

3GPP2 C.S0035-0

Version 1.0

Date: October 21, 2002



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1 **Revision History**

2

<u>Revision</u>	<u>Description</u>	<u>Date</u>
C.P9018-0 v0.4	Release 0	November 8, 2001
C.S0035-0 v1.0	Initial Publication	October 21, 2002

3

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FOREWORD

1
2 This document contains the requirements for CDMA Card Application Toolkit (CCAT). It
3 extends the Card Application Toolkit [1]¹ to enable operation in [4/5/6]. CCAT is a set of
4 commands and procedures for use during the network operation phase of CDMA, in addition
5 to those defined in [13]. Specifying the interface is to ensure interoperability between an R-
6 UIM and an ME independently of the respective manufacturers and operators. CCAT will allow
7 Service Providers to offer unique services to their subscribers by placing applications they
8 have designed (or third party applications) on the R-UIM that would function on any particular
9 manufacture's ME that supports the Toolkit features.

10 These requirements are expressed as additions to current release of [1]. The composite CCAT
11 specification is comprised of [1] and this ancillary document.

12 As stated in [1], the UICC refers to an ICC that supports a Network Access Application. All
13 references to UICC in [1] shall be interpreted as R-UIM in this document.
14

¹ [] indicates the corresponding document to be cross referenced

REFERENCES

The following standards are referenced in this text. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. ANSI and TIA maintain registers of currently valid national standards published by them.

1. ETSI TS 102 223, *Smart Cards; Card Application Toolkit*, Release 4.
2. ANSI X3.4, *Information Systems – Coded Character Sets – 7-bit American National Standard Code*, 1986.
3. C.S0015-A, *Short Message Service (SMS) Standard for Wideband Spread Spectrum Systems*, 2002.
4. TIA/EIA/IS-95-A, *Mobile Station – Base Station Compatibility Standard for Dual-Mode Wideband Spread Spectrum Cellular Standards*, May 1995.
5. TIA/EIA/IS-95-B, *Mobile Station – Base Station Compatibility Standard for Dual-Mode Wideband Spread Spectrum Cellular Standards*, December 1998.
6. TIA/EIA/IS-41-D, *Cellular Radio-Telecommunications Intersystem Operations*, 1997.
7. ETSI TS 102 221, *Smart Cards; UICC – Terminal Interface; Physical and Logical Characteristics*, Release 4.
8. ETSI TS 151 011, *Digital cellular telecommunications system (Phase 2+); Specification of the Subscriber Identity Module – Mobile Equipment (SIM-ME) interface*, 3GPP TS 51.011 Release 4.
9. C.R1001-C, *Administration of Parameter Value Assignments for TIA/EIA Spread Spectrum Standards*, 2002.
10. ITU-T Recommendation E.212, *Identification Plan for Land Mobile Stations*, 1988.
11. ETSI TS 123 038, *Digital Cellular Telecommunications System (Phase 2+) (GSM); Universal Mobile Telecommunications System (UMTS); Alphabets and Language-Specific Information*, 3GPP TS 23.038 Release 4.
12. ETSI TS 122.016, *International Mobile Equipment Identities (IMEI)*, 3GPP TS 22.016 Release 4.
13. C.S0023-A, *Removable User Identity Module for Spread Spectrum Systems*, 2002.
14. C.S0017-0-2, *Data Service Options for Spread Spectrum Systems: cdma2000 High Speed Packet Data Service Option 33*, 2000.
15. IETF RFC 1962, *The PPP Compression Control Protocol (CCP)*, June 1996.

1 GENERAL

1.1 Terms

Base Station. A fixed station used for communicating with mobile stations. Depending upon the context, the term base station may refer to a cell, a sector within a cell, a MSC, an OTAF or other part of the wireless system. (See also MSC and OTAF).

Card Application Toolkit. A set of generic commands and procedures for use by the ICC, irrespective of the access technology of the network.

CAT. See Card Application Toolkit.

CCAT. See CDMA Card Application Toolkit.

CDMA Card Application Toolkit. A set of commands and procedures for use during the network operation phase of CDMA.

ICC. Integrated Circuit(s) Card.

IMEI. International Mobile Equipment Identity.

IMSI. See International Mobile Subscriber Identity.

International Mobile Equipment Identity. A method of identifying a mobile equipment in the land mobile service as specified in [10].

International Mobile Subscriber Identity. A method of identifying a subscriber in the land mobile service as specified in [12].

M/O. Mandatory / Optional.

MCC. Mobile Country Code.

ME. Mobile Equipment.

Min. Minimum.

MNC. Mobile Network Code.

MSC. Mobile Switching Center.

Network Identification. A number that uniquely identifies a network within a wireless system. See also System Identification.

NID. See Network Identification.

NITZ. Network Identity and Time Zone.

OTAF. See Over-the-Air Provisioning Function.

OTASP. See Over-the-Air Service Provisioning.

Over-the-Air Provisioning Function. A configuration of network equipment that controls OTASP functionality messaging protocols.

Over-the-Air Service Provisioning. A process of provisioning mobile station operational parameters over the air interface.

- 1 **RFU.** Reserved for Future Use.
- 2 **R-UIM.** Removable User Identity Module.
- 3 **SID.** See System Identification.
- 4 **Simple TLV.** A data object that consists of a tag of length one byte, a length indicator, which
5 gives the number of bytes in the value field and a value part of variable length.
- 6 **SMS.** Short Message Service.
- 7 **SMS-MO.** Short Message Service Mobile Originated.
- 8 **SMS-MT.** Short Message Service Mobile Terminated.
- 9 **SW1/SW2.** Status Word 1/Status Word 2.
- 10 **System Identification.** A number uniquely identifying a wireless system.
- 11 **Terminal Response.** This function is used to transfer from the Terminal to the UICC the
12 response to a previously fetched proactive command.
- 13 **TLV.** Tag Length Value.
- 14 **TPDU.** See Transfer Protocol Data Unit.
- 15 **Transfer Protocol Data Unit.** Command and response format used for communication
16 between the ME and R-UIM.
- 17 **UICC.** Universal ICC.
- 18

2 OVERVIEW OF CCAT

The overview of CCAT shall follow the definitions specified in the sections of [1] shown in Table 2-1.

Table 2-1 Overview of CCAT

Section of [1]	Title
4	Overview of CAT
4.2	Proactive UICC
4.3	Data download to UICC
4.4	Menu Selection
4.5	Call control by network access application
4.7	Event download
4.8	Security
4.9	Multiple card
4.10	Timer Expiration
4.11	Bearer Independent Protocol
4.12	Description of Access Technology Indicator mechanism
4.13	Tag allocation guidelines

2.1 PROFILE DOWNLOAD

The profile download instruction shall follow the definitions specified in the sections of [1] shown in Table 2.1-1.

Table 2.1-2 Profile Download

Section of [1]	Title
5	Profile Download
5.1	Procedure
5.2	Structure and coding of TERMINAL PROFILE
5.3	Definition of display parameters in Profile download

2.2 Structure and Coding of TERMINAL PROFILE

This section lists only CDMA specific bytes (e.g. Twentieth Byte) of the TERMINAL PROFILE. All other bytes of the TERMINAL PROFILE can be found in [1].

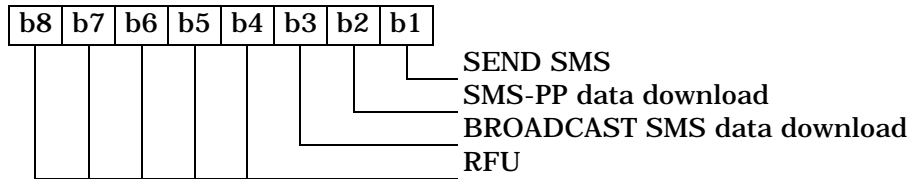
1 Profile:

2 Contents: The list of CAT facilities that are supported by the terminal.

3 Coding: 1 bit is used to code each facility.

- 4 - bit = 1: facility supported by terminal;
- 5 - bit = 0: facility not supported by terminal.

7 Twentieth byte (Proactive R-UIM):



8
9

3 PROACTIVE R-UIM

10 The proactive commands of the R-UIM shall follow the definitions specified in the sections of
11 [1] shown in Table 3-1.

12
13

Table 3-1 Proactive R-UIM

Section of [1]	Title
6	Proactive UICC
6.1	Introduction
6.2	Identification of terminal support
6.3	General procedure
6.4	Proactive UICC commands and procedures
6.5	Common elements in proactive UICC commands
6.6	Structure of proactive UICC commands
6.7	Command results
6.8	Structure of TERMINAL RESPONSE
6.9	Proactive UICC session and terminal display interaction
6.10	Handling of unknown, unforeseen and erroneous messages
6.11	Proactive commands versus possible terminal response

14

3.1 Proactive R-UIM Commands and Procedures

This section lists only proactive commands which contain CDMA specific parameters. All other proactive commands can be found in [1].

3.1.1 SEND SHORT MESSAGE

Two types are defined:

- a short message to be sent to the network in an SMS-SUBMIT message where the user data can be passed transparently;
- a short message to be sent to the network in an SMS-SUBMIT message where the text needs to be packed by the ME.

Where packing by the ME is not required, the CDMA SMS TPDU shall be coded as defined in [3]. The text length given by the R-UIM shall state the number of characters in the text string. The command details shall indicate “packing is not required”.

Where packing by the ME is required, the R-UIM shall use the “7-bit ASCII (ANSI X3.4)”, “IA5” or “GSM 7-bit default alphabet” as defined in [9] packed into 8-bit octets as defined in [11]. The text length given by the R-UIM shall state the number of characters in the text string. The ME shall pack the text string before submitting the message to the network. The command details shall indicate “packing is required”.

Optionally, the R-UIM may include in this command an alpha identifier. The use of this alpha identifier by the ME is described below.

- If the alpha identifier is provided by the R-UIM and is not a null data object, the ME shall use it to inform the user. This is also an indication that the ME should not give any other information to the user on the fact that the ME is sending a short message. If an icon is provided by the R-UIM, the icon indicated in the command may be used by the ME to inform the user, in addition to or instead of the alpha identifier, as indicated with the icon qualifier.
- If the alpha identifier is provided by the R-UIM and is a null data object (i.e. length = ‘00’ and no value part), this is an indication that the ME should not give any information to the user on the fact that the ME is sending a short message.
- If the alpha identifier is not provided by the R-UIM, the ME may give information to the user concerning what is happening.

If the ME is capable of SMS-MO, then it shall send the data as a Short Message TPDU to the destination address. The ME shall give the result to the R-UIM using TERMINAL RESPONSE (indicating successful or unsuccessful transmission of the Short Message) after receiving an SMS Acknowledgement Message from the network. If an alpha identifier was provided by the R-UIM, the ME should not give any information to the user at the reception of SMS Acknowledgement Message.

If the network unsuccessfully receives the Short Message TPDU, the ME shall inform the R-UIM using TERMINAL RESPONSE (network currently unable to process command). If a null alpha identifier was provided by the SIM, the ME should not give any information to the user at the unsuccessful network reception.

3.1.2 PROVIDE LOCAL INFORMATION

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

- location information: the mobile country code (MCC), 11th and 12th digits of IMSI (IMSI_11_12), system identification (SID), network identification (NID), base station identification (BASE_ID), longitude (BASE_LONG) and latitude (BASE_LAT) of the current base station;
- the ESN of the ME;
- the current date, time and time zone;
- the current ME language setting;
- the current access technology.

The ME shall return the requested local information, as stored in the ME, within a TERMINAL RESPONSE. Note, this information may not reflect the BASE_ID, BASE_LONG and BASE_LAT of the serving base station.

- When location information has been requested and no service is currently available, the ME shall return the data requested in the TERMINAL RESPONSE with the result "ME currently unable to process command - no service".
- When location information has been requested and the ME is on limited service (e.g. emergency calls only), the ME shall return the data requested in the TERMINAL RESPONSE with the result "Limited Service".

The ME shall return the current date and time as set by the user. If available, the ME shall also return the time zone from the network. If the time zone information is not available, the ME shall return 'FF' for this element.

3.2 Structure of Proactive R-UIM commands

This section only describes the structure of CDMA specific proactive commands. The structure all other proactive commands can be found in [1].

1 3.2.1 SEND SHORT MESSAGE

2

Description	Section	M/O	Min	Length
Proactive UICC command Tag	9.2 of [1]	M	Y	1
Length (A+B+C+D+E+F)	-	M	Y	1 or 2
Command details	5.1	M	Y	A
Device identities	8.7 of [1]	M	Y	B
Alpha identifier	8.2 of [1]	O	N	C
CDMA SMS TPDU	5.2	M	Y	E
Icon identifier	8.31 of [1]	O	N	F

3

4 3.2.2 PROVIDE LOCAL INFORMATION

5

Description	Section	M/O	Min	Length
Proactive UICC command Tag	9.2 of [1]	M	Y	1
Length (A+B)	-	M	Y	1 or 2
Command details	5.1	M	Y	A
Device identities	8.7 of [1]	M	Y	B

6

3.3 Structure of TERMINAL RESPONSE

3.3.1 Proactive Commands versus Possible Terminal Responses

This section lists only terminal responses to proactive commands defined in this section. All other terminal responses can be found in [1]. Table 3.3.1-1 shows for each proactive command the possible terminal response returned (marked by “•”).

Table 3.3.1-2 Proactive Commands versus Possible Terminal Responses

TERMINAL RESPONSE		PROACTIVE COMMAND	
		CDMA SEND SMS '13'	PRO- VIDE LOCAL INFO '26'
00	Command performed successfully	•	•
01	Command performed with partial comprehension	•	•
02	Command performed, with missing information	•	•
03	REFRESH performed with additional EFs read		
04	Command performed successfully, but requested icon could not be displayed	•	
05	Command performed, but modified by call control by		
06	Command performed successfully, limited service		•
07	Command performed with modification		
08	REFRESH performed but indicated NAA was not active		
10	Proactive UICC session terminated by the user		
11	Backward move in the proactive UICC session requested by the user		
12	No response from user		
13	Help information required by the user		
14	Reserved for 3GPP		
20	Terminal currently unable to process command	•	•
21	Network currently unable to process command	•	
22	User did not accept the proactive command		
23	User cleared down call before connection or network		
24	Action in contradiction with the current timer state		
25	Interaction with call control by NAA, temporary problem		
26	Launch browser generic error		
30	Command beyond ME's capabilities	•	•
31	Command type not understood by Terminal	•	•
32	Command data not understood by Terminal	•	•
33	Command number not known by Terminal	•	•
34	Reserved for 3GPP		
35	Reserved for 3GPP	•	
36	Error, required values are missing	•	•
37	Reserved for 3GPP		
38	Multiple Card command error		
39	Interaction with call/SM control by NAA, permanent	•	
3A	Bearer Independent Protocol error		
3B	Access Technology unable to process command		

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1

2 No text.

4 ENVELOPE COMMANDS

The envelope commands of the R-UIM shall follow the definitions specified in the sections of [1] shown in Table 4-1. This section lists only CDMA specific envelope commands.

Table 4-1 ENVELOPE Commands

Section of [1]	Title
7	ENVELOPE Commands
7.2	Menu Selection
7.3	Call Control by NAA
7.4	Timer Expiration
7.5	Event download

4.1 SMS-PP DATA DOWNLOAD

4.1.1 Procedure

If the service “data download via SMS-PP” is allocated and activated in the CDMA Service Table, then the ME shall follow the procedure below:

- When the ME receives a Short Message with:

Teleservice Identifier = Card Application Toolkit Protocol Teleservice (CATPT)

then the ME shall pass the message transparently to the R-UIM using the ENVELOPE (SMS-PP DATA DOWNLOAD) command as defined below:

- The ME shall not display the message, or alert the user of a short message waiting.
- The ME shall wait for an acknowledgement from the R-UIM.
- If the R-UIM responds with ‘90 00’, the ME shall acknowledge the receipt of the short message to the network using an SMS User Acknowledgement message.
- If the R-UIM responds with ‘93 00’, the ME shall either retry the command or send back an SMS User Acknowledgement message to the network with the User Response Code value indicating “CDMA Card Application Toolkit Busy”.
- If the R-UIM responds with ‘9F XX’, the ME shall use the GET RESPONSE command to retrieve the response data. The ME shall include the response data received from the R-UIM in the User Data field of the SMS User Acknowledgement message that it will send back to the network according to [3].
- If the ME has indicated in TERMINAL PROFILE that it supports the status word ‘9E XX’ and if the R-UIM responds with ‘9E XX’, the ME shall use the GET RESPONSE command to get the response data. The ME shall include the response data received from the R-UIM in the User Data field of the SMS User Acknowledgement message that

1 it will send back to the network according to [3]. The value of the User Response Code
2 of the SMS User Acknowledgement Message shall be "R-UIM data download error".

3
4 If the service "data download via SMS-PP" is neither allocated nor activated in the CDMA
5 Service Table and the ME receives a SMS Point-to-Point Message with Teleservice_ID = CATPT,
6 then the ME shall store the message in EF_{SMS} under DF_{CDMA}.

7 MEs not supporting CCAT shall store SMS Point-to-Point Messages in EF_{SMS} under DF_{CDMA}, as if
8 they were normal short messages.

9 4.1.2 Structure of ENVELOPE (SMS-PP DATA DOWNLOAD)

10 Direction: ME to R-UIM

11 The command header is specified in [1].

12 Command parameters/data:

Description	Section	M/O	Min	Length
SMS-PP DATA DOWNLOAD tag	9.1 of [1]	M	Y	1
Length (A+B)	-	M	Y	1 or 2
Device identities	8.7 of [1]	M	Y	A
CDMA SMS TPDU	5.2	M	Y	B

14
15 - Device identities: the ME shall set the device identities to:

16 Source: Network

17 Destination: R-UIM

18
19 Response parameters/data:

20 It is permissible for the R-UIM not to provide response data. If the R-UIM responds with '90 00'
21 then no response parameter shall be available, otherwise the R-UIM shall respond with '9F XX'
22 or '9E XX' and the following data is returned:

Byte(s)	Description	Length
1-X (X ≤ 128)	R-UIM Acknowledgement	X

4.2 CELL BROADCAST DATA DOWNLOAD

4.2.1 Procedure

If the service "data download via Broadcast SMS" is allocated and activated in the CDMA Service Table, then the ME shall follow the procedure below:

- When the ME receives a new Broadcast SMS message, the ME shall check the Service Category of the Broadcast SMS message.
- If the Service Category is CATPT, the ME shall pass the message transparently to the R-UIM using the ENVELOPE (BROADCAST SMS DATA DOWNLOAD) command defined below.
- The ME shall not display the message, or alert the user of a short message waiting.
- If the Service Category is not CATPT, then the ME shall determine if the message should be displayed, by following the procedures in [3].

The ME shall identify new Broadcast SMS messages by their message identifier and service category.

4.2.2 Structure of ENVELOPE (BROADCAST SMS DATA DOWNLOAD)

Direction: ME to R-UIM

The command header is specified in [1].

Command parameters/data:

Description	Section	M/O	Min	Length
BROADCAST SMS DATA DOWNLOAD tag	9.1 of [1]	M	Y	1
Length (A+B)	-	M	Y	1 or 2
Device identities	8.7 of [1]	M	Y	A
CDMA SMS TPDU	5.2	M	Y	B

- Device identities: the ME shall set the device identities to:

Source: Network

Destination: R-UIM

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1

2 No text.

5 SIMPLE-TLV DATA OBJECTS

The coding for SIMPLE-TLV data objects of the R-UIM shall follow the definitions specified in the section 8 of [1]. This section lists only CDMA specific SIMPLE-TLV data objects.

5.1 Command Details

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

Command number:

- Contents and coding: see Section 6.5.1 of [1].

Type of command:

- Contents:
 - the type of command specifies the required interpretation of the data objects which follow, and the required terminal procedure;
- Coding:
 - see section 9.4 of [1];

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

Command qualifier:

- Contents: Qualifiers specific to the command
- Coding:
 - SEND SHORT MESSAGE:
 - bit 1: 0 = packing not required;
 - 1 = SMS packing by the ME required;
 - bits 2-8: = RFU.
 - PROVIDE LOCAL INFORMATION:
 - '00' = Location information;
 - '03' = Date, time and time zone;
 - '04' = Language setting;

- 1 - '06' = Access technology;
- 2 - '07' = ESN of the ME;
- 3 - '08' to 'FF' = Reserved.

4 5.2 CDMA SMS TPDU

Byte(s)	Description	Length
1	CDMA SMS TPDU tag	1
2 to (Y-1)+2	Length (X)	Y
(Y-1)+3 to (Y-1)+X+2	CDMA SMS TPDU	X

6 The CDMA SMS TPDU is formatted as described in [3].

8 A CDMA SMS TPDU will have the following structure:

Byte(s)	Description	Length
(Y-1)+3	SMS_MSG_TYPE	1
One or more occurrences of the following segment:		
(Y-1)+4	PARAMETER_ID	1
(Y-1)+5	PARAMETER_LEN (Z)	1
(Y-1)+6 to (Y-1)+Z+5	Parameter Data	Z

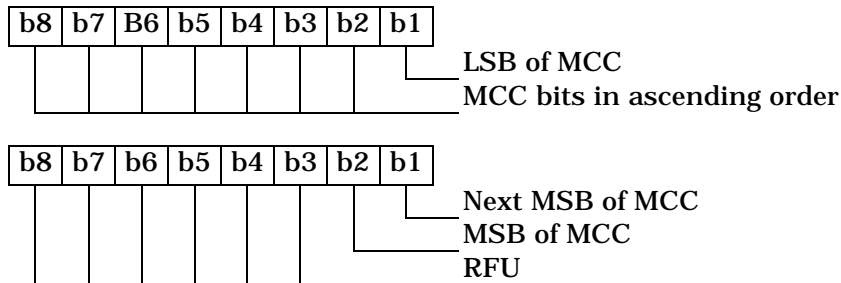
11 Note that the definition of CDMA SMS TPDU does allow multiple occurrences of the segment,
 12 which consists of "PARAMETER_ID", "PARAMETER_LEN" and "Parameter Data" as described
 13 in [3]. The number of repetitions of the aforementioned segment is determined by the Length
 14 and PARAMETER_LEN of each segment.

15 Refer to [3] for parameters needed for either SMS-Submit or SMS-Deliver messages.
 16
 17
 18

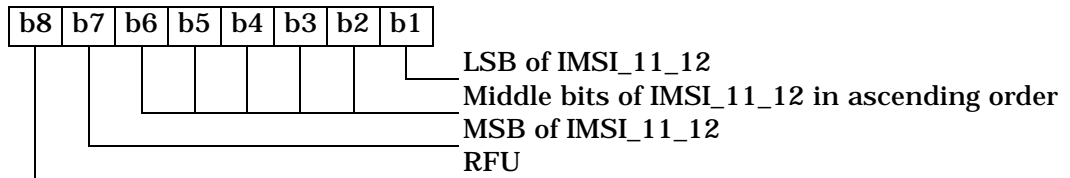
5.3 Location Information

Byte(s)	Description	Length
1	Location information tag	1
2	Length = '0F'	1
3 - 4	MCC	2
5	IMSI_11_12	1
6 - 7	SID	2
8 - 9	NID	2
10 - 11	BASE_ID	2
12 - 14	BASE_LAT	3
15 - 17	BASE_LONG	3

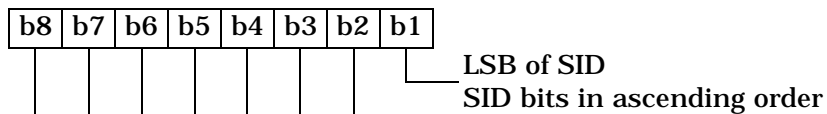
Bytes 3 - 4:

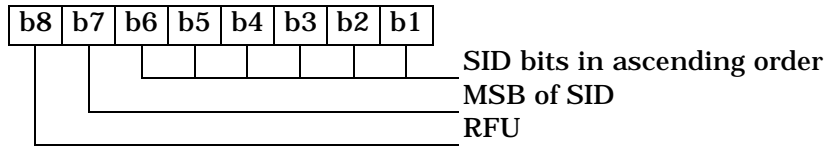


Byte 5:



Bytes 6 - 7:

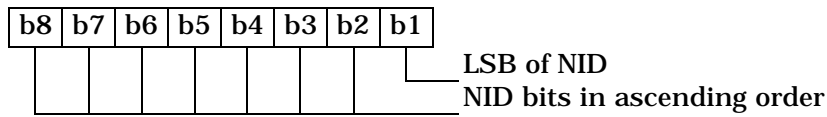




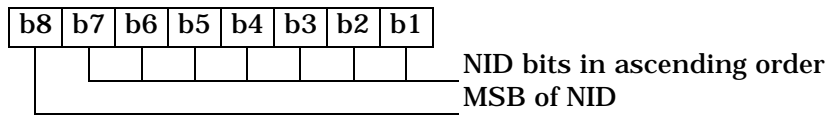
1

2 Bytes 8 - 9:

3



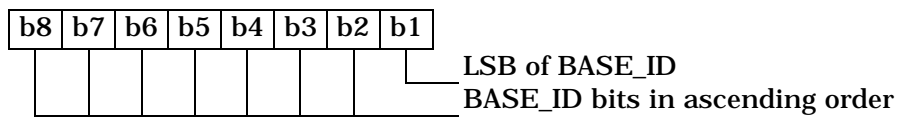
4



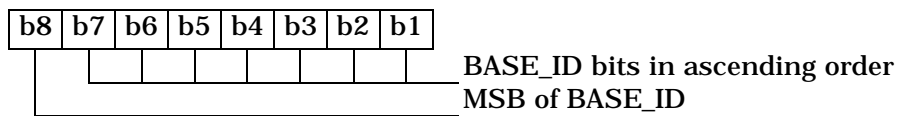
5

6 Bytes 10 - 11:

7



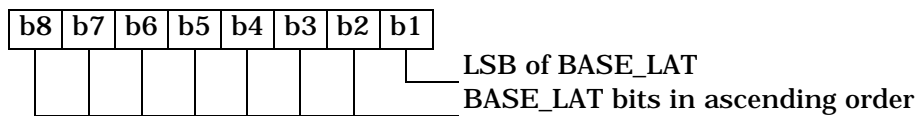
8



9

10 Bytes 12 - 14:

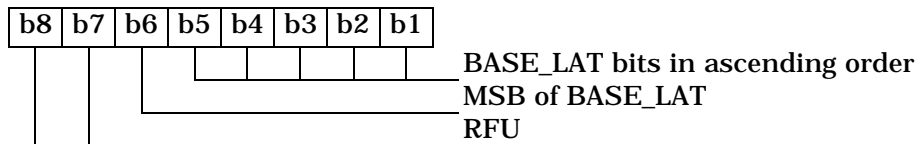
11



12



13



14

1 Bytes 15 – 17:

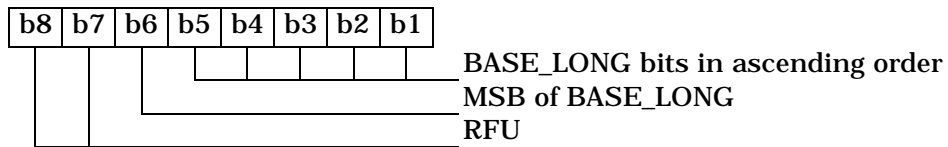
2



3



4



5

6 **5.4 CDMA Packet Data Bearer Parameters**

7

Byte(s)	Description	Length
1	CDMA Packet Data Bearer Parameters tag	1
2	PPP Payload Compression CCP Option	1
3	Length (X)	1
4 to (4+X-1)	QoS BLOB	X

8

9 The PPP Payload Compression CCP Option is coded as specified in [15]. The QoS BLOB coded
 10 as specified in section 2.2.9 of [14].

11

3GPP2 C.S0035-0

1

2 No text.

1 **6 TAG VALUES**

2 The tag values of the R-UIM shall follow the definitions specified in Section 9 of [1].

3

3GPP2 C.S0035-0

1

2 No text.

1 **7 ALLOWED TYPE OF COMMAND AND DEVICE IDENTITY COMBINATIONS**

2 The allowed types of commands and device identity combinations of the R-UIM shall follow the
3 definitions specified in Section 10 of [1].

4

3GPP2 C.S0035-0

1

2 No text.

1 **8 SECURITY REQUIREMENTS**

2 The security requirements of the R-UIM shall follow the definitions specified in Section 11 of
3 [1].

4

3GPP2 C.S0035-0

- 1
- 2 No text.

ANNEX A

Annex A of CCAT shall follow the annexes of [1] shown in Table A-1.

Table A-1 Overview of Annexes

Annex of [1]	Title
A	Support of CAT by Terminal Equipment
B	Example of DISPLAY TEXT Proactive UICC Command
C	Structure of CAT communications
D	Terminal display in proactive UICC session
E	Help information feature processing
F	Monitoring of events
G	Support of Multiple Card Operation
H	Multiple Card proactive command examples
I	Bearer independent protocol proactive command examples
J	WAP References
K	Use of CAT Bearer independent protocol for local links Bluetooth case
L	Bluetooth Service Discovery protocol
M	Use of CAT Bearer independent protocol for local links, server case

3GPP2 C.S0035-0

1

2 No Text

ANNEX B

Annex B gives an example of the Bearer independent protocol proactive command using CDMA packet data parameters.

ICC	Terminal	BS
-----	----------	----

OPEN CHANNEL

OPEN CHANNEL (immediate)
 Bearer description(PPP Payload Compression, QoS BLOB),
 Buffer size, Network Access Identifier,
 UICC/Terminal interface transport level (UDP, port *p*), data destination address) •

- Terminal Response (Channel identifier, link established, no further information, buffer size)
- ENVELOPE (Channel status event: Channel identifier, link established)

Origination (packet data service option) •
 • Channel Assignment

Service Request (QoS BLOB) •

• Service Connect (QoS BLOB)

• Service Connect Completion

• LCP Negotiation

•

• IPCP Negotiation
 (exchange user profile corresponding to Network Access Identifier) •

• CCP Negotiation
 (PPP Payload Compression) •

CLOSE CHANNEL

CLOSE CHANNEL(Channel identifier) •

- Terminal Response(OK)

Release •

• Release

RECEIVE DATA

- ENVELOPE (Data available)
- RECEIVE DATA (Channel Data length) •
- Terminal Response(Channel Data Length, Data<=Length)
- RECEIVE DATA (Channel Data length) •
- Terminal Response(Channel Data Length, Data<=Length)
- RECEIVE DATA (Channel Data length) •
- Terminal Response(Channel Data Length = 0, Data<=Length)

- Data (one complete SDU received)

1

SEND DATA 'Stored in Tx Buffer'

- SEND DATA (Store, Data) •
- Terminal Response(Channel Data length)
- SEND DATA (Store, Data) •
- Terminal Response(Channel Data length)
- SEND DATA (Immediate, Data) •
- Terminal Response(Channel Data length = 0)

Data •

GET CHANNEL STATUS

- GET CHANNEL STATUS •
- Terminal Response (Channel status)

1 Channel available

2

1

2 No text.