 Calling Line Identification Restriction (CLIR)

No interaction.

14.2.3 Connected Line Identification Presentation (COLP)

No interaction.

~~SAT/USAT shall be able to modify the called number that is displayed to the user.~~

14.2.4 Connected Line Identification Restriction (COLR)

No interaction.

14.3 Call Forwarding

14.3.1 Call Forwarding Unconditional (CFU)

SAT/USAT shall be able to modify the forwarded to number entered by the user and displayed, upon interrogation, to the user.

14.3.2 Call Forwarding Busy (CFB)

SAT/USAT shall be able to modify the forwarded to number entered by the user and displayed, upon interrogation, to the user.

14.3.3 Call Forwarding on No Reply (CFNRy)

SAT/USAT shall be able to modify the forwarded to number entered by the user and displayed, upon interrogation, to the user.

14.3.4 Call Forwarding on Not Reachable (CFNRc)

SAT/USAT shall be able to modify the forwarded to number entered by the user and displayed, upon interrogation, to the user.

14.4 Call Completion

14.4.1 Call Hold (CH)

No interaction.

14.4.2 Call Waiting (CW)

No interaction.

14.5 Multi Party (MPTY)

SAT/USAT shall be able to modify the called number entered by the user.

14.6 Closed User Group (CUG)

No interaction.

14.7 Advice of Charge (AoC)

No interaction.

14.8 Call Barring

14.8.1 Barring of all outgoing calls

No interaction.

14.8.2 Barring of outgoing international calls

14.8.2.1 Mobile originated calls

No interaction.

14.8.2.2 Forwarded Calls

No interaction.

14.8.3 Barring of outgoing international calls except those directed to the HPLMN country

No interaction.

14.8.4 Barring of all incoming calls

No interaction.

14.8.5 Barring of incoming calls when roaming

No interaction.

14.9 Explicit Call Transfer (ECT)

SAT/USAT shall be able to modify the transfer number entered by the user.

14.10 Completion of Call to Busy Subscriber (CCBS)

SAT/USAT shall be able to modify the number displayed to the user.

14.11 Multiple Subscriber Profile (MSP)

No interaction.

15 Interaction with network features

All services available in the network shall continue to be offered and remain applicable in addition to SAT/USAT. This includes the basic services, supplementary services and network features.

15.1 Interactions with Operator Determined Barring (ODB)

15.1.1 Barring of all outgoing calls

No interaction.

15.1.2 Barring of all outgoing international calls

No interaction.

15.1.3 Barring of all outgoing international calls except those directed to the home PLMN country

No interaction.

15.1.4 Barring of outgoing calls when roaming outside the home PLMN country

No interaction.

15.1.5 Barring of outgoing premium rate calls

No interaction.

15.1.6 Barring of incoming calls

No interaction.

15.1.7 Barring of incoming calls when roaming outside the home PLMN country

No interaction.

15.1.8 Operator Specific Barring

No interaction.

15.1.9 Barring of Supplementary Services Management

No interaction.

15.2 Interactions with Optimal Routing (OR)

No interaction.

15.3 Interactions with MExE

~~As an option the menu set up/display may utilize a micro-browser functionality if provided by the ME.~~The SAT/USAT applications have the a~~A~~bility to launch a micro-browser (on a given URL and a given bearer) if provided by the ME.

15.4 Interactions with CAMEL

No interaction.

~~For interworking purposes SAT/USAT shall be able to include free formatted information in the call set up for MO calls (mobile originated calls) , MO SMS (mobile originated SMS) and GPRS session set up. This information shall be forwarded transparently to a CAMEL CSE.~~

~~A CAMEL CSE shall be able to include free formatted information for MT calls (mobile terminated calls) that shall be forwarded transparently to the SAT/USAT.~~

16 Compatibility of SAT/USAT , ME~~UE/MS~~'s and applications

16.1 SAT/USAT Classification

Given the wide ranging hardware capabilities of ~~USIM/SIM~~(U)SIM ~~cards~~ and MEs, together with the development of SAT/USAT applications and applets, a SAT/USAT classification shall be supported to determine their respective capability and compatibility. The SAT/USAT classification shall apply both to ~~USIM/SIM~~(U)SIM ~~cards~~, MEs and applications and applets.

The objective is to:-

- classify the requirements of a SAT/USAT SIM card/applications and
- identify the commands and features supported by the ME

The development and maintenance of the SAT/USAT specification is done in accordance to the ETSI/3GPP release procedures. .I.e. annual releases of the specifications are done providing support for new commands and enhancements of existing commands. The annual Release may both contain commands that are mandatory for that Release and commands that are optional.

The classification of the optional commands and features in a given Release may be done with the concept of "Letter Classes". A Letter Class identifies a subset of functionality of the Release whichRelease, which will provide the user, SAT/USAT serving environment and application writer with a consistent set of commands and features.

The concept of a SAT/USAT Letter Classes is introduced to help identify the ME, and the USIM/SIM(U)SIM card/SAT/USAT application compatibility within a given Release. The SAT/USAT Letter Class is distinct and unrelated to the existing PLMN UE/MS Classmark. The SAT/USAT Letter Classes are not used during capability negotiations, but are intended to assist in designing applications by provision of a means for an application designer to identify which combinations of SAT/USAT features are supported by the MEs. Capability negotiations between the USIM/SIM(U)SIM and the ME are performed at the feature level, independent of the SAT/USAT Letter class.

In addition to classifying the ME as conforming to a specific Release and if applicable aone or several Letter Classes within the releases, an ME manufacturers declaration shall be provided. This shall indicate in detail the commands and features supported by the ME. Any conformance testing shall be performed in accordance to this declaration.

The support of a given Letter Class doesn't require the support of another Letter Class.

A given SAT/USAT ME classification identifies support by a SAT/USAT ME for a defined level of SAT/USAT functionality, but does not necessarily imply support of other levels of SAT/USAT classification.

SAT/USAT applications will be developed to execute on SAT/USAT UE/MS´s in one or more classifications. In order for SAT/USAT applications to be properly supported by a SAT/USAT UE/MS, the application shall be designated by the same classification of SAT/USAT UE/MS's on which they are intended to be executed.

16.2 ME/USIM/SIM(U)SIM operation

In the case of an ME not supporting SAT/USAT or not supporting a certain SAT/USAT feature the following shall apply:

- the USIM/SIM(U)SIM shall control (i.e. allow or prevent) the access to the network.
  This allows the USIM/SIM(U)SIM to prevent the use of a subscription (which may rely on the support of SAT/USAT features for correct operation) in an uncontrolled manner.
- if access to a PLMN is not prevented the ME shall support the non-SAT/USAT PLMN features without restriction.

16.3 ME/USIM/SIM(U)SIM capability information exchange

If supported, Tthe USIM/SIM(U)SIM and the ME shall exchange SAT/USAT capabilities when the card session is initiated. prior to network attach.

This exchange of information is important since the USIM/SIM(U)SIM then knows what the ME is capable of, and the USIM/SIM(U)SIM can thus adapt the service made available to the user accordingly. If the USIM/SIM(U)SIM does not receive any ME capability information it shall assume that the ME does not support SAT/USAT.

A USIM/SIM(U)SIM that supports SAT/USAT shall not attempt to invoke SAT/USAT functions in the ME if the ME has not indicated SAT/USAT support.

An ME that supports SAT/USAT shall not attempt to invoke SAT/USAT functions in the USIM/SIM(U)SIM if the USIM/SIM(U)SIM has not indicated that SAT/USAT is supported and is active.

16.4 ME and ~~USIM/SIM~~(U)SIM compatibility

For compatibility testing the ME manufacturers shall provide a declaration of the Release and if applicable the Letter Class(es) supported by the ME including the detail of all commands and features supported by the ME. It can be envisaged that ME implementations will exist that are compliant to a given release and which support commands and features from later releases.

~~16.5 Management Control Category requirements~~

~~The management control category of an application specifies whether or not the subscriber/user is allowed to perform SAT/USAT application management functions e.g. download/activate/de-activate the application.~~

~~Two management control categories "mandatory" and "conditional" are defined.~~

~~16.5.1 Mandatory.~~

~~Management functions of mandatory applications are restricted to the operator.~~

~~Mandatory applications provide the means for the network operator~~

~~a) to provide and manage the SAT/USAT execution environment resources~~

~~b) to provide and manage (i.e. identify version, activate, de-activate, delete, modify, download etc.) mandatory services~~

~~c) to provide SAT/USAT applications, which are required, for example, for the fulfillment of the users subscription.~~

~~16.5.2 Conditional.~~

~~The following management functions of conditional applications shall be optionally made available to the subscriber/user:~~

- ~~identify version, activate, de-activate, delete, download~~

~~Modification of the application by the user is, however, explicitly not allowed.~~

~~17 Cross Phase compatibility with future Phases of SAT/USAT~~

~~Where different entities support different phases of SAT/USAT it shall operate at the highest common phase. The SAT/USAT phase 1 is the smallest common unit~~.

Annex A (informative)~~:~~ Change history

Date	Version	Comment
June 98	0.0.0	Initial draft based on MExE stage 1.
June 98	0.1.0	Output of SMG1/SMG9 joint ad hoc
August 98	0.2.0	Updated by editor reflecting discussion at joint ad hoc in June.
August 98	0.3.0	Output of SMG1/SMG9 joint ad hoc meeting
November 98	0.4.0	Output of SMG1/SMG9 joint ad hoc meeting

January 99	0.5.0	Output of SMG1/SMG9 joint ad hoc meeting
January 99	0.5.1	Improved output of SMG1/SMG9 joint ad hoc meeting, submitted to SMG1 for information, with recommendation to raise to Version 1.0.0.
March 99	1.0.0	Raised to Version 1.0.0 by SMG1 Plenary
May 99	1.0.1	Draft changes, interim output of SMG1/SMG9 ad hoc meeting.
May 99	1.1.0	Output of SMG1/SMG9 joint ad hoc meeting
May 99	1.1.1	Minor editorial changes only. Output of SMG1/SMG9 joint ad hoc meeting
June 99	1.1.2	Spelling and editorial corrections, changes agreed to by email after the 5th ad hoc
September 99	1.3.0	New version after S1 meeting
September 99	1.3.1	Final version for approval at TSG-SA Korea
October 99	2.0.0	Editorial clean-up for version 2.0.0
October 99	3.0.0	Stage 1 approved at SA#5, Kyongju, Korea
March 00	3.1.0	Inclusion of CRs at SA#07.
June 00	3.2.0	Inclusion of CRs at SA#08.

Change history										
TSG SA#	**SA Doc.**	**SA1 Doc**	**Spec**	**CR**	**Rev**	**Rel**	**Cat**	**Subject/Comment**	**Old**	**New**
SA#05	SP99-434							Version 3.0.0 Approved		3.0.0
SMG#30	SP99-434							Version 3.0.0 Approved		3.0.0
SP-07	SP-000058	S1-000120	22.038	001		R99	D	USIM/SIM Application Toolkit, Service Description, Stage 1	3.0.0	3.1.0
SP-07	SP-000152		22.038	002	1	R99	B	Addition requirements for bearer independent data transfer feature	3.0.0	3.1.0
SP-08	SP-000196	S1-000432	22.038	003		R99	F	Deletion of note to non-existent TS	3.1.0	3.2.0

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Lisbon, Portugal, 11-14 february 2003 *(updated S1-022350)*

CR-Form-v7

CHANGE REQUEST

⌘ **22.038** **CR** **010** ⌘ **1** ⌘ Current version: **4.1.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ [X] ME [X] Radio Access Network [ ] Core Network [X]

Title:	⌘	Clean up of (U)SAT requirements
Source:	⌘	T3
Work item code:	⌘	TEI
Date:	⌘	14/02/2003
Category:	⌘	**A**
Release:	⌘	REL-4

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	Some of the requirements from USAT stage 1 have not been implemented in stage 3.
Summary of change:	⌘	Modifications or suppressions of some requirements
Consequences if not approved:	⌘	Inconsistency with other specifications

Clauses affected:	⌘	All

Other specs affected:	⌘	Y	N		⌘
				Other core specifications	
				Test specifications	
				O&M Specifications	

Other comments:	⌘	Related specifications: 31.111, 42.019

Technical Specification

3rd Generation Partnership Project; Technical Specification Group Services and System Aspects; (U)SIM ~~SIM/USIM~~ Application Toolkit (USAT/SAT); Service description; Stage 1 (Release 4)

The present document has been developed within the 3rd Generation Partnership Project (3GPP ™) and may be further elaborated for the purposes of 3GPP.
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Foreword

This Technical Specification has been produced by the 3GPP.

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

Version x~~3~~.y.z

where:

x the first digit:

1 presented to TSG for information;

2 presented to TSG for approval;

3 or greater i~~I~~ndicates TSG approved document under change control.

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

z the third digit is incremented when editorial only changes have been incorporated in the specification;

1 Scope

This ~~ETSI~~ 3GPP Technical Specification defines the stage one description of the ~~USIM/SIM~~(U)SIM application Toolkit (SAT/USAT). Stage one is an overall service description, primarily from the subscriber's and serving environment's points of view, and does not deal with the details of the human interface itself.

This TS includes information applicable to network operators, serving environments and terminal, switch and database manufacturers.

This TS contains the core requirements for a ~~USIM/SIM~~(U)SIM application Toolkit (SAT/USAT) which are sufficient to provide a complete service.

It is highly desirable however, that technical solutions for a ~~USIM/SIM~~(U)SIM application Toolkit (SAT/USAT) ~~should be~~are sufficiently flexible to allow for possible enhancements. Additional functionalities not documented in this TS may implement requirements which are considered outside the scope of this TS. This additional functionality may be on a network-wide basis, nation-wide basis or particular to a group of users. Such additional functionality shall not compromise conformance to the core requirements of the service.

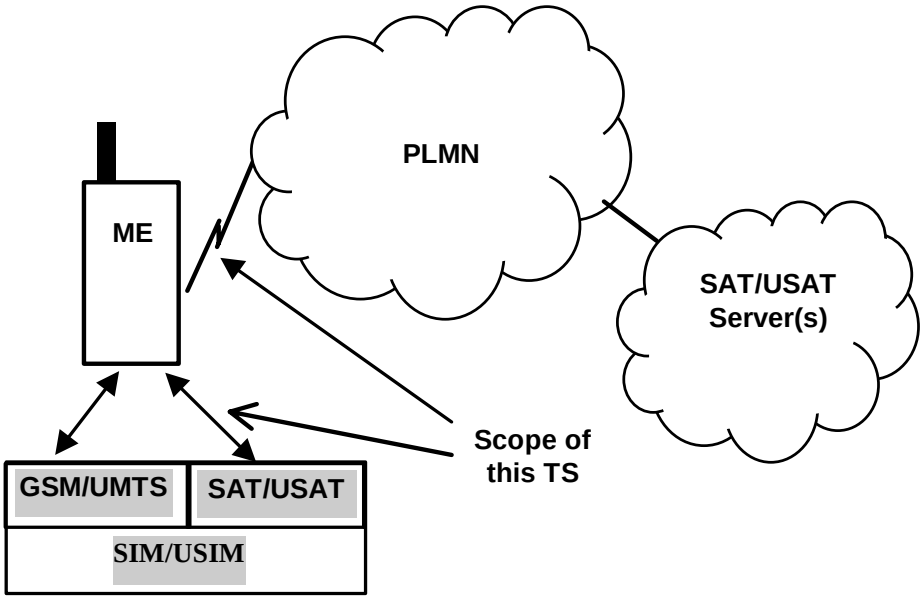

Figure 1: Scope of this TS

As indicated in Figure 1, the scope of this TS encompasses the SAT/USAT functionality in the UE/MS (comprising ~~USIM/SIM~~(U)SIM and ME) and the interaction with ~~the PLMN~~the PLMN environment. The SAT/USAT Server is not necessarily a separate entity as shown in the figure; nodes providing SAT/USAT services may also exist within the PLMN. The functionalities of the SAT/USAT servers (such as charging aspects, security level classification etc.) are not covered by this specification.

The requirements are considered to be applicable to both GSM and UMTS systems.

2 References

References may be made to:

a) specific versions of publications (identified by date of publication, edition number, version number, etc.), in which case, subsequent revisions to the referenced document do not apply; or

b) all versions up to and including the identified version (identified by "up to and including" before the version identity); or

c) all versions subsequent to and including the identified version (identified by "onwards" following the version identity); or

d) publications without mention of a specific version, in which case the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

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

2.1 Normative references

~~[1] GSM 01.04 (ETR 350): Digital cellular telecommunications system (Phase 2+); Abbreviations and acronyms~~

[1] 3GPP TS 31.101: UICC-Terminal Interface; Physical and Logical Characteristics

[2] ~~GSM 02.48: Security mechanisms for the SIM Application Toolkit; Stage 1~~Void

[3] ~~GSM 03.48: Security mechanisms for the SIM Application Toolkit; Stage 2~~Void

[4] ~~GSM~~3GPP TS ~~11~~51.011: Specification of the Subscriber Identity Module - Mobile Equipment interface

[5] ~~GSM~~3GPP TS 11.14: Specification of the SIM Application Toolkit for the Subscriber Identity Module - Mobile Equipment interface.

[6] 3GPP TS ~~SM 0~~42.019: Subscriber Identity Module Application Programming Interface (SIM API)

[7] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications"

[8] 3GPP TS 24.008: Mobile radio interface Layer 3 specification; Core network protocols; Stage 3~~GSM 04.08: Mobile radio interface layer 3 specification~~

[9] ~~GSM~~ 3GPP TS 23.060~~03.60~~: General Packet Radio Service (GPRS) Service description; Stage 2~~GPRS service description stage 2~~

[10] Void ~~GSM 03.64: GPRS overall description of the GPRS radio interface stage 2~~

[11] ~~GSM 07.60: GPRS mobile station supporting GPRS~~3GPP TS 27.060: Packet domain; Mobile Station (MS) supporting Packet Switched services

[12] ~~GSM 02.90~~3GPP TS 22.090: Unstructured Supplementary Service Data (USSD) Stage 1

[13] ~~GSM 03.90~~3GPP TS 23.090: Unstructured Supplementary Service Data (USSD) Stage 2

[14] 3GPP TS 31.111: USIM Application Toolkit (USAT)

3 Definitions and abbreviations

3.1 Definitions

For the purposes of this TS the following definitions apply:

applet: a small program that is intended not to be run on its own, but rather to be embedded inside another application

application: SAT/USAT information in the form of software, applications, associated resources (e.g. libraries) and/or data

bearer independent protocol: Mechanism at the interface between the (U)SIM and the ME which provide access to the data bearers supported by the ME.

buffer: A dedicated memory used to temporarily store data to be sent and/or retrieved.

content: data and/or information associated with, or independent of, a particular application which may be presented to or collected from a user

data channel: allow the (U)SIM and the network to exchange data using a selected bearer

link: radio resource

SAT/USAT service: a service enhanced (or made possible) by SAT/USAT technology

SAT/USAT execution environment: the SAT/USAT execution environment provides the mechanisms to operate single or multiple SAT/USAT-applications

SAT/USAT serving environment: an entity which delivers SAT/USAT services to the subscriber. This is normally the PLMN operator, but could be an entity with SAT/USAT responsibility (which may have been delegated by the PLMN operator)

SAT/USAT subscriber: the owner of a PLMN subscription who has entered into an agreement with a SAT/USAT serving environment for SAT/USAT services. Access to SAT/USAT services though other types of networks is out of scope of this specification

SAT/USAT server: a node supporting SAT/USAT services in the SAT/USAT service environment

user: the user of a SAT/USAT UE/MS , who may or may not be the subscriber

(U)SIM: SIM and/or USIM.

3.2 Abbreviations

For the purposes of this TS the following abbreviations apply:

API	Application Programming Interface
CAMEL	Customized Applications for Mobile network Enhanced Logic
CS	Circuit Switched
CSE	CAMEL Service Environment
IN	Intelligent Network
ME	Mobile Equipment
MExE	Mobile Execution Environment
MMI	Man Machine Interface
MS	Mobile Station
NO	Network Operator
PLMN	Public Land Mobile Network
SAT	SIM Application Toolkit
SCI	Subscriber Controlled Input
SIM	Subscriber Identity Module

UE	User Equipment
USAT	USIM Application Toolkit
USIM	Universal Subscriber Identity Module

Further abbreviations are given in ~~GSM 01.04 [1] and~~ TS 21.905 [7].

4 Description

SAT/USAT provides a standardised execution environment for applications stored on the ~~USIM/SIM~~(U)SIM card and the ability to utilize certain functions of the supporting mobile equipment. SAT/USAT provides mechanisms which allow applications, existing in the ~~USIM/SIM~~(U)SIM, to interact and operate with any ME which supports the specified mechanism(s) thus ensuring interoperability between a ~~USIM/SIM~~(U)SIM and an ME, independent of the respective manufacturers and operators. A transport mechanism is provided enabling applications to be down-loaded and/or updated.

A significant aspect of SAT/USAT is the highly secure environment provided by the ~~USIM/SIM~~(U)SIM card. This is further enhanced by the fact that the subscriber and the issuer of the ~~USIM/SIM~~(U)SIM and also the SAT/USAT applications have a "trusted relationship" (e.g. the subscriber trusts the issuer of the card to charge correctly for the resources used). This allows certain features, such as call control, to be implemented with a degree of freedom which would not be acceptable in a "non-trusted relationship".

The introduction of the SAT/USAT execution environment into UE/MSs (i.e. ME+~~USIM/SIM~~(U)SIM) is a significant step forward in their evolution. The ability of UE/MSs to support SAT/USAT represents an extension of the UE/MS's and PLMN capabilities. In order to allow current and future technologies to exploit and benefit from this, a standardized means of exchanging the MEs' and ~~USIM/SIM~~(U)SIMs capability profiles is supported.

This Technical Specification defines an enhancement of the ~~USIM/SIM~~(U)SIM/ME interface.

5 High level SAT/USAT requirements

The high level requirements of SAT/USAT are as follows:-

- provide the user with additional user interface functionalities to control and invoke services (e.g. menus, icons, etc.) ;
- to provide means for the user to personalize applications by means of parameters, if such parameters are made available by the application;
- provide support of a wide variety of applications;
- provide the means for SAT/USAT to interact with the user via the input and output devices of the ME;
- the means to transfer applications automatically or on demand to the ~~USIM/SIM~~(U)SIM from a SAT/USAT server, and upgrade existing applications via the PLMN;
- the means to transfer content automatically or on demand to or from the ~~USIM/SIM~~(U)SIM from or to a SAT/USAT server;
- the means to transfer content directly from one SAT/USAT application to a second UE/MS with a SAT/USAT application via the PLMN;
- the need for an inherent security architecture such that it shall be possible for both the SAT/USAT and SAT/USAT server sides of a connection to be authenticated (possibly implicitly by the use of digital signature or ciphering). The SAT/USAT server shall maintain security of ~~subscribers~~subscribers' personal data and PLMN data;
- it shall be possible to charge subscribers for the use of PLMN or third party SAT/USAT services;
- the means for SAT/USAT applications on the ~~USIM/SIM~~(U)SIM to communicate with other PLMN nodes;

- the means for the ME and ~~USIM/SIM~~(U)SIM to exchange SAT/USAT capability information;

- provision of SAT/USAT API(s) to facilitate the development and downloading of SAT/USAT applications;

- ~~Categorisation of applications in either "Mandatory" or "Conditional" shall allow application management. For conditional applications the means for the user to manage (i.e. identify version, delete, modify, save etc.) the applications and content on the SAT/USAT UE/MS shall be possible. Modification of the application by the user is, however, explicitly not allowed;~~

- It ~~shall~~may be possible for the user to activate and deactivate the USIM/SIM application execution environment; in this case the ME shall initiate a new (U)SIM session.

- the means for the network operator to provide and manage the SAT/USAT execution environment resources and also to provide and manage (i.e. identify version, activate, de-activate, delete, modify, download etc.) ~~those services of the management control class "mandatory";~~the applications;

- ~~the means to trace (e.g. for billing and customer care purposes) the source of origin of a particular communication activity;~~

- the means for the SAT/USAT application to fully control the display of all actions and network-responses related to the operation of the application. Optionally under user control the ME may display the individual actions/responses;

- the means for the SAT/USAT application to control the PLMN services/supplementary services via the standardized MMI. Only the originator (i.e. either user or SAT/USAT application) of the action shall directly receive the results/responses of that action (e.g. network response to an SCI). Optionally under user control the ME may display the individual actions/responses.

Some of the above requirements are subsequently elaborated.

6 SAT/USAT/ME interface requirements

6.1 SAT~~/USAT~~ API~~s~~

The ~~SAT/USAT~~SIM-API is defined in ~~GSM~~3GPP TS ~~0~~42.0~~1~~9 [6]. This API is valid for SAT and is referred to in this TS as SAT API.

The SAT~~/USAT~~ API for the ~~GSM USIM/~~SIM card shall allow application programmers easy access to the functions and data described in ~~GSM~~ 3GPP TS 51.011~~11.11~~ [4], ~~and GSM~~3GPP TS 11.14 [5], such that ~~USIM/~~SIM based services can be developed and loaded onto ~~USIM/~~SIMs (independent of the ~~USIM/~~SIM manufacturer), quickly and, if necessary, remotely, after the card has been issued. The SAT~~/USAT~~ API shall support pro-active functions as described in 3GPP TS ~~GSM~~ 11.14 [5] and transport functions as described in 3GPP TS 51.011 ~~GSM 11.11~~ [4].

6.2 SAT/USAT proactive capability

The SAT/USAT proactive capability is a mechanism whereby the ~~USIM/SIM~~(U)SIM can request specific actions to be taken by the ME by issuing "proactive commands" thus establishing and maintaining an interactive dialogue with the user and/or communicating with the network or an external device.

The ME shall inform the ~~USIM/SIM~~(U)SIM of the success or otherwise of each command issued to it by the ~~USIM/SIM~~(U)SIM, and also indicate the command details and if applicable add more specific information.

The proactive command set allows the SAT/USAT to instruct the ME to:

1 display text supplied by the USAT/SAT on the ME's display, with an indication of priority (normal or high), and a defined action (user activity or timeout) to terminate the text display.

2 display a text string and obtain the response in the form of a single user keystroke or a string of keys entered by the user and pass the response to the (U)SIM~~/SIM~~. If the response is designated as private by the (U)SIM~~/SIM~~ the ME shall not display the users response on the screen.

3 set up a voice call to an address with a specific priority as indicated by the (U)SIM ~~USIM/SIM~~(U)SIM~~-~~with all parameters indicated by the (U)SIM.

4 set up a data call to an address with specific bearer capability and priority, all parameters are indicated by the ~~USIM/SIM~~(U)SIM.

5 set up and manage a data channel (e.g. using a CSD, GPRS, SMS or USSD bearer) between the (U)SIM and an address using information provided by the (U)SIM~~SIM~~.

6 send data through a previously set up data channel. The (U)SIM ~~SIM~~ informs the ME if the data is to be sent immediately.

7 ~~7~~ retrieve data from the ME that has previously been received via a data channel set up using (5) above. The (U)SIM ~~SIM~~ informs the ME as to how much data it expects to retrieve.

8 ~~8~~ send a short message to the network. The short message text is supplied by the ~~USIM/SIM~~(U)SIM to the ME in either packed or unpacked SMS 7-bit alphabet, or UCS2 alphabet.

9 send a SS control, SS MMI string or USSD string, indicating which alphabet is used where applicable.

10 play a tone in the appropriate audio device.

11 negotiate, within reasonable tolerances, a periodic "polling" of the ~~USIM/SIM~~(U)SIM Toolkit.

12 refresh the image (if applicable) of the ~~USIM/SIM~~(U)SIM data contained in the ME memory, either entirely, or partially, or instruct the ME to re-initialize completely.

13 set up an event list in the ME such that the ~~USIM/SIM~~(U)SIM is informed by the ME when a ~~USIM/SIM~~(U)SIM indicated event has occurred.

14 set up an additional menu in the ME, by issuing the ME with a menu list, and allow indication back to the ~~USIM/SIM~~(U)SIM of the user selected menu item.

15 provide requested information from the ME to the ~~USIM/SIM~~(U)SIM, for example the MCC, MNC and IMEI.

16 communicate bi-directionally with an auxiliary device, e.g. a second card reader.

17 set up, refresh and interrogate several timers, and inform the ~~USIM/SIM~~(U)SIM when these expire, within reasonable tolerances.

18 display additional MMI information such as display information or tones with commands that employ network resources, with an indication to the ME as to the required level of ME generated MMI as a result of the interaction with the network.

19 allow the ME to display help information with the commands, by providing the associated text, related to the user action (e.g. menu selection).

Unless otherwise stated the following shall apply:

- The format of text to be displayed is designated by the ~~USIM/SIM~~(U)SIM and is either SMS default alphabet (packed or unpacked) or UCS2 alphabet.

- The format of the response from the ME is designated by the ~~USIM/SIM~~(U)SIM and is either keypad digit (0-9, *, #, +), SMS default alphabet characters or UCS2 alphabet characters.

6.3 ~~-~~ME Capability for support of bearer independent protocol

The ME supporting bearer independent protocol shall provide to the (U)SIM a common interface for any type of data bearer. This interface is in addition to dedicated commands (eg SMS, SS and USSD) for SAT/USAT application to exchange data with the network.

The communication is initiated by the (U)SIM. The ME negotiates with the (U)SIM and the network to establish the optimum channel considering the (U)SIM request, the network and ME capabilities.

The ME is responsible for maintaining and restoring the link should there be a link error.

7 SAT/USAT User Interface requirements

7.1 Data presentation requirements (e.g. Display)

In order to be able to create and operate applications with a homogeneous display(s) SAT/USAT shall fully control the display of all actions and all network-responses concerned with the operation of the application. SAT/USAT shall, upon completion/closure of the application, return full control to the ME.

The display of information shall be either in the form of text (i.e. alphanumeric characters) or in graphical form or both.

Optionally under user control the ME may display the individual actions/network responses.

7.2 Data acquisition requirements (e.g. Keypad)

In order to be able to create and operate applications with a homogeneous user interface SAT/USAT shall fully control the function associated with the user input for example via the keypad of the ME. Exceptions to this are keys which are "dedicated ME keys" such as the ON/OFF key. SAT/USAT shall, upon completion/closure of the application, return full control to the ME.

7.3 Access requirements (e.g. Menu)

A simple, powerful method for the user to access and interact with certain SAT/USAT applications shall be provided.

It shall be possible for the SAT/USAT-Application to set up a user interface (e.g. menu, icons) via the capabilities provided by the ME to allow the user to interact with a SAT/USAT application using, for example, the display and keypad.

7.4 Menu capability

7.4.1 Set up capability

The menu set up capability is a mechanism whereby the menu items (menu entries/structure etc.) required by the SAT/USAT is indicated to the ME by means of a proactive ~~USIM/SIM~~(U)SIM command(s). The menu set up capability is not directly available to the user. As an option this may include "help information" items.

7.4.2 Selection capability

The menu selection capability is a mechanism whereby the menu item selected by the user is indicated to the SAT/USAT by the ME via the ~~USIM/SIM~~(U)SIM interface. As an option this may include "help information" items.

7.5 Soft-key capability

The soft-key allocation capability is a mechanism whereby the ~~USIM/SIM~~(U)SIM indicates to the ME the text to be displayed and the SAT/USAT function which is to be assigned to a ME soft-key.

7.6 User control of the SAT/USAT execution environment

The user ~~shall~~may be able to ~~enable/disable~~control the SAT/USAT execution environment via the ME ~~as~~in accordance with the follow~~s~~ing cases:

i) the SAT/USAT execution environment is enabled/disabled

ii) the SAT/USAT execution environment is not allowed to make automatic calls

iii) the SAT/USAT execution environment is allowed to make automatic calls but only with user confirmation

iv) the SAT/USAT execution environment is allowed to make automatic calls without user confirmation.

In addition it shall be possible for the user to independently enable/disable the AT command feature.

~~The ME shall inform the SAT/USAT execution environment of the current status each time the status is changed and at power up.~~

Note that for ease of reading the term "automatic call" is used but this shall be taken to mean any network interaction initiated by SAT/USAT including SMS, USSD etc. but excluding user initiated interactions modified by SAT/USAT.

The user shall be notified by the ME if service access is prevented as the result of partially ~~or completely~~ disabling the SAT/USAT execution environment. It shall be possible to enable the SAT/USAT execution environment if service access has been prevented.

8 Network interface requirements

8.1 SAT/USAT SIM/Network interaction

SAT/USAT/Network interaction is required such that the SAT/USAT and the network can bi-directionally exchange data through the ME, employing any of the transport mechanisms defined in the section "SAT/USAT bearer requirements".

8.2 Communication control capability

The communication control capability is a mechanism whereby the use of communication resources is either initiated by the SAT/USAT application or modified by the SAT/USAT application subsequent to a user action. If supported by the ME, the ME shall, at the time of the user initiated communication request, inform the (U)SIM of the current cell location identity. The ~~USIM/SIM~~(U)SIM shall indicate to the ME if the presentation of information (display, tones etc.) shall be restricted to the explicit presentation of SAT/USAT supplied information or if it is required to present standard PLMN information (e.g. network responses) in addition to the SAT/USAT supplied information.

It shall be possible for:

- the ~~USIM/SIM~~(U)SIM to initiate and terminate a (~~USIM/SIM~~(U)SIM initiated) communication request with or without explicit confirmation by the user
- the ~~USIM/SIM~~(U)SIM to allow, bar or modify a communication request initiated by the user
- the ~~USIM/SIM~~(U)SIM to replace a user initiated communication request by another communication request (e.g. replace call request by an SS action etc.).

It shall be possible for the SAT/USAT serving environment to enable/disable the communication control capability. As an option, dependant on the subscribers subscription and the application, the user may enable/disable the communication control capability via a SAT/USAT serving environment and/or under the control of the Network Operator. The user shall be notified by the ME in case network service is lost as the result of disabling the communication control capability.

The communication control capability applies to all mobile originated requests independent of the applicable bearer service. Explicitly it applies to voice calls and to all services listed in the section "SAT/USAT bearer requirements" (e.g. SMS, supplementary service, circuit switched connection etc.) except for GPRS.

~~The source of the communication request shall be indicated to the network as defined in section "security, traceability requirements".~~

8.3 Service Interworking requirements

The SAT/USAT application shall be able to use all PLMN services and supplementary services (SS) including those functions available to the user via the standardized MMI (e.g. 2 SEND for Call Hold). Only the originator (i.e. either user or SAT/USAT application) of the action shall directly receive the results/responses of that action (e.g. network response to an SCI). Optionally under user control the ME may display the individual actions/responses.

9 SAT/USAT bearer requirements

9.1 Bearers supported

SAT/USAT shall support the transmission (mobile originated) and the reception (mobile terminated) of data by means of one of the following bearers, either using dedicated commands or managed by the ME (using the Bearer independent protocol) ;

BEARER	Dedicated commands	Bearer independent protocol
SMS	Yes	~~Yes~~No
CSD	No	Yes
GPRS	No	Yes
SS	Yes (MO only)	No
USSD	Yes (MO only)	No~~Yes~~
Cell Broadcast ~~(mobile originated excluded)~~ (only when the ME is connected to a GSM access network)	Yes (MT only)	No
SMS via GPRS	Yes	~~Yes~~No
Local Bearer (Bluetooth, IrDA, RS232, USB)	No	Yes

10 Charging requirements

It shall be possible to charge the subscriber for the use of SAT/USAT applications.

It shall be possible to charge for the following activities:-

- subscription:

  the subscriber's registration to use SAT/USAT services

- application transfer (download):

  the transfer of applications and/or information to a subscriber's SAT/USAT UE/MS

- application upgrading (download):

  the upgrading of previously transferred applications to a subscriber's SAT/USAT UE/MS

- application use:

  the use of applications by a subscriber's SAT/USAT UE/MS

- content:

  the provision of content within a SAT/USAT application

- roaming:

  the use of SAT/USAT applications by a subscriber when roaming

- transport:

  the use of a transport/bearer service (e.g. SMS)

11 Security requirements

The integrity of ~~the~~ the ~~USIM/SIM~~(U)SIM and existing security mechanisms shall not be compromised with the introduction of SAT/USAT services.

The security of the PLMN, the ~~USIM/SIM~~(U)SIM and the SAT/USAT applications shall not be able to be compromised by an external execution environment.

Applications running within an external execution environment are considered "non-trusted" until a secure authentication and identification procedure has been successfully performed. MExE is considered to be an external execution environment. MExE is not covered by this specification.

Applications designed using the features in this specification may require additional methods to provide additional data confidentiality, data integrity, and data sender validation, or any subset thereof.

11.1 Secure Environment requirements

A major aspect of the ~~USIM/SIM~~(U)SIM ~~card~~ is the security provided by the chip technology combined with the encryption and challenge/response procedures. The enhancement of the ~~USIM/SIM~~(U)SIM card by SAT/USAT shall not reduce nor endanger the current security. In addition, the SAT/USAT environment shall maintain (or improve) the same high levels of security. Adequate (future) measures shall be taken to ensure the fulfilment of this requirement also with future advances in technologies/services (either network-centric and/or UE/MS-centric).

12 ~~Traceability requirements~~Void

~~It shall be possible for the network operator to trace (i.e. identify) the source of following transactions:~~

- ~~Call set up;~~
- ~~Mobile initiated Short Messages;~~
- ~~GPRS session set up;~~
- ~~Control messages for Supplementary Services;~~
- ~~Mobile initiated USSD messages.~~

~~It shall be possible to differentiate between the following categories:~~

- ~~user initiated;~~
- ~~SAT/USAT initiated;~~
- ~~SAT/USAT modified,~~

~~and also to indicate the degree of user involvement:~~

- ~~confirmation by user;~~

- indication to user;

- no knowledge by user.

The SAT/USAT application ID shall be provided where applicable.

Note: traceability is required, for example, for customer care and charging purposes.

13 Roaming

Provided a roaming agreement for the necessary transport/bearer service(s) (e.g. SMS, GPRS) is currently valid, Tthen the SAT/USAT execution environment shall be supported when roaming providing a roaming agreement for the necessary transport/bearer service(s) (e.g. SMS, GPRS) is currently valid.

14 Interaction with supplementary services

14.1 General

This subclause defines the interaction between PLMN supplementary services and the SAT/USAT feature. PLMN supplementary services shall not have any knowledge of SAT/USAT based services.

14.2 Line Identification

14.2.1 Calling Line Identification Presentation (CLIP)

No interaction.

SAT/USAT shall be able to modify the calling number that is displayed to the user.

14.2.2 Calling Line Identification Restriction (CLIR)

No interaction.

14.2.3 Connected Line Identification Presentation (COLP)

No interaction.

SAT/USAT shall be able to modify the called number that is displayed to the user.

14.2.4 Connected Line Identification Restriction (COLR)

No interaction.

14.3 Call Forwarding

14.3.1 Call Forwarding Unconditional (CFU)

SAT/USAT shall be able to modify the forwarded to number entered by the user and displayed, upon interrogation, to the user.

14.3.2 Call Forwarding Busy (CFB)

SAT/USAT shall be able to modify the forwarded to number entered by the user and displayed, upon interrogation, to the user.

14.3.3 Call Forwarding on No Reply (CFNRy)

SAT/USAT shall be able to modify the forwarded to number entered by the user and displayed, upon interrogation, to the user.

14.3.4 Call Forwarding on Not Reachable (CFNRc)

SAT/USAT shall be able to modify the forwarded to number entered by the user and displayed, upon interrogation, to the user.

14.4 Call Completion

14.4.1 Call Hold (CH)

No interaction.

14.4.2 Call Waiting (CW)

No interaction.

14.5 Multi Party (MPTY)

SAT/USAT shall be able to modify the called number entered by the user.

14.6 Closed User Group (CUG)

No interaction.

14.7 Advice of Charge (AoC)

No interaction.

14.8 Call Barring

14.8.1 Barring of all outgoing calls

No interaction.

14.8.2 Barring of outgoing international calls

14.8.2.1 Mobile originated calls

No interaction.

14.8.2.2 Forwarded Calls

No interaction.

14.8.3 Barring of outgoing international calls except those directed to the HPLMN country

No interaction.

14.8.4 Barring of all incoming calls

No interaction.

14.8.5 Barring of incoming calls when roaming

No interaction.

14.9 Explicit Call Transfer (ECT)

SAT/USAT shall be able to modify the transfer number entered by the user.

14.10 Completion of Call to Busy Subscriber (CCBS)

SAT/USAT shall be able to modify the number displayed to the user.

14.11 Multiple Subscriber Profile (MSP)

No interaction.

15 Interaction with network features

All services available in the network shall continue to be offered and remain applicable in addition to SAT/USAT. This includes the basic services, supplementary services and network features.

15.1 Interactions with Operator Determined Barring (ODB)

15.1.1 Barring of all outgoing calls

No interaction.

15.1.2 Barring of all outgoing international calls

No interaction.

15.1.3 Barring of all outgoing international calls except those directed to the home PLMN country

No interaction.

15.1.4 Barring of outgoing calls when roaming outside the home PLMN country

No interaction.

15.1.5 Barring of outgoing premium rate calls

No interaction.

15.1.6 Barring of incoming calls

No interaction.

15.1.7 Barring of incoming calls when roaming outside the home PLMN country

No interaction.

15.1.8 Operator Specific Barring

No interaction.

15.1.9 Barring of Supplementary Services Management

No interaction.

15.2 Interactions with Optimal Routing (OR)

No interaction.

15.3 Interactions with MExE

~~As an option the menu set up/display may utilize a micro-browser functionality if provided by the ME.~~The SAT/USAT applications have the a~~A~~bility to launch a micro-browser (on a given URL and a given bearer) if provided by the ME.

15.4 Interactions with CAMEL

No interaction.

~~For interworking purposes SAT/USAT shall be able to include free formatted information in the call set up for MO calls (mobile originated calls) , MO-SMS (mobile originated SMS) and GPRS session set up. This information shall be forwarded transparently to a CAMEL CSE.~~

~~A CAMEL CSE shall be able to include free formatted information for MT calls (mobile terminated calls) that shall be forwarded transparently to the SAT/USAT.~~

16 Compatibility of SAT/USAT, ME~~UE/MS~~'s and applications

16.1 SAT/USAT Classification

Given the wide ranging hardware capabilities of ~~USIM/SIM~~(U)SIM ~~cards~~ and MEs, together with the development of SAT/USAT applications and applets, a SAT/USAT classification shall be supported to determine their respective capability and compatibility. The SAT/USAT classification shall apply both to ~~USIM/SIM~~(U)SIM ~~cards~~, MEs and applications and applets.

The objective is to:-

- classify the requirements of a SAT/USAT SIM card/applications and
- identify the commands and features supported by the ME

The development and maintenance of the SAT/USAT specification is done in accordance to the ETSI/3GPP release procedures. ~~.~~ I.e. annual releases of the specifications are done providing support for new commands and enhancements of existing commands. The annual Release may both contain commands that are mandatory for that Release and commands that are optional.

The classification of the optional commands and features in a given Release may be done with the concept of "Letter Classes". A Letter Class identifies a subset of functionality of the ~~Release which~~Release, which will provide the user, SAT/USAT serving environment and application writer with a consistent set of commands and features.

The concept of a SAT/USAT Letter Classes is introduced to help identify the ME, and the ~~USIM/SIM~~(U)SIM ~~card~~/SAT/USAT application compatibility within a given Release. The SAT/USAT Letter Class is distinct and unrelated to the existing PLMN UE/MS Classmark. The SAT/USAT Letter Classes are not used during capability negotiations, but are intended to assist in designing applications by provision of a means for an application designer to identify which combinations of SAT/USAT features are supported by the MEs. Capability negotiations between the ~~USIM/SIM~~(U)SIM and the ME are performed at the feature level, independent of the SAT/USAT Letter class.

In addition to classifying the ME as conforming to a specific Release and if applicable ~~a~~one or several Letter Classes within the release, an ME manufacturers declaration shall be provided. This shall indicate in detail the commands and features supported by the ME. Any conformance testing shall be performed in accordance to this declaration.

The support of a given Letter Class doesn't require the support of another Letter Class.

~~A given SAT/USAT ME classification identifies support by a SAT/USAT ME for a defined level of SAT/USAT functionality, but does not necessarily imply support of other levels of SAT/USAT classification.~~

SAT/USAT applications will be developed to execute on SAT/USAT UE/MS´s in one or more classifications. In order for SAT/USAT applications to be properly supported by a SAT/USAT UE/MS, the application shall be designated by the same classification of SAT/USAT UE/MS's on which they are intended to be executed.

16.2 ME/~~USIM/SIM~~(U)SIM operation

In the case of an ME not supporting SAT/USAT or not supporting a certain SAT/USAT feature the following shall apply:

- the ~~USIM/SIM~~(U)SIM shall control (i.e. allow or prevent) the access to the network.
  This allows the ~~USIM/SIM~~(U)SIM to prevent the use of a subscription (which may rely on the support of SAT/USAT features for correct operation) in an uncontrolled manner.
- if access to a PLMN is not prevented the ME shall support the non-SAT/USAT PLMN features without restriction.

16.3 ME/~~USIM/SIM~~(U)SIM capability information exchange

If supported, ~~T~~the ~~USIM/SIM~~(U)SIM and the ME shall exchange SAT/USAT capabilities when the card session is initiated. ~~prior to network attach.~~

This exchange of information is important since the ~~USIM/SIM~~(U)SIM then knows what the ME is capable of, and the ~~USIM/SIM~~(U)SIM can thus adapt the service made available to the user accordingly. If the ~~USIM/SIM~~(U)SIM does not receive any ME capability information it shall assume that the ME does not support SAT/USAT.

A ~~USIM/SIM~~(U)SIM that supports SAT/USAT shall not attempt to invoke SAT/USAT functions in the ME if the ME has not indicated SAT/USAT support.

An ME that supports SAT/USAT shall not attempt to invoke SAT/USAT functions in the ~~USIM/SIM~~(U)SIM if the ~~USIM/SIM~~(U)SIM has not indicated that SAT/USAT is supported and is active.

16.4 ME and ~~USIM/SIM~~(U)SIM compatibility

For compatibility testing the ME manufacturers shall provide a declaration of the Release and if applicable the Letter Class(es) supported by the ME including the detail of all commands and features supported by the ME. It can be envisaged that ME implementations will exist that are compliant to a given release and which support commands and features from later releases.

~~16.5 Management Control Category requirements~~

~~The management control category of an application specifies whether or not the subscriber/user is allowed to perform SAT/USAT application management functions e.g. download/activate/de-activate the application.~~

~~Two management control categories "mandatory" and "conditional" are defined.~~

~~16.5.1 Mandatory.~~

~~Management functions of mandatory applications are restricted to the operator.~~

~~Mandatory applications provide the means for the network operator~~

~~a) to provide and manage the SAT/USAT execution environment resources~~

~~b) to provide and manage (i.e. identify version, activate, de-activate, delete, modify, download etc.) mandatory services~~

~~c) to provide SAT/USAT applications, which are required, for example, for the fulfillment of the users subscription.~~

~~16.5.2 Conditional.~~

~~The following management functions of conditional applications shall be optionally made available to the subscriber/user:~~

- ~~identify version, activate, de-activate, delete, download~~

~~Modification of the application by the user is, however, explicitly not allowed.~~

~~17 Cross Phase compatibility with future Phases of SAT/USAT~~

~~Where different entities support different phases of SAT/USAT it shall operate at the highest common phase. The SAT/USAT phase 1 is the smallest common unit.~~

Annex A (informative): Change history

Change history											
TSG SA#	SA Doc.	SA1 Doc	Spec	CR	Rev	Rel	Cat	Subject/Comment	Old	New	WI
SA#05	SP99-434							Version 3.0.0 Approved		3.0.0	
SMG#30	SP99-434							Version 3.0.0 Approved		3.0.0	
SP-07	SP-000058	S1-000120	22.038	001		R99	D	USIM/SIM Application Toolkit, Service Description, Stage 1	3.0.0	3.1.0	
SP-07	SP-000152		22.038	002	1	R99	B	Addition requirements for bearer independent data transfer feature	3.0.0	3.1.0	
SP-08	SP-000196	S1-000432	22.038	003		R99	F	Deletion of note to non-existent TS	3.1.0	3.2.0	
SP-09	SP-000381	S1-000637	22.038	005		R4	D	Change of MExE name	3.2.0	4.0.0	
SP-10	SP-000541	S1-000862	22.038	007		Rel-5	B	LS on USAT local link mechanism and impact on TS 22.038	5.0.0	5.1.0	USAT1-LocLnk

Document History

Document history		
Date	**Version**	**Comment**
June 98	0.0.0	Initial draft based on MExE stage 1.
June 98	0.1.0	Output of SMG1/SMG9 joint ad hoc
August 98	0.2.0	Updated by editor reflecting discussion at joint ad hoc in June.
August 98	0.3.0	Output of SMG1/SMG9 joint ad hoc meeting
November 98	0.4.0	Output of SMG1/SMG9 joint ad hoc meeting
January 99	0.5.0	Output of SMG1/SMG9 joint ad hoc meeting
January 99	0.5.1	Improved output of SMG1/SMG9 joint ad hoc meeting, submitted to SMG1 for information, with recommendation to raise to Version 1.0.0.
March 99	1.0.0	Raised to Version 1.0.0 by SMG1 Plenary
May 99	1.0.1	Draft changes, interim output of SMG1/SMG9 ad hoc meeting.
May 99	1.1.0	Output of SMG1/SMG9 joint ad hoc meeting
May 99	1.1.1	Minor editorial changes only. Output of SMG1/SMG9 joint ad hoc meeting
June 99	1.1.2	Spelling and editorial corrections, changes agreed to by email after the 5th ad hoc
September 99	1.3.0	New version after S1 meeting
September 99	1.3.1	Final version for approval at TSG-SA Korea
October 99	2.0.0	Editorial clean-up for version 2.0.0
October 99	3.0.0	Stage 1 approved at SA#5, Kyongju, Korea
March 00	3.1.0	Inclusion of CRs at SA#07.
June 00	3.2.0	Inclusion of CRs at SA#08.
October 00	4.0.0	Inclusion of CRs at SA#09 to create Release 4 version.
January 01	4.1.0	Inclusion of CRs at SA#10.

TSG-SA WG1 #20 **S1-030466**

Seoul, Korea, 7th–11th April 2003 **Agenda Item:**

3GPP TSG-T3 Meeting #26 ***T3-030197-part3/3***

Lisbon, Portugal, 11-14 february 2003 *(updated S1-022351)*

CR-Form-v7

CHANGE REQUEST

⌘ **22.038** **CR** **011** ⌘ **1** ⌘ Current version: **5.2.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: UICC apps⌘ [X] ME [X] Radio Access Network [ ] Core Network [X]

Title:	⌘	Clean up of USAT requirements
Source:	⌘	T3
Work item code:	⌘	TEI
Date:	⌘	14/02/2003
Category:	⌘	**A**
Release:	⌘	REL-5

Use one of the following categories:
- ***F*** *(correction)*
- ***A*** *(corresponds to a correction in an earlier release)*
- ***B*** *(addition of feature),*
- ***C*** *(functional modification of feature)*
- ***D*** *(editorial modification)*

Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
Rel-4	*(Release 4)*
Rel-5	*(Release 5)*
Rel-6	*(Release 6)*

Reason for change:	⌘	Some of the requirements from USAT stage 1 have not been implemented in stage 3.
Summary of change:	⌘	Modifications or suppressions of some requirements
Consequences if not approved:	⌘	Inconsistency with other specifications

Clauses affected:	⌘	All

Other specs affected:	⌘	Y	N		⌘
		[ ]	[ ]	Other core specifications	
		[ ]	[ ]	Test specifications	
		[ ]	[ ]	O&M Specifications	

Other comments:	⌘	Related specification 31.111, 42.019

3G TS 22.038 V5.2.0 (2001-06)

Technical Specification

3rd Generation Partnership Project;
Technical Specification Group Services and System Aspects;
USIM ~~SIM/USIM~~ Application Toolkit (USAT~~/SAT~~); Service description;
Stage 1
(Release 5)

The present document has been developed within the 3rd Generation Partnership Project (3GPP ™) and may be further elaborated for the purposes of 3GPP.
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Foreword

This Technical Specification has been produced by the 3rd Generation Partnership Project (3GPP).

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

Version x.y.z

where:

- x the first digit:
  - 1 presented to TSG for information;
  - 2 presented to TSG for approval;
  - 3 or greater indicates TSG approved document under change control.
- y the second digit is incremented for all changes of substance, i.e. technical enhancements, corrections, updates, etc.
- z the third digit is incremented when editorial only changes have been incorporated in the document.

1 Scope

This ~~ETSI~~ 3GPP Technical Specification defines the stage one description of the ~~USIM/SIM~~USIM application Toolkit (~~SAT/~~USAT). Stage one is an overall service description, primarily from the subscriber's and serving environment's points of view, and does not deal with the details of the human interface itself.

This TS includes information applicable to network operators, serving environments and terminal, switch and database manufacturers.

This TS contains the core requirements for a ~~USIM/SIM~~USIM application Toolkit (~~SAT/~~USAT) which are sufficient to provide a complete service.

It is highly desirable however, that technical solutions for a ~~USIM/SIM~~USIM application Toolkit (~~SAT/~~USAT) ~~should be~~are sufficiently flexible to allow for possible enhancements. Additional functionalities not documented in this TS may implement requirements which are considered outside the scope of this TS. This additional functionality may be on a network-wide basis, nation-wide basis or particular to a group of users. Such additional functionality shall not compromise conformance to the core requirements of the service.

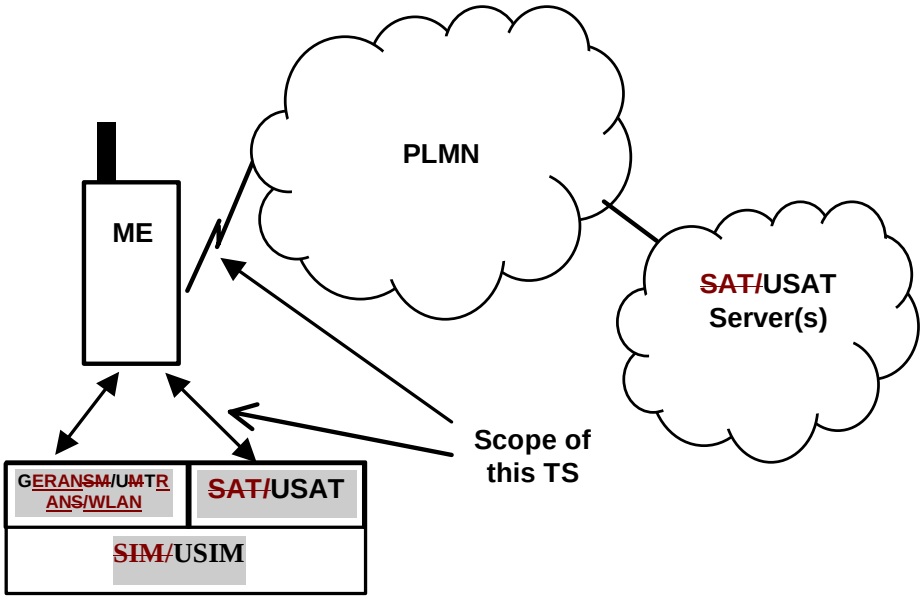

Figure 1: Scope of this TS

As indicated in Figure 1, the scope of this TS encompasses the ~~SAT/~~USAT functionality in the UE~~/MS~~ (comprising ~~USIM/SIM~~USIM and ME) and the interaction with ~~the PLMN~~the PLMN environment. The ~~SAT/~~USAT Server is not necessarily a separate entity as shown in the figure; nodes providing ~~SAT/~~USAT services may also exist within the PLMN. The functionalities of the ~~SAT/~~USAT servers (such as charging aspects, security level classification etc.) are not covered by this specification.

The requirements are considered to be applicable to both GSM and UMTS systems.

2 References

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

- References are either specific (identified by date of publication, edition number, version number, etc.) or non-specific.
- For a specific reference, subsequent revisions do not apply.
- For a non-specific reference, the latest version applies. In the case of a reference to a 3GPP document (including a GSM document), a non-specific reference implicitly refers to the latest version of that document *in the same Release as the present document*.

2.1 Normative references

~~[1] GSM 01.04 (ETR 350): Digital cellular telecommunications system (Phase 2+); Abbreviations and acronyms~~

[1] 3GPP TS 31.101: UICC-Terminal Interface; Physical and Logical Characteristics

[2] ~~GSM 02.48: Security mechanisms for the SIM Application Toolkit; Stage 1~~Void

[3] ~~GSM 03.48: Security Mechanisms for the SIM Aapplication toolkit; Stage 2~~Void

[4] ~~GSM 11.11: Specification of the Subscriber Identity Module - Mobile Equipment interface~~Void

[5] ~~GSM~~ 3GPP TS 11.14: Specification of the SIM Application Toolkit for the Subscriber Identity Module - Mobile Equipment interface.

[6] ~~GSM 02.19: Subscriber Identity Module Application Programming Interface (SIM API)~~Void

[7] 3GPP TR 21.905: "Vocabulary for 3GPP Specifications"

[8] 3GPP TS 24.008: Mobile radio interface Layer 3 specification; Core network protocols; Stage 3~~GSM 04.08: Mobile radio interface layer 3 specification~~

[9] ~~GSM~~ 3GPP TS 23.060~~03.60~~: General Packet Radio Service (GPRS) Service description; Stage 2~~GPRS service description stage 2~~

~~[10] GSM 03.64: GPRS overall description of the GPRS radio interface stage 2~~

[10] 3GPP TS 31.103: Characteristics of the ISIM Application

[11] ~~GSM 07.60: GPRS mobile station supporting GPRS~~3GPP TS 27.060: Packet domain; ~~-~~Mobile Station (MS) supporting Packet Switched services

[12] ~~GSM 02.90~~3GPP TS 22.090: Unstructured Supplementary Service Data (USSD) Stage 1~~&~~

[13] ~~GSM 03.90~~3GPP TS 23.090: Unstructured Supplementary Service Data (USSD) Stage 2

[14] 3GPP TS 31.111: USIM Application Toolkit (USAT)

[15] 3GPP TS 31.102: Characteristics of the USIM Application

3 Definitions and abbreviations

3.1 Definitions

For the purposes of this TS the following definitions apply:

applet: a small program that is intended not to be run on its own, but rather to be embedded inside another application

application: ~~SAT/~~USAT information in the form of software, applications, associated resources (e.g. libraries) and/or data

bearer independent protocol: Mechanism at the interface between the USIM and the ME which provide access to the data bearers supported by the ME.

buffer: A dedicated memory used to temporarily store data to be sent and/or retrieved.

content: data and/or information associated with, or independent of, a particular application which may be presented to or collected from a user

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

link: radio resource

~~SAT/~~USAT service: a service enhanced (or made possible) by ~~SAT/~~USAT technology

~~SAT/~~USAT execution environment: the ~~SAT/~~USAT execution environment provides the mechanisms to operate single or multiple ~~SAT/~~USAT-applications

~~SAT/~~USAT serving environment: an entity which delivers ~~SAT/~~USAT services to the subscriber. This is normally the PLMN operator, but could be an entity with ~~SAT/~~USAT responsibility (which may have been delegated by the PLMN operator)

~~SAT/~~USAT subscriber: the owner of a PLMN subscription who has entered into an agreement with a ~~SAT/~~USAT serving environment for ~~SAT/~~USAT services. Access to ~~SAT/~~USAT services though other types of networks is out of scope of this specification

~~SAT/~~USAT server: a node supporting ~~SAT/~~USAT services in the ~~SAT/~~USAT service environment

user: the user of a ~~SAT/~~USAT UE~~/MS~~ , who may or may not be the subscriber

(U)SIM: SIM and/or USIM.

3.2 Abbreviations

For the purposes of this TS the following abbreviations apply:

API	Application Programming Interface
CAMEL	Customized Applications for Mobile network Enhanced Logic
CS	Circuit Switched
CSE	CAMEL Service Environment
IN	Intelligent Network
ME	Mobile Equipment
MExE	Mobile Execution Environment
MMI	Man Machine Interface
~~MS~~	~~Mobile Station~~
NO	Network Operator
PLMN	Public Land Mobile Network
SAT	SIM Application Toolkit
SCI	Subscriber Controlled Input
SIM	Subscriber Identity Module

UE	User Equipment
USAT	USIM Application Toolkit
USIM	Universal Subscriber Identity Module

Further abbreviations are given in ~~GSM 01.04 [1] and~~ TS 21.905 [7].

4 Description

~~SAT/~~USAT provides a standardised execution environment for applications stored on the UICC~~USIM/SIM card~~ and the ability to utilize certain functions of the supporting mobile equipment. ~~SAT/~~USAT provides mechanisms which allow applications, existing in the ~~USIM/SIM~~UICC, to interact and operate with any ME which supports the specified mechanism(s) thus ensuring interoperability between a ~~USIM/SIM~~UICC and an ME, independent of the respective manufacturers and operators. A transport mechanism is provided enabling applications to be down-loaded and/or updated.

A significant aspect of ~~SAT/~~USAT is the highly secure environment provided by the UICC~~USIM/SIM card~~. This is further enhanced by the fact that the subscriber and the issuer of the UICC~~USIM/SIM~~ and also the ~~SAT/~~USAT applications have a "trusted relationship" (e.g. the subscriber trusts the issuer of the UICC~~card~~ to charge correctly for the resources used). This allows certain features, such as call control, to be implemented with a degree of freedom which would not be acceptable in a "non-trusted relationship".

The introduction of the ~~SAT/~~USAT execution environment into UE~~/MS~~s (i.e. ME+USIM~~/SIM~~) is a significant step forward in their evolution. The ability of UE~~/MS~~s to support ~~SAT/~~USAT represents an extension of the UE~~/MS~~'s and PLMN capabilities. In order to allow current and future technologies to exploit and benefit from this, a standardized means of exchanging the MEs' and USIM~~/SIM~~s capability profiles is supported.

This Technical Specification defines an enhancement of the ~~USIM/SIM(U)~~USIM/ME interface.

5 High level ~~SAT/~~USAT requirements

The high level requirements of ~~SAT/~~USAT are as follows:-

- provide the user with additional user interface functionalities to control and invoke services (e.g. menus, icons, etc.) ;
- to provide means for the user to personalize applications by means of parameters, if such parameters are made available by the application;
- provide support of a wide variety of applications;
- provide the means for ~~SAT/~~USAT to interact with the user via the input and output devices of the ME;
- the means to transfer applications automatically or on demand to the USIM~~/SIM~~ from a ~~SAT/~~USAT server, and upgrade existing applications via the PLMN;
- the means to transfer content automatically or on demand to or from the USIM~~/SIM~~ from or to a ~~SAT/~~USAT server;
- the means to transfer content directly from one ~~SAT/~~USAT application to a second UE~~/MS~~ with a ~~SAT/~~USAT application via the PLMN;
- the need for an inherent security architecture such that it shall be possible for both the ~~SAT/~~USAT and ~~SAT/~~USAT server sides of a connection to be authenticated (possibly implicitly by the use of digital signature or ciphering). The ~~SAT/~~USAT server shall maintain security of ~~subscribers~~subscribers' personal data and PLMN data;
- it shall be possible to charge subscribers for the use of PLMN or third party ~~SAT/~~USAT services;
- the means for ~~SAT/~~USAT applications on the USIM~~/SIM~~ to communicate with other PLMN nodes;

- the means for the ME and USIM~~/SIM~~ to exchange ~~SAT/~~USAT capability information;

- provision of ~~SAT/~~USAT API(s) to facilitate the development and downloading of ~~SAT/~~USAT applications;

- ~~Categorisation of applications in either "Mandatory" or "Conditional" shall allow application management. For conditional applications the means for the user to manage (i.e. identify version, delete, modify, save etc.) the applications and content on the SAT/USAT UE/MS shall be possible. Modification of the application by the user is, however, explicitly not allowed;~~

- It ~~shall~~may be possible for the user to activate and deactivate the USIM/SIM application execution environment; in this case the ME shall initiate a new USIM session.

- the means for the network operator to provide and manage the ~~SAT/~~USAT execution environment resources and also to provide and manage (i.e. identify version, activate, de-activate, delete, modify, download etc.) ~~those services of the management control class "mandatory";~~the applications;

- ~~the means to trace (e.g. for billing and customer care purposes) the source of origin of a particular communication activity;~~

- the means for the ~~SAT/~~USAT application to fully control the display of all actions and network-responses related to the operation of the application. Optionally under user control the ME may display the individual actions/responses;

- the means for the ~~SAT/~~USAT application to control the PLMN services/supplementary services and IP multimedia services via the standardized MMI. Only the originator (i.e. either user or ~~SAT/~~USAT application) of the action shall directly receive the results/responses of that action (e.g. network response to an SCI). Optionally under user control the ME may display the individual actions/responses.

- provide the user with additional user interface functionality to control and invoke IP multimedia services

Some of the above requirements are subsequently elaborated.

6 SAT/USAT/ME interface requirements

6.1 SAT~~/USAT~~ API~~s~~

The ~~SAT/USAT~~SIM-API is defined in ~~GSM~~3GPP TS ~~0~~4~~.0~~2.0~~1~~9 [6]. This API is valid for SAT and is referred to in this TS as SAT API.

The SAT~~/USAT~~ API for the ~~GSM USIM/~~SIM card shall allow application programmers easy access to the functions and data described in ~~GSM~~ 3GPP TS 51.011~~11.11~~ [4], ~~and GSM~~3GPP TS 11.14 [5], such that ~~USIM/~~SIM based services can be developed and loaded onto ~~USIM/~~SIMs (independent of the ~~USIM/~~SIM manufacturer), quickly and, if necessary, remotely, after the card has been issued. The SAT~~/USAT~~ API shall support pro-active functions as described in 3GPP TS ~~GSM~~ 11.14 [5] and transport functions as described in 3GPP TS 51.011 ~~GSM 11.11~~ [4].

6.2 ~~SAT/~~USAT proactive capability

The ~~SAT/~~USAT proactive capability is a mechanism whereby the UICC~~USIM/SIM~~ can request specific actions to be taken by the ME by issuing "proactive commands" thus establishing and maintaining an interactive dialogue with the user and/or communicating with the network or an external device.

The ME shall inform the UICC~~USIM/SIM~~ of the success or otherwise of each command issued to it by the UICC~~USIM/SIM~~, and also indicate the command details and if applicable add more specific information.

The proactive command set allows the ~~SAT/~~USAT to instruct the ME to:

1 display text supplied by the USAT~~/SAT~~ on the ME's display, with an indication of priority (normal or high), and a defined action (user activity or timeout) to terminate the text display.

2 display a text string and obtain the response in the form of a single user keystroke or a string of keys entered by the user and pass the response to the UICC~~USIM/SIM~~. If the response is designated as private by the UICC~~USIM/SIM~~ the ME shall not display the users response on the screen.

3 set up a voice call to an address with a specific priority as indicated by the UICC~~USIM/SIM~~ with all parameters indicated by the UICC~~SIM~~.

4 set up a data call to an address with specific bearer capability and priority, all parameters are indicated by the UICC~~USIM/SIM~~.

5 set up and manage a data channel (using a CSD, GPRS, SMS or USSD bearer) between the SIM and an address using information provided by the UICC~~SIM~~.

6 send data through a previously set up data channel. The UICC~~SIM~~ informs the ME if the data is to be sent immediately.

7 retrieve data from the ME that has previously been received via a data channel set up using (5) above. The UICC~~SIM~~ informs the ME as to how much data it expects to retrieve.

8 send a short message to the network. The short message text is supplied by the UICC~~USIM/SIM~~ to the ME in either packed or unpacked SMS 7-bit alphabet, or UCS2 alphabet.

9 send a SS control, SS MMI string or USSD string, indicating which alphabet is used where applicable.

10 play a tone in the appropriate audio device.

11 negotiate, within reasonable tolerances, a periodic "polling" of the USIM~~/SIM~~ Toolkit.

12 refresh the image (if applicable) of the USIM~~/SIM~~ data contained in the ME memory, either entirely, or partially, or instruct the ME to re-initialize completely.

13 set up an event list in the ME such that the UICC~~USIM/SIM~~ is informed by the ME when a ~~USIM/SIM~~ indicated event has occurred.

14 set up an additional menu in the ME, by issuing the ME with a menu list, and allow indication back to the UICC~~USIM/SIM~~ of the user selected menu item.

15 provide requested information from the ME to the UICC~~USIM/SIM~~, for example the MCC, MNC and IMEI.

16 communicate bi-directionally with an auxiliary device, e.g. a second card reader.

17 set up, refresh and interrogate several timers, and inform the UICC~~USIM/SIM~~ when these expire, within reasonable tolerances.

18 display additional MMI information such as display information or tones with commands that employ network resources, with an indication to the ME as to the required level of ME generated MMI as a result of the interaction with the network.

19 allow the ME to display help information with the commands, by providing the associated text, related to the user action (e.g. menu selection).

20 Provide indication from the ME to the ~~SAT/~~USAT when a key on the MMI has been pressed in a "~~"~~menu"~~"~~ (response to prompt) or and event (independent action) methods, with key identification. This indication shall be done in a secure manner.

Unless otherwise stated the following shall apply:

- The format of text to be displayed is designated by the UICC~~USIM/SIM~~ and is either SMS default alphabet (packed or unpacked) or UCS2 alphabet.

- The format of the response from the ME is designated by the UICC~~USIM/SIM~~ and is either keypad digit (0-9, *, #, +), SMS default alphabet characters or UCS2 alphabet characters.

6.3 ME Capability for support of bearer independent protocol

The ME supporting bearer independent protocol shall provide to the SIM a common interface for any type of data bearer. This interface is in addition to dedicated commands (eg SMS, SS and USSD) for SAT application to exchange data with the network.

The communication is initiated by the UICC~~SIM~~. The ME negotiates with the UICC~~SIM~~ and the network to establish the optimum channel considering the UICC~~SIM~~ request, the network and ME capabilities.

The ME is responsible for maintaining and restoring the link should there be a link error.

7 ~~SAT/~~USAT User Interface requirements

7.1 Data presentation requirements (e.g. Display)

In order to be able to create and operate applications with a homogeneous display(s) ~~SAT/~~USAT shall fully control the display of all actions and all network-responses concerned with the operation of the application. ~~SAT/~~USAT shall, upon completion/closure of the application, return full control to the ME.

The display of information shall be either in the form of text (i.e. alphanumeric characters) or in graphical form or both.

Optionally under user control the ME may display the individual actions/network responses.

7.2 Data acquisition requirements (e.g. Keypad)

In order to be able to create and operate applications with a homogeneous user interface ~~SAT/~~USAT shall fully control the function associated with the user input for example via the keypad of the ME. Exceptions to this are keys which are "dedicated ME keys" such as the ON/OFF key. ~~SAT/~~USAT shall, upon completion/closure of the application, return full control to the ME.

7.3 Access requirements (e.g. Menu)

A simple, powerful method for the user to access and interact with certain ~~SAT/~~USAT applications shall be provided.

It shall be possible for the ~~SAT/~~USAT-Application to set up a user interface (e.g. menu, icons) via the capabilities provided by the ME to allow the user to interact with a ~~SAT/~~USAT application using, for example, the display and keypad.

7.4 Menu capability

7.4.1 Set up capability

The menu set up capability is a mechanism whereby the menu items (menu entries/structure etc.) required by the ~~SAT/~~USAT is indicated to the ME by means of a proactive ~~USIM/SIM~~ command~~(s)~~. The menu set up capability is not directly available to the user. As an option this may include "help information" items.

7.4.2 Selection capability

The menu selection capability is a mechanism whereby the menu item selected by the user is indicated to the ~~SAT/~~USAT by the ME via the UICC-ME~~USIM/SIM~~ interface. As an option this may include "help information" items.

7.5 Soft-key capability

The soft-key allocation capability is a mechanism whereby the UICC~~USIM/SIM~~ indicates to the ME the text to be displayed and the ~~SAT/~~USAT function which is to be assigned to a ME soft-key.

7.6 User control of the SAT/USAT execution environment

The user may~~shall~~ be able to ~~enable/disable~~control the ~~SAT/~~USAT execution environment via the ME ~~as~~in accordance with the following cases:

i) the ~~SAT/~~USAT execution environment is enabled/disabled

ii) the ~~SAT/~~USAT execution environment is not allowed to make automatic calls

iii) the ~~SAT/~~USAT execution environment is allowed to make automatic calls but only with user confirmation

iv) the ~~SAT/~~USAT execution environment is allowed to make automatic calls without user confirmation.

In addition it shall be possible for the user to independently enable/disable the AT command feature.

~~The ME shall inform the SAT/USAT execution environment of the current status each time the status is changed and at power up.~~

Note that for ease of reading the term "automatic call" is used but this shall be taken to mean any network interaction initiated by ~~SAT/~~USAT including SMS, USSD etc. but excluding user initiated interactions modified by ~~SAT/~~USAT.

The user shall be notified by the ME if service access is prevented as the result of partially ~~or completely~~ disabling the ~~SAT/~~USAT execution environment. It shall be possible to enable the ~~SAT/~~USAT execution environment if service access has been prevented.

8 Network interface requirements

8.1 ~~SAT/~~USAT ~~SIM~~/Network interaction

~~SAT/~~USAT/Network interaction is required such that the ~~SAT/~~USAT and the network can bi-directionally exchange data through the ME, employing any of the transport mechanisms defined in the section "~~SAT/~~USAT bearer requirements".

8.2 Communication control capability

The communication control capability is a mechanism whereby the use of communication resources is either initiated by the ~~SAT/~~USAT application or modified by the ~~SAT/~~USAT application subsequent to a user action. If supported by the ME, the ME shall, at the time of the user initiated communication request, inform the UICC~~SIM~~ of the current cell location identity. The UICC~~USIM/SIM~~ shall indicate to the ME if the presentation of information (display, tones etc.) shall be restricted to the explicit presentation of ~~SAT/~~USAT supplied information or if it is required to present standard PLMN information (e.g. network responses) in addition to the ~~SAT/~~USAT supplied information.

It shall be possible for the UICC:

- ~~the USIM/SIM~~ to initiate and terminate a (UICC~~USIM/SIM~~ initiated) communication request with or without explicit confirmation by the user
- ~~the USIM/SIM~~ to allow, bar or modify a communication request initiated by the user
- ~~the USIM/SIM~~ to replace a user initiated communication request by another communication request (e.g. replace call request by an SS action etc.).

It shall be possible for the SAT/USAT serving environment to enable/disable the communication control capability. As an option, dependant on the subscribers subscription and the application, the user may enable/disable the communication

control capability via a SAT/USAT serving environment and/or under the control of the Network Operator. The user shall be notified by the ME in case network service is lost as the result of disabling the communication control capability.

The communication control capability applies to all mobile originated requests independent of the applicable bearer service. Explicitly it applies to voice calls and to all services listed in the section "SAT/USAT bearer requirements" (e.g. SMS, supplementary service, circuit switched connection etc.).

~~The source of the communication request shall be indicated to the network as defined in section "security, traceability requirements".~~

8.3 Service Interworking requirements

The ~~SAT/~~USAT application shall be able to use all PLMN services and supplementary services (SS) including those functions available to the user via the standardized MMI (e.g. 2 SEND for Call Hold). Only the originator (i.e. either user or ~~SAT/~~USAT application) of the action shall directly receive the results/responses of that action (e.g. network response to an SCI). Optionally under user control the ME may display the individual actions/responses.

9 ~~SAT/~~USAT bearer requirements

9.1 Bearers supported

~~SAT/~~USAT shall support the transmission (mobile originated) and the reception (mobile terminated) of data by means of one of the following bearers, either using dedicated commands or managed by the ME (using the Bearer independent protocol) ;

BEARER	Dedicated commands	Bearer independent protocol
SMS	Yes	~~Yes~~No
CSD	No	Yes
GPRS	No	Yes
SS	Yes (MO only)	No
USSD	Yes (MO only)	No
Cell Broadcast ~~(mobile originated excluded)~~) (only when the ME is connected to a GSM access network)	Yes (MT only)	No
SMS via GPRS	Yes	~~Yes~~No
Local Bearer (Bluetooth, IrDA, RS232, USB)	No	Yes

10 Charging requirements

It shall be possible to charge the subscriber for the use of ~~SAT/~~USAT applications.

It shall be possible to charge for the following activities:-

- subscription:

  the subscriber's registration to use ~~SAT/~~USAT services

- application transfer (download):

  the transfer of applications and/or information to a subscriber's ~~SAT/~~USAT UE~~/MS~~

- application upgrading (download):

  the upgrading of previously transferred applications to a subscriber's ~~SAT/~~USAT UE~~/MS~~

- application use:

  the use of applications by a subscriber's ~~SAT/~~USAT UE~~/MS~~

- content:

  the provision of content within a ~~SAT/~~USAT application

- roaming:

  the use of ~~SAT/~~USAT applications by a subscriber when roaming

- transport:

  the use of a transport/bearer service (e.g. SMS)

11 Security requirements

The integrity of ~~the~~ the ~~USIM/SIM(U)~~USIM and existing security mechanisms shall not be compromised with the introduction of ~~SAT/~~USAT services.

The security of the PLMN, the ~~USIM/SIM(U)~~USIM and the ~~SAT/~~USAT applications shall not be able to be compromised by an external execution environment.

Applications running within an external execution environment are considered "non-trusted" until a secure authentication and identification procedure has been successfully performed. MExE is considered to be an external execution environment. MExE is not covered by this specification.

Applications designed using the features in this specification may require additional methods to provide additional data confidentiality, data integrity, and data sender validation, or any subset thereof.

11.1 Secure Environment requirements

A major aspect of the UICC~~USIM/SIM card~~ is the security provided by the chip technology combined with the encryption and challenge/response procedures. The enhancement of the UICC ~~USIM/SIM card~~ by ~~SAT/~~USAT shall not reduce nor endanger the current security. In addition, the ~~SAT/~~USAT environment shall maintain (or improve) the same high levels of security. Adequate (future) measures shall be taken to ensure the fulfilment of this requirement also with future advances in technologies/services (either network-centric and/or UE~~/MS~~-centric).

12 ~~Traceability requirements~~ Void

~~It shall be possible for the network operator to trace (i.e. identify) the source of following transactions:~~

- ~~Call set up;~~
- ~~Mobile initiated Short Messages;~~
- ~~GPRS session set up;~~
- ~~Control messages for Supplementary Services;~~
- ~~Mobile initiated USSD messages.~~

~~It shall be possible to differentiate between the following categories:~~

- ~~user initiated;~~

~~- SAT/USAT initiated;~~

~~- SAT/USAT modified,~~

~~and also to indicate the degree of user involvement:~~

~~- confirmation by user;~~

~~- indication to user;~~

~~- no knowledge by user.~~

~~The SAT/USAT application ID shall be provided where applicable.~~

~~Note: traceability is required, for example, for customer care and charging purposes.~~

13 Roaming

Provided a roaming agreement for the necessary transport/bearer service(s) (e.g. SMS, GPRS) is currently valid, ~~T~~the ~~SAT/~~USAT execution environment shall be supported when roaming ~~providing a roaming agreement for the necessary transport/bearer service(s) (e.g. SMS, GPRS) is currently valid~~.

14 Interaction with supplementary services

14.1 General

This subclause defines the interaction between PLMN supplementary services and the ~~SAT/~~USAT feature. PLMN supplementary services shall not have any knowledge of ~~SAT/~~USAT based services.

14.2 Line Identification

14.2.1 Calling Line Identification Presentation (CLIP)

No interaction.

~~SAT/USAT shall be able to modify the calling number that is displayed to the user.~~

14.2.2 Calling Line Identification Restriction (CLIR)

No interaction.

14.2.3 Connected Line Identification Presentation (COLP)

No interaction.

~~SAT/USAT shall be able to modify the called number that is displayed to the user.~~

14.2.4 Connected Line Identification Restriction (COLR)

No interaction.

14.3 Call Forwarding

14.3.1 Call Forwarding Unconditional (CFU)

~~SAT/~~USAT shall be able to modify the forwarded to number entered by the user and displayed, upon interrogation, to the user.

14.3.2 Call Forwarding Busy (CFB)

~~SAT/~~USAT shall be able to modify the forwarded to number entered by the user and displayed, upon interrogation, to the user.

14.3.3 Call Forwarding on No Reply (CFNRy)

~~SAT/~~USAT shall be able to modify the forwarded to number entered by the user and displayed, upon interrogation, to the user.

14.3.4 Call Forwarding on Not Reachable (CFNRc)

~~SAT/~~USAT shall be able to modify the forwarded to number entered by the user and displayed, upon interrogation, to the user.

14.4 Call Completion

14.4.1 Call Hold (CH)

No interaction.

14.4.2 Call Waiting (CW)

No interaction.

14.5 Multi Party (MPTY)

~~SAT/~~USAT shall be able to modify the called number entered by the user.

14.6 Closed User Group (CUG)

No interaction.

14.7 Advice of Charge (AoC)

No interaction.

14.8 Call Barring

14.8.1 Barring of all outgoing calls

No interaction.

14.8.2 Barring of outgoing international calls

14.8.2.1 Mobile originated calls

No interaction.

14.8.2.2 Forwarded Calls

No interaction.

14.8.3 Barring of outgoing international calls except those directed to the HPLMN country

No interaction.

14.8.4 Barring of all incoming calls

No interaction.

14.8.5 Barring of incoming calls when roaming

No interaction.

14.9 Explicit Call Transfer (ECT)

~~SAT/~~USAT shall be able to modify the transfer number entered by the user.

14.10 Completion of Call to Busy Subscriber (CCBS)

~~SAT/~~USAT shall be able to modify the number displayed to the user.

14.11 Multiple Subscriber Profile (MSP)

No interaction.

15 Interaction with network features

All services available in the network shall continue to be offered and remain applicable in addition to ~~SAT/~~USAT. This includes the basic services, supplementary services and network features.

15.1 Interactions with Operator Determined Barring (ODB)

15.1.1 Barring of all outgoing calls

No interaction.

15.1.2 Barring of all outgoing international calls

No interaction.

15.1.3 Barring of all outgoing international calls except those directed to the home PLMN country

No interaction.

15.1.4 Barring of outgoing calls when roaming outside the home PLMN country

No interaction.

15.1.5 Barring of outgoing premium rate calls

No interaction.

15.1.6 Barring of incoming calls

No interaction.

15.1.7 Barring of incoming calls when roaming outside the home PLMN country

No interaction.

15.1.8 Operator Specific Barring

No interaction.

15.1.9 Barring of Supplementary Services Management

No interaction.

15.2 Interactions with Optimal Routing (OR)

No interaction.

15.3 Interactions with MExE

~~As an option the menu set up/display may utilize a micro browser functionality if provided by the ME.~~ The SAT/USAT applications have the the a~~A~~bility to launch a micro-browser (on a given URL and a given bearer) if provided by the ME.

15.4 Interactions with CAMEL

No interaction.

~~For interworking purposes SAT/USAT shall be able to include free formatted information in the call set up for MO calls (mobile originated calls) , MO SMS (mobile originated SMS) and GPRS session set up. This information shall be forwarded transparently to a CAMEL CSE.~~

~~A CAMEL CSE shall be able to include free formatted information for MT calls (mobile terminated calls) that shall be forwarded transparently to the SAT/USAT.~~

16 Compatibility of ~~SAT/~~USAT ME~~UE/MS~~'s and applications

16.1 ~~SAT/~~USAT Classification

Given the wide ranging hardware capabilities of UICCs~~USIM/SIM cards~~ and MEs, together with the development of ~~SAT/~~USAT applications and applets, a ~~SAT/~~USAT classification shall be supported to determine their respective capability and compatibility. The ~~SAT/~~USAT classification shall apply both to UICCs~~USIM/SIM cards~~, MEs and applications and applets.

The objective is to:-

- classify the requirements of a ~~SAT/~~USAT UICC~~SIM card~~/applications and
- identify the commands and features supported by the ME

The development and maintenance of the ~~SAT/~~USAT specification is done in accordance to the ETSI/3GPP release procedures. . I.e. annual releases of the specifications are done providing support for new commands and enhancements of existing commands. The annual Release may both contain commands that are mandatory for that Release and commands that are optional.

The classification of the optional commands and features in a given Release may be done with the concept of "Letter Classes". A Letter Class identifies a subset of functionality of the ~~Release which~~Release, which will provide the user, ~~SAT/~~USAT serving environment and application writer with a consistent set of commands and features.

The concept of a ~~SAT/~~USAT Letter Classes is introduced to help identify the ME, and the UICC~~USIM/SIM card~~/~~SAT/~~USAT application compatibility within a given Release. The ~~SAT/~~USAT Letter Class is distinct and unrelated to the existing PLMN UE~~/MS~~ Classmark. The ~~SAT/~~USAT Letter Classes are not used during capability negotiations, but are intended to assist in designing applications by provision of a means for an application designer to identify which combinations of ~~SAT/~~USAT features are supported by the MEs. Capability negotiations between the UICC~~USIM/SIM~~ and the ME are performed at the feature level, independent of the ~~SAT/~~USAT Letter C~~c~~lass.

In addition to classifying the ME as conforming to a specific Release and if applicable ~~a~~ one or several Letter Classes within the release, an ME manufacturers declaration shall be provided. This shall indicate in detail the commands and features supported by the ME. Any conformance testing shall be performed in accordance to this declaration.

The support of a given Letter Class doesn't require the support of another Letter Class.

~~A given SAT/USAT ME classification identifies support by a SAT/USAT ME for a defined level of SAT/USAT functionality, but does not necessarily imply support of other levels of SAT/USAT classification.~~

~~SAT/~~USAT applications will be developed to execute on ~~SAT/~~USAT UE~~/MS~~´s in one or more classifications. In order for ~~SAT/~~USAT applications to be properly supported by a ~~SAT/~~USAT UE~~/MS~~, the application shall be designated by the same classification of ~~SAT/~~USAT UE~~/MS~~'s on which they are intended to be executed.

16.2 ME/USIM~~/SIM~~ operation

In the case of an ME not supporting ~~SAT/~~USAT or not supporting a certain ~~SAT/~~USAT feature the following shall apply:

- the USIM~~/SIM~~ shall control (i.e. allow or prevent) the access to the network.
  This allows the USIM~~/SIM~~ to prevent the use of a subscription (which may rely on the support of ~~SAT/~~USAT features for correct operation) in an uncontrolled manner.
- if access to a PLMN is not prevented the ME shall support the non-~~SAT/~~USAT PLMN features without restriction.

16.3 ME/UICCUSIM/SIM capability information exchange

If supported, Tthe UICCUSIM/SIM and the ME shall exchange SAT/USAT capabilities when the card session is initiatedprior to network attach.

This exchange of information is important since the UICCUSIM/SIM then knows what the ME is capable of, and the UICCUSIM/SIM can thus adapt the service made available to the user accordingly. If the UICCUSIM/SIM does not receive any ME capability information it shall assume that the ME does not support SAT/USAT.

A UICCUSIM/SIM that supports SAT/USAT shall not attempt to invoke SAT/USAT functions in the ME if the ME has not indicated SAT/USAT support.

An ME that supports SAT/USAT shall not attempt to invoke SAT/USAT functions in the UICCUSIM/SIM if the UICCUSIM/SIM has not indicated that SAT/USAT is supported and is active.

16.4 ME and USIM/SIM compatibility

For compatibility testing the ME manufacturers shall provide a declaration of the Release and if applicable the Letter Class(es) supported by the ME including the detail of all commands and features supported by the ME. It can be envisaged that ME implementations will exist that are compliant to a given release and which support commands and features from later releases.

16.5 Management Control Category requirements

The management control category of an application specifies whether or not the subscriber/user is allowed to perform SAT/USAT application management functions e.g. download/activate/de-activate the application.

Two management control categories "mandatory" and "conditional" are defined.

16.5.1 Mandatory.

Management functions of mandatory applications are restricted to the operator.

Mandatory applications provide the means for the network operator

a) to provide and manage the SAT/USAT execution environment resources

b) to provide and manage (i.e. identify version, activate, de-activate, delete, modify, download etc.) mandatory services

c) to provide SAT/USAT applications, which are required, for example, for the fulfillment of the users subscription.

16.5.2 Conditional.

The following management functions of conditional applications shall be optionally made available to the subscriber/user:

- identify version, activate, de-activate, delete, download

Modification of the application by the user is, however, explicitly not allowed.

17 Cross Phase compatibility with future Phases of SAT/USAT

Where different entities support different phases of SAT/USAT it shall operate at the highest common phase. The SAT/USAT phase 1 is the smallest common unit.

Annex A (informative) : Change history

Document history		
Date	**Version**	**Comment**
June 98	0.0.0	Initial draft based on MExE stage 1.
June 98	0.1.0	Output of SMG1/SMG9 joint ad hoc
August 98	0.2.0	Updated by editor reflecting discussion at joint ad hoc in June.
August 98	0.3.0	Output of SMG1/SMG9 joint ad hoc meeting
November 98	0.4.0	Output of SMG1/SMG9 joint ad hoc meeting
January 99	0.5.0	Output of SMG1/SMG9 joint ad hoc meeting
January 99	0.5.1	Improved output of SMG1/SMG9 joint ad hoc meeting, submitted to SMG1 for information, with recommendation to raise to Version 1.0.0.
March 99	1.0.0	Raised to Version 1.0.0 by SMG1 Plenary
May 99	1.0.1	Draft changes, interim output of SMG1/SMG9 ad hoc meeting.
May 99	1.1.0	Output of SMG1/SMG9 joint ad hoc meeting
May 99	1.1.1	Minor editorial changes only. Output of SMG1/SMG9 joint ad hoc meeting
June 99	1.1.2	Spelling and editorial corrections, changes agreed to by email after the 5th ad hoc
September 99	1.3.0	New version after S1 meeting
September 99	1.3.1	Final version for approval at TSG-SA Korea
October 99	2.0.0	Editorial clean-up for version 2.0.0
October 99	3.0.0	Stage 1 approved at SA#5, Kyongju, Korea
March 00	3.1.0	Inclusion of CRs at SA#07.
June 00	3.2.0	Inclusion of CRs at SA#08.
October 00	4.0.0	Inclusion of CRs at SA#09 to create Release 4 version.
January 01	4.1.0	Inclusion of CRs at SA#10.

Change history

TSG SA#	SA Doc.	SA1 Doc	Spec	CR	Rev	Rel	Cat	Subject/Comment	Old	New	WI
SA#05	SP99-434							Version 3.0.0 Approved		3.0.0	
SMG#30	SP99-434							Version 3.0.0 Approved		3.0.0	
SP-07	SP-000058	S1-000120	22.038	001		R99	D	USIM/SIM Application Toolkit, Service Description, Stage 1	3.0.0	3.1.0	
SP-07	SP-000152		22.038	002	1	R99	B	Addition requirements for bearer independent data transfer feature	3.0.0	3.1.0	
SP-08	SP-000196	S1-000432	22.038	003		R99	F	Deletion of note to non-existent TS	3.1.0	3.2.0	
SP-09	SP-000381	S1-000637	22.038	005		R4	D	Change of MExE name	3.2.0	4.0.0	
SP-09	SP-000382	S1-000629	22.038	004		R5	B	Release 2000 features	3.2.0	5.0.0	
SP-10	SP-000541	S1-000862	22.038	007		Rel-5	B	LS on USAT local link mechanism and impact on TS 22.038	5.0.0	5.1.0	USAT1-LocLnk
SP-12	SP-010261	S1-010419	22.038	008		Rel-5	B	Indication of Key identification	5.1.0	5.2.0	USAT1