

Developer's Guide

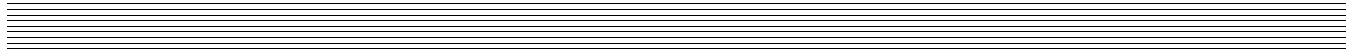
Motorola c18 AT Commands

98-08901C65-C





c18 AT Commands



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AT Commands

98-08901C65-C

REVISION HISTORY

Revision	Date	Description
O	June 2003	Initial Release
A	November 2003	Updates to existing AT commands Addition of new AT commands
B	February 2005	Updates to existing AT commands Addition of new AT commands Deletion of old AT commands
C	December 2005	New sections: "PRL Commands" on page 209, "Mobile IP" on page 294 and "Sleep Mode" on page 314
		Updates to existing AT Commands: "+CSS?", Serving System" on page 56, "+CSQ, Query Received Signal Quality" on page 141, "V, DCE Response Format" on page 171, "+MNAME" on page 198, "+MNAME2" on page 202, and "+MNAME3" on page 203
		Changes to notes that indicate relevance to product releases throughout chapter 4 on page 39

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1.1 SCOPE OF THIS MANUAL

This manual introduces the c18 AT commands, and describes how software developers can use these commands to communicate with the c18 device, and to create software applications that communicate with the c18 using these commands.

We at Motorola want to make this guide as helpful as possible. Keep us informed of your comments and suggestions for improvements.

You can reach us by email: CDMA support BAC018@email.mot.com or BAA068@email.mot.com.

1.2 WHO SHOULD USE THIS MANUAL

This manual is intended for software developers who communicate with the c18 device using the AT commands, and create applications to communicate with the c18 device using the AT commands.

1.3 APPLICABLE DOCUMENTS

c18 Cellular Engine Module Description – 98-08901C63-A

c18 Developer's Kit – 98-08901C64-A

1.4 TRADEMARKS

MOTOROLA and the Stylized M Logo are registered in the U.S. Patent and Trademark Office. All other product or service names are the property of their respective owners.

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1.5 HOW THIS MANUAL IS ORGANIZED

This manual contains the following chapters:

- **Chapter 1** contains this Preface.
- **Chapter 2** introduces the product features and provides a list of the AT commands.
- **Chapter 3** provides an introduction to the AT commands, and includes a general explanation of the command's format and usage.
- **Chapter 4** provides a reference to all the AT commands, including examples, where relevant.
- **Chapter 5** provides scenarios for applying various c18 functionality that include multi-command procedures.

PRODUCT FEATURES

The c18 is a CDMA 1x OEM that supports both AMPS and CDMA 1x technology. It is designed for integration in other devices, and provides advanced data features as well as outstanding voice capabilities.

The new c18 is extremely small in dimensions, yet packed with a host of highly-advanced features designed to facilitate fast and easy integration with OEM user products. It significantly shortens the development process for OEM developers, thanks to its wide range of built-in applications, and minimizes the product's time to market.

2.1 PRODUCT SPECIFICATIONS

Table 1. Product Specifications

Data Features	
CDMA 1X:	Packet data max BR 153.6 Kbps
CSD:	Max BR 14.4 Kbps
CDMA data:	<ul style="list-style-type: none">• IS707: Max BR 14.4 Kbps• IS95B: Max BR 64 Kbps
SMS:	<ul style="list-style-type: none">• MO/MT Text mode
FAX:	Class 2 Group 3
Voice Features	
Telephony	
Differential analog audio lines	
Vocoder 13K EVRC	
DTMF support	
Audio control: echo cancellation, noise suppression, side tone and gain control	
Supplementary Service	
USSD Phase II	
Call forwarding	
Call hold and multiparty	
Missed-call indicator	
AOC	
Call barring	
Emergency and Location	
FCC E911 Phase II Location Mandate using aGPS/AFLT	
Control/Status Indications	
Wakeup in	
Wakeup out	
AT Command Set	

Table 1. Product Specifications (*Continued*)

IS 707A AT commands
Motorola proprietary AT commands
Accessories
Firmware data loader
Data logger
Developer Kit



Note

Specifications are subject to change without prior notice.

2.2 c18 AT COMMANDS SUMMARY

Table 2, below, contains an alphabetical summary of all the c18 AT commands. It is followed by Table 3, page 16, which summarizes all the AT commands and is grouped by functionality.

Table 2. c18 AT Commands - Alphabetical

AT Command	Description	Page
\$QCCAV	This command provides a means to answer an incoming voice call using an AT command.	54
\$QCCLR	This command clears the mobile error log.	239
\$QCDMG	This command enables the transition to Diagnostics Monitor (DM) operation.	248
\$QCDMR	This command sets the Diagnostic Monitor (DM) baud rate.	246
\$QCMDR	This command sets the Medium Data Rate (MDR) (also known as HSPD) setting.	244
\$QCMIP	This command enables/disables Mobile IP functionality in the mobile.	252, 300
\$QCMIEP	This command enables/disables the currently active profile details.	303
\$QCMIPGETP	This command returns all the information corresponding to the particular profile number entered.	304
\$QCMIPHA	This command sets the IP addresses of the mobile's home address for the currently active profile.	313
\$QCMIPNAI	This command sets the NAI for the currently active profile.	305
\$QCMIPMASPI	This command sets the MN-AAA SPIs for the currently active profile.	309
\$QCMIPMASS	This command sets the MN-AAA shared secrets for the currently active profile.	307
\$QCMIPMHSPI	This command sets the MN-HA SPIs for the currently active profile.	310
\$QCMIPMHSS	This command sets the MN-HA shared secrets for the currently active profile.	308
\$QCMIPP	This command selects the MIP user profile to be active.	252, 301
\$QCMIPPHA	This command sets the IP addresses of the mobile's primary HA for the currently active profile.	311
\$QCMIPREG	This command configures the Mobile IP related parameters that are common to all the MIP user profiles currently saved inside the C-18's NVM.	299
\$QCMIPRT	This command sets the reverse tunneling for the currently active profile.	306
\$QCMIPSHA	This command sets the IP addresses of the mobile's secondary HA for the currently active profile.	312
\$QCMIPT	This command enables/disables the use of rfc2002bis authentication.	251, 302

Table 2. c18 AT Commands - Alphabetical (*Continued*)

AT Command	Description	Page
\$QCPKND	This command enables/disables automatic packet detection after a dial command.	258
\$QCQNC	This command enables/disables Quick Net Connect (QNC).	247
\$QCSCRM	This command enables/disables the mobile from SCRM'ing.	244
\$QCSO	This command sets the service option settings similar to CBST in GSM.	250
\$QCTRTL	This command enables/disables IS2000 mobiles from throttling the R-SCHF.	249
\$QCVAD	This command responds to a page message that has a voice service option with a page response that has a data service option.	259
&C	This command provides information about the state of the DCE communications channel.	145
&D	This command drops the DCE communications channel.	146
&F	This command causes the configuration stored in the phone to revert to the configuration specified by the manufacturer's factory default setting.	169
&V	This command dumps the status of all AT parameters.	169
+MMRR	This unsolicited message is sent to the TE by the SU if a master reset occurs, and master reset events reporting is enabled.	227
+CBC	This command allows an accessory to query the charge level of the battery.	147
+CCFC	This command controls the call forwarding supplementary service. Activation, deactivation, and status query are supported.	74
+CCLK	This command reads/sets the SU's current date and time settings.	113
+CCWA	This command shall enable/disable the Call Waiting notification unsolicited result code.	79
+CDV	This command dials voice calls.	55
+CFC	This command returns the interface fax compression.	233
+CGMI	This command requests the manufacturer's identification.	40
+CGMM	This command requests the model's identification.	40
+CGMR	This command requests the revision's identification.	42
+CGSN	This command returns the serial number of the product, in decimal format only.	43
+CHLD	This command controls call-related services, such as HOLD and MPTY.	75

Table 2. c18 AT Commands - Alphabetical (*Continued*)

AT Command	Description	Page
+CHUP	This command rejects an incoming call or hangs up a selected voice or data call, regardless of whether the accessory initiated the call.	51
+CHV	This command hangs up voice calls.	55
+CIEV	This command sends unsolicited messages when display indicator reporting is enabled by +CMER, and an indicator (for example, the Voice Mail icon) changes on the SU's display.	228
+CIMI	This command returns a text string that identifies the SU.	45
+CIMS	This command enables a terminal to set the MT2 active IMSI.	241
+CIND	This command enables an accessory to request the status of certain display indicators currently available in the SU.	58
+CKEV	This command sends unsolicited messages when local key press echo is enabled and a key is pressed on the SU keypad.	229
+CKPD	This command enables the emulated pressing of keys as if entered from the SU keypad or from a remote handset.	218
+CLCC	This command returns the list of current calls on the ME.	85
+CLIP	This command enables or disables the presentation of the CLI (Calling Line Identity) at the TE.	72
+CLIR	This command enables the calling subscriber to ask the network to query, enable or disable the presentation of the CLI of a MO call to the called party.	88
+CME	This command contains the codes that are returned for extended error status in response to a command that failed.	195
+CMEE	This command enables/disables the use of result code +CME ERROR: <err> as an indication of an error relating to the functionality of the SU.	197
+CMER	This command enables an external accessory to receive key press information from the SU internal keypad.	223
+CMGD	This command enables the accessory to delete messages from the preferred SU message storage <mem1> location <index>.	115
+CMGF	This command sets the type of input and output format of message to use.	120
+CMGL	This command enables the accessory to read a list of all SMS messages with status value <stat> from SU message storage <mem1>.	123
+CMGR	This command enables the accessory to read SMS messages from the SU.	127
+CMGW	This command stores a message to memory storage <mem2>.	133

Table 2. c18 AT Commands - Alphabetical (*Continued*)

AT Command	Description	Page
+CMS	This command contains the codes that are returned for extended error status in response to an SMS command that failed.	193
+CMSS	This command selects a pre-stored message from message storage <mem2> and sends it.	117
+CMTI	This command sends a message to the accessory upon receipt of an SMS message.	122
+CMUT	This command enable/disables muting during a voice call.	166
+CNMI	This command enables unsolicited notification of the accessory when an SMS message is received by the SU.	114
+CNUM	This command returns the numbers entered by the subscriber into “My Phone Numbers” using the Handset menu.	46
+COLP	This command gets and changes the current setting of the Calling Line Presentation.	78
+COPS	This command enables an application to query the current Carrier Name (which would be displayed if the standard display were attached).	140
+CPARM	This command gets/sets the cellular system parameters.	206
+CPAS	This command returns the activity status of the MT.	83
+CPBF	This command enables the accessory to search for a specified entry, by name, in the phone book.	103
+CPBR	This command recalls information from the phone book by location number.	99
+CPBS	This command selects the memory to be used for reading and writing entries.	98
+CPBW	This command enables a new entry from an accessory to be stored in the phone book, or an existing entry to be deleted from the phone book.	104
+CPMS	This command selects the memory storages <mem1>, <mem2>, and <mem3> to be used for various functions, such as reading or writing.	118
+CPRL1	This command sets or gets the PRL header parameters.	209
+CPRL2	This command enables the user to control the PRL acquisition table.	211
+CPRL3	This command enables the user to control the PRL System table.	214
+CRC	This command controls whether to present the extended format of an incoming call indication.	69
+CREG	This command enables/disables an unsolicited result code from network status registration.	138

Table 2. c18 AT Commands - Alphabetical (*Continued*)

AT Command	Description	Page
+CRING	This command generates a message whenever an incoming call (voice, data or fax) is indicated by the cellular network.	71
+CRTT	This command can play a cycle of a ring tone, stop this cycle in the middle and set a ring tone to be used from now forward to a specific alert field.	150
+CSCA	This GSM 07.05 command is used to update the Service Center Address. This field is required on GSM platform only.	136
+CSCS	This command selects the character set used on the SU.	44
+CSDH	This command controls whether detailed header information is shown in the text mode result code.	121
+CSMS	This command selects the message service and returns the types of messages that are supported by the ME.	117
+CSO	This command specifies the service to be requested for the next originated or terminated call.	62
+CSQ	This command returns the Signal Quality Measure <SQM> and the Frame Error Rate <FER>.	141
+CSS?	This command returns the kind of system with which the c18 is registered.	56
+CTTY	This command controls the TTY supplementary service.	241
+CVHU	This command hangs up the call that is currently in progress, regardless of whether the accessory initiated the call.	50
+EB	This parameter controls the behavior of the V.42 operation on the PSTN link (if present in the IWF).	194
+FAA	This command returns the adaptive answer parameter.	233
+FAP	This command returns the addressing and polling capabilities parameter.	233
+FBO	This command returns the Phase-C data-bit-order parameter.	233
+FBS	This command returns the buffer size parameter.	233
+FBU	This command returns the HDLC-frame-reporting parameter.	233
+FCC	This command returns the DCE-capabilities parameters.	233
+FCLASS	This command returns the service class selection parameter.	233
+FCQ	This command returns the copy-quality-checking parameter.	233

Table 2. c18 AT Commands - Alphabetical (*Continued*)

AT Command	Description	Page
+FCR	This command returns the cabability-to-receive parameter.	233
+FCS	This command returns the current-session results parameter.	233
+FCT	This command returns the DTE Phase-C timeout parameter.	233
+FEA	This command returns the Phase-C timeout parameter.	233
+FFC	This command returns the format-conversion parameter.	233
+FHS	This command returns the call-termination-status parameter.	233
+FIE	This command returns the procedure-interrupt-enable parameter.	233
+FIS	This command returns the current-session negotiation parameter.	233
+FKS	This command terminates the session.	233
+FLI	This command returns the local-ID-string parameter.	233
+FLO	This command returns the flow-control-select parameter.	233
+FLP	This command returns the indicate-document-to-poll parameter.	233
+FMI	This command requests the manufacturer's identification.	39
+FMM	This command requests the model's identification.	40
+FMR	This command requests the revision's identification.	42
+FMR	This command returns the revision identification.	42
+FMS	This command returns the minimum-Phase-C speed parameter.	233
+FNR	This command returns the negotiation-message-reporting control parameter.	233
+FNS	This command returns the nonstandard-frame FIF parameter.	233
+FPA	This command returns the selective polling address parameter.	233
+FPI	This command returns the local-polling-ID-string parameter.	233
+FPR	This command returns the serial-port-rate-control parameter.	233
+FPS	This command returns the page-status parameter.	233
+FPW	This command returns the password parameter for sending or polling.	233

Table 2. c18 AT Commands - Alphabetical (*Continued*)

AT Command	Description	Page
+FRY	This command returns the ECM-retry-value parameter.	233
+FSA	This command returns the subaddress parameter.	233
+FSP	This command returns the request-to-poll parameter.	233
+GCAP	This command enables the MT2 to transmit one or more lines of information text in a specific format, that permits the user to identify the minimum capabilities of the MT2.	144
+GMI	This command requests the manufacturer's identification.	39
+GMM	This command requests the model's identification.	40
+GMR	This command requests the revision's identification.	42
+GOI	This command causes the MT2 to transmit one or more lines of information text, determined by the manufacturer, which permits the MT2 user to identify the device, based on the ISO system for registering unique object identifiers.	247
+GSN	This command requests the MT2's serial number in HEX format.	43
+ICF	This parameter determines the local serial port start-stop (asynchronous) character framing that the MT2 uses while accepting TE2 commands, and while transmitting information text and result codes to the TE2.	240
+IFC	This parameter controls the local flow control between the TE2 and MT2 [1].	236
+ILRR	This parameter controls whether the extended-format information text is transmitted from the MT2 to the TE2.	239
+IPR	This parameter specifies the baud rate at which the MT2 accepts commands.	236
+MAFVL	This command allows the accessory to set the ringer and SU speaker volume levels to a fixed value and lock out the keypad volume control.	165
+MAID	This command returns the list of features available in the SU.	47
+MAMS	This command enables the host application to set the audio mode selection during a call.	163
+MAPC	This command sends an unsolicited message when asynchronous audio path change reporting is enabled and the audio path is changed.	162
+MAPS	This command sets and reports the radio's audio processing states.	158
+MAPTH	This command allows an accessory to determine the current audio path, and optionally to force the audio path to a particular setting (such as forcing hands-free mode).	164
+MAPV	This command returns the version of the accessory protocol that is supported in the SU.	49

Table 2. c18 AT Commands - Alphabetical (*Continued*)

AT Command	Description	Page
+MARD	This command enables and disables the auto-redial capability of the SU.	54
+MARS	This command reports when auto redial starts or ends, when auto redial reporting is enabled.	53
+MASS	This command enables/disables the reporting of hands-free audio start/stop messages.	157
+MAVL	This command enables an accessory to determine the current settings of all audio paths, as well as to change the setting of a particular path.	161
+MCHS	This private AT command reports radio's channel status.	224
+MCRS	This command changes and displays the current ring style.	154
+MCST?	This command queries the call processing state.	80
+MDBAD	This command sets/reads the auto-delete user preference setting in the date book database.	112
+MDBL	This command locks/unlocks the date book database. It is used primarily for synchronization of the date book with PIM (Personal Information Management) software	109
+MDBR	This command reads an entry or range of entries stored in the date book.	110
+MDBW	This command writes an entry to the date book.	107
+MDBWE	This command modifies event exception data for an entry in the date book.	106
+MEGA	This command updates the Email Gateway Address.	121
+MGCB	This command returns the current cellular band for which the radio is registered to.	226
+MHIG	This command allows an intelligent car kit to indicate the ignition state of the vehicle to the SU.	218
+MHMN	This command returns radio's home network name.	217
+MIPERR	This command returns an extended error report when Mobile IP session is failed.	294
+MKPD	This command enables the accessories to control the press and release of key presses.	222
+MLCK	This command locks the phone after the appropriate unlock code has been provided.	167
+MLKC	This unsolicited message is sent when the asynchronous phone lock status change event reporting is enabled and the phone lock status is changed.	226

Table 2. c18 AT Commands - Alphabetical (*Continued*)

AT Command	Description	Page
+MMAR	This command enables the accessory to change the <stat> of an SMS message in SU memory location <index>, preferred message storage <mem1>, from “REC UNREAD” to “REC READ”.	133
+MMDL	This command enables the accessory to request a mute/un-mute of the downlink audio paths.	160
+MMGL	This command enables the accessory to read a list of all SMS messages with status value <stat> from SU message storage <mem1>. This command differs from +CMGL in that no change is made to the read status of the message(s).	125
+MMGR	This command enables the accessory to read SMS messages from the SU. This command differs from +CMGR in that no change is made to the read status of the message.	130
+MMTC	This command sends an unsolicited message when asynchronous microphone mute status change reporting is enabled, and the microphone mute status is changed.	159
+MNAM	This command gets/sets the NAM parameters.	198
+MNAM2	This command gets/sets the NAM2 parameters.	202
+MNAM3	This command gets/sets the NAM3 parameters.	203
+MODE	This command selects an operating mode on the selected serial connection.	237
+MOON	This command enables the accessory to obtain information about the current operating mode of the SU.	243
+MPBF	This command enables the accessory to search for a specific entry, by name, in the phone book. It differs from +CPBF in that it also returns extra fields that are unique to Motorola phones.	104
+MPBFN	This command allows the accessory to search in the phone book for a particular entry, by phone number.	93
+MPBR	This command recalls phone entries from the phone book by location number.	100
+MPBSC	This command reads an entry from the phone book via scrolling.	90
+MPBSCS	This command selects the sort order (alphabetical, by index, and so on) for phone book scroll operations.	92
+MPBVR	This command reads global data, model data or voice data for a phone book entry(ies).	94
+MPBVW	This command writes global data, model data or voice data for phone book entry(ies).	96
+MPBW	This command enables a new entry from an accessory to be stored in the phone book, or an existing entry to be deleted from the phone book. It differs from +CPBW in that it also accepts the input of extra fields.	105

Table 2. c18 AT Commands - Alphabetical (*Continued*)

AT Command	Description	Page
+MPDPM	This command reads the percentage of shared dynamic memory used in the phone book and date book.	49
+MPIN	This command enables the accessory application to unlock the phone when the appropriate unlock code has been provided.	167
+MSCTS	This command controls the CTS behavior and deactivates it when the unit is in sleep mode.	321
+MSSI?	This command requests signal strength information.	52
+MUPB	This command sends the output when a phone book entry is accessed or modified by the user or an accessory.	229
+MVMN	This command enables the user to change the voice mail number of the phone.	52
+SNAM	Selects/reads the current active NAM to which the NAM data will be written/retrieved using AT+MNAM [x].	205
+VTD	This command sets the value of an integer <duration>, which defines the length of tones emitted as a result of the +VTS command.	156
+VTS	This command allows the transmission of a list of specified DTMF tones.	154
A	This command answers an incoming call after a RING/+CRING notification, placing the ME into the appropriate mode as indicated by the +CRING message.	68
AT&W	This command stores 3 parameter values into the NV and stores the current configuration as user's profile (0 or 1). It updates the setting and stores it in the NMV.	182
AT&Y	This function selects power up configuration as user's profile (0 or 1). It stores the settings in the NVM.	192
ATS24	This command activates/disables the sleep mode.	319
ATS99	This command sets the value of the delay before sending data to DTE.	320
ATS100	The S-Reg S100 is used to avoid frequent wakeup interrupts and low throughput.	321
CLCK	This command locks, unlocks or queries an ME or network facility <fac>.	59
D/DV	This command places a fax/data/voice call on the current network.	63
D>	This command places a fax/data/voice call on the current network by dialing directly from the ME phone book.	65
DL	This command places a data/voice call to the last number dialed.	67
DS	This command retrieves a dial number from the user profile stored in the memory.	64

Table 2. c18 AT Commands - Alphabetical (*Continued*)

AT Command	Description	Page
E	This command determines whether the TA echoes characters received from the TE during command state and on-line state.	174
H	This command hangs up a single mode call.	67
L	This command monitors the speaker volume.	231
M	This command monitors the speaker mode.	232
P	This command selects pulse dialing.	233
Q	This command enables/disables the DCE to transmit result codes to the DTE	173
S0	This S-parameter controls the automatic answering feature for the voice/data calls to the SU.	177
S10	This register is used by the IWF to determine the maximum time to remain connected to the PSTN line after detecting the absence of a received line signal.	181
S11	This register provides the DTMF tone duration and spacing.	182
S3	This register returns the carriage return character.	178
S4	This register provides the response formatting/line feed code character.	178
S5	This register provides the backspace character.	179
S6	This register pauses before blind dialing.	179
S7	This register is used by the IWF to time-out a PSTN data call connection and send a NO CARRIER result code on the U _m interface.	180
S8	This register is used by the IWF in multi-stage dialing to time the period of the “,” dial modifier.	180
S9	This register is used by the IWF as the period in which to detect a PSTN segment carrier and return carrier detection signaling to the phone.	181
V	This command returns the DCE response format.	171
X	This command selects the result codes and monitors the call progress.	176
Z	This register resets the phone to the default configuration.	182

The following list contains a summary of all the c18 AT commands, sorted according to functionality.

Table 3. c18 AT Commands - Functionality

AT Command	Description	Page
Modem ID		
Subscriber Unit Identity		
+GMI	This command requests the manufacturer's identification.	39
+FMI	This command requests the manufacturer's identification.	39
+CGMI	This command requests the manufacturer's identification.	40
+GMM	This command requests the model's identification.	40
+FMM	This command requests the model's identification.	40
+CGMM	This command requests the model's identification.	40
+GMR	This command requests the revision's identification.	42
+CGMR	This command requests the revision's identification.	42
+FMR	This command requests the revision's identification.	42
+CGSN	This command returns the serial number of the product, in decimal format only.	43
+GSN	This command requests the MT2's serial number in HEX format.	43
+CSCS	This command selects the character set used on the SU.	44
+CIMI	This command returns a text string that identifies the SU.	45
+CNUM	This command returns the numbers entered by the subscriber into "My Phone Numbers" using the Handset menu.	46
Capability Reporting		
+MAID	This command returns the list of features available in the SU.	47
+MAPV	This command returns the version of the accessory protocol that is supported in the SU.	49
+MPDPM	This command reads the percentage of shared dynamic memory used in the phone book and date book.	49

Table 3. c18 AT Commands - Functionality (*Continued*)

AT Command	Description	Page
Call Control		
Call Control Messages		
+CCWA	This command shall enable/disable the Call Waiting notification unsolicited result code.	79
+CSO	This command specifies the service to be requested for the next originated or terminated call.	62
+CVHU	This command hangs up the call that is currently in progress, regardless of whether the accessory initiated the call.	50
+CHUP	This command rejects an incoming call or hangs up a selected voice or data call, regardless of whether the accessory initiated the call.	51
+MVMN	This command enables the user to change the voice mail number of the phone.	52
+MSSI?	This command requests signal strength information.	52
+MARS	This command reports when auto redial starts or ends, when auto redial reporting is enabled.	53
+MARD	This command enables and disables the auto-redial capability of the SU.	54
\$QCCAV	This command provides a means to answer an incoming voice call using an AT command.	54
+CHV	This command hangs up voice calls.	55
+CDV	This command dials voice calls.	55
+CSS?	This command returns the kind of system with which the c18 is registered.	56
+CIND	This command enables an accessory to request the status of certain display indicators currently available in the SU.	58
CLCK	This command locks, unlocks or queries an ME or network facility <fac>.	59
+CSO	This command specifies the service to be requested for the next originated or terminated call.	62
D/DV	This command places a fax/data/voice call on the current network.	63
DS	This command retrieves a dial number from the user profile stored in the memory.	64
D>	This command places a fax/data/voice call on the current network by dialing directly from the ME phone book.	65

Table 3. c18 AT Commands - Functionality (*Continued*)

AT Command	Description	Page
DL	This command places a data/voice call to the last number dialed.	67
H	This command hangs up a single mode call.	67
A	This command answers an incoming call after a RING/+CRING notification, placing the ME into the appropriate mode as indicated by the +CRING message.	68
+CRC	This command controls whether to present the extended format of an incoming call indication.	69
+CRING	This command generates a message whenever an incoming call (voice, data or fax) is indicated by the cellular network.	71
+CLIP	This command enables or disables the presentation of the CLI (Calling Line Identity) at the TE.	72
+CCFC	This command controls the call forwarding supplementary service. Activation, deactivation, and status query are supported.	74
+CHLD	This command controls call-related services, such as HOLD and MPTY.	75
+COLP	This command gets and changes the current setting of the Calling Line Presentation.	78
Call Status Messages		
+MCST?	This command queries the call processing state.	80
+CPAS	This command returns the activity status of the MT.	83
+CLCC	This command returns the list of current calls on the ME.	85
Additional Call Processing Controls		
+CLIR	This command enables the calling subscriber to ask the network to query, enable or disable the presentation of the CLI of a MO call to the called party.	88
Phone and Date Books		
Directory Access Commands (Phone Book)		
+MPBSC	This command reads an entry from the phone book via scrolling.	90
+MPBSCS	This command selects the sort order (alphabetical, by index, and so on) for phone book scroll operations.	92
+MPBFN	This command allows the accessory to search in the phone book for a particular entry, by phone number.	93

Table 3. c18 AT Commands - Functionality (*Continued*)

AT Command	Description	Page
+MPBVR	This command reads global data, model data or voice data for a phone book entry(ies).	94
+MPBVW	This command writes global data, model data or voice data for phone book entry(ies).	96
+CPBS	This command selects the memory to be used for reading and writing entries.	98
+CPBR	This command recalls information from the phone book by location number.	99
+MPBR	This command recalls phone entries from the phone book by location number.	100
+CPBF	This command enables the accessory to search for a specified entry, by name, in the phone book.	103
+MPBF	This command enables the accessory to search for a specific entry, by name, in the phone book. It differs from +CPBF in that it also returns extra fields that are unique to Motorola phones.	104
+CPBW	This command enables a new entry from an accessory to be stored in the phone book, or an existing entry to be deleted from the phone book.	104
+MPBW	This command enables a new entry from an accessory to be stored in the phone book, or an existing entry to be deleted from the phone book. It differs from +CPBW in that it also accepts the input of extra fields.	105
Date Book Access Commands		
+MDBWE	This command modifies event exception data for an entry in the date book.	106
+MDBW	This command writes an entry to the date book.	107
+MDBL	This command locks/unlocks the date book database. It is used primarily for synchronization of the date book with PIM (Personal Information Management) software	109
+MDBR	This command reads an entry or range of entries stored in the date book.	110
+MDBAD	This command sets/reads the auto-delete user preference setting in the date book database.	112
System Date and Time Access Commands		
+CCLK	This command reads/sets the SU's current date and time settings.	113

Table 3. c18 AT Commands - Functionality (*Continued*)

AT Command	Description	Page
SMS		
SMS Commands		
+CNMI	This command enables unsolicited notification of the accessory when an SMS message is received by the SU.	114
+CMGD	This command enables the accessory to delete messages from the preferred SU message storage <mem1> location <index>.	115
+CMSS	This command selects a pre-stored message from message storage <mem2> and sends it.	117
+CSMS	This command selects the message service and returns the types of messages that are supported by the ME.	117
+CPMS	This command selects the memory storages <mem1>, <mem2>, and <mem3> to be used for various functions, such as reading or writing.	118
+CMGF	This command sets the type of input and output format of message to use.	120
+MEGA	This command updates the Email Gateway Address.	121
+CSDH	This command controls whether detailed header information is shown in the text mode result code.	121
+CMTI	This command sends a message to the accessory upon receipt of an SMS message.	122
+CMGL	This command enables the accessory to read a list of all SMS messages with status value <stat> from SU message storage <mem1>.	123
+MMGL	This command enables the accessory to read a list of all SMS messages with status value <stat> from SU message storage <mem1>. This command differs from +CMGL in that no change is made to the read status of the message(s).	125
+CMGR	This command enables the accessory to read SMS messages from the SU.	127
+MMGR	This command enables the accessory to read SMS messages from the SU. This command differs from +CMGR in that no change is made to the read status of the message.	130
+MMAR	This command enables the accessory to change the <stat> of an SMS message in SU memory location <index>, preferred message storage <mem1>, from "REC UNREAD" to "REC READ".	133
+CSCA	This GSM 07.05 command is used to update the Service Center Address. This field is required on GSM platform only.	136
+CMGW	This command stores a message to memory storage <mem2>.	133

Table 3. c18 AT Commands - Functionality (*Continued*)

AT Command	Description	Page
Network Service		
Network Service Commands		
+CREG	This command enables/disables an unsolicited result code from network status registration.	138
+COPS	This command enables an application to query the current Carrier Name (which would be displayed if the standard display were attached).	140
+CSQ	This command returns the Signal Quality Measure <SQM> and the Frame Error Rate <FER>.	141
Hardware Information		
Hardware Information Commands		
+GCAP	This command enables the MT2 to transmit one or more lines of information text in a specific format, that permits the user to identify the minimum capabilities of the MT2.	144
&C	This command provides information about the state of the DCE communications channel.	145
&D	This command drops the DCE communications channel.	146
+CBC	This command allows an accessory to query the charge level of the battery.	147
Audio Control Commands		
Audio Tone Commands		
+CRTT	This command can play a cycle of a ring tone, stop this cycle in the middle and set a ring tone to be used from now forward to a specific alert field.	150
+MCRS	This command changes and displays the current ring style.	154
+VTS	This command allows the transmission of a list of specified DTMF tones.	154
+VTD	This command sets the value of an integer <duration>, which defines the length of tones emitted as a result of the +VTS command.	156
+MA Audio Control Commands		
+MASS	This command enables/disables the reporting of hands-free audio start/stop messages.	157
+MAPS	This command sets and reports the radio's audio processing states.	158

Table 3. c18 AT Commands - Functionality (*Continued*)

AT Command	Description	Page
+MMTC	This command sends an unsolicited message when asynchronous microphone mute status change reporting is enabled, and the microphone mute status is changed.	159
+MMDL	This command enables the accessory to request a mute/un-mute of the downlink audio paths.	160
+MAVL	This command enables an accessory to determine the current settings of all audio paths, as well as to change the setting of a particular path.	161
+MAPC	This command sends an unsolicited message when asynchronous audio path change reporting is enabled and the audio path is changed.	162
+MAMS	This command enables the host application to set the audio mode selection during a call.	163
+MAPTH	This command allows an accessory to determine the current audio path, and optionally to force the audio path to a particular setting (such as forcing hands-free mode).	164
+MAFVL	This command allows the accessory to set the ringer and SU speaker volume levels to a fixed value and lock out the keypad volume control.	165
+CMUT	This command enable/disables muting during a voice call.	166
Access		
Access Control Commands		
+MLCK	This command locks the phone after the appropriate unlock code has been provided.	167
+MPIN	This command enables the accessory application to unlock the phone when the appropriate unlock code has been provided.	167
Modem Configuration and Profiles (S-registers)		
Modem Register Commands		
&F	This command causes the configuration stored in the phone to revert to the configuration specified by the manufacturer's factory default setting.	169
&V	This command dumps the status of all AT parameters.	169
AT&W	This command stores 3 parameter values into the NV.	182
V	This command returns the DCE response format.	171
Q	This command enables/disables the DCE to transmit result codes to the DTE	173

Table 3. c18 AT Commands - Functionality (*Continued*)

AT Command	Description	Page
E	This command determines whether the TA echoes characters received from the TE during command state and on-line state.	174
X	This command selects the result codes and monitors the call progress.	176
S0	This register disables automatic answering, and enables automatic answering after (Value - 1) × 6 sec.	177
S3	This register returns the carriage return character.	178
S4	This register provides the response formatting/line feed code character.	178
S5	This register provides the backspace character.	179
S6	This register pauses before blind dialing.	179
S7	This register is used by the IWF to time-out a PSTN data call connection and send a NO CARRIER result code on the U _m interface.	180
S8	This register is used by the IWF in multi-stage dialing to time the period of the “,” dial modifier.	180
S9	This register is used by the IWF as the period in which to detect a PSTN segment carrier and return carrier detection signaling to the phone.	181
S10	This register is used by the IWF to determine the maximum time to remain connected to the PSTN line after detecting the absence of a received line signal.	181
S11	This register provides the DTMF tone duration and spacing.	182
Z	This register resets the phone to the default configuration.	182
Error Handling Commands		
+CMS	This command contains the codes that are returned for extended error status in response to an SMS command that failed.	193
+EB	This parameter controls the behavior of the V.42 operation on the PSTN link (if present in the IWF).	194
+CME	This command contains the codes that are returned for extended error status in response to a command that failed.	195
+CMEE	This command enables/disables the use of result code +CME ERROR: <err> as an indication of an error relating to the functionality of the SU.	197
MNAM Programming		
+MNAM	This command gets/sets the NAM parameters.	198

Table 3. c18 AT Commands - Functionality (*Continued*)

AT Command	Description	Page
+MNAME	This command gets/sets the NAME parameters.	202
+MNAME3	This command gets/sets the NAME3 parameters.	203
+SNAM	Selects/reads the current active NAME to which the NAME data will be written/retrieved using AT+MNAME [x].	205
+CPARM		
+CPARM	This command gets/sets the cellular system parameters.	206
PRL Commands		
+CPRL1	This command sets or gets the PRL header parameters.	209
+CPRL2	This command enables the user to control the PRL acquisition table.	211
+CPRL3	This command enables the user to control the PRL System table.	214
User Interface		
+MH Handset Status/Control		
+MCHS	This private AT command reports radio's channel status.	224
MGCB	This command returns the current cellular band for which the radio is registered to.	226
+MHMN	This command returns radio's home network name.	217
+MHIG	This command allows an intelligent car kit to indicate the ignition state of the vehicle to the SU.	218
+CKPD	This command enables the emulated pressing of keys as if entered from the SU keypad or from a remote handset.	218
+MKPD	This command enables the accessories to control the press and release of key presses.	222
+CMER	This command enables an external accessory to receive key press information from the SU internal keypad.	223
Unsolicited UI Status Messages		
+MLKC	This unsolicited message is sent when the asynchronous phone lock status change event reporting is enabled and the phone lock status is changed.	226
+MMRR	This unsolicited message is sent to the TE by the SU if a master reset occurs, and master reset events reporting is enabled.	227

Table 3. c18 AT Commands - Functionality (*Continued*)

AT Command	Description	Page
+CIEV	This command sends unsolicited messages when display indicator reporting is enabled by +CMER, and an indicator (for example, the Voice Mail icon) changes on the SU's display.	228
+CKEV	This command sends unsolicited messages when local key press echo is enabled and a key is pressed on the SU keypad.	229
+MUPB	This command sends the output when a phone book entry is accessed or modified by the user or an accessory.	229
NOP Compatible		
"Ignored" (Compatible Only) Commands		
L	This command monitors the speaker volume.	231
M	This command monitors the speaker mode.	232
P	This command selects pulse dialing.	233
Fax		
Fax Commands		
+CFC	This command returns the interface fax compression.	233
+FKS	This command terminates the session.	233
+FIE	This command returns the procedure-interrupt-enable parameter.	233
+FIS	This command returns the current-session negotiation parameter.	233
+FLI	This command returns the local-ID-string parameter.	233
+FLO	This command returns the flow-control-select parameter.	233
+FLP	This command returns the indicate-document-to-poll parameter.	233
+FMS	This command returns the minimum-Phase-C speed parameter.	233
+FNR	This command returns the negotiation-message-reporting control parameter.	233
+FNS	This command returns the nonstandard-frame FIF parameter.	233
+FPA	This command returns the selective polling address parameter.	233
+FPI	This command returns the local-polling-ID-string parameter.	233
+FPR	This command returns the serial-port-rate-control parameter.	233

Table 3. c18 AT Commands - Functionality (*Continued*)

AT Command	Description	Page
+FPS	This command returns the page-status parameter.	233
+FPW	This command returns the password parameter for sending or polling.	233
+FRY	This command returns the ECM-retry-value parameter.	233
+FSA	This command returns the subaddress parameter.	233
+FSP	This command returns the request-to-poll parameter.	233
+FHS	This command returns the call-termination-status parameter.	233
+FFC	This command returns the format-conversion parameter.	233
+FEA	This command returns the Phase-C timeout parameter.	233
+FCT	This command returns the DTE Phase-C timeout parameter.	233
+FCS	This command returns the current-session results parameter.	233
+FCR	This command returns the cabability-to-receive parameter.	233
+FCQ	This command returns the copy-quality-checking parameter.	233
+FCC	This command returns the DCE-capabilities parameters.	233
+FBU	This command returns the HDLC-frame-reporting parameter.	233
+FBS	This command returns the buffer size parameter.	233
+FBO	This command returns the Phase-C data-bit-order parameter.	233
+FAP	This command returns the addressing and polling capabilities parameter.	233
+FAA	This command returns the adaptive answer parameter.	233
+FCLASS	This command returns the service class selection parameter.	233
+FMR	This command returns the revision identification.	42
+IPR	This parameter specifies the baud rate at which the MT2 accepts commands.	236
+IFC	This parameter controls the local flow control between the TE2 and MT2 [1].	236

Table 3. c18 AT Commands - Functionality (*Continued*)

AT Command	Description	Page
Interface		
Interface Commands		
+MODE	This command selects an operating mode on the selected serial connection.	237
\$QCCLR	This command clears the mobile error log.	239
+ILRR	This parameter controls whether the extended-format information text is transmitted from the MT2 to the TE2.	239
+ICF	This parameter determines the local serial port start-stop (asynchronous) character framing that the MT2 uses while accepting TE2 commands, and while transmitting information text and result codes to the TE2.	240
+CTTY	Activation, deactivation, and status query are supported. The Set command tells the c18 which TTY settings to request. The Set command, in query mode, interrogates the SU current TTY status. The Test command returns values supported by the TA as a compound value.	241
Information and Identification		
Information and Identification Commands		
+CIMI	This command enables a terminal to set the MT2 active IMSI.	241
+MOON	This command enables the accessory to obtain information about the current operating mode of the SU.	243
\$QCSCRM	This command enables/disables the mobile from SCRM'ing.	244
\$QCMDR	This command sets the Medium Data Rate (MDR) (also known as HSPD) setting.	244
\$QCDMR	This command sets the DM baud rate.	246
+GOI	This command causes the MT2 to transmit one or more lines of information text, determined by the manufacturer, which permits the MT2 user to identify the device, based on the ISO system for registering unique object identifiers.	247
Data Capability		
Data Capability Commands		
\$QCQNC	This command enables/disables Quick Net Connect (QNC).	247
\$QCDMG	This command enables the transition to Diagnostics Monitor (DM) operation.	248
\$QCSCRM	This command enables/disables IS2000 mobiles from SCRM'ing.	244

Table 3. c18 AT Commands - Functionality (*Continued*)

AT Command	Description	Page
\$QCSO	This command sets the service option settings.	250
\$QCMIPT	This command enables/disables the use of rfc2002bis authentication.	251
\$QCMIPP	This command selects the MIP user profile to be active.	252
\$QCMIP	This command enables/disables Mobile IP functionality in the mobile.	252
\$QCTRTL	This command enables/disables IS2000 mobiles from throttling the R-SCHF.	249
\$QCPKND	This command enables/disables automatic packet detection after a dial command.	258
\$QCVAD	This command responds to a page message that has a voice service option with a page response that has a data service option.	259
\$QCMTOM	This command originates a Mobile-to-Mobile Packet Data call using a QUALCOMM proprietary Service Option number.	260
+CTA	This command sets/reads/tests the U_m packet data inactivity timer.	261
+CAD?	This command queries the analog or digital service.	262
+CDR	This command controls whether the extended-format +CDR: intermediate result code is transmitted by the MT2.	263
+CDS	This parameter controls the V.42bis data compression function on the U_m interface.	264
+CRM	This command enable the user to set the protocol on the R_m interface.	266
+CQD	This command sets the timer value that specifies the period of inactivity before a data call is released.	267
+CMIP?	This command returns the mobile station's temporary IP address.	268
+CBIP?	This command returns the base station's temporary IP address.	268
+CMUX	This command sets the multiplex option to be proposed during the service negotiation procedures for connecting a STU-III secure service option.	269
+CFG	This command enables the storage of a string (up to and including the termination character) by the MT2 and its transmission to the base station prior to dialing.	270
+CXT	This command controls the handling of unrecognized commands by the MT2.	270
MV18S	This command controls the manner of operation of the V.18 capabilities (if present in the IWF).	272
+MV18R	This command controls whether the extended-format +MV18R: result code is transmitted from the IWF to the mobile station.	273

Table 3. c18 AT Commands - Functionality (*Continued*)

AT Command	Description	Page
+MS	This command controls the manner of operation of the modulation capabilities in the IWF.	274
+MR	This command controls whether the extended-format +MCR:<carrier> and +MRR:<rate> intermediate result codes are transmitted from the IWF to the mobile station.	274
+MA	This command lists the modulations that the base station may use to connect with the remote DCE in Automode operation, for answering or originating data calls, as additional alternatives to the modulation specified in the +MS command.	275
+ETBM	This command designates the action for data that remains in the DCE internal buffers when a call is terminated.	275
+ESR	This command controls the use of the selective repeat (SREJ) option in V.42 on the PSTN link (if present in the IWF).	277
+ES	This command controls the manner of operation of the V.42 protocol on the PSTN link (if present in the IWF).	278
+ER	This command controls whether the extended-format +ER: intermediate result code is transmitted from the IWF over the U _m interface.	280
+DS	This command controls the V.42bis data compression function on the PSTN link if provided in the IWF.	281
+DR	This command controls whether the extended-format +DR: intermediate result code is transmitted from the IWF over the U _m interface.	283
+EFCS	This command controls the use of the 32-bit frame check sequence option in V.42 on the PSTN link (if present in the IWF).	284
TCP/IP		
TCP/IP Commands		
\$QCPREV	This command returns the protocol revision in use.	285
\$QCRLPD	This command dumps the RLP statistics in ASCII format to the TE2.	285
\$QCRLPR	This command zeroes all the RLP statistics counters.	286
\$QCPPPD	This command dumps the PPP statistics in ASCII format to the TE2.	287
\$QCPPPR	This command zeroes all the PPP statistics counters.	287
\$QCIPD	This command dumps the IP statistics in ASCII format to the TE2.	288
\$QCIPR	This command zeroes all the IP statistics counters.	289

Table 3. c18 AT Commands - Functionality (*Continued*)

AT Command	Description	Page
\$QCUDPD	This command dumps the UDP statistics in ASCII format to the TE2.	289
\$QCUDPR	This command zeroes all the UDP statistics counters.	290
\$QCTCPD	This command dumps the TCP statistics in ASCII format to the TE2.	290
\$QCTCPR	This command zeroes all the TCP statistics counters.	291
\$QCRL3D	This command dumps the RLP 3 statistics in ASCII format to the TE2.	292
\$QCRL3R	This command zeroes all of the RLP 3 statistics counters.	292
Mobile IP		
Mobile IP Commands		
+MIPERR	This command returns an extended error report when Mobile IP session is failed.	294
\$QCMIPREG	This command configures the Mobile IP related parameters that are common to all the MIP user profiles currently saved inside the C-18's NVM.	299
\$QCMIP	This command enables or disables the support for Mobile IP.	300
\$QCMIPP	This command selects one of the MIP user profiles as the current active profile.	301
\$QCMIPT	This command enables/disables the use of rfc2002bis authentication.	302
\$QCMIPEP	This command enables/disables the currently active profile details.	303
\$QCMIPGETP	This command returns all the information corresponding to the particular profile number entered.	304
\$QCMIPNAI	This command sets the NAI for the currently active profile.	305
\$QCMIPRT	This command sets the reverse tunneling for the currently active profile.	306
\$QCMIPMASS	This command sets the MN-AAA shared secrets for the currently active profile.	307
\$QCMIPMHSS	This command sets the MN-HA shared secrets for the currently active profile.	308
\$QCMIPMASPI	This command sets the MN-AAA SPIs for the currently active profile.	309
\$QCMIPMHSPI	This command sets the MN-HA SPIs for the currently active profile.	310
\$QCMIPPHA	This command sets the IP addresses of the mobile's primary HA for the currently active profile.	311
\$QCMIPSHA	This command sets the IP addresses of the mobile's secondary HA for the currently active profile.	312

Table 3. c18 AT Commands - Functionality (*Continued*)

AT Command	Description	Page
\$QCMIPHA	This command sets the IP addresses of the mobile's home address for the currently active profile.	313
Sleep Mode		
Sleep Mode Commands		
ATS24	This command activates/disables the sleep mode.	319
ATS99	This command sets the value of the delay before sending data to DTE.	320
ATS100	The S-Reg S100 is used to avoid frequent wakeup interrupts and low throughput.	321
+MSCTS	This command controls the CTS behavior and deactivates it when the unit is in sleep mode.	321

INTRODUCING AT COMMANDS

3.1 AT COMMAND SET PROTOCOL

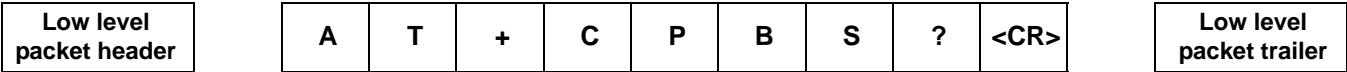
3.1.1 General Protocol

The format of the messages transmitted to the SU for the application protocol is the same for both the common and the protected command sets. Commands are exchanged in ASCII characters, with the "AT" characters at the beginning of the command. These characters provide a safe means of detecting the beginning of the command in the event that the SU and accessory become unsynchronized due to data loss. The rest of the input is the command data itself, followed by a line terminator. String data can be transferred using several character representations, the current character format is determined by the +CSCS command. The full specification of the input data is in "Data Formats" on page 35. The size of the line is available as part of the low-level protocol packet that is used to transport the command. Error detection is also provided by the low-level protocol packet. In most cases, the application level command is embedded within the low-level packet, but only the application level command is presented to the application within the SU, the low-level packet is discarded.

Return data from the SU is in a similar format, without the "AT" characters in the header. The data from the application is embedded within the low-level packet and that entire packet is transmitted to the accessory device. Each line of return data is terminated with a <CR> character which value is specified by command S3.

More than one command can be sent in a packet. In this case, the commands are separated by semicolons(";"). Only the first command requires the "AT" header, this is the packet header and is not part of any command. The line terminator <CR> is specified by command S3.

Command: AT+CPBS?



(Data_Len=8) **Application Protocol data**
Low level header and footer are stripped off by low-level software, and are included for reference only.

Figure 1. Example of Application Data Format

3.1.2 Formatting Rules

3.1.2.1 Command Formats

Commands come in two basic flavors — commands that accept input and commands that do not. Commands that do not accept input are commands that cause things to change, with no options regarding how the change occurs (an example is the +CGMM command which gets the device information).

Commands that accept data (even if all of the data is optional) provide three variations of the command; one to send in the data, one to get the current setting of the feature and one to obtain the possible settings for the feature. If the command accepts more than one piece of data, the data elements are separated by commas.

When dealing with optional data, only those values that are required need to be provided and the command can end after the last used value. Not all optional values must be provided, if no value is entered between commas then that optional element is not included.

Figure 2 provides an example of using a command with optional input data. In this example, the command has one required input and two optional inputs. This example shows the usage of a command with various sets of options to demonstrate the rules for including optional information elements.

Command Description

+CMD=<name>[,<format>[,<option>]]

Command used with no options

+CMD=154

Command used with <format>option

+CMD=154,5

Command used with <option2>option only

+CMD=154,,87

Figure 2. Optional Data Examples

3.1.2.1.1 Command with No Data

For commands that do not define any input data, the command is simply issued by itself. The SU processes the command and returns whatever data is appropriate.

3.1.2.1.2 Command Setting a Value

The normal use of the command is to issue the command followed by an equal sign and a list of values. In this mode, the values issued in the command are used to configure the feature driven by that command. As described above, values are separated by commas, and optional values are allowed.

AT+CMD=<value>

3.1.2.1.3 Querying a Command's Current Setting

Issuing the command followed by a question mark will cause the SU to return the current settings of the feature that is controlled by that command. This generally will reflect the settings that were passed in when the command was last issued.

AT+CMD?

3.1.2.1.4 Querying the Possible Command Settings

Issuing the command with an equals and question mark causes the SU to return the list of valid settings for all of the values that are input for that command. In some cases these settings are tailored to the particular SU configuration.

AT+CMD=?

3.1.2.1.5 Multiple Commands on One Line

Most commands can be separated by a semicolon (;), allowing multiple commands to be sent in a single packet. The first command requires the "AT" header at the beginning of the line, subsequent commands do not. The last command must be followed by the line terminator (<cr>).

For example, the three commands: +CMD1,+CMD2, and +CMD3? can be concatenated in the following manner:

AT+CMD1=23,56;+CMD2;+CMD3?<cr>

Basic commands (commands that have the form <command><number>) can be concatenated without using semicolons.

For example, the commands V, E, and I can be concatenated in the following manner:

ATV0E0I4<cr>

An extended command (D, S, and commands that contain a "+") that follow basic commands do not require a semicolon. However, basic commands following extended commands need a semicolon.

For example, the following concatenation of +CIMI and V is illegal and will return an error:

AT+CIMIV0<cr>

The correct way to concatenate +CIMI and V is as follows:

AT+CIMI;V0<cr>or ATV0+CIMI<cr>

The following concatenations of V, E, I, and +CIMI are legal:

ATV0I4E0+CIMI<cr>

ATV0+CIMI;I4E0<cr>

3.1.2.2 Data Formats

When multiple parameters are present for a single command, they are separated with commas (,), but no spaces should be included in the command line. The SU will not include spaces.

3.1.2.2.1 Phone Number Data

The standard defines two standard formats for presenting the phone number (either calling or called). One format uses the complete explicit dialing string, including the international access code. The other format replaces the access code with the "+" character (as European numbers are often written).

The default format is to use the "+" international dialing convention, this is format number 145. Conventional complete dialing is format number 129.

3.1.3 Response Rules

This is the area that probably deviates the most from "normal" AT command operations. All responses are required to identify the command to which they belong. This allows multiple commands to be executed if possible, and allows for commands that enable the generation of asynchronous data. Not all responses match up to a command, some responses are generated as unsolicited responses, providing data and information about ongoing system events.

The response header consists of the command code (+CGSN, for example) which is a response to followed by a colon (:), a space character, then the data that is being returned followed by the line terminator (<CR>).

For unsolicited responses that do not have a corresponding command (such as +MPB) the header is as defined for the response data (these are generally found in the Protected Commands, +CLIP, page 72, +COLP, page 78 and +CLIR, page 88) in the section describing the command. Any unsolicited responses that do not have an executable command have been given a "dummy" command to be used in the response header.

All commands are required to return a response to indicate that the command has been completed. If the command is one that does not return data (such as "H" to hang up) the response will consist of the response header and "OK" in the data field. Commands that return data may not be required to also include the "OK" response.

```
ATH<CR>
```

```
H: OK<CR>
```

Some commands return an unknown amount of data. Examples would be a command that returns a list of values, or a command that returns a group of phone book entries. If all the response data were returned in a single packet this may exceed the maximum packet length. These situations are called "open-ended responses". In cases where the order of the response data is not important, the SU may return the data in multiple response packets (multiple lines). Each packet shall contain the normal header (the command, and so on) and a subset of the data. After all of the data for the command has been returned, the SU will return a final response packet with the command header and "OK" in the data field. This signals to the device that the data for that command is completed.

```
AT+CGMR<CR>
```

```
+CGMR: "MCU:46 57 68",DSP:9934"<CR>
```

```
+CGMR: "APP:003452"<CR>
```

```
+CGMR: OK<CR>
```

The above example shows the response to the +CGMR command, requesting version number information.

The SU returns two lines of information, followed by the "OK" response to indicate the completion of the responses.

3.1.3.1 Ranges

Some commands return a range of data as part of their response. The range consists of a comma separated list of items enclosed by parenthesis. A range consists of one or more items. Spaces only exist in the range when part of a multi-character string is enclosed by double quotation marks. Items can either be a single entity, or two entities separated by a hyphen to indicate an abbreviated consecutive collection of items. In the case of an abbreviated consecutive collection, the first and last items are included in the collection.

If the items in the range are represented by numeric data, the range is listed in ascending order. If the items are represented by a single alpha-numeric character, the range is listed in numeric ascending order and alphabetic order starting with "A". Numbers appear before alphas, and the ordering is not case-sensitive. If the items are represented by alpha-numeric strings, the items represented by a single character conform to the above rules, and the items represented by multi-character alpha-numeric strings appear after the single character items with no ordering rules imposed. An abbreviated consecutive collection is not valid for items represented by multi-character alpha-numeric strings.

A range cannot be embedded within another range.

Examples

The following range represents a list of one item named "3":

```
(3)
```

The following range represents a list of four items named "1", "3", "5" and "7":

(1,3,5,7)

The following range represents a list of four items named "1", "2", "3", and "4". Note that items "2" and "3" are implied because "1-4" represents an abbreviated consecutive collection.

(1-4)

The following range represents a list of five items named "1", "3", "4", "5" and "A".

(1,3-5,A)

The following range represents a list of eight items "1", "23", "A", "B", "C", "E", "Dog" and "Cat".

(1,23,A-C,E,Dog,Cat)

The following range represents a list of eight items "1", "2", "3", "B", "C", "D", "Big Dog", and "Small Cat".

(1-3,B-D,"Big Dog","Small Cat")

3.1.3.2 Dates

Some commands may accept or return a date as a portion of their input or response. The date shall consist of a quoted string containing the date in the following hyphen-separated format: "MM-DD-YYYY". For months, days and years that are represented by numbers that occupy less characters than the width of their associated fields, the numbers shall be padded with zeroes in order to occupy the entire field.

It is a non-requirement for the SU to correct dates that are invalid. For example, the date "01-32-2002" being corrected to "02-01-2002" is implementation specific.

Examples

The following date represents November 9, 1975:

"11-09-1975"

The following date represents January 1, 100:

"01-01-0100"

The following date represents December 25, 2002:

"12-25-2002"

3.2 DEFINITIONS

3.2.1 Communication Data Interface - Common Defined Values of Parameters

<classx>: (default 7).

Sum of integers each representing a class of information.

- 1 Voice (telephony)
- 2 Data (refers to all bearer services)
- 4 Fax (facsimile services)



Note

Deviation from standard – these <classx> values are not supported: 8, 16, 32, 64, 128.

<number>:

String type phone number of forwarding address in format specified by <type>.

For set command, parameter is valid only for <mode> 3.

<type>:

Type of address octet in integer format; default 145 when dialing string includes international access code character "+", otherwise 129 - type of number "unknown".

<satype>:

type of sub address octet in integer format; default 128.

<subaddr>:

String type subaddress of format specified by <satype>.

<alpha>:

Optional string type alphanumeric representation of <number> corresponding to the entry found in phone book; used character set should be the one selected with command Select TE Character Set +CSCS.

<CLI validity>:

The Validity of Calling Line Identity presentation.

- 0 CLI valid.
- 1 CLI has been withheld by the originator.
- 2 CLI is not available due to interworking problems or limitations of originating network.

3.3 ACTIVATION MODE

Multiple protocols and services are available to the accessory device, which request the protocol via a mode change request command. The AT+Mode command is used to select the operating mode on the particular serial connection.

- Mode = 0: The default connection, either a Qualcomm command or IS-707 (CDMA). This is the mode available for a computer connection.
- Mode = 2: This mode provides access to the Motorola-specific commands set, and outputs the following banner when ready to accept commands:
+MBAN: Copyright 2000-2003 Motorola, Inc.

AT COMMANDS REFERENCE

4.1 MODEM ID

4.1.1 Subscriber Unit Identity

4.1.1.1 +GMI, Request Manufacturer ID



Note

The information in this section applies to release 3.0B and above.

This command causes the MT2 to transmit one or more lines of information text, determined by the manufacturer, which is intended to permit the user of the MT2 to identify the manufacturer. Typically, the text will consist of a single line containing the name of the manufacturer, but manufacturers may choose to provide more information if desired (for example, address, telephone number for customer service, and so on).

Mode Activation

Mode = 0 and Mode = 2.

AT Command	Response/Action	Remarks
+GMI	+GMI: <manufacturer>	

Example

AT+GMI

+GMI: Motorola CE, Copyright 2000

4.1.1.2 +FMI, Request Manufacturer ID



Note

The information in this section applies to release 3.0B and above.

This command returns the name/identification of the manufacturer.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+FMI	+FMI: <manufacturer>	

Example

AT+FMI

+FMI: Motorola CE, Copyright 2000

4.1.1.3 +CGMI, Request Manufacturer ID**Note**

The information in this section applies to release 3.0B and above.

This command returns the name/identification of the manufacturer.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
AT+CGMI	+CGMI: <manufacturer> OK	Returns the manufacturer's identification, using one or more lines of information text.

Example

AT+CGMI

+CGMI: Motorola CE, Copyright 2000

4.1.1.4 +GMM, +FMM, + CGMM, Request Model ID**Note**

The information in this section applies to release 3.0B and above.

These commands return a string containing information about the specific model. This information includes the technology used, and possibly the particular model number. If multiple technology is supported, they return all the supported technology.

**Note**

+GMM returns the same data as +CGMM, with a different header (+GMM:).

+FMM returns the same data as +CGMM and +GMM, with a different header (+FMM:).

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
AT+GMM AT+FMM AT +CGMM	<string>	Returns information about the specific model.

The following table shows the +GMM, +FMM and +CGMM support strings.

Table 4. +GMM, +FMM and +CGMM Technology Support Strings

<Parameter>	Description
"CDMA800"	CDMA at 800 MHz
"CDMA1900"	CDMA at 1900 MHz
"AMPS800"	AMPS analog at 800 MHz

Example

+GMM: "CDMA800","CDMA1900","AMPS800","MODEL=c18"

+CGMM: "CDMA800","CDMA1900","AMPS800","MODEL=c18"

+FMM: "CDMA800","CDMA1900","AMPS800","MODEL=c18"

4.1.1.5 +GMR, +CGMR, +FMR, Request Revision


Note

The information in this section applies to release 3.0B and above.

These commands return the revision identification, identifying the software revision in the ME.


Note

+GMR is activated also in mode 0.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
AT+GMR AT+CGMR AT+FMR	<revision>	Returns the software revision identification.

The following table shows the +GMR, +CGMR, +FMR parameters.

Table 5. +GMR, +CGMR, +FMR Parameters

<Parameter>	Description
<revision>	Character string with "".

Example

+GMR: "c18_X_087.0R"

+CGMR: "c18_X_087.0R"

+FMR: "c18_X_087.0R"

4.1.1.6 +CGSN, Request Product Serial Number Identification



Note

The information in this section applies to release 3.0B and above.

This command returns the serial number of the product in decimal format only. In the case of CDMA devices, this is the decimal format Electronic Serial Number (ESN). It is important to note that this is not a dotted decimal, as shown in the example.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
AT+CGSN	+CGSN: <serial number>	Returns the serial number of ME.

The following table shows the +CGSN parameters.

Table 6. +CGSN Parameters

<Parameter>	Description
<serial number>	String without "". Decimal non-dotted number indicating the Electronic Serial Number (ESN).

Example

AT+CGSN

+CGSN: ESN2182231126 //Decimal

4.1.1.7 +GSN, Request TA Serial Number ID

This command causes the MT2 to transmit one or more lines of information text, determined by the manufacturer, which is intended to permit the user of the MT2 to identify the individual device. Typically, the text consists of a single line containing a manufacturer-determined alphanumeric string, but manufacturers may choose to provide any information desired.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
+GSN	+GSN: <ESN> xx xx xx xx in hexadecimal format	

Example

```
at+mode=0
```

```
OK
```

```
at+gsn
```

```
+GSN: 42FB40B5(hex)
```

4.1.1.8 +CSCS, Select TE Character Set**Note**

The information in this section applies to release 3.0B and above.

This command selects the character set used on the SU.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+CSCS?	+CSCS: <chset>	Gets the current character set.
+CSCS=?	+CSCS: (list of <chset>s)	Gets all character sets supported.
+CSCS=<chset>	OK	Sets the character set, as defined by Table 7, “Supported Character Sets,” on page 44.

The following table shows the supported character sets.

Table 7. Supported Character Sets

<chset>	Character Set	Input/Output Format
“ASCII”	ASCII	Quoted string. For example, “AB” equals two 8-bit characters with decimal values 65, 66.
“UCS2”	Unicode (ISO/IEC 10646 [32])	HEX representation. For example, 00410042 equals two 16-bit characters with decimal values 65, 66.
“UTF8”	8-bit Unicode (ISO 10646 transformation format)	HEX representation.
“8859-1”	Latin (ISO 8859-1)	Quoted string.
“8859-C”	Cyrillic (ISO 8859-5)	Quoted string.

Table 7. Supported Character Sets (*Continued*)

<chset>	Character Set	Input/Output Format
"8859-A"	Arabic (ISO 8859-6)	Quoted string.
"8859-H"	Hebrew (ISO 8859-8)	Quoted string.
"KSC5601"	Korean	Quoted string.

Example

```

AT+CSCS=?
+CSCS: ("ASCII","UCS2","UTF8","8859-1","8859-C","8859-A","8859-H","KSC5601")
OK
AT+CSCS?
+CSCS: "ASCII"
OK
AT+CPBW=1,"8475763000",129,"Lin Zhao"
OK
AT+CSCS="UCS2"
OK
AT+CPBR=1
+CPBR: 1, "8475763000",129,004C006E0020005A00680061006F
OK

```

4.1.1.9 +CIMI, Request IMSI

This command returns a text string that identifies the SU. On platforms that support IMSI numbers, this is the IMSI number. The output string does not have double quotes. On platforms that do not support IMSI numbers, this command responds with a +CME ERROR indicating that the operation is not supported.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+CIMI	+CIMI: <IMSI>	Returns the SU identifier.

Example

```
AT+CIMI //Call on platform supporting IMSI numbers
+CIMI: 314566320021400

AT+CIMI //Call on platform not supporting IMSI numbers
+CME ERROR: 4 //Operation not supported
```

4.1.1.10 +CNUM, Subscriber Number



Note

The information in this section applies to release 3.0B and above.

This command returns the numbers entered by the subscriber into “My Phone Numbers” using the Handset menu.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
AT+CNUM	+CNUM: <number>	Returns the numbers that were entered into “My Phone Numbers” from the Handset menu.

Example

```
at+CNUM
+CNUM: 054556426
OK
```

4.1.1.11 +MGFV, Motorola Get Flex Version

This command returns the current flex version of the SU.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
AT+MGFV?	+MGFV: <"flex version">OK	

Example

```

at+mode=2
OK
+MBAN: Copyright 2000-2002 Motorola, Inc.
at+mgfv?
+MGFV: "XS5VRZ02C180NA_DDD - 0.0.2.A.B.0.0.1.1.7.0.2.0.0.3"
OK

```

4.1.2 Capability Reporting**4.1.2.1 +MAID, Get Accessory Feature Review**

This command enables an application to obtain a list of available features in an SU. This command returns a comma-separated binary string of available features in the phone. The ones and zeros indicate whether the selected feature is turned on or off respectively.

This command has been designed for future expansion. Additional features can be added to the end of the string if needed.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
AT+MAID	+MAID: <feature 1 status>, <feature 2 status>, ... <feature 11 status> OK	This is a read-only command.

The following table shows the +MAID features description.

Table 8. +MAID Features Description

<Parameter>	Description
<feature 1 status>	Indicates the presence of a phone book in the phone. True Phone book is present. False Phone book is not present.
<feature 2 status>	Indicates the presence of a date book in the phone. True Date book is present. False Date book is not present.
<feature 3 status>	Indicates the presence of an SMS AT Accessory Code in the phone. True SMS AT Accessory Code is present. False SMS AT Accessory Code is not present.

Table 8. +MAID Features Description (Continued)

<Parameter>	Description
<feature 4 status>	Indicates the presence of MO-SMS AT support in the phone. True MO-SMS is present. False MO-SMS is not present.
<feature 5 status>	Indicates the presence of Email addresses in the phone book and the MO-SMS Destination Address Field. True Email addresses are present. False Email addresses are not present.
<feature 6 status>	Indicates the presence of multiple phone books in the phone, enabled by inserting a memory stick in the phone. Note: The feature status is an indication of the state of a feature ID, not the actual presence or absence of the memory stick. True Multiple phone books may be present. False Multiple phone books are not present.
<feature 8 status>	Indicates the presence of a shared phone book or date book. True Shared dynamic memory phone/date book is present. False Shared dynamic memory phone/date is not present.
<feature 9 status>	Indicates the availability of the SMS Multiple Destination Addresses feature. True SMS Multiple Destination Addresses feature is available. False SMS Multiple Destination Addresses feature is not available.
<feature 10 status>	Indicates the availability of the Distinctive Alert feature, where a specific ring tone can be assigned to an entry in the phone book. True Distinctive Alert feature is available False Distinctive Alert feature is not available.
<feature 11 status>	Indicates the availability of the Phone Book Voice Tags Transferal feature. True Phone supports Voice Recognition and Phone Book Voice Tags Transferal False Phone does not support Voice Recognition, or the phone supports Voice Recognition, but does not support Phone Book Voice Tags Transferal.

Example

AT+MAID

+MAID: 1,1,1,1,1,0,0,1,1,0,1,0

4.1.2.2 +MPDPM, Phone/Date Book (Used) Percentage in Memory

This command reads the percentage of shared dynamic memory used in the phone book and date book.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+MPDPM	+MPDPM: <percent> OK	Returns a percentage (1 to 100) representing the current amount of memory being used in the shared memory storage of the phone book and date book.

Example

AT+MPDPM

+MPDPM: 40

OK

4.1.2.3 +MAPV, Get Accessory Protocol Version**Note**

The information in this section applies to release 3.0B and above.

This command returns the version of the accessory protocol that is supported in the SU. This version consists of a major version number and a minor version number, and should correspond with the protocol version number reported by the first SU release including that command.

A version of software claiming to support an accessory protocol version must support all commands in accordance with that version of the accessory protocol, as well as all commands for lower numbered versions of the protocol.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+MAPV	+MAPV: <major>.<minor>	<major> - Major protocol version number. <minor> - Minor protocol version number.

Example

AT+MAPV

+MAPV: 2.7.0

OK

4.2 CALL CONTROL

4.2.1 Call Control Messages

4.2.1.1 +CVHU, End Call, Hang Up

This command hangs up the call that is currently in progress. All active calls, voice and data are terminated, regardless of whether the accessory initiated the call. Emergency calls are typically handled by the other layers, therefore, if the call is not hung up, an error message is expected.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
AT+CVHU	OK	Hangs up the voice call.



Note

The CHV command can also be activated in Mode=0 and Mode=2.

Example

```
at+mode=2
```

```
OK
```

```
+MBAN: Copyright 2000-2002 Motorola, Inc.
```

```
051743732D: VOICE
```

```
OK
```

```
at+cvhu
```

```
OK
```

4.2.1.2 +CHUP, End Call, Hang Up

This command rejects an incoming call or hangs up a selected voice or data call, regardless of whether the accessory initiated the call. Emergency calls are typically handled by the other layers, therefore, if the call is not hung up, an error message is expected.

This command rejects the incoming call if the command is issued while the phone is ringing. In CDMA, the user interface stops ringing and causes the display to return to idle. If this command is issued after the call has already been connected, the call is terminated.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
AT+CHUP	OK	Hangs up the active call or rejects the incoming call.

Example

```
RING
```

```
//Example for +CHUP usage while the phone is ringing
```

```
AT+CHUP
```

```
OK
```

```
//Call is rejected
```


4.2.1.3 +MVMN, Set Voice Mail Number

This command enables the user to change the voice mail number of the phone. The voice mail number is a factory-set number (a Feature ID) that is dependent on the service provider, and is not stored in a phone list.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+MVMN=<vm_num>	OK or: ERROR: <err>	The voice mail number to be written, expressed as an ASCII string.

Example

```
AT+MVMN="8008778000"
```

```
OK
```

4.2.1.4 +MSSI?, Request Signal Strength Messages

This command requests the signal strength. This information is sent as unsolicited messages, when enabled, from the SU to privileged accessories. Accessories can also request the current signal strength by using the query form of this command. When unsolicited reporting is enabled, and a change occurs in the signal strength, this information is broadcast to all accessories.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
AT+MSSI?	+MSSI: <signal strength>	Requests the current signal strength.
+MSSI=<state>	OK	Enables/disables the unsolicited signal strength messages.

The following table shows the +MSSI? parameters.

Table 9. +MSSI? Parameters

<Parameter>	Description
<state>	Signal Strength Message Enable Settings 0 Signal Strength Messages Off 1 Signal Strength Messages On
<signal strength>	The current signal strength represented as a percentage value.

Example

AT+MSSI?

+MSSI: 69 <69% Signal Strength>

AT+MSSI=1

OK

Refer to “Test Results” on page 328 to view the +MSSI test results.

4.2.1.5 +MARS, Motorola Auto Redial Status Reporting

This command enables the ME to report when auto redial starts or ends, when enabled. An accessory can enable this reporting using the +MARS set command. The unsolicited message “+MARS:<status>” is sent from the ME to the TE when the auto redial starts or ends, provided that auto redial reporting is enabled.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+MARS=<mode>	+MARS:<status>	Reports the auto-redial status.

The following table shows the +MARS parameters.

Table 10. +MARS Parameters

<Parameter>	Description
<mode>	0 Disables auto-redial reporting. 1 Enables auto-redial reporting.
<status>	0 Auto-redial ends. 1 Auto-redial starts.

Example

+MARS:1 //Auto-redial mode starts

OK

AT+MARS=0 //Disable auto-redial reporting

OK

4.2.1.6 +MARD, Enable/Disable Auto-Redial

This command enables and disables the auto-redial capability of the SU.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+MARD=<state>	OK	Sets/clears auto-redial state.
+MARD?	+MARD: <state> OK	Reads current auto-redial state.

The following table shows the +MARD parameters.

Table 11. +MARD Parameters

<Parameter>	Description
<state>	0 Auto-redial enabled. 1 Auto-redial disabled.

Example

AT+MARD?

+MARD: 0

OK

AT+MARD=1

OK

4.2.1.7 \$QCCAV, Answer Incoming Voice Call

This command provides a means to answer an incoming voice call, using an AT command.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
\$QCCAV	Answer incoming voice call	

4.2.1.8 +CHV, Hang-up Voice Call

This command hangs-up a voice call.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
+CHV<value>	<value>	

The following table shows the +CHV parameters.

Table 12. +CHV Parameters

<Parameter>	Description
<value>	Hang-up voice call 0 Hang-up voice call 1-255 Reserved

Example

AT+CHV

OK

4.2.1.9 +CDV, Dial Command for Voice Calls

This command dials voice calls.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
+CDV<dial string>	OK or: NO CARRIER	

The following table shows +CDV parameters.

Table 13. +CDV Parameters

<Parameter>	Description
<dial string>	The number dialed. This command does not cause the MT2 to change to the online state.

Example

```
at+mode=0
```

```
OK
```

```
at+cdv057729619
```

```
OK
```

4.2.1.10 +CSS?, Serving System**Note**

The information in this section applies to release 3.0B and above.

Mode Activation

Mode = 0

**Note**

This command returns the kind of system with which the c18 is registered.

Set Command

Command	Response/Action	Remarks
AT+CSS	ERROR	Command is not supported

Read Command

Command	Response/Action	Remarks
AT+CSS?	AT+CSS? <Band Class>, <Band>, <SID> OK	Returns the kind of system with which the g20 is registered

Test Command

Command	Response/Action	Remarks
AT+CSS=?	AT+CSS=? CSS: (C, P), (CA, CB, PA, PB, PC, PD, PE, PF, Z), (0-16383, 99999) OK	List all supported value for <Band Class> and <Band> and <SID>

The following table shows the +CSS? parameters.

Table 14. +CSS? Parameters

<Parameter>	Description	
<Band Class>	C	The mobile station is registered with a cellular system.
	P	The mobile station is registered with a PCS system.
<Band>	CA	The mobile station is registered with a cellular A-band system.
	CB	The mobile station is registered with a cellular B-band system.
	PA	The mobile station is registered with a PCS A-band system.
	PB	The mobile station is registered with a PCS B-band system.
	PC	The mobile station is registered with a PCS C-band system.
	PD	The mobile station is registered with a PCS D-band system.
	PE	The mobile station is registered with a PCS E-band system.
	PF	The mobile station is registered with a PCS F-band system.
	Z	The mobile station is not registered.
<SID>	0-16383	The mobile station is registered with the system indicated.
	99999	The mobile station is not registered

Example

at+mode=0

OK

at+css?

+CSS: C,CA,8465

OK

4.2.1.11 CIND, Display the Current Service Status


Note

The information in this section applies to release 3.06 and above.

This command enables an accessory to request the status of certain display indicators currently available in the SU, such as whether it is in use, whether it is in service, and so on. Not all indicators are available through this command. Some indicators, such as the SMS and RSSI indicators, are accessible through other commands.

Mode Activation

Mode =2.

AT Command	Response/Action	Remarks
+CIND=?	+CIND: (<descr>, list of supported <value>) [,<descr>, list of supported <value>) [, ...]]	Lists the descriptions of the indicators.
+CIND?	+CIND: <value> [,<value> [, ...]] OK	Queries and returns the status of current indicators.

The following table shows the +CIND parameters.

Table 15. +CIND Parameters

<Parameter>	Description
<value>	The value of the indicator. In binary indicators 0 False 1 True Non-binary indicators can have a value of any non-negative integer.
<descr>	A short description of the indicator.

The following table shows a list of the available indicators.

Table 16. +CIND Available Indicators

<value>	<descr>	Description	Type
0-1	"voice mail"	Indicates the presence of a voice message(s).	Binary
0-1	"service"	Indicates whether the SU has network services available.	Binary

Table 16. +CIND Available Indicators (*Continued*)

<value>	<descr>	Description	Type
0-1	"call"	Indicates whether the SU is currently in use.	Binary
0-2	"roam"	Indicates whether the SU is: 0 Currently registered in its home network. 1 Roaming in its home network. 2 Roaming in a non-home network.	Non-negative integer
0-5	"signal"	Indicates the signal strength, in bars (0-lowest, 5-highest), received by the SU.	Non-negative integer

Example

AT+CIND?

+CIND: 0,1,0,1,4

OK

AT+CIND=?

+CIND: ("Voice Mail",(0,1)),("service",(0,1)),("call",(0,1)),("Roam",(0-2)),("signal",(0-5))

OK

Refer to "Test Results" on page 328, to view the +CIND test results.

4.2.1.12 +CLCK, Lock Unlock SU or Network Facility**Note**

The information in this section applies to release 3.06 and above.

The Set command locks, unlocks the ME or restricts the ME from originating/terminating specific call types (CSD, Fax, packet data calls, voice calls).

When querying the status of a single call barring program (+CLCK?), the status for each call type (outgoing and incoming) is returned.

The Test command returns values supported by the TA as a compound value.

Mode Activation

Mode = 2

**Note**

After the configuration of the c18 board using AT+CLCK, the user of the c18 board must return to activation mode 0 in order to initiate CSD data calls or packet data calls

The table below describes the different settings this AT command accepts.

Before using this command, read the notes below...

Inputs	Outputs	Remarks
<u>Set</u> +CLCK= <type>,<mode>,<Password>	On Error: <err> On Success: <OK>	<type> "AO" - outgoing calls "AI" - incoming calls "AB" - both incoming and outgoing calls <mode> 0 - Disable (restrict all) 1 - Enable (allow all, default value) 2 - Phonebook (allow only PB entries) 3 - allow voice calls for P_REV_IN_USE>0 (IS95A,IS95B,IS2000 ...), data calls (CSD, Fax) and packet data calls for P_REV_IN_USE>=6 (IS2000) only. 4 - allow voice calls for P_REV_IN_USE>0 (IS95A,IS95B,IS2000 ...), packet data calls for P_REV_IN_USE>=6 (IS2000) only. 5 - Allow data calls (CSD, Fax) and packet data calls only. Applicable for P_REV_IN_USE>=6 (IS2000) only. 6 - Allow packet data calls only. Applicable for P_REV_IN_USE>=6 (IS2000) only. 7 - Allow voice calls only. Applicable for P_REV_IN_USE>0 (IS95A,IS95B,IS2000 ...) 8 - Restrict voice calls. Applicable for P_REV_IN_USE>0 (IS95A,IS95B,IS2000 ...) <Password> ME, lock code - 4 characters long.
<u>Test</u> +CLCK=?	List of Supported <type> and <mode>	+CLCK:("AO","AI","AB"),(0-8)
<u>Read</u> +CLCK?	+CLCK: <In>,<Out>	<In> - restrictions for incoming calls. <Out> - restrictions for outgoing calls.

**Note**

- P_REV_IN_USE = Protocol revision level currently in use by the mobile station.
- P_REV_IN_USE>=6 means applicable for IS2000 only.
- P_REV_IN_USE=4 means applicable for IS95B only.
- P_REV_IN_USE>0 means applicable for IS95A, IS95B, IS2000 ...
- If call type is not mentioned then it is considered as restricted.
- Default password depends on the flex (for e.g. it can be "1234" or "0000").
- Default value for <mode> is 1

Example:

```
at+mode=2
```

```
OK
```

```
+MBAN: Copyright 2000-2002 Motorola, Inc.
```

```
at+cme=2
```

```
OK
```

```
at+clck?
```

```
+CLCK:5,5           // only data and packet data calls in IS2000
                    // allowed for MT calls,
                    // only data and packet data calls in IS2000 allowed
                    // for MO calls.
```

```
OK
```

```
at+clck="ao",1
```

```
+CME ERROR: incorrect password
```

```
at+clck="ao",1,"1234" // allow all types of calls for MO calls.
```

```
OK
```

```
at+clck?
```

```
+CLCK:5,1           // only data and packet data calls in IS2000 allowed
                    // for MT calls,
                    // All types of calls allowed for MO calls.
```

```
OK
```

```
at+clck="ai",7,"1234" // allow only voice calls for MT calls.
```

```
OK
```

```
at+clck?
```

```
+CLCK:7,1           // only voice calls allowed for MT calls.
                    // All types of calls allowed for MO calls.
```

```
OK
```

```
at+clck="ab",8,"1234" // allow only data and packet data calls for MT and
                    // MO calls.
```

OK

at+clck?

+CLCK:8,8 // only data and packet calls allowed for MT calls.

// only data and packet calls allowed for MO calls.

OK

at+clck=?

+CLCK:("AO","AI","AB"),(0-8)

OK

4.2.1.13 +CSO, Specify the Service Option

This command specifies the preferred service to be requested for the next originated packet call.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
AT+CSO=<[SO]>	OK	Sets the c18 service option preferred for mobile originating (MO) packet calls. HEX values are NOT SUPPORTED. Returns error for unsupported values.
AT+CSO?	+CSO: <SO>	Reads the current setting. By default the value is 1x data (so 33)
AT+CSO=?	+CSO: (0-33)	Indicates whether the command is supported, and defines the valid values.



Note

This command is supported from 03.12 SW version.

Defined Parameter Values:

The following service option is supported:

0x21 1x data

4.2.1.14 D/DV, Dial Command

This command places a fax/data/voice call on the current network. The default call type is a data call (CSD) (mode=0). If the +FCLASS command is used to set the call type to Fax, then the outgoing call is a fax call.

There must be an explicit request in order to make a voice call. This request bypasses the +FCLASS setting.

If a Data/Fax call was originated and answered by the remote side, a “CONNECT” notification is sent to the accessory. Then the SU and ME move to the online data/fax state (respectively).

The D[V] command places a voice call, on the current network, when issued from an accessory device. The D command is preferred. The V modifier is optional, and is ignored.

Mode Activation

Mode = 0 — Data Call

Mode = 2 — Voice Call

AT Command	Response/Action	Remarks
ATD<number>	1st Response: The Data/Fax call is connected. D: Data D: Fax 1st Response: The Voice call is connected. D: VOICE 2nd Response: Call place begins: OK When MO call fails: 1 - Connection Failure: No carrier or: busy or: No answer. 2 - General Failure: error	D<number> Valid phone digits are: {0 1 2 3 4 5 6 7 8 9 * # + , }. The following characters are ignored: {A B C D - () / . <space>} {p} Pause for a fixed length of time during dialing. One or more pause characters may be used. {w} Must occur after a complete phone number. Indicates a variable length wait. User entry (send key press message) is required to terminate the wait condition. One or more wait characters may be used, but consecutive wait characters are not permitted. Once user terminates the wait condition, remaining phone number characters are sent as DTMF tones. {n} Indicates a variable extension, menu entry, or other phone number character (or group of characters). Accessory is required to enter digit(s) during call placement, using the AT+MDN command. Only one variable character is permitted in a dial string. Plus (+) Digit – Translated to the international access code.



Note

- ATDP, ATDT are ignored – are handled as ATD.
- Control of supplementary services through the Dial command is not supported, due to control support through the specific supplementary service commands (CCFC, CLCK, and so on).
- ATD#777 command is used to originate a CDMA-1X packet session.

Example

At +mode=2 //Voice call

OK

at+colp=1

OK

atd06512467

atdl //Dial last number

+COLP: "054414588"

D: VOICE

OK

ath

OK

At +mode=0 //Data call

ok

atd06113611404 //Data call

BUSY

NO CARRIER

atd06113611404 //Data call - success

CONNECT

4.2.1.15 DS, Dial Number Stored in User Profile

This command retrieves a dial number from the user profile stored in SEEM (Z-register). The dial number is stored in memory using the AT&Z command. After the dial number is retrieved, the dialing process continues in the same manner as ATD<number>.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
ATDS=<n>	1 st Response: Call place begins: ATDS: "Dial Digits" 2 nd Response: See above.	<n> Location (0 to 3). Each location is a dial number (up to 35 characters).

4.2.1.16 D>, Direct Dialing from Phone Books

The D> command places a fax/data/voice call on the current network by dialing directly from the ME phone book.

The possible responses (Outputs) are the same as in the Dial command. Refer to “D/DV, Dial Command”, page 63.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
D><alpha>	Originates a call to the phone number for which the corresponding alphanumeric field is <alpha>. The currently used memory (phone book) is searched for the entry that begins with the alphanumeric pattern <alpha>.	<alpha> String type value, which should be equal to an alphanumeric field in a phone book entry. The character set used should be the one selected using the +CSCS command, described on page 44. <alpha> is case sensitive.
D>mem,<n>	Originates a call to the phone number in memory (phone book) mem and entry location <n>. Available memories may be queried with the +CPBS=?, Select Phone Book Storage Test command, described on page 98. Note: This command does not change the used memory set. Currently supported phone lists include: DC - SU dialed calls list (read-only) MC - SU missed calls list (read-only) ME - SU internal phone book MT, AD - Combines SIM and SU phone books RC - SU received calls list (read-only) ON SIM and ME "Own PhoneNumbers" QD - Quick Dial List	<n> This parameter is also called “Speed Dial Location”. It is an integer type memory location. <n> should be in the range of locations available in the memory currently being used.
D><n>	Originates a call to a phone number from the entry location <n> in the current memory.	



Note

The currently used memory (phone book) is set and read using the +CPBS= and +CPBS? memory commands, respectively.



Note

When the SU goes up, no default used memory is selected. Therefore, if ATD><alpha> or ATD><n> is sent from TE, a +CME ERROR: “not found” is returned. The +CME ERROR: “not found” is also returned when no match is found in an existing phone book.

Example

at+mode=2

OK

at+colp=1

OK

atd>"Eli"

+COLP:"77773025"

D:VOICE

OK

ath

OK

atd>"DC",1

+COLP: "77773025"

D: VOICE

OK

ath

OK

atd>2

+COLP: "77773025"

D: VOICE

OK

ath

OK

4.2.1.17 DL, Dial Last Number

This command places a data/voice call to the last number dialed. For more details, see “D/DV, Dial Command” on page 63.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
ATDL[:]	+CME ERROR: <err> 1 st Response: Call place begins: ATDL: “DIAL DIGITS” 2 nd Response: Data/Fax call connected D: Data D: Fax 2 nd Response: Voice call connected D: Voice	semicolon (;) – When this character is specified, a voice call is originated to the number last dialed. If a semicolon is not specified, a fax/data call is originated (mode 0). Note: The last call type is irrelevant.

Example

atdl

+COLP: "077714588"

D: VOICE

OK

ath

OK

4.2.1.18 H, Hang Up Call



Note

The information in this section applies to release 3.0B and above.

This command hangs up a single mode call. The ME terminates an active call in progress whether it is a data or voice call, regardless of whether the accessory initiated the call. Emergency calls are typically handled by the other layers, therefore if the call is not hung up, an error message is expected.

A NO CARRIER is returned to the TE before the regular OK approval.



Note

- ATH does not necessarily hang up in voice mode. If the AT+CVHU command is implemented, the response depends on the AT+CVHU setting.
- This command can't hang up voice call in mode 0, in order to hang up the voice call, the SU must be in mode 2. To hang up voice call in mode 0 use AT+CHV command.

Mode Activation

Mode = 2 and Mode = 0.

The following table shows the H parameters.

Table 17. H Parameters

<Parameter>	Description
IDLE	Error 3. ("Operation not allowed")
Single Active	Call released
MTPY Active	Call released (all calls)
Incoming call (RING)	Call released
Single Active and Waiting Call	Single Active released (waiting not affected)
MTPY Active and Waiting Call	MTPY Active released (waiting not affected)
Single Held or MTPY Held	Held or MTPY held released.
Held (Single) and Waiting Call	Waiting call released
IDLE	Error 3. ("Operation not allowed")

Example

```
:RING
+CLIP: "046750219",129
ata
OK
ath
OK
```

4.2.1.19 A, Answer Call



Note

The information in this section applies to release 3.0B and above.

This command answers an incoming call after a RING/+CRING notification, placing the ME into the appropriate mode as indicated by the +CRING message.

If the incoming call is a voice call and ATA succeeds, the ME returns OK.



Note

- If the SU is in activation mode 0 then in order to answer an incoming voice call AT\$QCCAV should be used instead of ATA.
- This command can't answer an incoming data call in mode 2, in order to answer an incoming data call, the SU must be in mode 0.

Mode Activation

Mode = 2 and Mode = 0

4.2.1.20 +CRC, Cellular Result Codes

This command controls whether to present the extended format of an incoming call indication. When enabled, an incoming call is indicated to the TE with the unsolicited result code +CRING:<type> instead of the normal RING.

The Test command returns values supported by the TA as a compound value.



Note

Once RING/CRING<type> is sent, CLI (Calling Line Identity) information is available (see "+CLIP, Calling Line Identification Presentation" on page 72).

Mode Activation

Mode = 2 and Mode = 0.

AT Command	Response/Action	Remarks
Set: +CRC=[<mode>]		<mode> 0 - Disables extended format RING(default value) 1 - Enables extended format +CRING:<type> (in mode 2) Ring <type> (in mode 0) 2 - Disable any incoming call indication, applicable to mode 2 only
Read: +CRC?	+CRC: <mode>	
Test: +CRC=?	In mode 2 only: +CRC: (list of supported <mode>s)	
Unsolicited result code: Normal format: Ring Or extended format: +CRING:<type> (in mode 2) Ring <type> (in mode 0)		<type> (type of incoming call): ASYNC asynchronous data call. DIRECT ASYNC directAsynchronousdatacall FAX Fax class 2.0 DIGITAL VOICE Digital voice ANALOG VOICE Analog voice

Examples

OK

+MBAN: Copyright 2000-2002 Motorola, Inc.

AT+CRC=?

+CRC: (0-2)

OK

RING //..Incoming Call..

+CLIP: "8475763400",129,"Motorola Inc."

AT+CRC=1 //Enable extended format ring type

OK //..Incoming Call..

+CRING: VOICE

+CLIP: "8475763400",129,"Motorola Inc."

AT+CRC=2 //Disable RING indicator

OK

+CLIP: "8475763400",129,"Motorola Inc." //Incoming voice call

at+mode=0

OK

at+crc=1 //Enable extended format ring type

OK

RING ASYNC // Incoming Data

RING ASYNC // Incoming Data

at+crc=0 //Disable extended format ring type

OK

RING // Incoming Data

RING // Incoming Data

4.2.1.21 +CRING, Incoming Call Notification RING, +CRING: and RING (MS Locked)

This unsolicited message command is generated by the SU whenever an incoming call (voice, data or fax) is indicated by the cellular network. Once the message is sent, information is available on the calling line (if available) using +CLIP. The +CRING: message comes with an indication of the type of incoming call. However, if there is an incoming call while the phone is locked, the RING (MS locked) indication is sent instead.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+CRING	RING +CRING: <type>	

The following table shows the +CRING parameters.

Table 18. +CRING Parameters

<Parameter>	Description
<type>	ANALOG VOICE Indicates that the incoming (alerted) call is an analog voice call.
	DIGITAL VOICE Indicates that the incoming (alerted) call is a digital (CDMA) voice call.
	ASYNC Indicates that the incoming (alerted) call is an async data call.
	DIRECT ASYNC Indicates that the incoming (alerted) call is a direct async data call.
	FAX Indicates that the incoming (alerted) call is a fax call.
	VOICE Indicates that the incoming (alerted) call is a voice call.



Note

Unsolicited reports are currently supported only in activation mode 2.



Note

Call type identification by the terminating side is guaranteed only if the call was originated from a CDMA network.

If a call (voice/data/fax) was originated from a network which is not a CDMA network, then in order for the terminating side to recognize the incoming call type, the AT command AT\$QCVAD (activation mode 0) must be used prior to receiving the call.

Example

```
+MCST: Page
+MCST: Traffic 766
+MCST: Alerting
+CRING: "Voice"
+CLIP: "8475763400",129,"Motorola Inc."
.
.
VOICE
```

Example#1 of RING (MS locked)

```
...<MS locked>...
RING                               //MS locked
...<MS unlocked>...
RING
RING
RING
```

Example#2 of RING (MS locked)

```
at+crc=1 (enable ring type)
...<MS locked>...
RING                               //(MS locked)
...<MS unlocked>...
+CRING: DIGITAL VOICE             //If voice call
+CRING: DIGITAL VOICE
+CRING: DIGITAL VOICE
+CRING: DIGITAL VOICE
```

4.2.1.22 +CLIP, Calling Line Identification Presentation



Note

The information in this section applies to release 3.0B and above.

The Set command enables or disables the presentation of the CLI (Calling Line Identity) at the TE. This setting is internal to the ME and does not require a query to the network.

The Read command queries the ME (<n> value) and the network (<m> value) for the current setting of the CLIP.

+CLIP: Response is returned after every RING or +CRING: sent from the ME to the TE.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
Set: +CLIP=[<n>]		<n> (enables/disables the CLI presentation after ring indication): 0 Disabled 1 Enabled Default is 0.
Read: +CLIP?	+CLIP: <n>	
Unsolicited result code: +CLIP:<number>, <type>[, <subaddr>, <satype>[,[<alpha>][, <CLI validity>]]]		When CLI is not available (<CLI validity>=2), <number> is an empty string ("") and <type> value is not significant. The ME returns the recommended value 129 for <type>.

The following table shows the +CLIP parameters.

Table 19. +CLIP Parameters

<Parameter>	Description
<number>	String type phone number of forwarding address in the format specified by <type>.
<type>	Type of address octet in integer format. The default is: 145 Dialing string includes international access code character "+". 129 Type of number "unknown".
<subaddr>	String type subaddress of format specified by <satype>. NULL, field not used.
<satype>	Type of sub address octet in integer format. NULL, field not used.
<alpha>	Optional string type alphanumeric representation of <number> corresponding to the entry found in the phone book.
<CLI validity>	The Validity of Calling Line Identity presentation. 0 CLI valid 1 CLI has been withheld by the originator. 2 CLI is not available due to interworking problems or limitations of originating network.

Examples

```

AT+CLIP=1                      //Enable CLI Presentation from ME to TE
OK
AT+CLIP? -->                   //Query ME and network
+CLIP:1,1                      //CLIP enabled by ME and provisioned by network
                               //..MT call..

:<number>,<type>[,<subaddr>,<satype>[,<alpha>][,<CLI validity>]]]
+CLIP: "035659260",129, , , "dow jhon" //..International MT call..
+CLIP: "051543732",129,,,"Avi"

```

4.2.1.23 +CCFC, Call Forwarding Number and Conditions



Note

The information in this section applies to release 3.0B and above.

This command controls the call forwarding supplementary service. Activation, deactivation, and status query are supported.

The Set command tells the c18 which call forwarding settings to request.

The Set command, in query mode, interrogates the SU current call forwarding status.

The Test command returns values supported by the TA as a compound value.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
<u>Set</u> AT+CCFC = <reason>, <mode>,[<phone number>]	On Error: <err> When Command successful:<OK> If <ok> phone should make a call according to user input.	<reason>: 0 - set call forward for unconditional reason. 1 - activate call forward when line is busy. 2 - activate call forward when there is no answer (activates after 6 rings). <mode>: 0 - system default - mode exist at first operation only. 1 - deactivate call forward 2 - activate call forward <phone number> : should be provided by user as a destination to be forward to.

AT Command	Response/Action	Remarks
<u>Read:</u> AT+CCFC?	Returns for each reason the current active mode, e.g. AT+CCFC? +CCFC: 0,1 +CCFC: 1,1 +CCFC: 2,0	
<u>Test:</u> AT+CCFC=?	Return supported reasons and modes.	(0-2),(0-2)

**Note**

It is impossible to originate a MO call during a CCFC request and it is impossible to make a CCFC request during an active call state.

The following table shows the +CCFC Set command variations.

Table 20. +CCFC Set Command Variations

<reason>	<mode>	<phone number>
0,1,2	1	e
0,1,2	2	m
m: must be specified e: error msg if provided		

**Note**

Some value carrier services, such as Call Forwarding, may vary depending on your service provider's network. Value carrier services are activated/deactivated using the ATD command and a specific code. This code may vary depending on the service provider. Consult your service provider for further information.

**Note**

Phone must have an active line for correct operation, else this command will not work.

Example

+CCFC: 0,1

+CCFC: 1,1

+CCFC: 2,0

4.2.1.24 +CHLD, Call Related Supplementary Services

This command controls the following call-related services:

- **HOLD:** A call is temporarily disconnected from the ME while the connection is retained by the network.
- **MTPY** (Multi-party) conversation - conference calls.

The network does not reserve more than one traffic channel for a mobile station; therefore, the served mobile subscriber can only have one call on hold at a time.



Note

Only a voice call can be put on HOLD.



Note

A precondition for multi-party service is that the served mobile subscriber has originated two calls, and is in control of one active call with the other call on Hold, both calls having been answered. In this situation, the served mobile subscriber can request the network to begin the MTPY service.

The maximum number of remote parties is 2.

The Test command returns values supported by the TA as a compound value.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
Set: +CHLD=[<n>]	+CME ERROR: <err>	<p><n> - call hold operation:</p> <p>0 Releases all held calls or: Sets User Determined User Busy for a waiting call.</p> <p>1x Releases specific call x, where x is the serial number of a call participating in an active MTPY call. (only supports x=2.)</p> <p>2 Places all active calls on hold, and accepts the held or waiting call.</p> <p>3 Adds a held call to the conversation - MTPY.</p> <p>Note: "Held calls" or "active calls" indicate a held or active call, single or MTPY. There cannot be two or more held/active single or MTPY calls.</p>
Test: +CHLD=?	List of supported operations (<n>s)	(0,1x,2,3)



Note

If user sets AT+CHLD=0 then the incoming waiting call will be ignored on the terminating side, but the originating side will not receive any indication that the call was ignored, and it will stay in the dialing mode.



Note

AT+CHLD=12 is guaranteed to release second MO call from 3-way multi-party only in Motorola coverage networks. On the other hand, in Nortel coverage networks AT+CHLD=12 will disconnect the call in the originating side but in the terminating side the call will be put on hold and will not be released until the originating side will terminate the 3-way multiparty conversation by using the ATH command.

The following table shows the allowed settings in different call state scenarios:

Table 21. Allowed Settings In Different Call State Scenarios

	At+chld=0	At+chld=2	At+chld=3	At+chld=12	remarks
One call active One call held	Not allowed	Allowed	Not allowed	Not allowed	Both calls are not allowed to be MO at the same time.
One call active One call waiting	Allowed	Allowed	Not allowed	Not allowed	
MO call active MO call held	Not allowed	Not allowed	Allowed	Not allowed	
3-way multiparty	Not allowed	Not allowed	Not allowed	Allowed	

Example

at+mode=2

OK

+MBAN: Copyright 2000-2002 Motorola, Inc.

at+clcc=1

OK

atd>"Eli Motorola"

+CLCC :1,0,2,0,0,"046750227pp211",129,"Eli Motorola"

+CLCC :1,0,0,0,0,"046750227pp211",129,"Eli Motorola"

D: VOICE

OK

+CLCC :2,1,5,0,0,"077714588",129,"Eli"

at+chld=2

OK

+CLCC :1,0,1,0,0,"046750227pp211",129,"Eli Motorola"

+CLCC :2,1,0,0,0,"077714588",129,"Eli"

ath

+CLCC :1,0,6,0,0,"046750227pp211",129,"Eli Motorola"

+CLCC :2,1,6,0,0,"077714588",129,"Eli"

OK

4.2.1.25 +COLP, Connected Line Identification

This command gets and changes the current setting of the Calling Line Presentation. +COLP: always follows a RING or +CRING: indicator.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+COLP?	+COLP: <number>,<type> [,<subaddr>,<satype>[,<alpha>]]	<number> The calling line number. <type> The presentation type of number. <subaddr> NULL, field not used. <satype> NULL, field not used. <alpha> The name of the calling party (if provided).
+COLP=<n>	Change current setting	<n> 0 Disable CLI presentation. 1 Enable CLI presentation.

Example

at+mode=2

OK

+MBAN: Copyright 2000-2002 Motorola, Inc.

at+colp=1

OK

atdl

+COLP: "054414588",129,"Eli"

D: VOICE

OK

4.2.1.26 +CCWA

This command shall enable/disable the Call Waiting notification unsolicited result code.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
Set: +CCWA = <n>	If value is legal: OK If value is illegal: +CME ERROR: <err>	<n> (enables/disables the call waiting unsolicited reporting) 0 - disable 1-enable
Test: +CCWA=?	+CCWA: (0-1)	
Read: +CCWA?	+CCWA: <n>	<n> - Current setting for Unsolicited reporting

The following table shows the +CCWA parameters

Table 22. +CCWA parameters

<Parameter>	Description
< Number >	String type phone number of forwarding address in the format specified by <type>.
< Type >	Type of address octet in integer format. 145 - Dialing string includes international Access code character "+". 129 - Type of number "unknown".
< Class >	1 - voice (telephony)



Note

If +CCWA is enabled and an incoming voice call is waiting to be accepted/ignored then the format of the unsolicited report will be as follows:

+CCWA: <number>, <Type>, <Class>

Example

```
at+mode=2
OK
+MBAN: Copyright 2000-2002 Motorola, Inc.
at+ccwa=1           // enable unsolicited reporting of call waiting
OK
at+ccwa=?           // Get legal values for +CCWA
+CCWA: (0,1)
OK
at+ccwa?            // Get current value
+CCWA: 1
OK

atd054123456        // originate call
D: VOICE
OK

+CCWA: "046750227",129,1 // incoming waiting call
+CCWA: "046750227",129,1 // incoming waiting call
+CCWA: "046750227",129,1 // incoming waiting call
+CCWA: "046750227",129,1 // incoming waiting call
at+chld=2           // accept waiting call
OK
```

4.2.2 Call Status Messages

4.2.2.1 +MCST, Request Call Processing Status



Note

The information in this section applies to release 3.0B and above.

This command queries the call processing state. Note that states 1 - 17 are call processing states, and can therefore be queried. States 64 to 72 indicate various phases of call origination, which can be thought of as sub-states of MCST 17. Generally, queries do not return one of these sub states, but instead return MCST 17. Refer to “D/DV, Dial Command”, page 63, for more detailed examples.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+MCST?	+MCST: <n>	1.Requests current call processing engine state. See table 24 MCST? Parameters for possible result codes. 2. the +MCST? Command is operational both in state 0 and 1
+MCST= <state>	OK	Enables/disables unsolicited call status messages..

The following table shows the +MCST parameters.

Table 23. +MCST Parameters

<Parameter>	Description
<state>	0 Call Status Messages Off 1 Call Status Messages On

Example

AT+MCST?

+MCST: 1 <idle>

AT+MCST=1

OK

atd077774588

+MCST: 64

+MCST: 17

D: VOICE

OK

+MCST: 3

+MCST: 1

The following table shows the +MCST? parameters.

Table 24. +MCST? Parameters

<Parameter>	Description
<n>	<p>Call processing state codes</p> <ul style="list-style-type: none"> 1 Idle call state 2 Single incoming call 3 Single call active 4 Multi-party call active 5 Single call held 6 Multi-party call held 7 Dual call (fully connected active call and held call) 8 Dual multi-party call active 9 Dual multi-party call held 10 Single active call plus call waiting 11 Multi-party call active plus call waiting 12 Single call held plus call waiting 13 Multi-party call held plus call waiting 14 Dual calls plus call waiting 15 Dual multi-party calls active plus call waiting 16 Dual multi-party calls held plus call waiting 17 Call control busy 64 Calling 65 Call failed (with Exit and Retry soft keys displayed) 66 Redialing (with Cancel soft key on left) 67 Waiting for service (TDMA specific) 68 No service 69 No redial 70 Outgoing calls restricted (with OK soft key on right) 71 Outgoing calls phone book only (with OK soft key on right) 72 Security fail

4.2.2.2 +CPAS, Phone Activity Status


Note

The information in this section applies to release 4.07 and above.

This command returns the activity status of the MT. It can be used to query the MT before requesting an action from it. The <value> parameter requests the return of additional status information about the MT, including call state, band, channel status, and service.

The Test command returns values supported by the MT as a compound value.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
AT+CPAS=<value>	If <value>=1 +CPAS: <state> If <value>=2 +CPAS: <state>,<band>, <channel>,<service> OK	Returns the activity status of the c18.
AT+CPAS=?	+CPAS: (1,2)	Returns the supported values for <value>.

The following table shows the +CPAS parameters.

Table 25. +CPAS Parameters

<Parameter>	Description
<value>	1 Reports the <state> subparameter of the +CPAS information response. 2 Reports all subparameters of the +CPAS information response.
<state>	Phone Activity Status 0 No service 1 Calling 3 Idle + Conversation 6 Alerting
<band>	0 800 MHz 1 900 MHz 3 1900 MHz 4 Unknown

Table 25. +CPAS Parameters (Continued)

<Parameter>	Description
<channel>	0 Digital Channel. 3 Analog Channel. DCCH Dedicated Control Channel DCCH + SCH Dedicated Control Channel + Supplemental Channel FCH Fundamental Channel FCH + SCH Fundamental Channel + Supplemental Channel
<service>	0 Idle 1 Voice/speech service 2 A-sync data service 4 Fax data service 20 Packet data service

**Note**

After the first time that the phone recognizes the channel type (like FCH or DCCH) it will show the channel type consistently.

Example

```
AT+CPAS=1
```

```
+CPAS:3
```

```
AT+CPAS=2    // In Idle
```

```
+CPAS:3,0,0,0
```

```
AT+CPAS=2
```

+CPAS: 6,0,FCH,1 //Incoming call

4.2.2.3 +CLCC, List Current Calls

This command returns the list of current calls on the ME.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
Set: AT+CLCC=<state>	OK or: +CME ERROR: <err>	<state> 0 Disables clcc unsolicited indication. 1 Enables clcc unsolicited indication <idx>. Integer type; call identification number.

AT Command	Response/Action	Remarks
Execute: AT+CLCC	+CLCC: <idx>,<dir>,<call state>, <mode>, <empty>[,<number>, <type>,<alpha>] OK	<dir> 0 Mobile originated call (MO) 1 Mobile terminated call (MT) <call state> 0 Active 1 Held 2 Dialing (MO call) 3 Alerting (MO call) - Not implemented in CDMA. 4 Incoming (MT call) 5 Waiting (MT call) 6 Released (not in 707, only in c18) <mode> (bearer/teleservice) 0 Voice Call 1 Data 2 Fax <empty> 0 Call is not part of a multi-party call 1 Call is one of the parties in a multi-party call <number> String type phone number in format specified by <type>. <type> Type of address octet in integer format: 129 Unknown number 145 International number with access character + <alpha> String type alphanumeric representation of <number> corresponding to the entry found in the phone book.
Read: AT+CLCC?	+CLCC: <state> OK +CME ERROR <err>	
Test: AT+CLCC=?	+CLCC: (List of supported <state>s) OK +CME ERROR <err>	

**Note**

The call state order for an MO call in CDMA network is dialing, active (goes to that state even if the terminating side doesn't answer to that call), released.

The call state order for an MT call in CDMA network is incoming/ waiting, active, released.

Asynchronous answers are also permitted, by using at+clcc=1.

**Note**

Unsolicited reports are currently supported only in activation mode 2.

**Note**

Call type identification by the terminating side is guaranteed only if the call is originated from a CDMA network.

If a call (voice/data/fax) is originated from a network which is not a CDMA network, then in order for the terminating side to recognize the incoming call type, the AT command AT\$QCVAD (activation mode 0) must be used prior of receiving the call.

Examples

```
AT+CLCC=?
```

```
+CLCC: (0,1)
```

```
OK
```

```
AT+CLCC
```

```
+CLCC: 1,0,0,0,0,"01256316830",129,"Shmuel"
```

```
OK
```

```
AT+CLCC?
```

```
+CLCC: 0
```

```
OK
```

```
AT+CLCC=1
```

```
//Example with unsolicited indication
```

```
OK
```

```
ATD055490698
```

```
// Mobile Originated call is made
```

```
+CLCC: 1,0,2,0,0,"055490698",129,"Alpha"
```

```
+CLCC: 1,0,0,0,0,"055490698",129,"Alpha"
```

```
D: VOICE
```

```
OK
```

```
ATH
```

```
// Call is released.
```

```
+CLCC: 1,0,6,0,0,"055490698",129," Alpha "
```

4.2.3 Additional Call Processing Commands

4.2.3.1 +CLIR, Calling Line Identification Restriction

This command allows the calling subscriber to enable or disable the presentation of the CLI of a MO call to the called party.

The network enables three possible provisions of CLIR: Not provisioned, provisioned permanently, and provisioned in temporary mode.

The provision is fixed and cannot be changed by an AT command.

Temporary Mode

Temporary mode can be in one of two states:

- State A: Presentation restricted (CLIR on) by default.
- State B: Presentation permitted (CLIR off) by default..

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
Set: +CLIR=[<n>]		<n> Sets the adjustment for outgoing calls: 1 CLIR invocation - change temporary mode default to CLIRON (state A). 2 CLIR suppression - change temporary mode default to CLIROFF (state B). <m> Shows the subscriber CLIR service status in the network: (currently in CDMA it is impossible to query the network). 0 CLIR not provisioned (not supported). 1 CLIR provisioned in permanent mode (not supported). 2 Unknown (default value). 3 CLIR temporary mode presentation restricted (not supported). 4 CLIR temporary mode presentation allowed (not supported).
Read: +CLIR?	+CLIR: <n>,<m>	
Test: +CLIR=?	+CLIR: (list of <n>s)	(1,2)

The following table shows the +CLIR Read/Set command variations.

Read Response <m>	Possible Read Response <n>	Possible Set <n>
2	1	1, 2
2	2	1,2

**Note**

When the service is in state B and the SU wishes to disable the CLI presentation (turn CLIR on) for a single call, it can do so using the ATD command.

Every SU that is subscribed to CLIR temporary mode service has a default subscription either to state A or B.

In c18, It is impossible to query the Network for the actual provision state of CLIR.

If the SU is subscribed to permanent provision and CLIR is set off using AT+CLIR=2 (CLI presentation permitted), then caller ID will be restricted anyway at the terminating side (CLI presentation restricted).

**Note**

When +CLIR is enabled (invocation) in temporary mode then the dial string may not contain any non-digit characters ('+', '*', etc.).

In case it will contain non-digits then error code 270 will be returned.

Example

AT+CLIR=?

+CLIR: (1,2)

OK

AT+CLIR?

+CLIR: 1,3

OK

AT+CLIR=1

OK

AT+CLIR?

+CLIR: 2,4

OK

4.3 PHONE AND DATE BOOKS

4.3.1 Directory Access Commands (Phone Book)

4.3.1.1 +MPBSC, Scroll Phone Book Entries

This command reads an entry from the phone book via scrolling. This command can be used to recall an entry from a relative location. The phone maintains an internal position counter (initialized at the first entry) that is updated after each successful scroll operation. If only one location is specified, and that location is empty, an error is returned.

This command acts on the currently active phone book, as selected using the +CPBS command, described in “+CPBS, Select Phone Book Memory” on page 98.

The sort order for the phone book is determined by the +MPBSCS command, described in “+MPBSCS, Select Phone Book Scroll Sort Order” on page 92.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+MPBSC=<scroll_oper> [,<num>]	+MPBR: <index>,<number>,<type>,<text>,...	Reads a phone book entry via scroll.
+MPBSC=?	+MPBSC=? (<scroll_oper>,<scroll_oper>,...), <num_ent>	Obtains valid scroll operations.

The following table shows the +MPBSC parameters.

Table 26. +MPBSC Parameters

<Parameter>	Description
<scroll_oper>	<ol style="list-style-type: none"> 1 Returns the first entry in list. 2 Returns the previous entry in the list. 3 Returns the current entry in the list. 4 Returns the next entry in the list. 5 Returns the last entry in the list. 6 Scrolls backwards to the first entry starting with a different character. For example, if at a 'Z' entry when this request is made, and there are no 'Y' entries, and there are 3 'X' entries, the FIRST 'X' entry will be displayed first. (See example section that follows). 7 Scroll forward to the first entry starting with a different character. (See example section that follows).

Table 26. +MPBSC Parameters

<Parameter>	Description
<num>	<p>Maximum number of entries to be returned. Default value is 1.</p> <p>Note: If multiple entries are requested, there is no wrap-around ("OK" is returned after the last entry in the list is output). Wrap-around occurs only when the current index is at the end-of the list and a SINGLE entry is requested.</p>

Example

AT+MPBSC=?

+MPBSC: (1-7),6

AT+MPBSC=1,6

+MPBR: 23,"8007598888",129,"Aaron",...*

+MPBR: 14,"8001234567",129,"Betty",...*

+MPBR: 25,"8007654321",129,"Carol",...*

+MPBR: 71,"4257891234",129,"Xavier",...*

+MPBR: 4,"2061234567",129,"Xiang",...*

+MPBR: 2,"8475767800",129,"Zack",...*

OK

AT+MPBSC=1,2

+MPBR: 23,"8007598888",129,"Aaron",...*

+MPBR: 14,"8001234567",129,"Betty",...*

OK

AT+MPBSC=4

+MPBR: 25,"8007654321",129,"Carol",...*

OK

AT+MPBSC=5

+MPBR: 2,"8475767800",129,"Zack",...*

OK

AT+MPBSC=7,5

+MPBR: 71,"4257891234",129,"Xavier",...*

+MPBR: 4,"2061234567",129,"Xiang",...*

+MPBR: 2,"8475767800",129,"Zack",...*

OK

AT+MPBSC=6

+MPBR: 23,"8007598888",129,"Aaron",...*

OK

4.3.1.2 +MPBSCS, Select Phone Book Scroll Sort Order



Note

The information in this section applies to release 3.0B and above.

This command selects the sort order (alphabetically, by index, and so on) for phone book scroll operations.

This command acts on the currently active phone book, as selected using the +CPBS command, described on page 98.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+MPBSCS=<sort_order>	OK	Selects the sort order to be used.
+MPBSCS=?	+MPBSCS: (<sort_order>,<sort_order>,...) or: +CME ERROR: <err>	Obtains valid sort orders.

The following table shows the +MPBSCS parameters.

Table 27. +MPBSCS Parameters

<Parameter>	Description
<sort_order>	Currently selected sort order. 0 Sort by name. 1 Sort by Unique Name. 2 Sort by Speed Location. 3 Sort by Voice Name. 4 Sort by Chronological entry. 5-8 Sort by name.
<sort_range>	The range of data included in the sort.
<err>	Error code sort order is invalid.

Example

AT+MPBSCS=?

+MPBSC: (0-8)

OK

AT+MPBSC=1

OK

AT+MPBSCS?

+MPBSCS: 1

OK

4.3.1.3 +MPBFN, Find Phone Book Entries by Number

This command allows the accessory to search in the phone book, by phone number, for a particular entry. If no entry can be found that matches that name, the command does not return any entries. If multiple matches are found, all are returned.

This command acts on the currently active phone book, as selected using the +CPBS command, described on page 98.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+MPBFN=<ph_num>	+MPBFN: <index>, <number>, <type>, <text>, <ph_type>, , . . .	Searches in the phone book for a particular entry by phone number. <ph_num> - The text string of the phone number to search for

Example

AT+MPBFN="4257654321 "

+MPBR: 79,"4257654321",145,"Jonathan",1,0

4.3.1.4 MPBVR/MPBVW Commands

The existing PST can read phone book entries from a phone and write them back. When phone book entries are read from the database and sent out to the PST, any voice tags associated with the entries are dropped.

MPBVR and MPBVW commands enable systems that have enhanced PST to send the voice data (model information and voice data for voice recognition, shortened for voice data) associated with a phone book entry voice tag to PST and to write it back to the phone.

There are two crucial pieces of data for each voice tag: Model data and voice data. For the entire phone book, only global data needs to be read. Global data is 8 bytes in length. Model data, which is used by DSP for voice recognition, is 182 bytes. Voice data, which is used for playback, is 3800 bytes. Within these 3800 bytes, 3400 bytes are the actual data, and 400 bytes are headers. When SEEM reads the voice data from SEEM, it divides the 3400 bytes data into 100 SEEM packets, each with a header of 4 bytes, for a total header size of 400 bytes.

4.3.1.5 +MPBVR, Read Phone Book Voice Tag Data

This command reads global data, model data or voice data for a phone book entry(ies).

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
AT+MPBVR=<read_type> [,<voice_tag>]	+MPBVR: <sequence_number>, <total_number_of_packets>, <length>,<data_in_ASCII_string> The response for this command is sent in one packet via multiple chunks because of the buffer size limit. Following is the response format for global data, model data and voice data: 1 For global data: +MPBVR:0,1,<length>,<data_in_ASCII_String> 2 For model data: +MPBVR:0,1,<length>,<data_in_ASCII_String> 3 For voice data: +MPBVR:0,1,<length>,<data_in_ASCII_String>	Reads global data, model data or voice data.
+MPBVR?	+MPBVR: <size of buffer>	Returns the acceptable buffer size that can be accepted. For example, 200 characters including the header.
+MPBVR=?	+MPBVR: <range of voice tags>, <size of global data>, <size of model data>, <size of voice data>	Returns a valid range of voice tags, and the size of each data type in bytes. Note: 0 is an invalid voice tag index.



Note

1. When responding to +MPBVR=?, the upper bound of the voice tag field is a variable. It may vary for different models, or carriers and so on.
2. Before the phone sends the data, it needs to convert the data from binary to ASCII in hex format. The simplest conversion scheme is to convert each nibble to 0-9 and A-F. For example, if the original binary data is 0x4E, it becomes 0x34 and 0x45 after conversion.
3. Since voice data is 7600 bytes (6800 bytes of data plus 800 bytes of header) after conversion, an error could occur before the phone completes sending out the entire 7600 bytes. If this occurs, the phone software sends an error. The external host software should detect the error.
4. If the reading command fails for any reason, the external host software should retry the command. It should also specify a limit of re-tries. If the number of re-tries reaches this limit, it should abort the operation.

The following table shows the +MPBVR parameters.

Table 28. +MPBVR Parameters

<Parameter>	Description
<read_type>	1 Not used. 2 Global data. <voice_tag> is not needed. 3 Model data. <voice_tag> needs to be specified. 4 Voice data. <voice_tag> needs to be specified.
<sequence_number>	The number identifier for the response starting from 0.
<voice_tag>	The index associated with a phone book entry. 0 Indicates an invalid voice tag 1-21 Indicates a valid voice tag index.
<total_number_of_packets>	The total number of packets in the response. Combined with <sequence_number>, it can be used to detect the end of the response for a command.
<length>	The number of bytes in the <data_in_ASCII_String>.

Examples

AT+MPBVR?

+MPBVR: 200

OK

+MPBVR=?

+MPBVR: (1-21), 8, 182, 3800

OK

+MPBVR=2

+MPBVR: 0,1,16,"410E3456FE67"

OK

4.3.1.6 +MPBVW, Write Phone Book Voice Tag Data

This command writes global data, model data or voice data for phone book entry(ies).

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
AT+MPBVW=<write_type> [,<voice_tag>], <sequence_number>, <total_number_of_commands>, <length>, <data in ASCII String>	OK or ERROR where: If <write_type> is DELETE_ALL, the command is to delete all existing voice tag data. Since the existing SEEM interface updates the valid record table automatically for every write of voice data, you need to clear all existing voice tag data before writing any voice data to ensure the integrity of the voice tag data. A valid record table is a SEEM internal array that indicates which voice tag is valid and which is not. Due to the length of Model Data and Voice Data, these types of data must be sent to the phone using multiple commands. In this case, the <sequence_number> of packets is from 0 to <total_number_of_packets-1>.	Writes global data, model data or voice data.
+MPBVW?	+MPBVW: <size of buffer>	Returns the acceptable buffer size. For example, 200 characters including header.
+MPBVW=?	+MPBVW: <range of voice tags>, <size of global data>, <size of model data>, <size of voice data>	Returns a valid range of voice tags, and the size of each data type in bytes. Note that 0 is an invalid voice tag index.



Note

1. As Model Data and Voice Data are sent in multiple commands, the phone software should have a timer. If the phone does not receive the next packet within the given time, it should time out and return to the waiting state and wait for the next command. In this case, since the external host does not know that the phone's timer has expired, it will continue sending the next packet, but it will be rejected by the phone because it is expecting the packet with 0 <sequence_number>.
2. If the <data in ASCII string> is longer than the command is capable of processing (200 characters including header), the command responds with ERROR.
3. If an error occurs when processing the command, the phone rejects the command by responding with ERROR, and waits for the same packet to be sent again.
4. If an error occurs after processing the command (after responding with OK), the phone goes back to the waiting state, waiting for the next command. If the next command's sequence number is not 0, the phone rejects it by responding with ERROR.

The following table shows the +MPBVW parameters.

Table 29. +MPBVW Parameters

<Parameter>	Description
<write_type>	1 Deletes all voice tags. No other parameters are required. 2 Global Data. <voice_tag> is not required. 3 Model Data. All parameters must be specified. 4 Voice Data. All parameters must be specified.
<voice_tag>	The index associated with a phone book entry. 0 Indicates an invalid voice tag. 1-21 Indicates a valid voice tag index.
<sequence_number>	The number identifier for the response that starts with 0.
<total_number_of_packets>	The total number of commands for the same type of data. Combined with <sequence_number>, it can be used to detect the end of the commands for the same data type.
<length>	The number of bytes in the <data_in_ASCII_String>.
<data in ASCII String>	The string data in ASCII format.

Examples

AT+MPBW?

+MPBVR: 200

OK

+MPBVW=?

+MPBVW: (1-21), 8, 182, 3800

OK

+MPBVW=1

OK

+MPBVW=2,,0,1,16,"0000200000000000"

OK

+MPBVW=3,1,0,3,152,"000C0514F0EDFEFCFEFDFFFF01010101FBF8FBF5FF030004020E00FD1508F6F7F4F210140203FE0301FF020FF9FF01FB05060CFDFC0000FFFA03F0EC110A040A0705F8FE0D0F00FFFAFF06FE"

OK

```
+MPBVW=3,1,1,3,152,""F4FA02FFFD70813E9EEFEF30D04040703061014FF0FFFFBF8E
B03F90105F6F51411F9FBF2F7F6FEFEFA07FE04DC1204060FF50DF101FAFDF8FF03ED0
90301FD00FFFE00FFFFD3F5FBFC04FD"
```

OK

```
+MPBVW=3,1,2,3,60,"0C010B030502020202020303010103060203030403030303020203040
303"
```

4.3.1.7 +CPBS, Select Phone Book Memory

This command selects the memory to be used for reading and writing entries in SUs that contain more than one phone book memory (For example, GSM phones that enable separate storage on the SIM card and in the SU's internal EEPROM.)

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+CPBS?	+CPBS: <storage>	Returns the currently selected storage.
+CPBS=?	+CPBS: (list of supported <storage>s)	Returns a list of available storage identifiers.
+CPBS=<storage>	OK	Sets the active phone book to <storage>.

The following table shows the +CPBS parameters.

Table 30. +CPBS Parameters

<Parameter>	Description
<storage>	"DC" SU dialed calls list (read-only) "MC" SU missed calls list (read-only) "ME" SU internal phone book "MT", "AD" SU phone book "RC" SU received calls list (read-only) "ON" ME "Own Phone Numbers" "QD" Quick Dial list

Example

```

at+cpbs=?
+CPBS: "ME","MT","ON","DC","MC","RC","AD","QD"
OK
at+cpbs?
+CPBS: "AD"
OK
at+cpbs="MT"
OK

```

4.3.1.8 +CPBR, Read Phone Book Entries

This command recalls information from the phone book by location number. This command can be used to recall information from a specific location, or from a range of locations. If only one location is specified and that location is empty, an error is returned. If a range is requested, all locations that contain data within that range are returned.

This command can also be used to obtain information about the number of locations and the maximum size of the phone number and alpha tag fields in the phone book.

This command acts on the currently active phone book, as selected with the +CPBS command. (See “+CPBS, Select Phone Book Memory” on page 98.)

Mode Activation

Mode = 2.

AT Command	Possible Responses	Remarks
+CPBR=<index1>[,<index2>]	+CPBR: <index>,<number>,<type>,<text>	Reads phone book entries.
+CPBR=?	+CPBR: <index range>,<nlength>,<tlength>	Obtains phone book information on this phone.

The following table shows the +CPBR parameters.

Table 31. +CPBR Parameters

<Parameter>	Description
<index> <index1> <index2>	Index for a given phone book entry. Integer.
<index_range>	Range of phone book indices. Range of integers (for example, 15-73).

Table 31. +CPBR Parameters (*Continued*)

<Parameter>	Description
<number>	Phone number of a given entry. ASCII string of max length <nlength>.
<type>	Address type of a phone number. Integer.
<text>	Text identifier for a phone book entry, using the character set specified by the +CSCS command. String of max length <tlength>.
<nlength>	The maximum size of a phone number, in digits. Integer.
<tlength>	The maximum number of characters in the <text> entry. Integer.

Example

AT+CPBR=?

+CPBR: 1-79,32,20

OK

AT+CPBR=23

+CPBR: 23,"18007598888",129,"Skypage"

OK

AT+CPBR=1,20

+CPBR: 2,"8475767800",129,"Moto Voicemail"

+CPBR: 10,"8475551212",129,""

OK

4.3.1.9 +MPBR, Read Extended Phone Book Entries

This command recalls phone entries from the phone book by location number, either from a specific location, or from a range of locations. If only one location is specified, and that location is empty, an error will be returned. If a range is requested, all locations that contain data within that range are returned. This command differs from the +CPBR command in that it returns several extra fields, including the following:

- Phone type, which represents the type of phone number stored in the entry (home, work, pager and so on).
- Voice tag, which represents whether voice tag is present, and if so, the index of the voice tag.
- Alert tone, which represents the distinctive alert tone associated with the entry.
- Backlight, which is a reserved field for future implementation of the backlight feature.
- Is_primary, which indicates whether the entry is the primary number for the user.

This command can also be used to obtain information about the number of locations and the maximum size of the phone number and alpha tag fields in the phone book.

This command acts on the currently active phone book, as selected using the +CPBS command. (See “+CPBS, Select Phone Book Memory” on page 98 for more information.)

Mode Activation

Mode = 2.

AT Command	Possible Responses	Remarks
+MPBR=<index1>[,<index2>]	+MPBR: <index>,<number>,<type>,<text>,<ph_type>,<voice_tag>,<alert_tone>,<backlight>,<is_primary>	Reads phone book entries.
+MPBR=?	+MPBR: <index range>,<nlength>,<tlength>,ptypes,<voice tag range>,<email_length>,<dr_range>,<bl_range>,<is_primary_range>	Obtains information about the phone book on this phone.

The following table shows the +MPBR parameters.

Table 32. +MPBR Parameters

<Parameter>	Description
<index><index1> <index2>	The index for a given phone book entry. Integer.
<number>	Phone number of a given entry. ASCII string of max length <nlength>.
<type>	The address type of a phone number. Integer.
<text>	Text identifier for a phone book entry, using the character set specified by the +CSCS command. String of max length <tlength>.
<ph_type>	Type of phone (for example, home, work, mobile and so on). Integer.
<alert_tone>	The distinctive alert tone style when the number is the originator of an incoming call. Integer. 255 Invalid alert tone entry indicating that no ringer is set.
<backlight>	This field is reserved to support the future implementation of the backlight feature. Integer.

Table 32. +MPBR Parameters (*Continued*)

<Parameter>	Description
<is_primary>	0 Non-primary number 1 Primary number Integer.
<index range>	The index for a given phone book entry.
<nlength>	The maximum size of a phone number, in digits.
<tlength>	The maximum number of characters in the <text> entry.
<ptypes>	The maximum allowable phone types.
<voice_tag range>	Lists the range of valid value for the voice tag index.
<voice_tag>	The index associated with a phone book entry. 0 Indicates an invalid voice tag 1-21 Indicates a valid voice tag index. The range upper bound is a variable.+MPBR=? should be used to determine the upper bound.
<email_length>	The maximum string length for the email address in the <number> field when phone type is "email".
<dr_range>	The range of distinctive ringer (alert tones). This range only represents the valid (flexed) alert tones for the specific SU. Note: 255 is the setting for no ring tone and is always present.
<bl_range>	The range of backlight styles.
<is_primary_range>	Lists the range of valid value for the <is_primary> field.

Example

AT+MPBR=? //With ring tones 0-31, 101-131, 255 flexed on
+MPBR: 1-79,32,20,7,0-21,50,(0-31,101-131,255),(0-2),(0-1)
OK

AT+MPBR=? //With ring tones 1, 15, 20-30, 101-131, 255 flexed on
+MPBR: 1-79,32,20,7,0-21,50,(1,15,20-30,101-131,255),(0-2),(0-1)
OK

AT+MPBR=? //With ring tones 1, 255 flexed on
+MPBR: 1-79,32,20,7,0-21,50,(1,255),(0-2),(0-1)

OK

AT+MPBR=? //With ring tones 1, 3, 5, 7, 101, 255 flexed on

+MPBR: 1-79,32,20,7,0-21,50,(1,3,5,7,101,255),(0-2),(0-1)

OK

AT+MPBR=23

+MPBR: 23,"18007598888",129,"Clinton",3,2,255,0,0

OK

AT+MPBR=1,20

+MPBR: 2,"8475767800",129,"Moto Voicemail",4,0,23,0,1

+MPBR: 10,"8475551212",129,"",1,1,6,0,1

OK

4.3.1.10 +CPBF, Find Phone Book Entries

This command enables the accessory to search for a specified entry, by name, in the phone book. If no entry can be found that matches that name, the command returns an error value. If multiple matches are found, all are returned.

This command acts on the currently active phone book, as selected with the +CPBS command. (Refer to "+CPBS, Select Phone Book Memory", page 98, for more information.)

Mode Activation

Mode = 2.

AT Command	Possible Responses	Remarks
+CPBF=<findtext>	+CPBF: <index>, <number>, <type>, <text>...<index>, <number>, <type>, <text>	Searches the phone book for a particular entry, by name.

The following table shows the +CPBF parameters.

Table 33. +CPBF Parameters

<Parameter>	Description
<findtext>	The text substring for which to search. The character set to be used is defined by the +CSCS command.

Example

AT+CPBF="Moto"

+CPBF: 2,"8475767800",129,"Moto Voicemail"

4.3.1.11 +MPBF, Find Extended Phone Book Entries

This command enables the accessory to search for a specified entry, by name, in the phone book. This command is similar to +CPBF, described in the previous section, except that it also returns the extra fields that are unique to Motorola phones. These fields include the following:

- Phone type, which represents the type of phone number stored in the entry (home, work, pager, and so on).
- Voice tag, which represents whether a voice tag is present.
- Alert tone, which represents the distinctive alert tone associated with the entry.
- Backlight, which is a reserved field for future implementation of backlight feature.
- Is_primary, which indicates whether the entry is the primary number for the user.

Mode Activation

Mode = 2.

AT Command	Possible Responses	Remarks
+MPBF=<findtext>	+MPBF: <index>,<number>,<type>,<text>, <ph_type>,...	Searches in the phone book for a particular entry by name (returns the extra fields that are unique to Motorola phones).

The following table shows the +MPBF parameters.

Table 34. +MPBF Parameters

<Parameter>	Description
<findtext>	The text substring for which to search. The character set is specified by the +CSCS command, described on page 44.

Example

```
AT+MPBF="Moto"
```

```
+MPBF: 2,"8475767800",129,"Moto Voicemail",3,...
```

```
OK
```

4.3.1.12 +CPBW, Write Phone Book Entry

This command enables a new entry from an accessory to be stored in the phone book, or an existing entry to be deleted from the phone book. The command enables an entry to be stored to either a specific location, or to the next available location in the phone book.

This command acts on the currently active phone book, as selected with the +CPBS command (see "+CPBS, Select Phone Book Memory" on page 98 for more information).

Mode Activation

Mode = 2.

AT Command	Possible Responses	Remarks
+CPBW=[<index>][,<number>[,<type>][,<text>]]	OK	Stores a new storage entry or deletes an existing entry.
+CPBW=?	+CPBW: <index range>, [<nlength>], [<tlength>] <index range>, <nlength>, <tlength>	Queries permitted locations and sizes.

Example

AT+CPBW=?

+CPBW: 1-99,32,20

//Store information in first available location

AT+CPBW=,"8005551212",129,"Sam Spade"

OK

Erase location 21

AT+CPBW=21

OK

4.3.1.13 +MPBW, Write Extended Phone Book Entry

This command enables a new entry from an accessory to be stored in the phone book, or an existing entry to be deleted from the phone book. The command allows the entry to be stored to a particular location, or to be stored to the next available location in the phone book.

This command differs from the +CPBW command in that it accepts the input of several extra fields. These fields include:

- Phone type, which represents the type of phone number stored in the entry (home, work, pager, and so on).
- Voice tag, which represents whether a voice tag is present, and if so, the index of the voice tag.
- Alert tone, which represents the distinctive alert tone associated with the entry.
- Backlight, which is a reserved field for future implementation of backlight feature.
- Is_primary, which indicates whether the entry should be set as the primary number for the user.

Mode Activation

Mode = 2.

AT Command	Possible Responses	Remarks
+MPBW=[<index>][,<number>[,<type>[,<text>[,<ph_type>[,<voice_tag>[,<alert_tone>[,<backlight>[,<is_primary>]]]]]]].	OK or: CME ERROR: <err>	Sets a new storage entry or deletion of an existing entry.
+MPBW=?	Refer to +MPBR=? for details	Queries allowable locations and sizes.

Example

.AT+MPBW=,"8005551212",129,"Sam Spade",2,3,0,1 //Store primary number for user "Sam Spade" i in first available location

OK

AT+MPBW=12,"+5551212",145,"Sam Spade",0,0,12,0,0//Store non-primary number for user "Sam Spade" in index 12

OK

AT+MPBW=21 //Erase location 21

4.3.2 Date Book Access Commands

4.3.2.1 +MDBWE, Write Date Book Event Exception



Note

The information in this section applies to release 3.0B and above.

This command modifies event exception data for an entry in the date book. This command is also used to delete an entry from the date book.

Mode Activation

Mode = 2.

AT Command	Possible Responses	Remarks
+MDBWE= <i>,<ex_no>,<ex_type>	OK or: CME ERROR	Modifies the event exception data for a specific event.

The following table shows the +MDBWE parameters.

Table 35. +MDBWE Parameters

<Parameter>	Description
<i>	Index of event.
<ex_no>	Occurrence of event (0 = first).
<ex_type>	Type of event exception: 0 Delete this entry from the date book (remove all occurrences). 1 Remove occurrence <ex_no> only.

Example

AT+MDBL=1

AT+MDBWE=12,3,1 //Remove occurrence 3 of event 12

OK

AT+MDBWE=13,3,0 //Remove entry 13

OK

AT+MDBL= 0

4.3.2.2 +MDBW, Write Date Book Entry

This command writes an entry to the date book.

Mode Activation

Mode = 2.

AT Command	Possible Responses	Remarks
+MDBW= <i>,<ev_title>,<timed>,<al_en>,<start_time>,<start_date>,<duration>,<al_time>,<al_date>,<repeat>	OK or: CME ERROR: <err>	Writes an entry.

The following table shows the +MDBW parameters.

Table 36. +MDBW Parameters

<Parameter>	Description
<i>	Location in which to write entry.
<ev_title>	Text representing the event title.

Table 36. +MDBW Parameters (*Continued*)

<Parameter>	Description
<timed>	1 Alarm timed. 0 Not timed.
<al_en>	1 Alarm enabled. 0 Disabled.
<start_time>	Event start time.
<start_date>	Event start date.
<duration>	Event duration, in minutes.
<al_time>	Event alarm time.
<al_date>	Event alarm date.
<repeat>	0 Non-recurring event. 1 Repeat daily. 2 Repeat weekly. 3 Repeat monthly on date. 4 Repeat monthly on day. 5 Repeat yearly.

Example

```
at+mode=2
```

```
OK
```

```
+MBAN: Copyright 2000-2002 Motorola, Inc.
```

```
at+mdbl=1
```

```
OK
```

```
at+mdbw=20,"Holiday",1,1,"21:00","04-21-2003",60,"20:55","04-21-2003",2
```

```
OK
```

```
at+mdbl=0
```

```
OK
```

4.3.2.3 +MDBL, Lock/Unlock Date Book

This command locks/unlocks the date book database. It is used primarily for synchronization of the date book with PIM (Personal Information Management) software.

Mode Activation

Mode = 2.

AT Command	Possible Responses	Remarks
+MDBL?	MDBL: <n>	Returns the current date book lock/unlock status.
+MDBL=?	20 MDBL: (0,1)	Returns possible settings for +MDBL.
+MDBL=<n>	OK	Forces a lock/unlock of the date book database.

The following table shows the +MDBL parameters.

Table 37. +MDBL Parameters

<Parameter>	Description
<n>	1 Lock date book. 0 Unlock date book.

Example

AT+MDBL=?

+MDBL: (0,1)

OK

AT+MDBL=1

OK

AT+MDBL?

+MDBL: 1

4.3.2.4 +MDBR, Read Date Book Entry

This command reads an entry or range of entries stored in the date book.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+MDBR=?	+MDBR: <entries>,<used>,<strlen>,<ex_max> ,<ex_type_max> (all are integer values)	Returns all pertinent date book parameters required for PIM software.
+MDBR=<i1>[,<i2>]	+MDBR:<i>,<ev_title>,<timed>,<al_en>,<start_time>,<start_date>,<duration>,<al_time>,<al_date>,<repeat>	Returns entry or range of entries.

The following table shows the +MDBR parameters.

Table 38. +MDBR Parameters

<Parameter>	Description
<entries>	Total number of date book entries
<used>	Number of entries currently used
<strlen>	Maximum string length of event title
<ex_max>	Maximum number of event exceptions
<ex_type_max>	Maximum number of event exception types
<i>	Entry index
<ev_title>	Text representing the event title
<timed>	1 Alarm timed 0 Alarm not timed
<al_en>	1 Alarm enabled 0 Alarm disabled
<start_time>	Event start time
<start_date>	Event start date
<duration>	Event duration, in minutes

Table 38. +MDBR Parameters (*Continued*)

<Parameter>	Description
<al_time>	Event alarm time
<al_date>	Event alarm date
<repeat>	0 Non-recurring event 1 Repeat daily 2 Repeat weekly 3 Repeat monthly on date 4 Repeat monthly on day 5 Repeat yearly

Example

```
at+mode=2
```

```
OK
```

```
+MBAN: Copyright 2000-2002 Motorola, Inc.
```

```
at+mdbl=1
```

```
OK
```

```
at+mdbr=17
```

```
+MDBR: 17,"Test",1,1,"17:00","05-04-2003",60,"16:55","05-04-2003",1
```

```
OK
```

```
at+mdbr=17,19
```

```
+MDBR: 17,"Test",1,1,"17:00","05-04-2003",60,"16:55","05-04-2003",1
```

```
+MDBR: 18,"Test2",1,1,"00:00","05-05-2003",60,"23:55","05-04-2003",2
```

```
+MDBR: 19,"Eli",1,1,"20:00","05-04-2003",30,"19:55","05-04-2003",1
```

```
OK
```

```
at+mdbl=0
```

```
OK
```

4.3.2.5 +MDBAD, Date Book Auto-Delete User Preference

This command sets/reads the auto-delete user preference setting in the date book database. This setting controls the period that date book records are stored after the event has occurred. This setting also controls the period that to-do-list items are held after the items are either due or completed.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+MDBAD?	MDBAD: <n>	Returns the current date book auto-delete setting.
+MDBAD=?	MDBAD: (0,1,2,4,8)	Returns possible settings for +MDBAD.
+MDBAD=<n>	OK	Sets the auto-delete value to <n>.

The following table shows the +MBAD parameters.

Table 39. +MBAD Parameters

<Parameter>	Description
<n>	<p>Number of weeks to wait before an auto-delete can be performed on the record.</p> <p>0 Never perform auto-delete on this record.</p> <p>1 Delete after 1 week.</p> <p>4 Delete after 4 weeks.</p>

Example

```

AT+MDBAD=?
+MDBAD: (0,1,2,4,8)
OK
AT+MDBAD=1
OK
AT+MDBAD?
+MDBAD: 1
OK

```

4.3.3 System Date and Time Access Command

4.3.3.1 +CCLK, Read Set System Date and Time



Note

The information in this section applies to release 3.0B and above.

This command reads/sets the SU's current date and time settings.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+CCLK?	+CCLK: <time> Note: <time> is always in the format "yy/MM/dd,hh:mm:ss±zz"	Returns the current date and time setting.
+CCLK=<time>	OK	Sets the system clock's date and time.
+CCLK=?	+CCLK: "99/12/31,23:59:59,(-47...+48)"	Return the highest values that this command work with

The following table shows the +CCLK parameters.

Table 40. +CCLK Parameters

<Parameter>	Description
<time>	ASCII string in "yy/MM/dd,hh:mm:ss±zz", or "yy/MM/dd,hh:mm:ss" format, where: yy 2-digit year [1970-2069] MM 2-digit month [01-12] dd 2-digit day of month [00-31] hh 2-digit hour [00-23] mm 2-digit minute [00-59] ss 2-digit seconds [00-59] zz Timezone offset from GMT, in quarter-hours [-47...+48]. this value is not specified, set to 00.

Example

```
AT+CCLK="00/12/25,08:30:00"
```

```
OK
```

```
AT+CCLK?
```

```
+CCLK: " 00/12/25,08:30:05+00"
```

```
AT+CCLK="01/07/04,21:00:12+43"
```

```
OK
```

```
AT+CCLK?
```

```
+CCLK: "01/07/04,21:00:34+00"
```

4.4 SMS**4.4.1 SMS Commands****4.4.1.1 +CNMI, New Message Indication to the TE**

This command enables unsolicited notification of the accessory when an SMS message is received by the SU. If the SU does not support the requested indication, a final result code +CMS ERROR: <err> is returned.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+CNMI=<mode>[,<mt>[,<bm>[,<ds>[,<bfr>]]]]	OK	Turns on the new SMS indication feature.
+CNMI?	+CNMI: <mode>,<mt>,<bm>,<ds>,<bfr>	Queries the current setting.
+CNMI=?	+CNMI: (list of supported <mode>s),(list of supported <mt>s), (list of supported <bm>s),(list of supported <ds>s),(list of supported <bfr>s)	Queries the new message unsolicited result code modes.

The following table shows the +CNMI parameters.

Table 41. +CNMI Parameters

<Parameter>	Description
<mode>	0 Do not forward unsolicited result codes. 3 Forward unsolicited codes to the accessory.

Table 41. +CNMI Parameters (*Continued*)

<Parameter>	Description
<mt>	0 Disable SMS notification. 1 Enable SMS notification (See "+CMTI, Unsolicited Result Code (SMS Message Receipt)" on page 122).
<bm>	0 Disable broadcast SMS notification.
<ds>	0 Disable SMS status reports.
<bfr>	0 Flush SU's result code buffer when <mode> 1-3 is entered.

Example

AT+CNMI=? //Query new message unsolicited result code modes
+CNMI: (0,3),(0,1),(0),(0),(0)
OK

AT+CNMI?
+CNMI: 0,0,0,0,0 //Query current settings
OK

AT+CNMI=3,1,0,0,0 //Turn on new SMS indication
OK

4.4.1.2 +CMGD, Delete Message**Note**

The information in this section applies to release 3.06 and above.

This command enables the accessory to delete messages from the preferred SU message storage <mem1> location <index>, or multiple messages according to <delflag>.

If the optional parameter <delflag> is entered, and is greater than 0, the <index> parameter is practically ignored.

(<mem1> is selected using the +CPMS command, described in "+CPMS, Preferred Message Storage" on page 114.) If deleting fails, result code +CMS ERROR: <err> is returned.

**Note**

The deletion of multiple commands is a time-consuming process that may require more than 60 seconds to complete.

Mode Activation

Mode = 2.

Set Command

Mode = 2

Command	Response/Action	Remarks
+CMGD=<index>[,<deflag>]	OK Or; +CMS ERROR: <err>	Deletes the message.

Test Command

Command	Response/Action	Remarks
+CMGD=?	+CMGD: (list of valid <index>s), (list of valid <deflag>s)	

The following table shows the +CMGD parameters.

Table 42. +CMGD Parameters

<Parameter>	Description
< index>	1-65535 Index in the SMS memory of the message to be deleted.
<deflag>	0 Deletes the message specified in <index> 1 Deletes all read messages 2 Deletes all read messages and sent MO messages 3 Deletes all read messages, sent and unsent MO messages 4 Deletes all messages

Example

```

AT+CMGD=101      /*Delete the specific index message */
OK
AT+CMGD=101,0    /*Delete the specific index message */
OK
AT+CMGD=1,4      /* Delete all messages */
OK

```

4.4.1.3 +CMSS, Send Message From Storage

This command selects a pre-stored message from message storage <mem2> and sends it. <mem2> is selected with the +CPMS command, described in “+CPMS, Preferred Message Storage” on page 118.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+CMSS=<index>	+CMSS:<mr>	Sends a message from storage to the network.

The following table shows the +CMSS parameters.

Table 43. +CMSS Parameters

<Parameter>	Description
<index>	Integer type. This is the index in the SMS memory of the message to be sent.
<mr>	Message reference number.

Example

AT+CMSS=7

+CMSS: 12

OK

4.4.1.4 +CSMS, Select Message Service

This command selects the message service and returns the types of messages that are supported by the ME.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+CSMS=<service>	+CSMS: <mt>,<mo>,<bm> 0 The type is not supported by the ME. 1 The type is supported by the ME.	Sets the type of service and returns the types of messages supported by the ME. <mt> Mobile terminated messages <mo> Mobile originated messages <bm> Broadcast type messages

AT Command	Response/Action	Remarks
+CSMS?	+CSMS: <service>,<mt>,<mo>,<bm>	Returns supported message types along with the current service setting.
+CSMS=?	+CSMS: (list of supported <service>s)	Returns a list of all services supported by the TA.

The following table shows the +CSMS parameters.

Table 44. +CSMS Parameters

<Parameter>	Description
<service>	Integer that defines the type of service. Values 1 to 127 are not supported. The only supported service value is 128 (manufacturer specific).

Example

AT+CSMS=128

+CSMS: 1,1,1

OK

AT+CSMS?

+CSMS: 128,1,1,1

OK

AT+CSMS=?

+CSMS: (128)

OK

4.4.1.5 +CPMS, Preferred Message Storage

This command selects the memory storages <mem1>, <mem2>, and <mem3> to be used for various functions, such as reading or writing.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+CPMS=<mem1>[,<mem2>[,<mem3>]]	+CPMS: <used1>,<total1>,<used2>,<total2>,<used3>,<total3>	Sets the memory storage.

AT Command	Response/Action	Remarks
+CPMS?	+CPMS: <mem1>,<used1>,<total1>,<mem2>,<used2>,<total2>,<mem3>,<used3>,<total3>	Reads current message storage.
+CPMS=?	+CPMS: (list of supported <mem1>s),(list of supported <mem2>s), (list of supported <mem3>s)	Lists all supported memory storage for <mem1>, <mem2> and <mem3>.

The following table shows the +CPMS parameters.

Table 45. +CPMS Parameters

<Parameter>	Description
<mem1>	The memory from which messages are read and deleted.
<mem2>	The memory to which writing and sending are made.
<mem3>	The memory to which receiving SMSs are to be stored.
<used>	The number of messages stored.
<total>	The total storage space.

The following table shows the list of <mem>.

Table 46. List of <mem>

<mem>	Description	Supported for <mem1>	Supported for <mem2>	Supported for <mem3>
"MT"	Includes "IM", "OM", "BM" and "DM" message storages, united together	Supported	Not supported	Not supported
"IM"	Inbox text message storage	Supported	Not supported	Supported
"OM"	Outbox text message storage	Supported	Supported	Not supported
"DM"	Draft text message storage	Supported	Supported	Not supported
"BM"	Broadcast message storage	Supported	Not supported	Not supported

Example

```

AT+CPMS="IM","OM","IM"
+CPMS: 2,10,3,10,2,10
OK
AT+CPMS
+CPMS: "IM",2,10,"OM",3,10,"IM",2,10
OK
AT+CPMS=?
+CPMS: ("IM","OM","BM","MT","DM"),("OM","DM"),("IM")
OK
at+cpms?
+CPMS: MT,0,1000,OM,0,250,IM,0,250
OK

```

4.4.1.6 +CMGF, Message Format

The set command sets the type of input and output format of message to use.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+CMGF=<mode>	OK	Sets the message format.
+CMGF?	+CMGF: 1	Reads current message format.
+CMGF=?	+CMGF: (0-1)	Lists all supported message formats.

The following table shows the +CMGF parameters.

Table 47. +CMGF Parameters

<Parameter>	Description
<mode>	Format of messages 0 Indicates PDU mode 1 Indicates TEXT mode

Example

```

at+cmgf=?
+CMGF: (0-1)
OK

```

```

at+cmgf?
+CMGF: 1
OK
at+cmgf=0
OK
at+cmgf?
+CMGF: 0
OK

```

4.4.1.7 +MEGA, Email Gateway Address

This Motorola-specific command updates the Email Gateway Address. MO SMS will not succeed if this field is not set correctly.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+MEGA=<ega>	OK	Sets the Email Gateway address.
+MEGA?	+MEGA:<ega>	Queries the Email Gateway address.

The following table shows the +MEGA parameters.

Table 48. +Mega Parameters

<Parameter>	Description
<ega>	Email Gateway Address, represented in a quoted string. Refer to <sca> for allowable characters.

Example

```

AT+MEGA="4252833433"
OK

```

```

AT+MEGA?
+MEGA: "4252833433"
OK

```

4.4.1.8 +CSDH, Show Text Mode Parameters

This command controls whether detailed header information is shown in the Text mode result code. For SMS-DELIVERs and SMS-SUBMITs in result code for commands +CMGR and +CMGL, the detailed header information contains <sca>, <tosca>, <fo>, <vp>, <pid>, <dc>, <length>, <toda>, and <tooa>; for SMS-COMMANDs in +CMGR result code, the detailed header includes <pid>, <mn>, <da>, <toda>, <length>, and <cdata>.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+CSDH=<show>	OK	Controls whether detailed header information is shown.
+CSDH?	+CSDH: <show>	Reads current value for <show>.
+CSDH=?	+CSDH: (list of supported <show>s)	Lists all supported values for <show>.

The following table shows the +CSDH parameters.

Table 49. +CSDH Parameters

<Parameter>	Description
<show>	0 Do not show header values in result codes. 1 Show the header value in result codes.

Example

AT+CSDH=0

OK

AT+CSDH?

+CSDH: 0

OK

AT+CSDH=?

+CSDH=(0)

OK

4.4.1.9 +CMTI, Unsolicited Result Code (SMS Message Receipt)

This unsolicited message is sent to the accessory by the SU upon receipt of an SMS message. Generation of these unsolicited messages is enabled using the +CNMI command, described in “+CNMI, New Message Indication to the TE” on page 114.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+CMTI:	+CMTI: <mem>,<index>	Unsolicited Result Code (SMS Message Receipt)

The following table shows the +CMTI parameters.

Table 50. +CMTI Parameters

<Parameter>	Description
<mem>	String type. Message memory space. Refer to Table 46, "List of <mem>" on page 119.
<index>	This is the location in which the new message is stored. Integer.

Example

+CMTI: "ME",2

4.4.1.10 +CMGL, List Messages

This command enables the accessory to read a list of all SMS messages with status value <stat> from SU message storage <mem1>. (<mem1> is selected using the +CPMS command, described in "+CPMS, Preferred Message Storage" on page 118.) It returns a series of responses, one per message, containing the message index, status, and data. For each message, if the status of the message is 'received unread', the status is changed to 'received read'. If listing fails, a final result code +CMS ERROR:<err> is returned.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
TEXT mode (+CMGF=1): +CMGL=<stat>	+CMGL:<index>,<stat>,<oa/da>, <CR><LF><data><CR><LF>	
PDU mode (+CMGF=0): +CMGL=<stat>	+CMGL: <index>,<stat>, <length> <CR><LF>< PDU data><CR><LF>	See section 4.4.1.12 and section 4.4.1.13 for PDU data .
TEXT mode (+CMGF=1): +CMGL=?	+CMGL: ("REC UNREAD", "REC READ", "STO UNSENT", "STO SENT", "ALL") OK	Queries the list of supported <stat>s.
PDU mode (+CMGF=0): +CMGL=?	+CMGL: (0-4) OK	Queries the list of supported <stat>s.

The following table shows the +CMGL parameters.

Table 51. +CMGL Parameters

<Parameter>	Description
<stat> in TEXT mode	"REC UNREAD" Received unread (new) message. (Default) "REC READ" Received read message. "STO UNSENT" Stored unsent message. "STO SENT" Stored sent message. "ALL" All messages
<stat> in PDU mode	0 List received unread messages 1 List received read messages 2 List stored unsent messages. 3 List stored sent messages. 4 List all messages
<index>	The message number of the message.
<oa/da>	Origin/destination address value in string format. When Email SMS feature is available, this address is a string that contains one or more MIN numbers and/or email addresses, separated by spaces. Otherwise, this field should contain a single MIN number..
<length>	Applicable only for PDU mode. The length of the PDU data in bytes.

**Note**

In order to support zero values inside the PDU User data content in 8 bit data encoding , set +MSZL=1, otherwise the content will be truncated at the first zero it encounters.

Example for Text mode

```

AT+CMGL="ALL"                                //Read all SMS messages
+CMGL: 1,"REC READ","0501234567"
This is a test "Hello world"
+CMGL: 2,"STO UNSENT","0501234567"
this is a second test
OK
AT+CMGL=?                                     // Queries the list of supported <stat>s.
+CMGL: ("REC UNREAD","REC READ","STO UNSENT","STO SENT","ALL")
OK

```

Example for PDU mode

```

at+cmgl=4
+CMGL: 102,1,,26
040A81507016051000004050036135730009E8329BFD0695D969
+CMGL: 103,3,,22
11FF098150615100F10004C409E8329BFD0695D96932
+CMGL: 101,2,,21
11FF098150615100F10000C409E8329BFD0695D969
OK
at+cmgl=?
+CMGL: (0-4)
OK

```

4.4.1.11 +MMGL, Motorola List Messages

This command enables the accessory to read a list of all SMS messages with status value <stat> from SU message storage<mem1>. (<mem1> is selected using the +CPMS command, described in “+CPMS, Preferred Message Storage” on page 118). This command is similar to +CMGL, except that no change is made to the read status of the message(s). Also, a new <stat> selection is defined, "HEADER ONLY", which can be used to query the SU for a list of message headers without attendant message data. This feature provides an accessory with all the necessary information for message-at-a-time access, and allows the accessory to implement first/last/next/previous message selection.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
TEXT mode (+CMGF=1): +MMGL=<stat>.	+MMGL:<index>,<stat>,<oa/da>, <CR><LF><data><CR><LF>	
PDU mode (+CMGF=0): +MMGL=<stat>	+MMGL: <index>,<stat>, <length> <CR><LF>< PDU data><CR><LF>	See section 4.4.1.12 and section 4.4.1.13 for PDU data .
TEXT mode (+CMGF=1): +MMGL=?	+MMGL: ("REC UNREAD", "REC READ", "STO UNSENT", "STO SENT", "ALL", "HEADER ONLY") OK	Queries the list of supported <stat>s.
PDU mode (+CMGF=0): +MMGL=?	+MMGL: (0-5) OK	Queries the list of supported <stat>s.

The following table shows the +MMGL parameters.

Table 52. +MMGL Parameters

<Parameter>	Description	
<stat> in TEXT mode	"REC UNREAD"	Received unread (new) message. (Default)
	"REC READ"	Received read message.
	"STO UNSENT"	Stored unsent message.
	"STO SENT"	Stored sent message.
	"ALL"	All messages
	"HEADER ONLY"	Message headers without attendant message data.
<stat> in PDU mode	0	List received unread messages
	1	List received read messages
	2	List stored unsent messages.
	3	List stored sent messages.
	4	List all messages
	5	List header only
<index>	The message number of the message.	
<oa/da>	Origin/destination address value in string format. When Email SMS feature is available, this address is a string that contains one or more MIN numbers and/or email addresses, separated by spaces. Otherwise, this field should contain a single MIN number..	
length	Applicable only for PDU mode. The length of the PDU data in bytes.	

**Note**

In order to support zero values inside the PDU User data content in 8 bit data encoding, set +MSZL=1, otherwise the content will be truncated at the first zero it encounters.

Example for TEXT mode

```
AT+MMGL="HEADER ONLY"           //Read the headers of all SMS messages
+MMGL: 1,"REC READ","0501234567"
+MMGL: 2,"STO UNSENT","0501234567"
OK
AT+MMGL=?
+MMGL: ("REC UNREAD","REC READ","STO UNSENT","STO SENT",
"ALL","HEADER ONLY")
OK
```

Example for PDU mode

```

at+mmgl=4
+MMGL: 102,0,,26
040A81507016051000004050036135730009E8329BFD0695D969
+MMGL: 103,3,,22
11FF098150615100F10004C409E8329BFD0695D96932
+MMGL: 101,2,,21
11FF098150615100F10000C409E8329BFD0695D969
OK
at+mmgl=?
+MMGL: (0-5)
OK

```

4.4.1.12 +CMGR, Read Message

This command enables the accessory to read SMS messages from the SU. It returns a message with the location value <index> from the preferred message storage <mem1>. (<mem1> is selected using the +CPMS command, described in "+CPMS, Preferred Message Storage" on page 114). If the status of the message is "received unread", the status in the storage changes to "received read". If reading fails, a final result code +CMS ERROR: <err> is returned.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
TEXT mode (+CMGF=1): +CMGR=<index>	+CMGR: <stat>,<oa/da>[,<scts>] <CR><LF><data><CR><LF>	Reads a message from the SU in TEXT format.
PDU mode (+CMGF=0): +CMGR=<index>	+CMGR: <State> ,<PDU length> <CR><LF><Bitmap><OA len>< TOOA><OA>< PID>< DCS>< SCTS><UDL><UD><CR><LF>	Reads a message from the SU in PDU format.

The following table shows the +CMGR parameters in TEXT mode.

Table 53. +CMGR Parameters for TEXT Mode

<Parameter>	Description
<index>	The index in the SMS memory of the message to be Retrieved.

Table 53. +CMGR Parameters for TEXT Mode

<Parameter>	Description
<oa/da>	Originating/destination address value in string format. When the Email SMS feature is available, this address is a string that contains one or more MIN numbers and/or Email addresses, separated by spaces. Otherwise, this Field should contain a single MIN number.
<scts>	Service center time stamp in time string format. Presented in incoming SMS messages only .
<data>	Message data.

The following table shows the +CMGR parameters for PDU mode.

Table 54. +CMGR Parameters for PDU Mode

Field name	Name description	Size (in bytes)	Valid values	Value description
Bitmap *		1	see ETSI 03.40	MTI + MMS + RP + UDHI + SRI
OA len	Origination address length	1	0x02 - 0x14	Number of characters in OA
TOOA	Origination address type	1	0x81	Code of OA type
OA	Origination address	2-11	Phone number string, composed of BCD characters only.	OA phone number. Every 2 digits are replaced (12 is 21 etc.) In case of odd number of digits pad with F.
PID	Protocol ID	1	0x00 0x26	TEXT 0x00 PAGING 0x26
DCS	Data coding scheme	1	0x00 0x04 0x08	0x00 - 7 bit ASCII 0x04 - 8 bit 0x08 - UCS2
SCTS	Service Center Time Stamp	7	Year 00 - 99 Month 01-12 Day 01-31 Hour 00-24 Minute 00-59 Seconds 00-59	Every 2 digits are replaced (12 is 21 etc.), Year month day hour minute seconds 00 Note : the last byte is always zero

Table 54. +CMGR Parameters for PDU Mode (Continued)

Field name	Name description	Size (in bytes)	Valid values	Value description
UDL	User data length	1	1-160	Length of uncompressed user data in bytes
UD	User data		Encoded text, composed of hexadecimal characters only	User data
<State>	State of message	1	0-5	0 List received unread messages 1 List received read messages 2 List stored unsent messages. 3 List stored sent messages. 4 List all messages 5 List header only (only applicable in +MMGL)

The Bitmap Octet for SMS Submit is divided as follows:

7	6	5	4	3	2	1	0
RP-Replay Path Not supported	UDHI- User Data Header Indication Not supported	SRI - Status Report Indication			MMS- More Messages to Send	MTI -Message Type Indicator	

**Note**

In order to support zero values inside the PDU User data content in 8 bit data encoding, set +MSZL=1 , otherwise the content will be truncated at the first zero it encounters.

TEXT Mode Example

AT+CMGR=2 //Read the message

+CMGR: "REC UNREAD","0507654321","95/07/03,17:38:15"

This is Mr. Jones testing

OK

PDU Mode Example

```
at+cmgr=139
```

```
+CMGR: 2,,30
```

```
11FF0781111111F10000C414E8329BFD06D1D1E939283D078541F4F29C0E
```

```
OK
```

4.4.1.13 +MMGR, Motorola Read Message

This command enables the accessory to read SMS messages from the SU. This command is identical to +CMGR, except that no change is made to the read status of the message.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
TEXT mode (+CMGF=1): +MMGR=<index>	+MMGR: <stat>,<oa/da>[,<scts>] <CR><LF><data><CR><LF>	Reads a message from the SU in TEXT format
PDU mode (+CMGF=0): +MMGR=<index>	+MMGR: <State> ,<PDU length> <CR><LF><Bitmap><OA len><TOOA><OA>< PID>< DCS>< SCTS><UDL><UD><CR><LF>	Reads a message from the SU in PDU format

The following table shows the +MMGR parameters for TEXT mode.

Table 55. +MMGR Parameters for TEXT mode

<Parameter>	Description
<index>	The index in the SMS memory of the message to be Retrieved..
<oa/da>	Originating/destination address value in string format. When the Email SMS feature is available, this address is a string that contains one or more MIN numbers and/or Email addresses, separated by spaces. Otherwise, this Field should contain a single MIN number.
<scts>	Service center time stamp in time string format. Presented in incoming SMS messages only..
<data>	Message data.

The following table shows the +MMGR parameters for PDU mode.

Table 56. +MMGR Parameters for PDU mode

Field name	Name description	Size (in bytes)	Valid values	Value description
Bitmap *		1	see ETSI 03.40	MTI + MMS + RP + UDHI + SR
OA len	Origination address length	1	0x02 - 0x14	Number of characters in OA
TOOA	Origination	1	0x81	Code of OA type
OA	Origination address	2-11	Phone number string, composed of BCD characters only.	OA phone number. Every 2 digits are replaced (12 is 21 etc.) In case of odd number of digits pad with F.
PID	Protocol ID	1	0x00 0x26	TEXT 0x00 PAGING 0x26
DCS	Data coding scheme	1	0x00 0x04 0x08	0x00 - 7 bit ASCII 0x04 - 8 bit 0x08 - UCS2
SCTS	Service Center Time Stamp	7	Year 00 - 99 Month 01-12 Day 01-31 Hour 00-24 Minute 00-59 Seconds 00-59	Every 2 digits are replaced (12 is 21 etc.), Year month day hour minute seconds 00 Note : the last byte is always zero
UDL	User data length	1	1-160	Length of uncompressed user data in bytes
UD	User data		Encoded text, composed of hexadecimal characters only	User data

Table 56. +MMGR Parameters for PDU mode (Continued)

Field name	Name description	Size (in bytes)	Valid values	Value description
<State>	State of message	1	0-5	0 List received unread messages 1 List received read messages 2 List stored unsent messages. 3 List stored sent messages. 4 List all messages 5 List header only (only applicable in +MMGL)

The Bitmap Octet for SMS Submit is divided as follows:

7	6	5	4	3	2	1	0
RP-Replay Path Not supported	UDHI- User Data Header Indication Not supported	SRI - Status Report Indication			MMS- More Messages to Send	MTI -Message Type Indicator	

**Note**

In order to support zero values inside the PDU User data content in 8 bit data encoding, set +MSZL=1, otherwise the content will be truncated at the first zero it encounters.

TEXT Mode Example

AT+MMGR=2 //Read the message

+MMGR: "REC UNREAD","0507654321","95/07/03,17:38:15"

This is Mr. Jones testing

OK

PDU Mode Example

at+Mmgr=139

+MMGR: 2,,30

11FF0781111111F10000C414E8329BFD06D1D1E939283D078541F4F29C0E

OK

4.4.1.14 AT+MSZL = 1 // zero is +MMAR, Motorola Mark As Read

This command enables the accessory to change the <stat> of an SMS message in SU memory location <index>, preferred message storage <mem1>, from “REC UNREAD” to “REC READ”. (<mem1> is selected with the +CPMS command.) If the status change fails, +CMS ERROR: <err> is returned.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+MMAR=<index>	OK	Marks the index in the SMS memory of the message to be as read.

The following table shows the +MMAR parameters.

Table 57. +MMAR Parameters

<Parameter>	Description
<index>	Integer type. This is the index in the SMS memory of the message to be marked as read.

Example

AT+MMAR=76

OK

4.4.1.15 +CMGW, Write Message to Memory

This command stores a message to memory storage <mem2>. <mem2> is selected using the +CPMS command, described in “+CPMS, Preferred Message Storage” on page 118.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
if TEXT mode (+CMGF=1): +CMGW=<da><CR>text is entered<CTRL-Z/ESC>	+CMGW: <index> OK	Writes a message In text format.
If PDU mode (+CMGF=0): +CMGW=<length><CR>< Bitmap> <DA len> <TODA><DA><PID><DCS><VP><U DL>< UD ><CTRL-Z/ESC>	+CMGW: <index> OK	Writes a message In PDU format.

The following table shows the +CMGW parameters for TEXT mode.

Table 58. +CMGW Parameters for TEXT mode

<Parameter>	Description
<da>	The destination address in a quoted string. When the Email SMS feature is available, this address is a string that contains one or more MIN numbers and/or email addresses, separated by spaces. Otherwise, this field contains a single MIN number.
<ctrl-Z>	Indicates the end of the message body.
<ESC>	Cancels command processing.
<index>	The index in memory storage.

The following table shows the +CMGW parameters for PDU mode.

Table 59. +CMGW Parameters for PDU mode

Field name	Name description	Size (in bytes)	Valid values	Value description	Notes
Bitmap *		1	see ETSI 03.40	MTI + RD + VPF + RP + UDHI + SRR	
MR	Message reference number	1	0xFF	A number identifying the message, for reference	Should be always 0xFF
DA len	Destination address length	1	0x02 - 0x14	Number of characters in DA	
TODA	Destination address type	1	0x81	Code of DA type	the only supported address type is unknown telephone numbering plan
DA	Destination address	2-11	Phone number string, composed of BCD characters only.	DA phone number. Every 2 digits are replaced (12 is 21 etc.) In case of odd number of digits pad with F.	
PID	Protocol ID	1	0x00 0x26	TEXT 0x00 PAGING 0x26	

Table 59. +CMGW Parameters for PDU mode (Continued)

Field name	Name description	Size (in bytes)	Valid values	Value description	Notes
DCS	Data coding scheme	1	0x00 0x04 0x08	0x00 - 7 bit ASCII 0x04 - 8 bit 0x08 - UCS2	
VP	Validity period	1	0-255	0-143 (VP + 1) x 5 minutes (i.e. 5 minutes intervals up to 12 hours) 144 - 167 12 hours + ((VP-143) x 30 minutes) 168 - 196 (VP - 166) x 1 day 197 - 255 (VP - 192) x 1 week	
UDL	User data length	1	1-160	Length of uncompressed user data in bytes	
UD	User data		Encoded text, composed of hexadecimal characters only	User data	

The Bitmap Octet for SMS Submit is divided as follows:

7	6	5	4	3	2	1	0
RP-Replay Path Not supported	UDHI-User Data Header Indication Not supported	SRR - Status Report Request	VPF-Validity Period Format Only relative format is supported.		RD-Reject Duplicates Not supported	MTI -Message Type Indicator	

**Note**

In order to support zero values inside the PDU User data content in 8 bit data encoding, set +MSZL=1, otherwise the content will be truncated at the first zero it encounters.

TEXT MODE Example

AT+CMGW="5124335432"

This is the message body. ^Z

+CMGW: 7

OK

PDU MODE Example

Example :

AT+MODE=2

OK

+MBAN: Copyright 2000-2002 Motorola, Inc.

AT+CMGF=0 // go to PDU mode

OK

AT+MSZL = 1 // zero is not considered as string terminator for incoming SMS messages

AT+CNMI=3,1 // enable unsolicited notification to the TE of incoming SMS messages

OK

AT+CMGW=24

> 11FF098150418005F60004C40BFFEE43E4994312D5CBA3B4 ^Z // 8 bit encoding

+CMGW: 228

OK

AT+CMSS=228 // send SMS message from index 228

+CMSS: 90 // this is the reference id of the sent SMS

4.4.1.16 +CSCA, Service Centre Address

This GSM 07.05 command is used to update the Service Center Address. This field is required on GSM platform only.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+CSCA=<sca> [,<tosca>]		<p><sca> - Service Center Address, represented in a quoted string. Allowed characters are: digits and '*', '#', '+'. Character '+' is only allowed in the beginning of the string. Character conversion will take place based on the currently selected character set. The +CSCS command is used to select the character set - (See Table 7).</p> <p><tosca> - Type of Service Center Address is the current address format setting.</p>

AT Command	Response/Action	Remarks
+CSCA?		

Example

AT+CSCA="4252833433"

OK

AT+CSCA?

+CSCA: "4252833433",129

OK

4.4.1.17 +MSZL, Motorola Support for Zero Values**Note**

The information in this section applies to release 3.06 and above.

This command disables/enables the zero value to be as string terminator for SMS DELIVER (incoming) messages encoded in 8 bit data encoding while in SMS PDU mode.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+MSZL=<value>	OK	
+MSZL=?	+MSZL:(0-1) OK	Show list of supported values
+MSZL?	+MSZL: <value>	

The following table shows the +MSZL parameters.

Table 60. +CMGW Parameters for TEXT mode

<Parameter>	Description
<value>	0 - zero is considered as stream terminator 1 - zero is not considered as stream terminator

**Note**

- The setting is saved in the NVM so at the next power up the setting will be preserved.
- It is advisable to set +MSZL to 1 if the SMS PDU mode is used most of the time and the User data is encoded in 8 bit data encoding.

4.5 NETWORK SERVICE

4.5.1 Network Service Commands

4.5.1.1 +CREG, Network Registration Status


Note

The information in this section applies to release 3.06 and above.

This command enables/disables network registration.

The Set command controls the presentation "+CREG:", and the result for the read operation.

The Read command returns the status of the result code presentation, as well as an integer <n> that shows whether the network has currently indicated the registration of the ME. Location information elements <SID> and <NID> of home network are returned.

Mode Activation

Mode = 0.

The AT command application enters a continuation state while processing the Read command.

AT Commands Reference

Upon continuation, the AT application waits for an answer from the ME signaling.

AT Command	Response/Action	Remarks
Set: AT+CREG=<n>	AT+CREG=0 OK	<n> 0 Disables network registration. 1 Enables network registration. Default value is 1.
Read: AT+CREG?	AT+CREG? <SID>,<NID>,<STAT> OK	
Test: AT+CREG=?	+CREG: (list of supported <n>s) OK	


Note

After changing the CREG command state from 1 to 0 and from 0 to 1 the phone make a soft restart to enable the phone to be registered or deregistered.

The following table shows the +CREG parameters.

Parameter	Description
<SID>	0-32767 System ID.
<NID>	0-65535 Network ID.
<STAT>	0 - Not registered. 1 - Registered, home network. 5 - Registered, roaming.

Example

```
at+creg=?
```

```
+CREG: (0-1)
```

```
OK
```

```
at+creg?
```

```
+CREG: 8465,65535,1
```

```
OK
```

```
at+creg=0
```

```
OK
```

```
at+creg?
```

```
+CREG: 8465,65535,0
```

```
OK
```

```
at+creg=1
```

```
OK
```

```
at+creg?
```

```
+CREG: 8465,65535,1
```

```
OK
```

```
at+creg=2
```

```
ERROR
```


4.5.1.2 +COPS, Operator Selection


Note

The information in this section applies to release 4.07 and above.

This command enables an application to query the current Carrier Details.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
AT+COPS?	+COPS:<ma_type>,<carrier name>,<sys_id>,<net_id>	Displays the current service status. - If MA not registered yet then <sys_id>,<net_id> value displayed as 65535.

The following table shows the +COPS parameters.

Table 61. +COPS Parameters

<Parameter>	Description
<ma_type>	Network type (for example, CDMA)
<carrier name>	Name of the carrier
<sys_id>	System identification
<net_id>	Network identification

Example

```
at+mode=2
```

```
OK
```

```
+MBAN: Copyright 2000-2003 Motorola, Inc.
```

```
at+cops?
```

```
+COPS: CDMA,Verizon Wireless,67,65535
```

```
OK
```

4.5.1.3 +CSQ, Query Received Signal Quality

This command returns the Signal Quality Measure <SQM> and the Frame Error Rate <FER>.

Mode Activation

Mode = 0

AT Command	Response/Action	Remarks
Set: AT+CSQ	ERROR	Command is not supported.
Read: AT+CSQ?	AT+CSQ? <SQM>, <FER> OK	Returns the Signal Quality Measurement <SQM> and the Frame Error Rate <FER>.
Test: AT+CSQ=?	AT+CSQ=? CSQ: (0-31, 99), (0-7, 99) OK	Lists all supported values for <SQM> and <FER>.

The following table shows +CSQ parameters.

Table 62. +CSQ Parameters

<Parameter>	Description
<SQM>	0-31 - Signal Quality Measurement. 99 - SQM is not known or is not detectable. All other values are reserved. Note: The exact meaning of the SQM is defined by the manufacturer. The lowest quality reported by the SQM is 00. The highest quality reported by the SQM is 31.
<FER>	0 0.01% 1 0.01% to less than 0.1% 2 0.1% to less than 0.5% 3 0.5% to less than 1.0% 4 1.0% to less than 2.0% 5 2.0% to less than 4.0% 6 4.0% to less than 8.0% 7 =8.0% 99 <FER> is not known or is not detectable. All other values are reserved.

Example

AT+CSQ

+CSQ: 98,1

Refer to “Test Results” on page 328, to view the +CSQ test results.

4.5.1.4 +MCSQ, Motorola Query Received Signal Quality



Note

The information in this section applies to release 3.06 and above.

This command returns the Signal Quality Measure <SQM> and the Frame Error Rate <FER> and the real RSSI value in dbm with the minus sign <RSSI>.

Mode Activation

Mode = 0.

AT Commands Reference

The following table shows +MCSQ parameters.

Table 63. +CSQ Parameters

<Parameter>	Description
<SQM>	0-31 Signal Quality Measurement. 99 SQM is not known or is not detectable. All other values are reserved. Note: The exact meaning of the SQM is defined by the manufacturer. The lowest quality reported by the SQM is defined as 00. The highest quality reported by the SQM is 31..
<FER>	0 0.01% 1 0.01% to less than 0.1% 2 0.1% to less than 0.5% 3 0.5% to less than 1.0% 4 1.0% to less than 2.0% 5 2.0% to less than 4.0% 6 4.0% to less than 8.0% 7 =8.0% 99 <FER> is not known or is not detectable. All other values are reserved.
	(-120) - (-21) Real Power in dbm.

Example

AT+MCSQ

+MCSQ: 31, 99, -68

Refer to “Test Results” on page 328, to view the +CSQ test results.

4.5.1.5 +MAMPS


Note

The information in this section applies to release 3.0F and above.

This command enables the mobile set to analog or digital network.

Mode Activation

AT+MODE=2.

Test Command

Command	Response/Action	Remarks
+MAMPS=?	+MAMPS: (0-1) OK	0 refers to digital 1 refers to analog

Read Command

Command	Response/Action	Remarks
+MAMPS?	+MAMPS: 0 OK Or +MAMPS: 1 OK	0 refers to digital 1 refers to analog

Set Command

Command	Response/Action	Remarks
+ MAMPS =0 + MAMPS =1	OK	

Example

AT+MODE=2 /*Enter P2K Mode */

OK

AT+MAMPS=? /*Test */

+MAMPS: (0-1)

OK

AT+MAMPS=? /*Read */

+MAMPS: 0

OK

AT+MAMPS=1 /*Set */

OK

AT+MAMPS=? /*Read */

+MAMPS: 1

OK

4.6 HW INFO

4.6.1 Hardware Information Commands

4.6.1.1 +GCAP, Request Overall Capabilities

This extended-format command causes the MT2 to transmit one or more lines of information text in a specific format. The content is a list of additional capabilities command +<name>s, which is intended to permit the user of the MT2 to identify the minimum capabilities of the MT2.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
+GCAP	+CIS707 (+CIS707-A when IS-2000 is defined), +MS, +ES, +DS, +FCLASS	An MT2 conforming to this standard includes at least the following items, in the result code for the +GCAP command: * +CIS707, +MS, +ES, +DS, +FCLASS.

Example

at+mode=0

OK

at+gcap

+GCAP: +CIS707-A, +MS, +ES, +DS, +FCLASS

OK

4.6.1.2 &C, Circuit 109 (Received Line Signal Detector) Behavior



Note

The information in this section applies to release 3.06 and above.

This command determines the data adapter (DCE) control of DCD behavior. Data Carrier Detect (DCD) pin is the RS-232 signal pin that informs the DTE device (laptop) of the state of the DCE device communications channel.



Note

This pin has few common names like DCD, CD or RLSD.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
AT&CX	<X>	Range is (0-2)

The following table shows &C parameters.

Table 64. &C Parameters

<Parameter>	Description
<X>	<p>X=0 Data Carrier Detect pin Asserted (ON) at all times.</p> <p>X=1 Indicates the connection status. At IDLE state DCD is Deasserted (OFF). When mobile Start Circuit Switch Data call or Packet Data Call (when "CONNECT" appears) Data Carrier Detect pin is Asserted (ON) and stay ON during the call. When the call is ended DCD is Deasserted (OFF).</p> <p>X=2 Data Carrier Detect pin Asserted (ON) at all times but will wink (Deassert briefly then re-Assert) at the end of Packet Data Call.</p> <p>Default value is 1.</p>



Note

on the ADB board (below URT1 connector) the DCD LED is turn on (illuminates) when DCD is Deasserted (OFF) and the DCD LED is turn off (stop illuminate) when DCD is Asserted (ON). X=2 on release 4.07 will wink (Deassert briefly then re-Assert) at the end of Packet Data Call only..

Example

```
at+mode=0
```

```
OK
```

```
at&c0
```

```
OK
```

```
at&c1
```

```
OK
```

```
at&c2
```

```
OK
```

4.6.1.3 &D, Circuit 108 (Data Terminal Ready) Behavior**Note**

The information in this section applies to release 3.06 and above.

This command defines Data adaptor (DCE) reaction to DTR signal. Data Terminal Ready (DTR) pin is the RS-232 signal that the DTE device uses to drop the DCE communications channel.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
AT&DX	<x>	Range (0,2)

The following table shows &D parameters.

Table 65. &D Parameters

<Parameter>	Description
<X>	<p>X=0 DTR transitions are ignored.</p> <p>X=1 During Circuit Switch Data call (CSD) after a ON to OFF DTR transition the Data Adapter (DCE) returns to command mode, without dropping the line.</p> <p>During Packet Data Call after a ON to OFF DTR transition the Data Adapter (DCE) end the data call.</p> <p>X=2 During Circuit Switch Data call (CSD) or During Packet Data Call after a ON to OFF DTR transition, the Data Adapter (DCE) end the data call.</p> <p>Default value is 2..</p>

**Note**

- on the ADB board (below URT1 connector) the DTR LED is turn on (illuminates) when DTR is OFF (Deasserted) and the DTR LED is turn off (stop illuminate) when DTR is ON (Asserted).
- For testing AT&D1 during CSD call, a short jumper can be use to simulate DTR drop. By plugging it between the DTR and GND pins at P113 pins group on the ADB. After a momentary short, the jumper can be taking out. The DCE shell enters command mode (similar to at "+ ++" sequence) and the CSD call shell not dropped. After doing some AT commands, to return back to CSD ON LINE state, type "ATO" (AT back to on-line command)..

Example

```
at+mode=0
```

```
OK
```

```
at&d0
```

```
OK
```

```
at&d1
```

```
OK
```

```
at&d2
```

```
OK
```

4.6.1.4 +CBC, Battery Charge Level

This command allows an accessory to query the charge level of the battery.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
get: +CBC?	+CBC: <bcs>,<bcl>	<bcs> - Battery Status. Values 0-3 are GSM 07.07 definitions, others are Motorola specific. <bcl> - Battery Charge level. 0 indicates no battery, 1-100 indicates percent charge remaining.

The following table shows battery status values.

Table 66. Battery status values

<bcs>	Description
0	Battery Powered.
1	Externally powered, battery connected.

Table 66. Battery status values

<bc>	Description
2	Externally powered, no battery connected.
3	Invalid power supply.

Example

```
at+mode=2
```

```
OK
```

```
21
```

```
AT+CBC
```

```
+CBC: 0,57
```

```
OK
```

4.6.1.5 +MSCTS, Enables/Disable WAKE_IN Line Control on C18 Sleep Mode**Note**

The information in this section applies to releases 3.0F and above or 4.08 and above.

This command instructs the c18 to detect or to ignore the WAKE_IN line state changes and defines the behavior of the RS232 CTS line when the c18 is in sleep mode (or in normal mode). This command also affects RS232 CTS line behavior during wakeup/sleep periods.

When MSCTS is set to '1', the WAKE_IN line enables the DTE to be constant awake by shorting the WAKE_IN line to ground causing the CTS line to be constant asserted. When the DTE disconnects the WAKE_IN from ground (put it back to HIGH) the DCE (c18) can enter sleep mode according to S24 time and the CTS line becomes constant deasserted.

**Note**

- The command MSCTS=1 is functional only when S24>0.
- When MSCTS is set to '0', the WAKE_IN line is changed by the DTE and ignored by the DCE (c18).

Set Command

The Set command configures the c18 CTS behavior and WAKE_IN line interrupt handling.

```
Mode=0
```

Command	Response/Action
AT+MSCTS=<control>	OK

Read Command

The Read command returns the current control value.

Command	Response/Action
AT+MSCTS?	+MSCTS: <current control> OK

Test Command

The Test command returns the possible control values.

Command	Response/Action
AT+MSCTS=?	+MSCTS:(0-1) OK

The following table shows the +MSCTS parameters.

Table 67. +MSCTS Parameters

<bc>	Description
0 (default)	<p>In active mode, when S24 is set to '0', the CTS is used as normal RS232 H/W Flow Control so CTS is usually asserted when RS232 is operational. Line WAKE_IN input changes are ignored by DTE (c18).</p> <p>In Sleep Mode, when S24>0, the CTS follow the Main Clock state, as follows:</p> <ul style="list-style-type: none"> When the Main Clock is fast, the RS232 CTS line is asserted. When the Main Clock is slow, the RS232 CTS line is deasserted. Line WAKE_IN input changes are ignored by DTE (c18).
1	<p>RS232 CTS line state depends on the WAKE_IN line state, as follows:</p> <ul style="list-style-type: none"> When WAKE_IN line is active (short to ground), the RS232 CTS line is constant asserted and the c18 will be stayed awake all that time. When WAKE_IN line is inactive (open - high), the RS232 CTS line is deasserted all that time (inactive), and c18 can enter sleep mode according to the S24 value.

Example

AT+MSCTS=?

+MSCTS:(0-1)

OK

AT+MSCTS?

+MSCTS:0

OK

AT+MSCTS=1

OK

AT+MSCTS?

1

OK

4.7 AUDIO CONTROL COMMANDS

4.7.1 Audio Tone Commands

4.7.1.1 +CRTT, Ring Type Selection (P2K Compatible)

This command can play a cycle of a ring tone, stop this cycle in the middle and set a ring tone to be used from now forward until a specific alert field.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
Set AT+CRTT=<operation>, [[<RingTypeNumber>], <AlertField>]	OK or: ERROR	Does the following: <ul style="list-style-type: none"> • Sets a ring type to a specific field. • Plays one cycle of a specified ring type. • Stops the played ring type.
Read AT+CRTT?	[+CRTT: <AlertField>,<RingTypeNumber>] [<CR><LF>+CRTT: <AlertField>,<RingTypeNumber>] ... OK	Returns the ring type number of every available alert field.
Test AT+CRTT=?	+CRTT:(<list of supported <operation>s),(<list of supported <RingTypeNumber>s),(list of supported <AlertFields>) OK	Returns the following: <ul style="list-style-type: none"> • List of supported operations. • List of supported ring types numbers. • List of supported alert fields.

The following table shows the +CRTT parameters.

Table 68. +CRTT Parameters

<Parameter>	Description
<operation>	0 Set ringer style to specific alert field 1 Play a specific ringer style 2 Stop the ringer style being played

Table 68. +CRTT Parameters (*Continued*)

<Parameter>	Description
<RingTypeNumber>	<div> 0 SILENT 1 CONTINENTAL 2 CLASSIC 3 ATTENTION 4 SIREN 5 VIBE_DOT 6 VIBE_DASH 7 VIBE_DOT_DOT 8 VIBE_DOT_DASH 9 VIBE_PULSE 10 SNAGGLE 11 BEEP 12 DINGDONG 13 BITS_AND_BYTES 14 CHARGE 15 FUNK 16 BOOGIE 17 FIBONACCI 18 COSMIC 19 UH_OH 20 BOMBS_AWAY 21 RONDO_ALA_TURCA 22 BACH_INVENTION_1 23 TOCCATA_AND_FUGUE 24 CANON_IN_D 25 1812_OVERTURE 26 MAPLE_LEAF_RAG 27 NURSERY_RHYME 28 CUMPARASITA 29 NESSUN_DORMA 30 HAVA_NAGILA 31 CHINESE_MELODY 32 SONATA_IN_C 33 PATRIOTIC_1 34 PATRIOTIC_2 35 PATRIOTIC_3 36 CHIMES_HIGH 37 CHIMES_LOW 38 DING 39 TADA 40 NOTIFY 41 DRUM 42 CLAPS 43 FANFARE 44 CHORD_HIGH 45 CHORD_LOW </div>

Table 68. +CRTT Parameters (*Continued*)

<Parameter>	Description
<AlertField>	0 CALLS 1 LINE_1 2 LINE_2 3 TEXT_MSG 4 WEB_MSG 5 INBOX 6 VOICE_MAIL 7 INFO_SVCS 8 ANS_MACHINE 9 ALARMS 10 DATA_CALLS 11 FAX_CALLS

Example

AT+CRTT=?

+MCRS:(0-2),(0-31,36-45,255),(0,5-6,9-11,12)

OK

AT+CRTT?

+CRTT:0,1

+CRTT:5,45

+CRTT:6,13

+CRTT:9,12

+CRTT:10,17

+CRTT:11,17

OK

AT+CRTT=0,29,6

OK

AT+CRTT=0,32,5

ERROR

AT+CRTT=1,45

OK

AT+CRTT=2

OK

4.7.1.2 +MCRS, Change Ring Style

This command changes and displays the current ring style.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
Set AT+MCRS=<ring_style>	OK	<ring_style> Sets the ring style. 0 Loud ring 1 Soft ring 2 Vibrate 3 Vibrate and ring 4 Silent
Read AT+MCRS?	+MCRS: <ring_style> OK	Returns the current ring style.
Test AT+MCRS=?	+MCRS: (0-4)	Returns the range of ring styles supported by the command.

Example

AT+MCRS=?

+MCRS: (0-4)

OK

AT+MCRS?

+MCRS: LOUD RING

OK

AT+MCRS=2

OK

AT+MCRS?

+MCRS: VIBRATE

OK

4.7.1.3 +VTS, Start DTMF Tone

This command allows the transmission of a list of specified DTMF tones. Once the command has been accepted and processed, it is not interruptable by other key presses. Thus, the command is not holding up processor time that would prevent other oper-

ations to be carried out while the tone is being transmitted. GSM valid phone number characters A, B, C, and D will not be supported by this command.

The command allows the specification of a duration, in units of 100 milliseconds, for the specified DTMF tone to be transmitted. This duration value can be individually set to a default value (for the use of this command) by the command, +VTD, described later.

When the tone specified in the command has been started, it will only be stopped either when the duration (given in the command or the saved value that is controlled by the command +VTD) has expired or when a stop DTMF tone command, +MVTSP, has been received for the currently playing tone. Note that the duration can be set to value 0, which is defined to be no timeout, in this case, the tone can only be stopped by explicitly sending a stop command.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
Set +VTS=<DTMFtone>[,<duration>]	Set the specified DTMF tone to transmit and optionally set the duration for this transmission.	<DTMFtone> - the equivalent tones for the ASCII characters {0-9,#,*}, either enclosed in quotation marks or not. <duration> - an unsigned integer (0-600) in units of 100 milliseconds.
Read +VTS?	+VTS: (the <DTMFtone> currently being transmitted) or +CME ERROR: <err> - if no tone is currently being transmitted ERROR +CME ERROR: <err> - returns error for the set command if an unsupported DTMF tone is specified or the duration is out of range.	
Test +VTS=?	+VTS: (list of <DTMFtone>s), (0-600: in 100ms)	



Note

The GSM 07.07 specification is ambiguous with respect to the use of quotation marks with the +VTS command. For this reason, +VTS has been implemented to accept the <DTMF tone> ASCII character both quoted and unquoted.

Example

```
AT+VTS=?
```

```
+VTS: (0,1,2,3,4,5,6,7,8,9,*,#),(0-600: in 100ms)
```

```
OK
```

```
AT+VTS="8",50
```

```
AT+VTS?
```


+VTS: 8

OK

AT+VTS="*"

OK

4.7.1.4 +VTD, Set Default Tone Duration

This command sets the value of an integer <duration>, which defines the length of tones emitted as a result of the +VTS command. A value different than zero causes a tone of duration <duration>/10 seconds. The value zero means no timeout, the tone is being transmitted continuously until an explicit stop command is sent.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
Set +VTD=<duration>		<duration> - an unsigned integer (0-600) in units of 100 milliseconds; the default value is set to be 30, which is 3 seconds; the value 0 means no timeout.
Read +VTD?	+VTD: (the current <duration> value) ERROR +CME ERROR: <err> - returns error for the set command if the specified value is out of the valid range.	
Test +VTD=?	+VTD: (0-600: in 100ms)	

Example

AT+VTD=?

+VTD: (0-600: in 100ms)

AT+VTD?

+VTD: 30

AT+VTD=600

OK

AT+VTD?

+VTD: 600

OK

4.7.2 +MA Audio Control Commands

4.7.2.1 +MASS, Hands-free Audio Processing

This command enables/disables the reporting of hands free audio start/stop messages. If the reporting of hands free audio start/stop messages is enabled and the hands free audio starts or stops, an unsolicited message will be sent to report the event.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+MASS=<mode>	Enable/disable the asynchronous hands free audio start/stop reporting	+MASS: <audio_type>, <spkr_routing>, <mic_routing>

The following table shows the +MASS parameters.

Table 69. +MASS Parameters

<Parameter>	Description
<mode>	0 Disable event reporting 1 Enable event reporting Default is 0.
<msg>	0 Audio generation stopped 1 Voice type audio started 2 Alert type audio started (all ringers) 3 Any none DTMF key press tone started 4 DTMF key press tones started 5 Any network tones started 6 VA and VR started 7 VA started 8 VR started 9 VA output started
<spkr_routing>	0 No audio routing for speakerphone 1 Audio routed to private mode path (internally) 2 Audio routed to external path
<mic_routing>	0 No audio routing for microphone 1 Audio routed to internal microphone 2 Audio routed to external microphone

Example

```

AT+MASS=1
OK                                     //Asynchronous handsfree audio start/stop reporting is enabled
+MASS:1, 1, 1                         //This information is output automatically if voice type audio starts, and audio is routed
                                      //to the internal speakerphone and microphone
+MASS:1, 2, 2                         //This information is output automatically if voice type audio starts, and audio is routed
                                      //to the external speakerphone and microphone
+MASS:0,0,0                           //This information is output automatically if the audio generation stops
AT+MASS=0
OK                                     //Asynchronous audio start/stop reporting is disabled, no message output if the audio
                                      //starts or stops

```

4.7.2.2 +MAPS, Hands-free Audio Processing

This private AT command sets and reports the radio's audio processing states.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
AT+MAPS=<att>,<state>	OK	Sets audio processing attribute states.
AT+MAPS=?	+MAPS: (list of supported <att>,<state> values)	Lists valid command input values.
AT+MAPS?	+MAPS: <att>,<state> - returns current state of mute path.	Lists current audio processing attribute states.

The following table shows the +MAPS parameters.

Table 70. +MAPS Parameters

<Parameter>	Description
<att>	Downlink Path Parameter 0 Entertainment_Mute 1 Echo_Cancelation 2 Noise_Suppression
<state>	Mute State parameter 0 Disable 1 Enable

Example

```

AT+MAPS?
+MAPS: 0,1
+MAPS: 1,1
+MAPS: 2,0
OK
AT+MAPS=?
+MAPS: (0-2),(0-1)
OK
AT+MAPS=0,1
OK

```

4.7.2.3 +MMTC, Hands-free Audio Processing

This command sends an unsolicited message when asynchronous microphone mute status change reporting is enabled, and the microphone mute status is changed.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+MMTC=<n>	+MMTC:<status> The new state of the microphone mute.	Enables/Disables asynchronous microphone mute status change reporting.

The following table shows the +MMTC parameters.

Table 71. +MMTC Parameters

<Parameter>	Description
<n>	Microphone Mute Status Change Reporting integer parameter 0 Disable 1 Enable The default is 0.

Example

```

at+mode=2
OK
at+mmtc=1
OK

```

atd>"Eli"

D: VOICE

OK

+MMTC: 1 /* mute on */

+MMTC: 0 /* mute off */

ath

OK

4.7.2.4 +MMDL, Set Downlink Audio Path Mute

This command enables the accessory to request a mute/unmute of the downlink audio paths.



Note

Speaker path can be muted only during an active voice call.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+MMDL=<downlink path>,<setting>	OK	Sets mute/unmute state of downlink path.

The following table shows the +MMDL parameters.

Table 72. +MMDL Parameters

<Parameter>	Description
<downlink path>	Downlink Path parameter 1 Speaker path 2 Alert path
<setting>	Mute State parameter 0 Unmute downlink path 1 Mute downlink path

Example

AT+MMDL=1,1 //Mute speaker downlink paths during active voice call

OK

AT+MMDL=2,0 //Unmute only the downlink alert path

OK

4.7.2.5 +MAVL, Set/Request Volume Setting

This command enables an accessory to determine the current settings of all audio paths, as well as to change the setting of a particular path. Only supported paths are returned when the current settings are requested. Only supported paths can be modified. Attempts to modify unsupported paths result in an error code. Attempts to exceed the maximum volume level for the path result in an error code.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+MAVL?	+MAVL: <path>,<setting>	Reads current volume settings on all paths.
+MAVL=<path>,<setting>	OK	Sets <path> to the new level <setting>.

The following table shows the +MAVL parameters.

Table 73. +MAVL Parameters

<Parameter>	Description
<path>	The numeric path identifier 1 Ringer 2 Phone
<setting>	The volume level to which the path is currently set.

Example

AT+MAVL?

+MAVL: 1,4

+MAVL: 2,2

AT+MAVL=1,6

+MAVL: 1,6

AT+MAVL=4,4

+CME ERROR: xx Path not available

AT+MAVL=2,19

+CME ERROR: xx Level out of range

4.7.2.6 +MAPC, Audio Path Change Event

This command sends an unsolicited message when the asynchronous audio path change reporting is enabled and the audio path is changed. The audio path names listed here should be consistent with the audio path names for the command +MAPTH.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+MAPC=<n>	+MAPC: <path>	Enable/disable asynchronous audio path change reporting. This information is output when asynchronous audio path change reporting is enabled, and an audio path change occurs.

The following table shows the +MAPC parameters.

Table 74. +MAPC Parameters

<Parameter>	Description
<n>	0 Disable 1 Enable The default is 0.
<path>	Path name 1 Handset 2 Hands free 3 Speaker phone 4 Auto hands free

Example

+MAPC=1

OK //Asynchronous audio path change reporting is enabled

+MAPC:2 //This information is output automatically if the audio path is changed to Handsfree

+MAPC:1 //This information is output automatically if the audio path is changed to Handset

+MAPC=0 //Asynchronous audio path change reporting is disabled, no output if audio path is changed after this point

OK

4.7.2.7 +MAMS, Set Audio Mode Selection


Note

The information in this section applies to release 3.06 and above.

This command enables the host application to set the audio mode selection during a call. This command is only valid during a call. In all other cases, it returns ERROR.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
AT+MAMS=[<voice_alg>], [<noise_reduct>],[<side_tone>], [<echo_suppress>]	OK or: +CME ERROR: operation not permitted	Allows the host application to set the audio mode selection.
AT+MAMS?	+MAMS: <voice_alg>, <noise_reduct>,<side_tone>, <short_echo_cancellation>	Enables the host application to view the audio mode selection.
AT+MAMS=?	+MAMS: (2),(0-1),(0),(0-4) OK	Enables the host application to view the command entry syntax.

The following table shows the +MAMS parameters.

Table 75. +MAMS Parameters

<Parameter>	Description
<voice_alg>	2 Only Valid Value
<noise_reduct>	0 Off 1 On
<side_tone>	0 Off
<echo_suppress>	0 Off - EC off for all the audio routings. 1 VOC_EC_ESEC - Ear Seal Echo Cancellation. 2 VOC_EC_HEADSET - Echo cancellation for the Headset audio routing. 3 VOC_EC_AEC (default) - Automatic Echo Cancellation (EC would be on in the current active audio routing). 4 VOC_EC_SPEAKER - Echo cancellation for the Speaker audio routing.

4.7.2.8 +MAPTH, Set/Request Audio Path

This command enables an accessory to determine the current audio path, and optionally to force the audio path to a particular setting (such as forcing hands free mode). When the audio system is idle (no audio services are active) the default value of “Hands free” is returned.

This command can also be used to obtain the list of paths that are supported in the current configuration.

Attempts to change to a non-supported audio path result in an error.



Note

MAPTH controls the routing of voice audio only. Alerts are always routed externally.

Path 4, Auto Hands free, will not return an error, but currently has no effect.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+MAPTH?	+MAPTH: <path>[,<path>...]	Requests the current active audio path.
+MAPTH=?	+MAPTH: <path>[,<path>...]	Requests the supported audio paths.
+MAPTH=<path>	OK	Changes the audio path to the requested path.

The following table shows the +MAPTH parameters.

Table 76. +MAPTH Parameters

<Parameter>	Description
<path>	Path name 1 Handset 2 Hands free 3 Speaker Phone 4 Auto Hands free



Note

The “Speaker Phone” path is only valid if a built-in speaker phone exists in the portable.

“Auto Hands free” means that audio manager will decide where to route the audio path.

Example

AT+MAPTH=?

+MAPTH: (1-4) //If the phone has a built-in speaker phone

+MAPTH: (1,2,4) //If the phone does not have a built-in speaker phone

AT+MAPTH?

```

+MAPTH: 2
AT+MAPTH=3
OK                                     //If the phone has a built-in speaker phone
+CME ERROR: xx                       //If the phone does not have a built-in speaker phone
AT+MAPTH=5
+CME ERROR: xx

```

4.7.2.9 +MAFVL, Set/Request Fixed Audio Level

This command allows the accessory to set the ringer and SU speaker volume levels to a fixed value and lock out the keypad volume control.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+MAFVL=<n>[,<rsetting>,<psetting>]	OK	Sets the fixed audio level state.
+MAFVL?	+MAFVL: <n>	Requests current fixed audio level state.

The following table shows the +MAFVL parameters.

Table 77. +MAFVL Parameters

<Parameter>	Description
<n>	0 Fixed audio level off. 1 Fixed audio level on.
<rsetting>	The audio level at which to fix the ringer volume (required when enabling fixed audio level).
<psetting>	The audio level at which to fix the SU volume (required when enabling fixed audio level).

Example

```

AT+MAFVL?
+MAFVL: 0
AT+MAFVL=1,4,4
OK
AT+MAFVL=0
OK

```

4.7.2.10 +CMUT, Muting Voice Calls

This command enables/disables muting during a voice call. It has no effect in idle mode. A new call always begins in an unmuted state, regardless of this command's last setting.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
AT+CMUT=<n>	OK or: ERROR	Enables and disables uplink voice muting during a voice call.
AT+CMUT?	+CMUT: <n>	Displays the current settings.
AT+CMUT=?	+CMUT: list of supported <n>s OK or: ERROR	Tests whether the command is supported.

The following table shows the +CMUT parameters.

Table 78. +CMUT Parameters

<Parameter>	Description
<n>	0 Mute Off 1 Mute On

4.8 ACCESS

4.8.1 Access Control Commands

4.8.1.1 +MLCK, Phone Lock Status Change Event

This command locks the phone after the appropriate unlock code has been provided. The locking procedure requires an unlock code verification to ensure that the user will not lock the phone without having the proper code to unlock it afterwards.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
AT+MLCK=<pin>	OK	Executes the command to lock the phone.

The following table shows the +MLCK parameters.

Table 79. +MLCK Parameters

<Parameter>	Description
<pin>	Current PIN. Unlock code verification (string of 4 bytes).

Example

```
AT+MLCK="0000"           //Assume unlock code is "1234"
```

```
+CME ERROR: INCORRECT_PASSWORD
```

```
AT+MLCK="1234"
```

```
OK
```

4.8.1.2 +MPIN, Unlock Phone

This command enables the accessory application to unlock the phone when the appropriate unlock code has been provided.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
AT+MPIN=<pin>	OK	Executes the command to unlock the phone.
AT+MPIN?	+MPIN: <code> OK	Returns an integer indicating whether the phone unlock code is required. This is an independent phone lock status check only.

The following table shows the +MPIN parameters.

Table 80. +MPIN Parameters

<Parameter>	Description
<pin>	Current PIN.
<newpin>	Unlock code, a string of length 4.
<code>	<div>READY</div> <div>Phone is not waiting for an unlock code.</div> <div>UNLOCK CODE</div> <div>Phone is waiting for the unlock code.</div>

Example

AT+MPIN?

+MPIN: UNLOCK CODE

OK

AT+MPIN="1234" //Unlock, lock code is "1234"

OK

AT+MPIN?

+MPIN: READY

OK

AT+MPIN="1234" //Attempt to unlock when not locked, OK is returned

OK

AT+MPIN?

+MPIN: READY

OK

4.9 MODEM CONFIGURATION AND PROFILES (S-REGISTERS)

4.9.1 Modem Register Commands

4.9.1.1 &F, Set to Factory Defined Configuration

When this command (or AT&Fn) is received on either the R_m or U_m interface, the configuration stored in the phone reverts to the configuration specified by the manufacturer's factory default setting. The phone closes the transport layer connection, if open.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
AT&F AT&Fn	OK or: ERROR	

Example

```
at+mode=0
```

```
OK
```

```
at&f
```

```
OK
```

4.9.1.2 &V, Dump Configuration Parameters



Note

The information in this section applies to release 3.0F and above.

This command dumps the status of all AT parameters, including the single-letter parameters not otherwise readable, but does not include the +QC parameters. It also displays the configuration of the active profile, stored profile 0 and stored profile 1.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
&V	<Status AT commands List> ACTIVE PROFILE: ... (profile data) STORED PROFILE 0: ... (profile data) STORED PROFILE 1: ... (profile data) OK	

Example

at&v

```
&C: 2; &D: 2; &F: 0; E: 1; L: 0; M: 0; Q: 0; V: 1; X: 4; Z: 0; S0: 0S10: 14; S11: 95; S3: 13; S4: 10; S5: 8; S6: 2; S7: 50; S8: 2;
S9: 6 +FCLASS: 0; +CFG: ""; +FCC: 0,1,0,0,0,0,0; +FIS: 0,1,0,0,0,0,0 +CDR: 0; +CDS: 0,1,2048,6; +CFC: 0; +CQD: 10;
+CRC: 0; +CRM: 0; +CTA: 0 +CXT: 0; +DR: 0; +DS: 3,0,2048,6; +EB: 1,0,30; +EFCS: 1; +ER: 0 +ES: 3,0,2; +ESR: 1;
+ETBM: 1,1,20; +FAA: 0; +FAP: 0,0,0; +FBO: 0 +FBU: 0; +FCQ: 1,0; +FCR: 0; +FCT: 1E; +FEA: 0; +FFC: 0,0,0,0; +FHS:
0 +FIE: 0; +FIP: 0; +FLI: ""; +FLO: 1; +FLP: 0; +FMS: 0; +FNR: 0,0,0,0 +FNS: ""; +FPA: ""; +FPI: ""; +FPP: 0; +FPR: 8;
+FPS: 1; +FPW: "" +FRQ: 0,0; +FRY: 0; +FSA: ""; +FSP: 0; +ICF: 3,3; +IFC: 2,2; +ILRR: 0 +IPR: 19200; +MA: ; +MR: 0;
+MS: ; +MV18R: 0; +MV18S: 0,0,0; +CMUX: C,2 +MODE: 0; +MAMS: 2,1,0,3
```

ACTIVE PROFILE:

E1 Q0 V1 X4 &C1 &D2 &Y0

S00:000 S03:013 S04:010 S05:008 S06:002 S07:050 S08:002 S09:006 S10:014 S11:095

STORED PROFILE 0:

E1 Q0 V1 X4 &C1 &D2

S00:000 S03:013 S04:010 S05:008 S06:002 S07:050 S08:002 S09:006 S10:014 S11:095

STORED PROFILE 1:

E1 Q0 V1 X4 &C1 &D2

S00:000 S03:013 S04:010 S05:008 S06:002 S07:050 S08:002 S09:006 S10:014 S11:095

OK

4.9.1.3 V, DCE Response Format

This command returns the DCE response format.

Mode Activation

MODE=0 and MODE=2.

Command Type	AT Command	Response/Action
Set Command both for MODE=0 and MODE=2	ATV0	Display result codes as numbers
Set Command both for MODE=0 and MODE=2	ATV1	Display result codes as words
Read Command in MODE 0	AT&V	The forth field from the response beginning. V: 0; Or V: 1;
Read Command in MODE 2	ATV?	V: 0 OK or V: 1 OK

The following table shows the V parameters.

Table 81. V Parameters

<Parameter>	Description
<V0>	Display result codes as numbers.
<V1>	Display result codes as words.

Example 1

```
at+mode=0
```

```
OK
```

```
atv1
```

```
OK
```

```
atv0
```

```
0tv0
```


Example 2

at+mode=0

OK

at&v

&C: 1; &D: 2; &F: 0; E: 1; L: 0; M: 0; Q: 0; V: 1; X: 4; Z: 0; S0: 0

S10: 14; S11: 95; S3: 13; S4: 10; S5: 8; S6: 2; S7: 50; S8: 2; S9: 6

+FCLASS: 0; +CFG: ""; +FCC: 0,1,0,0,0,0,0; +FIS: 0,1,0,0,0,0,0

+CDR: 0; +CDS: 0,1,2048,6; +CFC: 0; +CQD: 10; +CRC: 0; +CRM: 0; +CTA: 0

+CXT: 0; +DR: 0; +DS: 3,0,2048,6; +EB: 1,0,30; +EFCS: 1; +ER: 0

+ES: 3,0,2; +ESR: 1; +ETBM: 1,1,20; +FAA: 0; +FAP: 0,0,0; +FBO: 0

+FBU: 0; +FCQ: 1,0; +FCR: 0; +FCT: 1E; +FEA: 0; +FFC: 0,0,0,0; +FHS: 0

+FIE: 0; +FIP: 0; +FLI: ""; +FLO: 1; +FLP: 0; +FMS: 0; +FNR: 0,0,0,0

+FNS: ""; +FPA: ""; +FPI: ""; +FPP: 0; +FPR: 8; +FPS: 1; +FPW: ""

+FRQ: 0,0; +FRY: 0; +FSA: ""; +FSP: 0; +ICF: 3,3; +IFC: 2,2; +ILRR: 0

+IPR: 19200; +MA: ; +MR: 0; +MS: ; +MV18R: 0; +MV18S: 0,0,0; +CMUX: C,2

+MODE: 0; +MAMS: 2,1,0,3

+CPAS: 0,1,0,2,1,0,3,1279477291,0,18226048,0,34048,0,0,2050,1397311019,0,1822610

0,0,400,0,0,4,1229079339,0

+CSO: 65535; +CPARM: ""; +CREG: 0,2; +CIMS1: ""; +MNAM: ""; +MNAM2: ""

+MNAM3: ""; +MIPERR: 1; +CPRL1: ""; +CPRL2: ""; +CPRL3: ""; +RESET: ""

+SNAM: 3925868615; +ERTST: 3925868615

OK

ate0

OK //Do not display Command Echo

ate1

OK

at+mode=2

OK

+MBAN: Copyright 2000-2003 Motorola, Inc.

ate?

E: 1

ate0

OK //Do not display Command Echo

ate1

OK

4.9.1.4 Q, Result Code Suppression

This command enables/disables the DCE to transmit result codes to the DTE. When result codes are suppressed, no portion of any intermediate, final or unsolicited result code is transmitted. The information text in response to commands is not affected by this command.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
ATQ	OK or: No response	

The following table shows the Q parameters.

Table 82. Q Parameters

<Parameter>	Description
<Q0>	Return result codes.
<Q1>	Do not return result codes.

Example

```
at+mode=0
```

```
OK
```

```
atq0
```

```
OK
```

```
atq1
```

4.9.1.5 E, Command Echo


Note

The information in this section applies to release 4.07 and above.

This command determines whether the TA echoes characters received from the TE during command state and on-line command state.

Mode Activation

Mode = 0 and Mode=2.

AT Command	Description
ATE0	Do not echo commands in command state or online command state.
ATE1	Echo commands in command state or online command state.

Read Command in Mode 0

AT Command	Response/Action	Remarks
AT&V	The forth field from the response beginning. E: 0; Or E: 1;	

Read Command in Mode 1

AT Command	Response/Action	Remarks
ATE?	E: 0 OK or E: 1 OK	

Example

```
at+mode=0
```

```
OK
```

```
at&v
```

```
&C: 1; &D: 2; &F: 0; E: 1; L: 0; M: 0; Q: 0; V: 1; X: 4; Z: 0; S0: 0
```

S10: 14; S11: 95; S3: 13; S4: 10; S5: 8; S6: 2; S7: 50; S8: 2; S9: 6
 +FCLASS: 0; +CFG: ""; +FCC: 0,1,0,0,0,0,0; +FIS: 0,1,0,0,0,0,0
 +CDR: 0; +CDS: 0,1,2048,6; +CFC: 0; +CQD: 10; +CRC: 0; +CRM: 0; +CTA: 0
 +CXT: 0; +DR: 0; +DS: 3,0,2048,6; +EB: 1,0,30; +EFCS: 1; +ER: 0
 +ES: 3,0,2; +ESR: 1; +ETBM: 1,1,20; +FAA: 0; +FAP: 0,0,0; +FBO: 0
 +FBU: 0; +FCQ: 1,0; +FCR: 0; +FCT: 1E; +FEA: 0; +FFC: 0,0,0,0; +FHS: 0
 +FIE: 0; +FIP: 0; +FLI: ""; +FLO: 1; +FLP: 0; +FMS: 0; +FNR: 0,0,0,0
 +FNS: ""; +FPA: ""; +FPI: ""; +FPP: 0; +FPR: 8; +FPS: 1; +FPW: ""
 +FRQ: 0,0; +FRY: 0; +FSA: ""; +FSP: 0; +ICF: 3,3; +IFC: 2,2; +ILRR: 0
 +IPR: 19200; +MA: ; +MR: 0; +MS: ; +MV18R: 0; +MV18S: 0,0,0; +CMUX: C,2
 +MODE: 0; +MAMS: 2,1,0,3
 +CPAS: 0,1,0,2,1,0,3,1279477291,0,18226048,0,34048,0,0,2050,1397311019,0,1822610
 0,0,400,0,0,4,1229079339,0
 +CSO: 65535; +CPARM: ""; +CREG: 0,2; +CIMS1: ""; +MNAM: ""; +MNAM2: ""
 +MNAM3: ""; +MIPERR: 1; +CPRL1: ""; +CPRL2: ""; +CPRL3: ""; +RESET: ""
 +SNAM: 3925868615; +ERTST: 3925868615

OK

ate0

OK //Do not display Command Echo

ate1

OK

at+mode=2

OK

+MBAN: Copyright 2000-2003 Motorola, Inc.

ate?

E: 1

ate0

OK //Do not display Command Echo

ate1

OK

4.9.1.6 X, Result Code Selection and Call Progress Monitoring Control

This command selects the result codes and monitors the call progress.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
ATX	<X0> <X1> <X2> <X3> <X4>	

The following table shows the X parameters.

Table 83. X Parameters

<Parameter>	Description
<X0>	Send a CONNECT message when a connection is established by blind dialing. Ignores dial tone and busy signal.
<X1>	Enable additional result code CONNECT <rate>. Disable dial tone and busy detection.
<X2>	Enable additional result codes CONNECT <rate> and NO DIALTONE. Disable busy detection. Enable dial tone detection.
<X3>	Enable additional result codes CONNECT <rate> and BUSY. Enable busy detection. Disable dial tone detection.
<X4>	Enable additional result codes CONNECT <rate>, BUSY and NO DIALTONE. Enable busy and dial tone detection.

Example

```

atx0
OK
atx1
OK
atx2
OK
atx3
OK
atx4
OK

```

4.9.1.7 S0, Automatic Answer

This S-parameter controls the automatic answering feature for the voice/data calls to the SU. If set to 0, automatic answering is disabled. If set to a non-zero value, it shall cause the SU to answer voice/data calls when the incoming call indication (RING or +CRING) has occurred the number of times indicated by the value.

Mode Activation

Mode = 0.

Register	Response/Action	Remarks
ATS0=<n>	OK	<n> = 0: Automatic answering is disabled (default). <n> = 1 to 255: Enable automatic answering on the ring number specified.
ATS0?	Returns the current value.	

Example

```

ATS0?
000
OK
ATS0=001
OK
ATS0?
001
OK

```

4.9.1.8 S3, Command Line Termination Character

This Basic S-Register returns the carriage return character value.

Mode Activation

Mode = 0.

Register	Response/Action	Remarks
ATS3	13	

Example

```
at+mode=0
```

```
OK
```

```
ats3?
```

```
013
```

```
OK
```

4.9.1.9 S4, Response Formatting/Line Feed Code Character

This Basic S-Register provides the response formatting/line feed code character.

Mode Activation

Mode = 0.

Register	Response/Action	Remarks
ATS4	10	

Example

```
at+mode=0
```

```
OK
```

```
ats4?
```

```
010
```

```
OK
```

4.9.1.10 S5, Command Line Backspace Character

This Basic S-Register provides the backspace character.

Mode Activation

Mode = 0.

Register	Value	Remarks
ATS5	8	

Example

at+mode=0

OK

ats5?

008

OK

4.9.1.11 S6, Pause Before Blind Dialing

This Basic S-Register pauses before blind dialing.

Mode Activation

Mode = 0.

Register	Response/Action	Remarks
ATS6	2 to 10 Default value is 2.	

Example

at+mode=0

OK

ats6?

002

OK

ats6=005

OK

4.9.1.12 S7, Number of Seconds to Establish End-to-End Data Connection

This Basic S-Register is used by the IWF to time-out a PSTN data call connection and send a NO CARRIER result code on the U_m interface.

Mode Activation

Mode = 0.

Register	Response/Action	Remarks
ATS7	1 to 255 Default value is 50.	

Example

ats7?

050

OK

ats7=120

OK

4.9.1.13 S8, Number of Seconds to Pause When “,” Is Encountered in a Dial String.

This Basic S-Register is used by the IWF in multi-stage dialing to time the period of the "," dial modifier.

Mode Activation

Mode = 0.

Register	Response/Action	Remarks
ATS8	0 to 255 Default value is 2.	

Example

ats8?

002

OK

ats8=017

OK

4.9.1.14 S9, Carrier Detect Threshold

This Basic S-Register is used by the IWF as the period in which to detect a PSTN segment carrier and return carrier detection signaling to the phone.

Mode Activation

Mode = 0.

Register	Response/Action	Remarks
ATS9	0 to 255 Default value is 6.	

Example

```
ats9?
006
OK
ats9=009
OK
```

4.9.1.15 S10, Number of 0.1 Seconds from Carrier Loss to Disconnect

This Basic S-Register is used by the IWF to determine the maximum time to remain connected to the PSTN line after detecting the absence of a received line signal. If this register is set to 255, the IWF assumes a carrier is always present.

Mode Activation

Mode = 0.

Register	Response/Action	Remarks
ATS10	1 to 254 Number of 0.1 seconds to remain connected. 255 Disable carrier detect. Default value is 14.	

Example

```
ats10?
014
OK
ats10=025
OK
```

4.9.1.16 S11, DTMF Tone Duration and Spacing

This Basic S-Register provides the DTMF tone duration and spacing.

Mode Activation

Mode = 0.

Register	Response/Action	Remarks
ATS11	50 to 255 Default value is 95.	

Example

```
ats11?
095
OK
ats11=254
OK
```

4.9.1.17 Z, Reset to Default Configuration

This command resets the phone to the default configuration. When this command is received, the phone closes the transport layer connection, if open.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
ATZ0	OK	

Example

```
at+mode=0
OK
atz0 //Reset the phone to the default configuration
OK
```

4.9.1.18 AT&W

This command stores parameters' values into their flash memory items. Enable this command to define the parameters' values at module power up or after reset.

**Note**

The information in this section applies to release 3.14 and above.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
AT&W[<n>]	OK or ERROR	AT&Wn = {AT&W, AT&W0, AT&W1} n={NULL, 0, 1}

Parameter	Description
<n>	NV storage target location.
Empty	AT&W stores current active S0, \$QCVAD and IPR to the NV. The current active S0 is stored to the user profile '0', while current active values of \$QCVAD and IPR are stored to the proper NV items.
0	Store as user profile '0' AT&W0 stores the current active configuration of E, Q, V, X, &C &D, S0, S3, S4, S5, S6, S7, S8, S9, S10, S11 as the user profile '0' in the NV. The default value is 0.
1	Store as user profile '1' AT&W1 stores the current active configuration of E, Q, V, X, &C &D, S0, S3, S4, S5, S6, S7, S8, S9, S10, S11 as the user profile '1' in the NV.

The table below summarizes which parameter can be stored or fetch per the used command.

Parameter	Command (Y=Store to NV, N= Don't store to NV)				
	AT&W	AT&W0	AT&W1	AT&Y0	AT&Y1
S0	Y (Note 2)	Y	Y	Y	Y
\$QCVAD	Y	N	N	N	N
IPR	Y	N	N	N	N
E, Q, V, X, &C, &D S3, S4, S5, S6, S7, S8, S9, S10, S11	N	Y	Y	Y	Y



Note

The command AT&W stores S0 into Profile 0. Even when profile 1 (AT&Y1) is in use and S0 has been changed, then if AT&W is used, the current S0 is saved to Profile 0 NV.

If the module uses profile 1, saving S0 to profile1 can be done using AT&W1.

By default, S0 is taken from Profile 0 and its default value is 0. \$QCVAD and IPR are taken from their NV items, which are the last active values that were stored using AT&W. The default value for \$QCVAD is 0 and for IPR is 19200.

The value for E, Q, V, X, &C, &D and S3-S11 depend on the last AT&Y0 or AT&Y1, which selects the active profile. By default, the active profile is profile 0.

The stored profile will be active in accordance with the AT&Yn settings command. To return the values to their defaults, use AT&F command (ATZ is improper). To see the active configuration and stored profiles, use AT&V report command.

Example

```
at+ipr?
```

```
+IPR:19200
```

```
OK
```

```
at+ipr=2400
```

```
OK
```

```
/* Change the Terminal baud rate from 19200 to 2400 */
```

```
at+ipr?
```

```
+IPR:2400
```

```
OK
```

```
ats0?
```

```
000
```

```
OK
```

```
ats0=5
```

```
OK
```

```
ats0?
```

```
005
```

```
OK
```

```
at$qcvad?
```

```
$QCVAD:0
```

```
OK
```

```
at$qcvad=2
```

```
OK
```

```
at$qcvad?
```

```
$QCVAD:2
```

```
OK
```

```
at&w
```

OK

Power down the SU.

Power up the SU.

ats0?

005

OK

at+ipr?

+IPR:2400

OK

at\$qcvad?

\$QCVAD:2

OK

Example 2

at&v

&C: 1; &D: 2; &F: 0; &W: 0; &Y: 0; E: 1; L: 0; M: 0; Q: 0; V: 1; X: 4

Z: 0; S0: 0; S10: 14; S11: 95; S3: 13; S4: 10; S5: 8; S6: 2; S7: 50

S8: 2; S9: 6; S24: 0; S99: 30; S100: 1; +FCLASS: 0; +CFG: ""

+FCC: 0,1,0,0,0,0,0,0; +FIS: 0,1,0,0,0,0,0,0; +CDR: 0; +CDS: 0,1,2048,6

+CFC: 0; +CQD: 10; +CRC: 0; +CLIP: 0; +CRM: 0; +CTA: 20; +CXT: 0; +DR: 0

+DS: 3,0,2048,6; +EB: 1,0,30; +EFCS: 1; +ER: 0; +ES: 3,0,2; +ESR: 1

+ETBM: 1,1,20; +FAA: 0; +FAP: 0,0,0; +FBO: 0; +FBU: 0; +FCQ: 1,0

+FCR: 0; +FCT: 1E; +FEA: 0; +FFC: 0,0,0,0; +FHS: 0; +FIE: 0; +FIP: 0

+FLI: ""; +FLO: 1; +FLP: 0; +FMS: 0; +FNR: 0,0,0,0; +FNS: ""; +FPA: ""

+FPI: ""; +FPP: 0; +FPR: 8; +FPS: 1; +FPW: ""; +FRQ: 0,0; +FRY: 0

+FSA: ""; +FSP: 0; +ICF: 3,3; +IFC: 2,2; +ILRR: 0; +IPR: 19200; +MA:

+MR: 0; +MS: ; +MV18R: 0; +MV18S: 0,0,0; +CMUX: C,2; +MODE: 0

+MAMS: 2,1,0,3; +CPAS: 0,1,0,2; +CSO: 33; +CPARM: ""; +CREG: 0,2; +CIMS: ""; +MNAM: ""; +MNAM2: ""

+MNAM3: ""; +CPRL1: ""; +CPRL2: ""; +CPRL3: ""; +RESET: ""

+SNAM: 3925868615; +MSCTS: 0; +CTXP: ""; +CMODE: 0; +CFREQ: ""

ACTIVE PROFILE:

E1 Q0 V1 X4 &C1 &D2 &Y0

S00:000 S03:013 S04:010 S05:008 S06:002 S07:050 S08:002 S09:006 S10:014 S11:095

STORED PROFILE 0:

E1 Q0 V1 X4 &C1 &D2

S00:000 S03:013 S04:010 S05:008 S06:002 S07:050 S08:002 S09:006 S10:014 S11:095

STORED PROFILE 1:

AT Commands Reference

E1 Q0 V1 X4 &C1 &D2

S00:000 S03:013 S04:010 S05:008 S06:002 S07:050 S08:002 S09:006 S10:014 S11:095

OK

at&y1

OK

ats6=9

OK

ats7=6

OK

ats9=11

OK

ats10=20

OK

ats11=200

OK

at&w1

OK

at+reset

OK

at&v

&C: 1; &D: 2; &F: 0; &W: 0; &Y: 1; E: 1; L: 0; M: 0; Q: 0; V: 1; X: 4

Z: 0; S0: 0; S10: 20; S11: 200; S3: 13; S4: 10; S5: 8; S6: 9; S7: 6

S8: 2; S9: 11; S24: 0; S99: 30; S100: 1; +FCLASS: 0; +CFG: ""

+FCC: 0,1,0,0,0,0,0,0; +FIS: 0,1,0,0,0,0,0,0; +CDR: 0; +CDS: 0,1,2048,6

+CFC: 0; +CQD: 10; +CRC: 0; +CLIP: 0; +CRM: 0; +CTA: 20; +CXT: 0; +DR: 0

+DS: 3,0,2048,6; +EB: 1,0,30; +EFCS: 1; +ER: 0; +ES: 3,0,2; +ESR: 1

+ETBM: 1,1,20; +FAA: 0; +FAP: 0,0,0; +FBO: 0; +FBU: 0; +FCQ: 1,0

+FCR: 0; +FCT: 1E; +FEA: 0; +FFC: 0,0,0,0; +FHS: 0; +FIE: 0; +FIP: 0

+FLI: ""; +FLO: 1; +FLP: 0; +FMS: 0; +FNR: 0,0,0,0; +FNS: ""; +FPA: ""

+FPI: ""; +FPP: 0; +FPR: 8; +FPS: 1; +FPW: ""; +FRQ: 0,0; +FRY: 0

+FSA: ""; +FSP: 0; +ICF: 3,3; +IFC: 2,2; +ILRR: 0; +IPR: 19200; +MA:

+MR: 0; +MS: ; +MV18R: 0; +MV18S: 0,0,0; +CMUX: C,2; +MODE: 0

+MAMS: 2,1,0,3; +CPAS: 0,1,0,2; +CSO: 33; +CPARM: ""; +CREG: 0,2; +CIMS1: ""; +MNAME: ""; +MNAME2: ""

+MNAME3: ""; +CPRL1: ""; +CPRL2: ""; +CPRL3: ""; +RESET: ""

+SNAM: 3925868615; +MSCTS: 0; +CTXP: ""; +CMODE: 0; +CFREQ: ""

ACTIVE PROFILE:

E1 Q0 V1 X4 &C1 &D2 &Y1

S00:000 S03:013 S04:010 S05:008 S06:009 S07:006 S08:002 S09:011 S10:020 S11:200

STORED PROFILE 0:

E1 Q0 V1 X4 &C1 &D2

S00:000 S03:013 S04:010 S05:008 S06:002 S07:050 S08:002 S09:006 S10:014 S11:095

STORED PROFILE 1:

E1 Q0 V1 X4 &C1 &D2

S00:000 S03:013 S04:010 S05:008 S06:009 S07:006 S08:002 S09:011 S10:020 S11:200

OK

at&f

OK

at+reset

OK

at&v

&C: 1; &D: 2; &F: 0; &W: 0; &Y: 0; E: 1; L: 0; M: 0; Q: 0; V: 1; X: 4

Z: 0; S0: 0; S10: 14; S11: 95; S3: 13; S4: 10; S5: 8; S6: 2; S7: 50

S8: 2; S9: 6; S24: 0; S99: 30; S100: 1; +FCLASS: 0; +CFG: ""

+FCC: 0,1,0,0,0,0,0; +FIS: 0,1,0,0,0,0,0; +CDR: 0; +CDS: 0,1,2048,6

+CFC: 0; +CQD: 10; +CRC: 0; +CLIP: 0; +CRM: 0; +CTA: 20; +CXT: 0; +DR: 0

+DS: 3,0,2048,6; +EB: 1,0,30; +EFCS: 1; +ER: 0; +ES: 3,0,2; +ESR: 1

+ETBM: 1,1,20; +FAA: 0; +FAP: 0,0,0; +FBO: 0; +FBU: 0; +FCQ: 1,0

+FCR: 0; +FCT: 1E; +FEA: 0; +FFC: 0,0,0,0; +FHS: 0; +FIE: 0; +FIP: 0

+FLI: ""; +FLO: 1; +FLP: 0; +FMS: 0; +FNR: 0,0,0,0; +FNS: ""; +FPA: ""

+FPI: ""; +FPP: 0; +FPR: 8; +FPS: 1; +FPW: ""; +FRQ: 0,0; +FRY: 0

+FSA: ""; +FSP: 0; +ICF: 3,3; +IFC: 2,2; +ILRR: 0; +IPR: 19200; +MA:

+MR: 0; +MS: ; +MV18R: 0; +MV18S: 0,0,0; +CMUX: C,2; +MODE: 0

+MAMS: 2,1,0,3; +CPAS: 0,1,0,2; +CSO: 33; +CPARM: ""; +CREG: 0,2; +CIMS: ""; +MNAME: ""; +MNAME2: ""

+MNAME3: ""; +CPRL1: ""; +CPRL2: ""; +CPRL3: ""; +RESET: ""

+SNAM: 3925868615; +MSCTS: 0; +CTXP: ""; +CMODE: 0; +CFREQ: ""

ACTIVE PROFILE:

E1 Q0 V1 X4 &C1 &D2 &Y0

S00:000 S03:013 S04:010 S05:008 S06:002 S07:050 S08:002 S09:006 S10:014 S11:095

STORED PROFILE 0:

E1 Q0 V1 X4 &C1 &D2

S00:000 S03:013 S04:010 S05:008 S06:002 S07:050 S08:002 S09:006 S10:014 S11:095

STORED PROFILE 1:

E1 Q0 V1 X4 &C1 &D2

S00:000 S03:013 S04:010 S05:008 S06:002 S07:050 S08:002 S09:006 S10:014 S11:095

OK

4.9.1.19 S24, Set Number of Seconds Delay Before C18 Enters Sleep Mode


Note

The information in this section applies to release 3.0F and above.

This command activates/disables the sleep mode. The terminal sends ATS24=5, and if there are no radio and UART activities, the c18 enters sleep mode in 5 seconds.

If terminal has some indication of the CTS pin activity, it can see:

- If +MSCTS=0 (default), the line changes its state periodically. For more information refer to “+MSCTS, Enables/Disable WAKE_IN Line Control on C18 Sleep Mode” on page 148”.
- If +MSCTS=1, the line is switched off at the moment of entering sleep mode and stays off even if c18 is awakened.

Set Command

The Set command sets the amount of time, in seconds; the c18 should wait before entering sleep mode.

Command	Response/Action
AT24=[<value>]	OK

Read Command

The Read command returns the current value.

Command	Response/Action
AT24?	<value> OK

Test Command

The Test command returns the possible value.

Command	Response/Action
ATS24=?	S24: (list of supported <value>) OK

The following table shows the S24 parameters.

Table 84. S24 Parameters

<bc>	Description
<value>	Number of seconds ($0 \leq n \leq 255$) 0 Disable sleep mode >0 Enable sleep mode The default value is 0.

Example

```

ATS24?
000
OK
ATS24=5
OK
ATS24?
005
OK
ATS24=?
S24: (0-255
OK

```

4.9.1.20 S99, Set Number of m-seconds before sending data to DTE



Note

The information in this section applies to release 3.0F and above.

This command defines the duration in [m-sec] of the delay for DTE waking up.

When `ATS99=x`, the pulse length is 2x before data transmission begin.

Default value of S99 is 30m-sec.

Set Command

The Set command sets the amount of time, in [m-sec]; the c18 should wait before sending data to DTE.

Command	Response/Action
AT99=[<value>]	OK

Read Command

The Read command returns the current value.

Command	Response/Action
AT99?	<value> OK

Test Command

The Test command returns the possible value.

Command	Response/Action
ATS99=?	S99: : (list of supported <value>) OK

The following table shows the S99 parameters.

Table 85. S99 Parameters

<bc>	Description
<value>	Number of [m-sec] (1 <= n <= 255) The default value is 30.

Example

ATS99?

030

OK

ATS99=5

OK

ATS99?

005

OK

ATS99=?

S99: (1-255)

OK

4.9.1.21 S100, Set Number of Seconds to avoid Frequent Wakeup Interrupts and Low Throughput from the Last Sent Character to DTE



Note

The information in this section applies to release 3.0F and above.

The S100 use to avoid frequent wakeup interrupts and low throughput, the c18 will use wakeup output indication for data only after S100 seconds elapsed from the last sent character to DTE.

Default value of ATS100 is 1 second.

Set Command

The Set command sets the amount of time, in seconds; the c18 should avoid frequent wakeup interrupts and low throughput.

Command	Response/Action
AT100=[<value>]	OK

Read Command

The Read command returns the current value.

Command	Response/Action
AT100?	<value> OK

Test Command

The Test command returns the possible value.

Command	Response/Action
ATS100=?	S100: (list of supported <value>) OK

The following table shows the S100 parameters.

Table 86. Battery status values

<bcs>	Description
<value>	Number of seconds] (1 <= n <= 255). The default value is 1 second.

Example

```

ATS100?
001
OK
ATS100=5
OK
ATS100?
005
OK
ATS100=?
S100: (1-255)
OK
    
```

4.9.1.22 AT&Y



Note

The information in this section applies to release 3.0F and above.

This command selects power up configuration as user's profile 0 or 1.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
AT&Y[<n>]	OK or ERROR	

Parameter	Description
<n>	User's profile number: 0 - Selects power up configuration as user's profile 0 1 - Selects power up configuration as user's profile 1

Example

at+y0 /* Selects power up configuration as user's profile 0 */

OK

at+y1 /* Selects power up configuration as user's profile 1 */

OK

at+y2

ERROR

4.9.2 Error Handling Commands**4.9.2.1 +CMS, Error Codes**

This command contains the codes that are returned for extended error status in response to an SMS command that failed. Codes above 511 are Motorola-specific error codes.

Mode Activation

Mode = 2.

Table 87. +CMS Error Codes

Code	Description
300	ME failure
301	SMS service of ME reserved
302	Operation not allowed
303	Operation not supported
305	Invalid text mode parameter
320	Memory failure
321	Invalid memory index
322	Memory full
330	SMSC address unknown
331	No network service
332	Network timeout

Table 87. +CMS Error Codes (*Continued*)

Code	Description
500	Unknown error
...511	Other values in range 256...511 are reserved
512...	Manufacturer specific
512	Network busy — MOTOROLA-specific
513	Invalid destination address — MOTOROLA-specific
514	Invalid message body length — MOTOROLA-specific
515	Phone is not in service — MOTOROLA-specific
516	Invalid preferred memory storage — MOTOROLA-specific
517	User terminated — MOTOROLA-specific

4.9.2.2 +EB, Break Handling in Error Control Operation

This extended-format compound parameter controls the behavior of the V.42 operation on the PSTN link (if present in the IWF).

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
+EB	OK or: ERROR	

Example

```
at+mode=0
```

```
OK
```

```
at+eb?
```

```
+EB: 1,0,30
```

```
OK
```

at+eb=?

ERROR

at+eb=1,1,250

OK

at+eb?

+EB: 1,1,250

OK

4.9.2.3 +CME, Error Codes

This command contains the codes that are returned for extended error status in response to a command that failed. Codes above 100 are Motorola-specific error codes.

Mode Activation

Mode = 2.

Table 88. +CME Error Codes

Code	Description
0	Phone failure
1	No connection to phone
2	Phone-adapter link reserved
3	Operation not allowed
4	Operation not supported
20	Memory full
21	Invalid Index
22	Not found
23	Memory failure
24	Text string too long
25	Invalid characters in text string
26	Dial string too long
27	Invalid characters in dial string
30	No network service

Table 88. +CME Error Codes (*Continued*)

Code	Description
31	Network timeout
32	Network not allowed - emergency calls only
100	Unknown
256	Too many active calls — MOTOROLA-specific
257	Call rejected — MOTOROLA-specific
258	Unanswered call pending — MOTOROLA-specific
259	Unknown calling error — MOTOROLA-specific
260	No phone number recognized — MOTOROLA-specific
261	Call state not idle — MOTOROLA-specific
262	Call in progress — MOTOROLA-specific
263	Dial state error — MOTOROLA-specific
270	Dial String contains non-digits while CLIR is on
271	Outgoing calls restricted
272	Outgoing calls restricted , Phonebook only

Example

At+mode=2

OK

at+cme=2

OK

at+clir?

+CLIR: 1,3

OK

atd+97254414588

+CME ERROR: Dial String contains non-digits while CLIR is on

at+clir=2

OK

atd+97254414588

+CLCC :1,0,2,0,0,"+97254414588",145,"Eli"

+CLCC:1,0,0,0,0,"+97254414588",145,"Eli"

D: VOICE

OK

+CLCC:1,0,6,0,0,"+97254414588",145,"Eli"

4.9.2.4 +CMEE, Report Mobile Equipment

The Set command disables/enables the use of result code +CME ERROR: <err> as an indication of an error relating to the functionality of the SU. When enabled, SU related errors cause +CME ERROR: <err> final result code instead of the regular ERROR final result code. For all SMS AT commands, the +CMEE set command disables/enables the use of result code +CMS ERROR: <err> as an indication of an error relating to the functionality of the SU. When enabled, SU related errors cause +CMS ERROR: <err> final result code instead of the regular ERROR final result code.

For Accessory AT commands other than the SMS commands, the Read command reads the current setting format of result code.

The Test command returns all supported format values as a compound value.

Mode Activation

Mode = 2.

At Command	Response/Action	Remarks
at+cme=<n>	Disables/enables the use of CME ERROR:<err> result code instead of of ERROR.	<n> 0 Disable +CME ERROR: <err> or +CMS ERROR: <err> result code. Use ERROR instead.
at+CMEE?	Returns the current <n> value.	1 Enable +CME ERROR: <err> and +CMS ERROR: <err> result code. Use numeric <err> values. Refer to Table 87, “+CMS Error Codes” on page 193, and Table 88, “+CME Error Codes” on page 195.
at+CMEE=?	Returns supported values for <n>.	2 Enable +CME ERROR: <err> and +CMS ERROR: <err> result code. Use verbose <err> values. Refer to Table 87, “+CMS Error Codes” on page 193, and Table 88, “+CME Error Codes” on page 195.

Example

at+cme?

+CMEE: 000

OK

at+cme=?

+CMEE: (0-2)

OK

at+cmee=1

OK

at+cmee?

+CMEE: 1

OK

at+cmee=2

OK

at+cmee?

+CMEE: 2

OK

4.9.3 MNAM Programming

This command enables you to read and set the NAM parameters.

4.9.3.1 +MNAM

This command gets or sets the NAM parameters as shown in Table 89.

Table 89. NAM Parameters Relevant to +MNAM

Parameter Name	Parameter Values	Description	Mutual Field for All NAMs
1	0-32767	AMPS (Analog) HOME_SID	
2	0-255	Option Byte 1	
3	0-10	Mobile Identification Number (MIN)	
4	0-10	Mobile Directory Number (MDN)	
5	0-255	Station Class Mark (SCM).	
6	0-15	Access Overload Code (ACCOLC)	
7	0-9	Service Level	Yes
8	0-255	Option Byte 2	Yes
9	0-255	Option Byte 3	Yes

The following table shows the CDMA P2K 1x NAM option byte definitions.

Table 90. CDMA P2K 1x NAM Option Byte Definitions

lsb=0 msb=7	msb <-- 11110000 --> lsb	1x Bit Status	Bit Definition
	Option byte 1:		
0	Min Mark	not active	

Table 90. CDMA P2K 1x NAM Option Byte Definitions (Continued)

1	Markov test override LSB	not active	
2	Disallow non-Home side foreign SID in PSCAN	not active	
3	Markov test override	not active	
4	Markov test override MSB	not active	
5	(Reserved) End to End Signalling Mark	not active	
6	(Reserved) Preferred System Mark	not active	
7	(Reserved) Local Use Mark	Always =1	for N.America markets
	Option byte 2:		
0	(Reserved) Lock Disable	not active	
1	(Reserved) Service Level Disable	not active	
2	(Reserved) Auto Recall	not active	
3	Single System Scan	not active	
4	Portable Data Logging	not active	
5	Call timers for originations only	Always =0	for N.America markets
6	Enable Test Menu / 2 second # to suspend	not active	
7	7 -Display call processing statistics	not active	
	Option byte 3:		
0	Unused	not active	
1	Selectable System Scan Disable	not active	
2	Unused	not active	
3	Unused	not active	
4	(Reserved) Auto Redial Disable	not active	
5	Test Mobile Enable / Auto Answer	not active	1 = Enabled, 0 = Disabled 1x = unimportant ('1' or '0')
6	NAMs active - lsb	Active	0 = 1 NAM, 1 = 2 NAMs 120x = single NAM only

Table 90. CDMA P2K 1x NAM Option Byte Definitions (*Continued*)

7	NAMs active - msb	Always =0	2 NAMs max
	Option byte 4:		
0	(Reserved) Word Sync Scan Disable	not active	
1	Data Menu Pre-arrangement Enable	not active	
2	Handset Test Mode Disable	not active	
3	CAMPS - turn on CAMPS functionality	not active	
4	SMS: Add local time offset to timestamp Enable	Always =0	for N.America markets
5	Long DTMF Enable	Always =1	Enables flex control
6	3W Booster Enable	not active	
7	(Reserved) Motorola Enhanced Scan Enable	not active	
	Option byte 5:		
0	Config bit for mob term while NID roamer	Always =1	for N.America markets
1	Config bit for mob term while SID roamer	Always =1	for N.America markets
2	Config bit: mob term using home SID, NID pair	Always =1	for N.America markets
3	Voice Privacy Bit. Used for Lucent Interop	Active	1 = Enabled 0 = Disabled
4	(Reserved) Extended Address Method Enable	not active	
5	Preferred mode - lsb	Active	see table below
6	Preferred mode - msb	Active	see table below
7	Force Preferred Vocoder Mode	not active	

The following table shows the options for optional byte 5: bits 5 and 6.

Table 91. Option byte 5 - bits 5 and 6

lsb bit 5	0	1	0	1
msb bit 6	0	0	1	1
mode	CDMA only	CDMA Preferred	Analog only	Not allowed

Mode Activation

Mode = 0

Read Command

AT Command	Response/Action
AT+MNAME?	<p>Parameter Value Description:</p> <p>< AMPS (Analog) HOME_SID ></p> <p>< Option Byte 1 ></p> <p>< Mobile Identification Number (MIN) ></p> <p>< Mobile Directory Number (MDN) ></p> <p>< Station Class Mark (SCM)></p> <p>< Access Overload Code (ACCOLC) ></p> <p>< Service Level ></p> <p>< Option Byte 2 ></p> <p>< Option Byte 3>.</p> <p>with:</p> <p>OK - The command is executed successfully.</p>

Set Command

AT Command	Response/Action	Remarks
AT+MNAME= < AMPS (Analog) HOME_SID > , < Option Byte 1 > ,< Mobile Identification Number (MIN) >,< Mobile Directory Number (MDN) >,< Station Class Mark (SCM)>,< Access Overload Code (ACCOLC) >,< Service Level >,< Option Byte 2 >,< Option Byte 3>.	<p>OK</p> <p>The command is executed successfully.</p> <p>ERROR</p> <p><name of the wrong parameter> (Refer to "Appendix A", page 335).</p> <p>The parameter was out of range or the numbers entered or one of the parameters are greater or smaller than the existing ones. See Table 89.</p>	<ul style="list-style-type: none"> In case the previous value is the same and you do not want to change it, write a comma sign (',') instead and then continue writing the rest of the parameters. Number of parameters entered must be nine exactly. To make sure the changes are determined in the NV - turn the phone Off and then restart it. <p>This feature is Flex dependent.</p>

4.9.3.2 +MNAME2

This command gets or sets the NAME2 parameters as shown in Table 92.

Table 92. NAME2 Parameters Relevant to +MNAME2

Parameter Name	Parameter Values	Description	Mutual Field for All NAMEs
1	0-1023	AMPS initial paging channel	
2	0-9999	AMPS First Dedicated Channel System A	Yes
3	0-9999	AMPS First Dedicated Channel System B	Yes
4	0-9999	AMPS Number Of Channels To scan	Yes
5	0-255	Option Byte 4	Yes
6	0-255	Option Byte 5	
7	0-7	Slot cycle index (SCI)	
8	0-32767	System ID (SID)	
9	0-65535	Network ID (NID)	
10	0-3	Mobile country code (MCC)	

Mode Activation

Mode = 0

Read Command

AT Command	Response/Action
AT+MNAME2?	Parameter Value Description: < AMPS initial paging channel> < AMPS First Dedicated Channel System A> < AMPS First Dedicated Channel System B> < AMPS Number Of Channels To scan> < Option Byte 4>, < Option Byte 5> < Slot cycle index (SCI)> < System ID (SID) > < Network ID (NID)> < Mobile country code (MCC)> with: OK - The command executed successfully.

Set Command

AT Command	Response/Action	Remarks
AT+MNAME=< AMPS initial paging channel> , < AMPS First Dedicated Channel System A> ,< AMPS First Dedicated Channel System B>,< AMPS Number Of Channels To scan>,< Option Byte 4>,< Option Byte 5>,< Slot cycle index (SCI)>,< System ID (SID) >,< Network ID (NID)>,< Mobile country code (MCC)>	OK The command executed successfully. ERROR <name of the wrong parameter> (Refer to "Appendix A", page 335). The parameter was out of range or the numbers entered or one of the parameters are greater or smaller than existing ones. See Table 92.	<ul style="list-style-type: none"> In case the previous value is the same and you do not want to change it, write a comma sign (',') instead and then continue writing the rest of the parameters. Number of parameters entered must be ten exactly. To make sure the changes are determined in the NV - turn the phone Off and restart it.

4.9.3.3 +MNAME

This command gets or sets the NAME parameters as shown in Table 93.

Table 93. NAME Parameters Relevant to +MNAME

Parameter Name	Parameter Values	Description
1	00-99	imsi 11 12
2	0-8	System mode
3	0-2	vocoder type
4	0-111	true imsi address number
5	0-1	true imsi status
6	1- Programmed 0- Deprogrammed	true imsi programmed/deprogrammed
7	0000000000-9999999999	true imsi mobile identification number
8	000-999	true imsi mobile country number
9	00-99	true imsi 11 12
10	0000-1023	cdma primary channel system A
11	0000-1023	cdma primary channel system B
12	0000-1023	cdma secondary channel system A
13	0000-1023	cdma secondary channel system B

Mode Activation

Mode = 0.

Read Command

AT Command	Response/Action
AT+MNAME3?	<p>Parameter Value Description:</p> <p><imsi 11 12></p> <p><System mode ></p> <p><vocoder type ></p> <p><true imsi address number ></p> <p><true imsi status ></p> <p><true imsi programmed/deprogrammed ></p> <p><true imsi mobile identification number ></p> <p><true imsi mobile country number ></p> <p><true imsi 11 12></p> <p><cdma primary channel system A ></p> <p><cdma primary channel system B ></p> <p><cdma secondary channel system A ></p> <p><cdma secondary channel system B ></p> <p>with:</p> <p>OK -The command executed successfully.</p>

Set Command

AT Command	Response/Action	Remarks
AT+MNAM3=<imsi 11 12>, <System mode >, <vocoder type >,<true imsi address number >, <true imsi status >, <true imsi programmed/ deprogrammed >, <true imsi mobile identification number>, <true imsi mobile country number >, <true imsi 1112>, <cdma primary channel system A >, <cdma primary channel system B >, <cdma secondary channel system A >, <cdma secondary channel system B >	OK The command was executed successfully. ERROR <name of the wrong parameter> (Refer to "Appendix A", page 335). The parameter was out of range or the numbers entered or one of the parameters are greater or smaller than the existing ones. See Table 93.	<ul style="list-style-type: none"> In case the previous value is the same and you do not want to change it, write a comma sign (',') instead and then continue writing the rest of the parameters. If parameter number '6' (<true imsi programmed/deprogrammed >) is set to '0', then True Imsi will be deprogrammed ("true imsi mobile identification number" will be set with the four least-significant digits set to ESN p and converted directly from binary to decimal, modulo 10000, "true imsi mobile country number " will be set to '0' ," true imsi 11 12" will be set to zero). <p>In order to program the True imsi ,< true imsi programmed/deprogrammed > must be set to 1 (see IS683A , page 3-1 , paragraph 20).</p> <ul style="list-style-type: none"> Number of parameters entered must be 10 exactly. To make sure the changes are determined in the NV - turn the phone Off and then restart it.

4.9.3.4 +SNAM

Selects/reads the current active NAM to which the NAM data will be written/retrieved using AT+MNAM [x].

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
read: AT+SNAM?	SNAM: 1 OK - The command executed successfully. ERROR - in case a syntax mistake.	
set: AT+SNAM= < active nam>	OK - The command executed successfully. ERROR - in case a syntax mistake.	<p>The number of the maximum allowed NAM profiles is currently two.</p> <p>To choose the maximum allowed NAM profile, bits '6' and '7' of option byte '3' must be configured as follows:</p> <ol style="list-style-type: none"> If bit 6 = 0 and bit 7=0 then a single NAM profile is allowed. If bit 6 = 1 and bit 7=0 then two NAM profiles are allowed.

AT Command	Response/Action	Remarks
test: AT+SNAM=?	SNAM: 1-2 OK The command executed successfully. ERROR in case a syntax mistake.	Get Maximum Allowed NAM's, get legal boundary for this command ,(option byte 3) bit 6=1 bit 7=0

4.9.4 +CPARM



Note

The information in this section applies to release 3.06 and above.

This command gets or sets the cellular system parameters that described in Table 94.

Table 94. Cellular System Parameters Relevant for +CPARM

Parameter Name	Parameter Values	Description
1	0-32767	Cellular System ID
2	0-65535	Cellular Network ID
3	0-7	Slot Cycle Index
4	0-15	Access Overload Class
5	0-1	The Cellular band as described in 3GPP2 C.S0002
6	0-2047	Primary channel A
7	0-2047	Secondary channel B
8	0-2047	Secondary channel A
9	0-2047	Secondary channel B
10	0-999	Lock Code
11	0-999999	Security Code
12	0-255	Station Class Mark

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
read: AT+CPARM?	Parameter Value Description < Cellular System ID > < Cellular Network ID > < Access Overload class > < The Cellular band > < Primary channel A > (N/A) < Primary channel B > (N/A) < Secondary channel A > (N/A) < Secondary channel B > (N/A) < Lock Code >. < Security Code >. < Station Class Mark >. OK The command executed successfully. ERROR	- <Lock code> field can be fixed 4 digit number or it can start with initial 4 digit number (e.g 1234), then changed to the last 4 digit of the MDN (after MDN is changed). This feature is Flex dependent.
set: AT+CPARM = <SID>, <NID>, <SCI>, <ACCLOC>, <Cellular Band (N/A)>, <PchA (N/A)>, <PchB (N/A)>, <SchA (N/A)>, <SchB (N/A)>, <Lock>, <Sec>, <SCM>	OK The command executed successfully. ERROR	In case the previous value is the same and you don't want to change it, write a comma sign (',') instead and carry on writing the rest of the parameters. - In case the lock code is in "follow MDN" mode then the change will take effect only until the next MDN change.
Test: AT+CPARM=?	(0-32767),(0-65535),(0-7),(0-15),(0-1),(0-2047) ,(0-2047) ,(0-2047) ,(0-2047),(0-9999),(0-999999),(0-255)	



Note

The primary,secondary channels and band_class fields,specified in the AT+CPARM command will form the "CDMA Preferred Set"of the SU for the initial search to acquire a CDMA Pilot Channel after power on. No other CDMA channels will be used for the initial search.



Note

This command is not supported in SW ver C18_X_2.8_3.0.6.0R.

Example

(Change the 4th parameter "ACCLOC" from 2 to 0)

at+cparm?

+CPARM: 8465,65535,2,2,0,0,0,0,0,3872,000000,106

OK

at+cparm=,,,0,,,,,,

OK

at+cparm?

+CPARM: 8465,65535,2,0,0,0,0,0,0,3872,000000,106

OK

At+cparm=?

+CPARM: (0-32767),(0-65535),(0-7),(0-15),(0-1),(0-2047) ,(0-2047) ,(0-2047) ,(0-2047),(0-9999),(0-999999),(0-255)

OK

4.9.5 +MPOD, Power Off Delay

This command changes the power off delay settings when ignition is off.

Mode Activation

Mode = 2



Note

Supported on 03.xx SW version from 03.12 and above.

AT Command	Response/Action	Remarks
AT+MPOD=<mode>	OK or: ERROR +CME ERROR: <err>	Sets the power off delay when ignition is off: 0 - powers down immediately 1 - powers down after 15 minutes 2 - powers down after 30 minutes 3 - powers down after 60 minutes 4 - working continuously
AT+MPOD?	+MODE: <current POD> or: ERROR +CME ERROR: <err>	Returns current power off delay mode
AT+MPOD =?	+MPOD: (range of <mode>s)	Returns the list of available modes for this interface.

Example

```
at+mpod?  
+MPOD: 4  
OK  
at+mpod=3  
OK  
at+mpod?  
+MPOD: 3  
OK  
at+mpod=?  
+MPOD:(0-4)  
OK
```

4.9.6 PRL Commands

4.9.6.1 +CPRL1, Set/Get PRL Header

This command either sets or gets the PRL header parameters.



- When changing the list id (first parameter), the PRL tables reset to their default values.
- The commands +cprl1, +cprl2 and +cprl3 manage the PRL.
- The user is required to set the current nam using the command AT+SNAM, otherwise the changes/read will occur for the current nam. For each NAM the PRL max buffer size is 6KB for both the Acquisition table and the System table.

Mode Activation

Mode=0

AT Command	Response/Action	Remarks
+CPRL1?	+cprl1: <list id>,<preferred only>,<default roam ind>,<current num>,<buffer size>,<number of Acquisition row>,< number of system row>	

AT Command	Response/Action	Remarks
+CPRL1=<list id>,<preferred only>,<default roam ind>	OK Or CPRL error (see Appendix A)	<ul style="list-style-type: none"> If the list id is changed, the current PRL labels are cleared and set to the default PRL. In case the previous value is the same and you do not want to change it, write a comma sign (',') instead and carry on writing the rest of the parameters. The number of parameters entered must be three exactly.
+CPRL1=?	+CPRL1:(0-65535), (0,1), (0-255) OK	

**Note**

The default PRL data is a single row for each one of the tables as follows:

- Acquisition default row: type - 1 (Cellular Analog), data - 0 (System A).
- System default row: SID - 0, NID - 65535, Preferred/Negative - 1 (Preferred), GEO region - 0 (New), Priority - 0 (Same), Acq. Index - 0, Roaming Indicator - 0 (On).

The following table shows the +cprl1 parameters.

Table 95. +cprl1 Parameters

<Parameter>	Description	Remark
<list id>	The PRL version.	
<preferred only>	If TRUE then limits the registration on the system, which is preferred in the PRL system table.	
<default roam ind>	<p>The indicator used when you are registered to the default system:</p> <ul style="list-style-type: none"> 0 - On 1 - Off 2 - Flashing 3 - Out of Neighborhood 4 - Out of Building 5 - Preferred System 6 - Available System 7 - Alliance Partner 8 - Premium Partner 9 - Full Service 10 - Partial Service 11 - Banner On 12 - Banner Off 255 	
<current num>	The current NAM (need to be set by the user with AT+SNAM)	Read only, Set by +snam

Table 95. +cprl1 Parameters (*Continued*)

<buffer size>	Currently used PRL buffers (in bytes).	Read only
<number of Acquisition row>	Currently sets acquisition rows in acquisition table.	Read only
< number of system row>	Currently sets system rows in system table.	Read only

4.9.6.2 +CPRL2, Managing PRL Acquisition Table

This command enables the user to control the PRL acquisition table, as follows:

- Returns the number of the current rows in the table
- Returns specific row parameters
- Updates a specific row in the table or adds a specific row to the table.



Note

- This command changes the amount of parameters depending on the acquisition row type (3rd parameter).
- The commands +cprl1, +cprl2 and +cprl3 manage the PRL.
- The user is required to set the current nam using the command AT+SNAM, otherwise the changes/read will occur for the current nam. For each NAM the PRL max buffer size is 6KB for both the Acquisition table and the System table.

Mode Activation

Mode=0

AT Command	Response/Action	Remarks
+cprl2?	+CPRL2: <number of current Acq. Row>	<ul style="list-style-type: none"> • Returns the number of rows. • The maximum row index is the number of current rows minus one.
+cprl2=0,<Row ind>	+CPRL2: <Row ind>,<Acq. type>,<data>[,<data>[...]]	<p>This is a <u>read command</u> (first parameter is 0).</p> <ul style="list-style-type: none"> • It returns the parameters of the row of the given row index. • When acquisition type is 2,3,5 or 6, then there can be more than one data fields, although the data fields are occupied within parentheses.
+cprl2=1,<Row ind + 1>,<Acq. Type>,<data>[,<data>[...]]	OK Or CPRL error (see appendix A)	<p>This is a <u>set command</u> (first parameter is 1).</p> <ul style="list-style-type: none"> • If row index equals to <numbers of current Acq. Row>, then a new row is inserted.
+cprl2=?	+CPRL2: 0,(0-<max current Acq Row>) Or 1,(0-<max current Acq Row + 1>),(1-6),(0-1175)[,(0-1175)...]	<max current Acq Row> is the index row.

The following table shows the +cprl2 parameters.

Table 96. +cprl2 Parameters

<Parameter>	Description	Remark
<number of current Acq. Row>	The number of the actual row in the acquisition table.	The same as the 6th parameter given by at+cprl1?
<Row ind>	The index of the row	Starts from 0
<Aqc. Type>	The type of acquisition (the channel group) 1 - Cellular Analog 2 - Cellular CDMA (Standard Channels) 3 - Cellular CDMA (Custom Channels) 4 - Cellular CDMA Preferred 5 - PCS Blocks 6 - PCS channels	<ul style="list-style-type: none"> • Group 1-4: are 800Mhr group channels • Group 5-6: are the 1900Mhr group channel • Group 1, 4: have 1 data field • Group 2: has 2 data fields • Group 5: has up to 6 data fields • Group 3, 6: have up to 10 data fields

Table 96. +cprl2 Parameters (*Continued*)

<data>

Type	Data	
0 (Reserved)	N/A.	
1 (Cellular Analog)	0 (System A) or 1 (System B) or 3 (System A or B)	
2 Cellular CDMA (Standard Channels)	Data1	Data2
	0 (System A) or 1 (System B) or 3 (System A or B)	1 (Primary CDMA) or 2 (Secondary CDMA) or 3 (Primary or Secondary).
3 Cellular CDMA (Custom Channels)	<u>System A</u> : 1-311, 689-694, 1013-1023. <u>System B</u> : 356-644, 739-777.	
4 (Cellular CDMA Preferred)	0 (System A) or 1 (System B) or 3 (System A or B)	
5 (PCS Blocks).	0 (block A) 1 (block B) 2 (block C) 3 (block D) 4 (block E) 5 (block F) or instead: 7 (block W) as wildcard.	
6 (PCS Channels)	25 - 1175	

**Note**

In PCS block, when choosing Wildcard, all other block data are ignored.

4.9.6.3 +CPRL3, Managing PRL System Table

This command enables the user to control the PRL System table, as follows:

- Returns the number of the current rows in the table
- Returns specific row parameters
- Updates a specific row in the table or adds a specific row to the table



Note

- The commands +cprl1, +cprl2 and +cprl3 manage the PRL.
- The user is required to set the current nam using the command AT+SNAM, otherwise the changes/read will occur for the current nam. For each NAM the PRL max buffer size is 6KB for both the Acquisition table and the System table.

Mode Activation

Mode=0

AT Command	Response/Action	Remarks
+cprl3?	+CPRL3: <number of current Sys. Row>	<ul style="list-style-type: none"> • Returns the number of rows. • The maximum row index is the current number of rows minus one.
+cprl3=0,<Row ind>	+cprl3: <Row ind>,<sid>,<nid>,<preferred/negative>,<Geo. Region>,<priority>,<Acq. Index>,<roam ind.>	<p>This is a <u>read only</u> mode.</p> <ul style="list-style-type: none"> • It returns the parameters of the row of the given row index. • Always returns all eight parameters. • If row is negative, the last <priority> and <roam ind> parameters shall be ignored.
+cprl3=1,<Row ind + 1>,<sid>,<nid>,<preferred/negative>,<Geo. Region>,<priority>,<Acq. Index>,<roam ind.>	OK Or CPRL error (see appendix A)	<p>This is a set command.</p> <ul style="list-style-type: none"> • If a row index equals to <numbers of current Sys. Row>, then a new row is inserted. • The first row is always set to <Geo. Region> = 0. • If a row is changed from <u>preferred to negative</u>, the <priority> and <roam ind> are ignored. • If a row is changed from <u>negative to preferred</u>, then you must enter valid values for the fields <priority> and <roam ind>. • If row is negative: <priority> and <roam ind> cannot be changed.
+cprl3=?	+CPRL3: 0,(0-<max current Sys Row>) Or 1,(0-<max current Sys Row + 1>),(0-32767),(0-65535),(0,1),(0,1),(0,1),(0-<max current Acq Row>),(0-255) OK	<ul style="list-style-type: none"> • <max current Acq Row> is the index row • <max current Sys Row> is the index row

The following table shows the +cprl3 parameters.

Table 97. +cprl3 Parameters

Parameter	Description	Remark
<number of current Sys. Row>	The number of the actual row in the system table	The same as the 7th parameter given by at+cprl1?
<Row ind>	The index of the row	Starts from 0
<sid>	System ID 0-32767	
<nid>	Network ID 0-65535	65535 is a Wildcard, which means it is registered on every founded NID.
<preferred/negative>	Choose if the system row is Preferred or Negative 1 – Preferred 0 – Negative	<ul style="list-style-type: none"> <u>Preferred</u> – this is a valid row to be checked while seeking the PRL for a system to register on. <u>Negative</u> – this row will be ignored while seeking for a system.
<Geo. Region>	Geographical region: 0 – new 1 – same	The value of the first row in the system table is always 0.
<priority>	The priority of the system against other system rows in the same area. 0 - Same 1 – More	This field is actual only if the row is not Negative.
<Acq. Index>	Acquisition table row index	Must have a valid row index in the acquisition table.
<roam ind.>	The Roaming Indicator to be used when the registration is made on this system row (SID,NID and channel): 0 - On 1 - Off 2 - Flashing 3 - Out of Neighborhood 4 - Out of Building 5 - Preferred System 6 - Available System 7 - Alliance Partner 8 - Premium Partner 9 - Full Service 10 - Partial Service 11 - Banner On 12 - Banner Off 255	This field is actual only if the row is not Negative.

4.9.6.4 CPRL Error Result Codes

The following table shows the CPRL Error Result Codes.

Table 98. CPRL Error Result Codes

Code	String Error Results
83	DS_ATCOP_CURRENT_PRL_IS_INVALID
84	DS_ATCOP_INVALID_WRITE_INTO_THE_PRL
85	DS_ATCOP_BAD_LIST_ID
86	DS_ATCOP_BAD_PREFERRED_ONLY
87	DS_ATCOP_BAD_DEFAULT_ROAMING_INDICATOR
88	DS_ATCOP_MISSING_CMD_TYPE
89	DS_ATCOP_BAD_COMMAND_TYPE
90	DS_ATCOP_FAIL_TO_READING_ACQUISITION_RECORD
91	DS_ATCOP_ACQUISITION_INDEX_ABOVE_THE_CURRENT_AVAILABLE_RECORDS
92	DS_ATCOP_ACQUISITION_INDEX_ABOVE_THE_MAXIMUM_ALLOWED_RECORDS
93	DS_ATCOP_BAD_ACQUISITION_INDEX
94	DS_ATCOP_BAD_ACQUISITION_TYPE
95	DS_ATCOP_BAD_ACQUISITION_DATA
96	DS_ATCOP_BAD_ACQUISITION_CELLULAR_CHANNEL
97	DS_ATCOP_BAD_ACQUISITION_CDMA_BLOCK
98	DS_ATCOP_FAIL_TO_READ_SYSTEM_RECORD
99	DS_ATCOP_SYSTEM_INDEX_ABOVE_THE_CURRENT_AVAILABLE_RECORDS
100	DS_ATCOP_SYSTEM_INDEX_ABOVE_THE_MAXIMUM_ALLOWED_RECORDS
101	DS_ATCOP_BAD_SYSTEM_INDEX
102	DS_ATCOP_BAD_SYSTEM_SID
103	DS_ATCOP_BAD_SYSTEM_NID
104	DS_ATCOP_BAD_SYSTEM_NEG_PREF
105	DS_ATCOP_BAD_SYSTEM_GEO_REG

Table 98. CPRL Error Result Codes (*Continued*)

106	DS_ATCOP_BAD_SYSTEM_PRI
107	DS_ATCOP_BAD_SYSTEM_ACQ_REC
108	DS_ATCOP_BAD_SYSTEM_ROAM_IND
109	DS_ATCOP_NOT_ENOUGH_PARAMETERS
110	DS_ATCOP_TOO_MANY_PARAMETERS
111	DS_ATCOP_INDEX_MISSING
112	DS_ATCOP_VALUE_MISSING
113	DS_ATCOP_ADD_NEW_PARAMETER_WITHOUT_VALUE
114	DS_ATCOP_ALGORITHM_CONFLICT
115	DS_ATCOP_ACQ_REC_RESERVED
116	DS_ATCOP_ACQ_REC_NONE
117	DS_ATCOP_UNKNOWN_CURRENT_NAM
118	DS_ATCOP_UNKNOWN_SYSTEM_PARAMETER
119	DS_ATCOP_MUST_TO_INSERT_PRI_AND_ROAM_IND_VALUES
120	DS_ATCOP_EXCEEDED_PRL_SIZE

4.10 UI

4.10.1 +MH Handset Status/Control

4.10.1.1 +MHMN, Home Network Name

This command returns the radio's home network name.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+MHMN?	+MHMN: <name>	Returns the radio's home network name.

The following table shows the +MHMN parameters.

Table 99. +MHMN Parameters

<Parameter>	Description
<name>	A quoted string indicating home network name.

Example

AT+MHMN?

+MHMN: "Home Only"

4.10.1.2 +MHIG, Set Ignition State

This command allows an intelligent car kit to indicate the ignition state of the vehicle to the SU. This allows the SU to turn on and off with ignition, or to enter a power saving state when the ignition has been turned off. The actual operation depends on the SU.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+MHIG=<state>	OK if no error	Sets ignition state.

The following table shows the +MHIG parameters.

Table 100. +MHIG Parameters

<Parameter>	Description
<state>	0 Vehicle ignition off 1 Vehicle ignition on

Example

AT+MHIG=1

OK

4.10.1.3 +CKPD, Keypad Control

This command allows the emulated pressing of keys as if entered from the SU keypad or from a remote handset. The keycodes used by this command are virtual keycodes, shown in See Table 101, which may not be supported by all SUs. If a key is not supported by an SU, the SU will return +CME ERROR: indicating that error 25 (Invalid character) has occurred.

This command is provided primarily to support test efforts, and to allow the emulation of a handset device by a peripheral. This command is not intended to be used by accessory devices to access items within SU menus. Use the commands intended for manipulating features for this purpose, to preserve compatibility across SUs and SU versions.

Mode Activation

Mode = 2.

The following table shows the virtual keycodes.

Table 101. Virtual Keycodes

Character	ASCII	Description
#	35	Hash/Pound key
*	42	Star key
0..9	48..57	Number keys
V/v	86/118	Down arrow
^	94	Up arrow
[91	Left softkey
:	58,124	Right softkey
]	93	Center softkey
E/e	69/101	End key
S/s	83/115	Send key
P/p	80/112	Power key
M/m	77/109	Menu key
:S/:s	58,83/58,115	Smart key
:Z/:z	58,90/58,122	Single Volume key
U/u	85/117	Side Volume Up key
D/d	68/100	Side Volume Down key
:U/:u	58,85/58/117	Side Volume Up key (No Scroll)
:D/:d	58,68/58,100	Side Volume Down key (No Scroll)
:M/:m	58,77/58, 109	Feature key to access SMS
:V/:v	58,86/58,118	Feature key to access voice mail
:P/:p	58,80/58,112	Feature key to access phone book
:F/:f	58,70/58,102	Menu Scroll Forward

Table 101. Virtual Keycodes (*Continued*)

Character	ASCII	Description
:B/b	58,66/58,98	Menu Scroll Backward
Q/q	81/113	MUTE key
:K/k	58,75/58,107	Multiband Knifedswitch
:A/a	58,65/58,97	Voice Annotator key
:P/p	58,80/58,112	Show Service Dialing Numbers
X/x	88/120	Option key
:Q/q	58,81/58,113	Fast Access key
C/c	67/99	Clear key
:I/i	58,73/58,105	Invalid key
:X/x	58,88/58,120	Joystick Up
:C/c	58,67/58,99	Joystick Down
:L/l	58,76/58,99	Joystick Left
:R/r	58,82/58,114	Joystick Right
:\$	36	Speaker
:H/h	58,72/58,104	Headset Single position
:J/j	58,74/58,106	Headset Dual position

AT Command	Response/Action	Remarks
+CKPD=<"keys">[,<time>[,<pause>]]	OK if key press accepted +CME ERROR: <err> if rejected +CKEV: if key press echo is enabled and phone is not locked	Allows the emulated pressing of keys.

The following table shows the +CKPD parameters.

Table 102. +CKPD Parameters

<Parameter>	Description
<"keys">	A virtual keycode.

Table 102. +CKPD Parameters (*Continued*)

<Parameter>	Description
<time>	Time for which to hold the key, in 0.1 second intervals
<pause>	Time to pause between key presses, in 0.1 second intervals

Example

```

at+mode=2
OK
at+cmer=3,2,0,2,0           //Report key press events
OK
at+ckpd="#"
OK
+CKEV: "#",1
+CKEV: "#",0
at+ckpd="E"
OK
+CKEV: "E",1
+CKEV: "E",0
at+ckpd=35
OK
+CKEV: "#",1
+CKEV: "#",0
at+ckpd=69
OK+CKEV: "E",1
+CKEV: "E",0

```

4.10.1.4 +MKPD, Auxiliary Keypad Control

This command enables the accessories to control the press and release of key presses. The keycodes used by this command are virtual keycodes, shown in Table 101, “Virtual Keycodes,” on page 219, which may not be supported by all SUs. If a key is not supported by an SU, the SU returns +CME ERROR: indicating that error 25 (Invalid character) has occurred.

Only a single key may be pressed at a given time. Sending in a new key press without releasing the previous key will result in a the previous key being automatically released.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+MKPD=<key>,<state>	OK if key press accepted +CME ERROR: <err> if rejected +CKEV: if key press echo is enabled and phone is not locked	Allows the accessories to control the press.

The following table shows the +MKPD parameters.

Table 103. +MKPD Parameters

<Parameter>	Description
<keys>	A virtual keycode.
<state>	Key press state. 0 Key released 1 Key pressed

Example

```
AT+MKPD=1,1
```

```
OK
```

```
+CKEV: 1,1 //If +CMER is configured to echo and phone not locked
```

```
.
```

```
.
```

```
AT+MKPD=1,0
```

```
OK
```

```
+CKEV: 1,0 //If +CMER is configured to echo and phone not locked
```

4.10.1.5 +CMER Keypad Mode, Set/Request Local Key Press Echo

This command enables an external accessory to receive key press information from the SU internal keypad. This is used in some cases to track user activity for redisplay on a vehicle system, or to perform accessory-specific menu operations.



Note

This command is used for more than just enabling/disabling keypad event reporting. Information on the other event reporting modes is contained in other sections.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+CMER?	+CMER: <mode>,<keyp>,<disp>,<ind>,<bfr>	Returns current event reporting settings.
+CMER=?	+CMER: (list of <modes>s), (list of <keyp>s), (list of <disp>s), (list of <ind>s), (list of <bfr>s)	Returns the list of supported event reporting settings.
+CMER=<mode>[,<keyp>,<disp>[,<ind>[,<bfr>]]]]	OK	Sets the event reporting mode.

The following table shows the +CMER parameters.

Table 104. +CMER Parameters

<Parameter>	Description
<keyp>	0 Buffer unsolicited result codes in SU 1 Discard unsolicited result codes in on-line mode 2 Buffer result codes in on-line mode 3 Forward unsolicited result codes
<mode>	0 Do not report keypad events 1 Discard unsolicited result codes in on-line mode 2 Buffer result codes in on-line mode
<disp>	0 No display of event reporting
<ind>	0 Do not report indicator events 1 Report indicator events not caused by +CIND 2 Report all indicator events
<bfr>	0 Clear buffer when <mode> 1-3 is entered 1 Flush buffer when <mode> 1-3 is entered

Example

AT+CMER=?

+CMER: (0,3),(0,1,2),(0),(0,1,2),(0)

AT+CMER?

+CMER: 0,0,0,0,0

AT+CMER=3,2,0,2,0

OK

4.10.1.6 +MCHS, Channel Status

This private AT command reports radio's channel status. This provides information about the channel that the SU is currently tuned to, or in the case that the SU is not in service, information that the SU is not currently tuned to a channel. This command will send asynchronous updates when the channel state changes, if requested.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+MCHS?	+MCHS: <status>	
+MCHS=?		
+MCHS=<mode>	OK	

The following table shows the +CMER parameters.

Table 105. <mode> Values for +MCHS

<mode>	Description
0	Disable output of unsolicited channel status messages
1	Enable output of unsolicited channel status messages

Table 106. <status> Values for +MCHS

<state>	Description
"NS"	SU currently is not in service in any mode.
"A"	SU is on an AMPS (analog) channel
"CDMA"	SU is on a CDMA (IS-95) channel

Table 106. <status> Values for +MCHS (Continued)

<state>	Description
"TDMA"	SU is on a TDMA (IS-136) channel
"GSM"	SU is on a GSM channel
"iDEN"	SU is operating on an iDEN channel
"UMTS"	SU is operating on a UMTS mode channel (Europe WCDMA)
"ARIB"	SU is operating on an ARIB mode channel (Japan WCDMA)

Example

AT+MCHS=?

+MCHS: (0,1)

OK

AT+MCHS?

+MCHS: "NS"

OK

AT+MCHS=1

OK

4.10.1.7 +MGCB, Get Current Band

This command returns the current cellular band for which the radio is registered to.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+MGCB?	+MGCB: <band>	<band> - the current cellular band represented as a string

Table 107. <band> Values for +MGCB

<mode>	Description
800	SU is on 800 MHz cellular band
900	SU is on 900 MHz cellular band
1800	SU is on 1800 MHz (1.8 GHz) cellular band
1900	SU is on 1900 MHz (1.9 GHz) cellular band

Example

AT+MGCB?

+MGCB: "1900"

OK

4.10.2 Unsolicited UI Status Messages

4.10.2.1 +MLKC, Phone Lock Status Change Event

This unsolicited message is sent when the asynchronous phone lock status change event reporting is enabled and the phone lock status is changed, either via AT commands (See "+MLCK, Phone Lock Status Change Event" on page 167, and "+MPIN, Unlock Phone" on page 167) or via the phone's UIS.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+MLKC=<mode>	+MLKC: <status>	Enable/disable the asynchronous phone lock status change reporting.

The following table shows the +MLKC parameters.

Table 108. +MLKC Parameters

<Parameter>	Description
<mode>	0 Disable asynchronous reporting 1 Enable asynchronous reporting
<status>	0 Phone is Unlocked 1 Phone is Locked

Example

AT+MLKC=1

OK

AT+MPIN?

+MPIN: READY

OK

+MLKC: 1 //User locked phone via keypad

+MLKC: 0 //User unlocked phone via keypad

AT+MLCK="1234"

OK

+MLKC: 1

4.10.2.2 + MMRR, Motorola Master Reset Reporting

This unsolicited message is sent to the TE by the SU if a master reset occurs, and master reset events reporting is enabled. The TE is able to enable or disable this reporting.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+MMRR=<mode>	OK	Enables/disables the reporting of master reset occurrences in the SU.

The following table shows the +MMRR parameters.

Table 109. +MMRR Parameters

<Parameter>	Description
<mode>	0 Disable master reset event reporting. 1 Enable master reset event reporting. Default is 0.

Example

$$\text{AT}+\text{MMRR}=1$$

```
OK //Master reset event
```

+MMRR

4.10.2.3 + CIEV, Indicator Reporting

This command sends an unsolicited message when display indicator reporting is enabled by +CMER, and an indicator (for example, the Voice Mail icon) changes on the SU's display.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
NA	+CIEV: <ind>,<value>	This is an unsolicited message.

The following table shows the +CIEV parameters.

Table 110. +CIEV Parameters

<Parameter>	Description
<ind>	Indicates the indicator order number as defined in Table 16, “+CIND Available Indicators,” on page 58. The indicator order number is 0-based for Motorola Telematics devices and 1-based for all other devices.
<value>	<p>The value of the indicator.</p> <p>For binary indicators:</p> <p>0 OFF</p> <p>1 ON.</p> <p>Non-binary integers can have any non-negative integer value.</p>

4.10.2.4 + CKEV, Key Press Echo Output

This command sends an unsolicited message when local key press echo is enabled and a key is pressed on the SU keypad. The identity of the key is broadcast to all accessories, along with information about whether the key was pressed or released. This can be configured to send only key presses from the SU keypad, or from accessories as well as the keypad.

When the phone is locked, if the identity of the key pressed is a digit or a softkey, the “@” character is used in the message event instead of the actual key being pressed, so that no passwords or codes entered by the user can be monitored or stolen by attached accessories.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
NA	+CKEV: <key>,<press>	This is an unsolicited message.

The following table shows the +CKEV parameters.

Table 111. +CKEV Parameters

<Parameter>	Description
<key>	The key that changed state, as defined in Table 101, “Virtual Keycodes,” on page 219.
<press>	0 Key was released 1 Key was pressed

4.10.2.5 + MUPB, Phone Book Event

This command is sent by the SU when a phone book entry is accessed or modified by the user or an accessory.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+MUPB=<n>	OK if parameter accepted +MUPB: <event>,<index>	Enables/disables phone book event reporting.

The following table shows the +MUPB parameters.

Table 112. +MUPB Parameters

<Parameter>	Description
<n>	0 Phone Book Event Reporting Off 1 Phone Book Event Reporting On
<event>	The type of operation performed on the location 1 Stored (new) 2 Modified 3 Cleared

Example

```
at+mode=2
```

```
OK
```

```
+MBAN: Copyright 2000-2002 Motorola, Inc.
```

```
at+mupb?
```

```
ERROR
```

```
at+mupb=1
```

```
OK
```

```
+MUPB: 1,10,"DC"
```

```
+MUPB: 2,10,"DC"
```

4.10.2.6 +MMCR, Motorola Master Clear Reporting

If reporting of master clear event is enabled and master clear occurs in the SU, the SU sends an unsolicited message to the TE to indicate this event. The TE shall be able to enable or disable this reporting.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+MMCR=<mode>		

Table 113. +MMCR <mode> values

<mode>	Description
0	Disable master clear event reporting (default)
1	Enable master clear event reporting.

Example

```
at+mode=2
```

```
OK
```

```
AT+MMCR=1
```

```
OK
```

```
.....<master clear event>....
```

```
+MMCR
```

4.11 NOP - COMPATIBLE**4.11.1 "Ignored" (Compatible Only) Commands****4.11.1.1 L, Monitor Speaker Loudness**

This command monitors the speaker volume.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
ATL	<L0> <L1> <L2> <L3>	

The following table shows the L parameters.

Table 114. L Parameters

<Parameter>	Description
<L0>	Low speaker volume
<L1>	Low speaker volume
<L2>	Medium speaker volume
<L3>	High speaker volume

Example

```
at+mode=0
```

```
OK
```

```
atl1
```

```
OK
```

```
atl2
```

```
OK
```

```
atl3
```

```
OK
```

4.11.1.2 M, Monitor Speaker Mode

This command monitors the speaker mode.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
ATM	<M0> <M1>	

The following table shows the M parameters.

Table 115. M Parameters

<Parameter>	Description
<M0>	Speaker off
<M1>	Speaker on until carrier reported (support of this feature is optional)

Example

```
atm0
```

```
OK
```

```
atm1
```

```
OK
```

4.11.1.3 P, Select Pulse Dialing

This command selects pulse dialing.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
ATP	OK	

Example

atp

OK

4.12 FAX

4.12.1 Fax Commands

The following table shows a list of all the Fax commands.

Table 116. Fax Commands

AT Command	Response/Action	Remarks
+CFC, U _m Interface Fax Compression	<value>	Activation Mode = 0. <value> 0 No compression 1 V.42bis compression with parameters as set by the +CDS command 2 Modified Read compression.
+FKS, Terminate Session		Activation Mode = 0.
+FIE, Procedure-Interrupt-Enable Parameter		Activation Mode = 0.
+FIS, Current-Session Negotiation Parameter		Activation Mode = 0.
+FLI, Local-ID String Parameter		Activation Mode = 0.
+FLO, Flow-Control-Select Parameter		Activation Mode = 0.
+FLP, Indicate-Document-to-Poll Parameter		Activation Mode = 0.
+FMS, Minimum-Phase-C-Speed Parameter		Activation Mode = 0.

Table 116. Fax Commands (*Continued*)

AT Command	Response/Action	Remarks
+FNR, Negotiation-Message-Reporting Parameter		Activation Mode = 0.
+FNS, Nonstandard-Frame FIF Parameter		Activation Mode = 0.
+FPA, Selective Polling Address Parameter		Activation Mode = 0.
+FPI, Local-Polling ID-String Parameter		Activation Mode = 0.
+FPR, Serial-Port Rate Control Parameter		Activation Mode = 0.
+FPS, Page Status Parameter		Activation Mode = 0.
+FPW, Password Parameter		Activation Mode = 0.
+FRY, ECM-Retry Value Parameter		Activation Mode = 0.
+FSA, Subaddress Parameter		Activation Mode = 0.
+FSP, Request-to-Poll Parameter		Activation Mode = 0.
+FHS, Call-Termination-Status Parameter		Activation Mode = 0.
+FFC, Format-Conversion Parameter		Activation Mode = 0.
+FEA, Phase-C Received EOL-Alignment Parameter		Activation Mode = 0.
+FCT, DTE Phase-C Timeout Parameter		Activation Mode = 0.
+FCS, Current-Session Results Parameter		Activation Mode = 0.
+FCR, Capability-to-Receive Parameter		Activation Mode = 0.
+FCQ, Copy-Quality-Checking Parameter		Activation Mode = 0.

Table 116. Fax Commands (*Continued*)

AT Command	Response/Action	Remarks
+FCC, DCE-Capabilities Parameters		Activation Mode = 0. VR Vertical-resolution subparameter Bit-rate subparameter 0 2400 bits/s 1 4800 bits/s 2 7200 bits/s 3 9600 bits/s WD Page-width subparameter [LN] Page-length subparameter [DF] Data-compression-format subparameter [EC] Error-correction subparameter BF Binary-file-transfer subparameter ST Scan-time-per-line subparameter
+FBU, HDLC-Frame-Reporting Parameter		Activation Mode = 0.
+FBS, Buffer Size; Read-Only Parameter		Activation Mode = 0.
+FBO, Phase-C Data-Bit-Order Parameter		Activation Mode = 0.
FAP, Addressing and Polling Capabilities Parameter		Activation Mode = 0.
+FAA, Adaptive-Answer Parameter		Activation Mode = 0. See "+FCLASS, Service-Class Selection Parameter", below.
+FCLASS, Service-Class Selection Parameter	Mobile returns ERROR for +FCLASS=1	Activation Mode = 0. 0 Class -0 1 Class-1 support unavailable 2.0 Class-2.0 fax service (EIA/TIA-592)
+FMR, Report Revision ID		Activation Mode = 0. For more information see "+GMR, +CGMR, +FMR, Request Revision" on page 42.

4.12.1.1 +IPR, Local DTE-DCE Serial Port Rate

This extended-format numeric parameter specifies the data rate at which the MT2 accepts commands, in addition to 1200 bps or 9600 bps (as required in EIA/TIA-602). It may be used to select operations at rates at which the MT2 is not capable of automatically detecting the data rate being used by the TE2. Settings can be saved using AT&W command.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
+IPR=X	OK or: Error	X = 300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 The R _m default rate is 19200 bps.
+IPR?	<value>	
+IPR=?	<value> range (300, 600, 1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200)	

Example

at+ipr?

+IPR: 19200

OK

4.12.1.2 +IFC, Local DTE-DCE Flow Control

This extended-format compound parameter controls the operation of local flow control between the TE2 and MT2 [1]. Hardware and software flow control is supported for both Async and Packet services.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
+IFC=<m>,<n>	OK or: ERROR	m 0-3 The default is 2. n 0-2 The default is 2.

Example

```

AT+IFC?
+IFC: 2,2
OK
at+ifc=2,3
ERROR
at+Ifc=2,2
OK

```

4.13 INTERFACE**4.13.1 Interface Commands****4.13.1.1 +MODE, Select Interface Mode**

This command selects an operating mode on the selected serial connection. The response to the command (“OK” or “ERROR”) is returned in the current protocol format.

After the response code is transmitted (and acknowledged, if necessary) the connection changes to the new mode.

AT Command	Response/Action	Remarks
AT+MODE?	+MODE: <mode>	Returns the current setting of interface mode.
AT+MODE=<mode>	OK or: ERROR	Sets the interface mode to <mode>, An ERROR is returned if the interface does not support that mode, or if the interface does not enable the mode to be changed.
AT+MODE=?	+MODE: (0-16)	Returns the list of available modes for this interface.

The following table shows the +Mode parameters.

Table 117. +MODE Parameters

<Parameter>	Description
<mode>	<p>0 - Default mode. The default for an RS-232 connection, either Qcom or IS-707a (CDMA). This is the mode that is available to a computer connection.</p> <p>1 -Reserved Test Commands.</p> <p>2 -Motorola Accessory Mode. This mode provides access only to the AT command set.</p> <p>3-reliable accessory</p> <p>4-GEMCore</p> <p>5-Multiplexor</p> <p>6-Authenticating reliable accessory</p> <p>7-GPS accessory</p> <p>8-change USB config</p> <p>9-phone test framework</p> <p>10-MP3-Lite accessory</p> <p>11-Datalogging</p> <p>12-Network Monitor</p> <p>13-TCP/IP/PPP</p> <p>14-WATT protocol (primarily for Telematics devices)</p> <p>15-reserved</p> <p>16-Telematics device with no protocol</p>



Note

Modes 1, 3-16 is for Special Use Mode, getting into these modes while using a terminal will cause connection failure between terminal and UUT. To reconnect you must power cycle the UUT. The 0,2 mode are the only compatible for AT Command use.

Example

AT+MODE=?

+MODE: (0-16)

AT+MODE?

+MODE: 0

at+mode=2

OK

+MBAN: Copyright 2000-2003 Motorola, Inc.

AT+MODE?

+MODE: 2

4.13.1.2 \$QCCLR, Clear Mobile Error Log


Note

The information in this section applies to release 3.0B and above.

This command clears the mobile error log.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
\$QCCLR	\$QCCLR: OK	
\$QCCLR=?	\$QCCLR: OK	

Example

at\$QCCLR

\$QCCLR:

OK

4.13.1.3 +ILRR, TE2-MT2 Local Rate Reporting

This extended-format numeric parameter controls whether the extended-format +ILRR:<rate> information text is transmitted from the MT2 to the TE2.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
+ILRR	Mobile accepts only "OFF"	

Example

at+ilrr?

+ILRR: 0

OK

at+ilrr=1

ERROR

4.13.1.4 +ICF, TE2-MT2 Character Framing


Note

The information in this section applies to release 3.0B and above.

This extended-format compound parameter determines the local serial port start-stop (asynchronous) character framing that the MT2 uses while accepting TE2 commands, and while transmitting information text and result codes to the TE2, if this is not determined automatically. (Refer to “+IPR, Local DTE-DCE Serial Port Rate” on page 236).

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
+ICF	OK	Set to default (default is 3,3)
+ICF=<value1>,<value2>	OK or: ERROR	QUALCOMM Rm interface is fixed at 8 data bits. No parity, 1 stop bit. Error is returned for any other parameters. Value 1 - can get only 3 Value 2 - can get between 0-3
+ICF?	+ICF: <value1>,<value2> OK	
+ICF=?	+ICF: (3-3),(0-3) OK	

Example

```
at+mode=0
OK
at+icf?
+ICF: 3,3
OK
at+icf=?
+ICF: (3-3),(0-3)
OK
at+icf=3,1
OK
at+icf?
+ICF: 3,1
OK
```

4.13.1.5 +CTTY, change TTY mode - Tele Typewriter

Activation, deactivation, and status query are supported. The Set command tells the c18 which TTY settings to request. The Set command, in query mode, interrogates the SU current TTY status. The Test command returns values supported by the TA as a compound value.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
<u>Set</u> +CTTY=<mode>	On Error: <err> When Command successful:<OK>	<mode> 0 - Voice mode 1 - TTY mode 2 - VCO mode 3 - HCO mode
<u>Read</u> +CTTY?	+CTTY:<mode>	
<u>Test</u> +CTTY?	+CTTY: (list of supported <Mode>s)	+CTTY: (0,1,2,3)

4.14 INFORMATION AND IDENTIFICATION

4.14.1 Information and Identification Commands

4.14.1.1 +CIMSI, Set and Query the Active IMSI

This command enables a terminal to set the MT2 active IMSI. The new IMSI is saved in the non-volatile memory. The SU is automatically reset after the new IMSI is written. The ESN cannot be changed.

As a response to the terminal initiating 'AT+CIMSI?', the MT2 returns its IMSI and ESN parameters.

Mode Activation

Mode = 0.

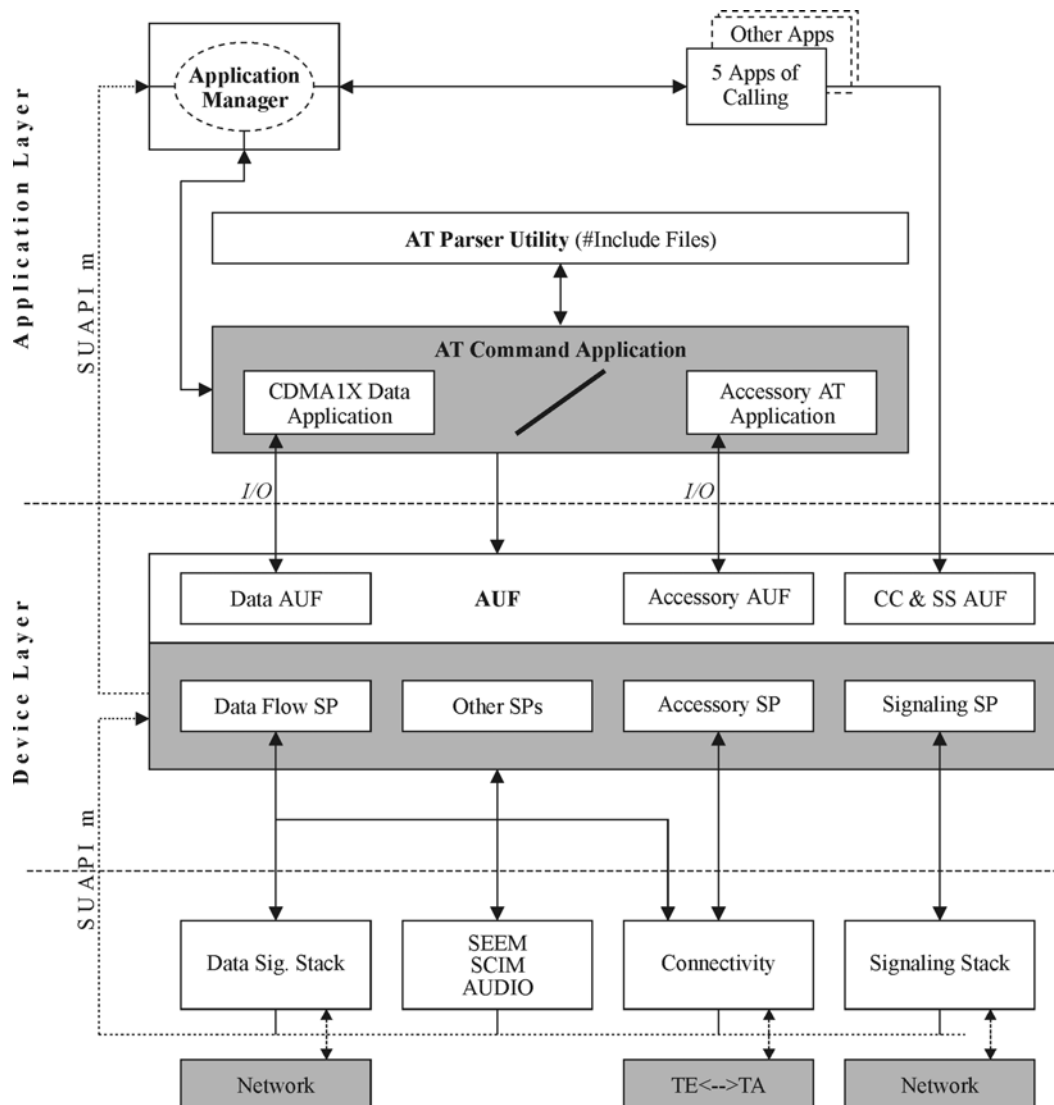
AT Commands	Response/Action	Remarks
AT+CIMSI = <IMSI>	OK	The command enables a terminal to set the MT2 active IMSI.
AT+CIMSI?	MT2 returns its IMSI and ESN parameters.	Queries the MT2 IMSI and ESN parameters.

The following table shows the +CIMS1 parameters.

Table 118. +CIMS1 Parameters

<Parameter>	Description
<IMSI>	15digits, ASCII -15 digits representing MT2 International Identification.
<ESN>	32 bit, HEX - A 32 bit number assigned by the MT2 manufacturer, uniquely identifying MT2.

The IMSI structure is:



Example

AT+CIMSI?

CIMSI: 4407770100, '0x1A76AB1F'

OK

AT+CIMSI=4407770222

OK

AT+CIMSI?

CIMSI: 4407770222, '0x1A76AB1F'

OK

4.14.1.2 +MOON, Motorola ON Status

This command enables the accessory to obtain information about the current operating mode of the SU. This information may also be sent as an unsolicited response when the operating mode of the SU changes. Information about the phone power state can also be obtained through low-level protocol messages.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+MOON?	+MOON: <mode> OK	Returns the SU's current operating mode, if the current mode is in the SU Operating Modes table, or simply "OK" if the current operating mode returned by the DL is not in the SU Operating Modes table.
+MOON=?	+MOON: (list of <mode>s)	Returns a list of operating modes supported by the SU.

The following table shows the +MOON parameters.

Table 119. +MOON Parameters

<Parameter>	Description
<mode>	0 Powered on (ME is ready to receive accessory commands from the TA/TE)

Example

AT+MOON?

+MOON: 0

4.14.1.3 \$QCSCRM, Enable/Disable Mobile from SCRM'ing


Note

The information in this section applies to release 3.0B and above.

This command enables/disables the mobile from SCRM'ing (SCRM, Supplemental Channel Request Message).

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
\$QCSCRM	OK	Set the default to 1.
\$QCSCRM=X	OK or: ERROR	Command only applies to SO 33 calls. This value is stored in NV. 0 Mobile never SCRMs 1 Mobile can SCRM as needed. The default is 1.
\$QCSCRM?	\$QCSCRM: X OK	
\$QCSCRM=?	\$QCSCRM: (0-1) OK	

Example

AT+MODE=0

OK

AT\$QCSCRM?

\$QCSCRM: 1

OK

AT\$QCSCRM=0

OK

4.14.1.4 \$QCMDR=, Set Medium Data Rate (MDR) (HSPD) Setting


Note

The information in this section applies to release 3.0B and above.

This command sets the Medium Data Rate (MDR) (also known as HSPD) setting.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
\$QCMDB=<MDR mode>	OK or: ERROR	- set the MDR mode. - take effect after PUD. - set to "0" and made PUD will set it to "1" ..
\$QCMDB?	\$QCMDB: <MDR mode> OK	
\$QCMDB=?	\$QCMDB: (0-3) OK	



Note

If \$QCMIP=1 then mdr mode is always set to "3" (SO 33 if available).

Table 120. \$QCMDB Parameters

<Parameter>	Description
MDR mode	<p>0 - MDR Service Only. The mobile will originate with SO 22 or SO 25. The mobile will not negotiate to any other service option if SO 22 and SO 25 are unavailable.</p> <p>1 - MDR Service, if available. The mobile will originate with SO 22 or SO 25, but will negotiate to a Low-Speed Packet service option if MDR is not available. The mobile will not negotiate to SO 33.</p> <p>2 - SPD only. The mobile will originate a Low-Speed Packet call only. The mobile will not negotiate to SO 22, SO 25, or SO 33.</p> <p>3 - SO 33, if available. The mobile will negotiate to MDR or Low-Speed Packet service options if SO 33 is not available</p>

Example

AT\$QCMDR?

\$QCMDR: 3

OK

AT\$QCMDR=2

OK

4.14.1.5 \$QCMDR=, Set DM Baud Rate**Note**

The information in this section applies to release 3.0B and above.

This command sets the DM baud rate (for use with Diagnostic Monitor only).

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
\$QCMDR=<DM baud rate>	OK or: ERROR	Set DM baud rate values: 19200, 38400, 57600, 115200, 230400
\$QCMDR?	\$QCMDR: <DM baud rate> OK	
\$QCMDR=?	\$QCMDR: (19200, 38400, 57600, 115200, 230400, 460800) OK	

**Note**

The parameter option "460800" cannot be set.

Example

```
at$QCDMR?  
$QCDMR: 19200  
OK  
AT$QCDMR=?  
$QCDMR: (19200, 38400, 57600, 115200, 230400, 460800)  
OK  
AT$QCDMR=38400  
OK
```

4.14.1.6 +GOI, Device Identification

This command causes the MT2 to transmit one or more lines of information text, determined by the manufacturer, which permit the MT2 user to identify the device, based on the ISO system for registering unique object identifiers. Typically, the text consists of a single line containing numeric strings delimited by period characters.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
+GOI	—	

4.15 DATA CAPABILITY

4.15.1 Data Capability Commands

4.15.1.1 \$QCQNC, Enable/Disable Quick Net Connect (QNC)



Note

The information in this section applies to release 3.0B and above.

This command enables/disables Quick Net Connect (QNC).

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
\$QCQNC	OK	Set to default (default is 1)
\$QCQNC=X	OK or: ERROR	0 Disable QNC capability. This means that packet Originations will use the Packet Data Service Option number. 1 Enable QNC capability. This means that Packet Originations will use the Async Data Service Option number.
\$QCQNC?	\$QCQNC: X OK	
\$QCQNC=?	\$QCQNC: (0-1) OK	

Example

AT\$QCQNC?

\$QCQNC: 1

OK

AT\$QCQNC=0 // Disable QNC capability.

OK

4.15.1.2 \$QCDMG, Transition to Diagnostics Monitor Operation

This command enables the transition to Diagnostics Monitor (DM) operation.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
\$QCDMG	OK	The phone serial port is transitioned to DM mode. DM mode runs at 38.4 Kbps and uses a proprietary half-duplex protocol.

4.15.1.3 \$qctrl=X, R-SCH Throttling Enable/Disable


Note

The information in this section applies to release 3.0B and above.

This command enables/disables IS2000 mobiles from throttling the R-SCHF. The R-SCH is throttled when the assigned R-SCH rate is considered “too high” and could over utilize the CPU.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
AT\$QCTRL	OK	Set to default (default is 1)
AT\$QCTRL=X	OK Or ERROR	0 Mobile never throttles R-SCH 1 Mobile can throttle R-SCH as needed. The default is 1. This command only applies to SO 33 calls. This value is stored in NV.
AT\$QCTRL?	\$QCTRL: X OK	
AT\$QCTRL=?	\$QCTRL: (0-1) OK	

Example

```
at+mode=0
```

```
OK
```

```
at$qctrl?
```

```
$QCTRL: 0
```

```
OK
```

```
at$qctrl=?
```

```
$QCTRL: (0-1)
```

```
OK
```

```
at$qctrl=1
```

```
OK
```

4.15.1.4 \$QCSO=X, Service Option Set Settings


Note

The information in this section applies to release 3.0B and above.

This command sets the service option settings. The QUALCOMM mobile is capable of using pre-IS707 (IS-99 and IS-653) and IS-707 service options.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
AT\$QCSO	OK	Set to default (default is 0)
at\$qcso=X		X=0 Use pre-IS-707 Service Option numbers (only affects Rate Set 1 Service Option numbers) X=1 Use proprietary Service Option numbers. RS1: Async 4 G3 Fax 5 Packet 7 RS 2: Async 0x8021 G3 Fax 0x8022 Packet 0x8020 X=2 Use IS-707/IS-707A Service Option numbers (default for HSPD builds)
AT\$QCSO?	\$QCSO: X OK	
AT\$QCSO=?	\$QCSCRM: (0-1) OK	

Example

```

at+mode=0
OK
at$qcso=?
$QCSO: (0-2)
OK
at$qcso=1
OK
at$qcso?
$QCSO: 1
OK

```

4.15.1.5 \$QCMIPT, Enables/Disables RFC2002bis Authentication


Note

The information in this section applies to release 3.0B and above.

This command enables/disables the use of rfc2002bis authentication.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
\$QCMIPT	OK	Set to default (default is 0).
\$QCMIPT=<auth indicator>	OK or: ERROR	0 - Use of rfc2002bis authentication is disabled. Rfc2002 style authentication is used instead. 1 - Use of rfc2002bis authentication is enabled. Note: This AT command is for test purposes only and should not be changed by the mobile phone user.
\$QCMIPT?	\$QCMIPT: <auth indicator> OK	
\$QCMIPT=?	\$QCMIPT: (0-1) OK	

Example

```
at$QCMIPT?
```

```
$QCMIPT: 0
```

```
OK
```

```
AT$QCMIPT=?
```

```
$QCMIPT: (0-1)
```

```
OK
```


4.15.1.6 \$QCMIPP, Select MIP User Profile To Be Active.


Note

The information in this section applies to release 3.0B and above.

This command selects the MIP user profile to be active. It takes a profile number between 0 and 5. This value is stored in NV. This AT command is expected to be used by users to configure Dial-Up Networking.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
\$QCMIPP	OK	Set to default (default is 0)
\$QCMIPP=<profile>	OK or: ERROR	
\$QCMIPP?	\$QCMIPP: <profile> OK	
\$QCMIPP=?	\$QCMIPP: (0-5) OK	

Example

AT\$QCMIPP?

\$QCMIPP: 0

OK

AT\$QCMIPP=?

\$QCMIPP: (0-5)

OK

4.15.1.7 \$QCMIP, Enables/Disables Mobile IP


Note

The information in this section applies to release 3.0B and above.

This command enables/disables Mobile IP functionality in the mobile.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
\$QCMIP	OK or: ERROR	Set to default The default value is 0. Note: When the AT\$QCMIP value is changed to 1 or 2, this modifies the value of AT+CRM to 2. AT+CRM with a value of 2 enables network model operation. Changing the value to 0 will reset the AT+CRM to its original value.
\$QCMIP=<value>	OK Or ERROR	<p>0 Mobile IP disabled, Simple IP only.</p> <p>1 Mobile IP preferred. In the initial MIP registration, if the network does not support Mobile IP, then the mobile automatically reverts to Simple IP (forces a PPP renegotiation by sending a LCP C-Req). However, if a Mobile IP session is registered and then the mobile enters a network that does not support Mobile IP, the mobile will drop the session and inform the upper layers of the failure (for example, by dropping DCD to a laptop).</p> <p>2 Mobile IP only. The mobile will make data calls only when Mobile IP is supported in the network. During a MIP session, if the mobile hands off to a network that does not support MIP, then the mobile will drop the session and inform the upper layers of the failure (for example, by dropping DCD to a laptop). This value is stored in NV.</p>
\$QCMIP?	\$QCMIP: <value> OK	

AT Command	Response/Action	Remarks
\$QCMIP=?	\$QCMIP: (0-2) OK	

Example

AT\$QCMIP?

\$QCMIP: 0

OK

AT\$QCMIP=?

\$QCMIP: (0-2)

OK

4.15.1.8 +MIPERR, Mobile IP Error Report

This command returns an extended error report when Mobile IP session is failed. The error report (max 20 errors) provides detailed description of the failure reason.

The errors format can be textual or numeric.

Mode Activation

Mode = 0

AT Command	Response/Action	Remarks
AT+MIPERR=[<n>]	OK	n=1, numeric default n=2, text
AT+MIPERR	+ MIPERR: : <time of received error>, < ERROR (string or value) > OK	max 20 errors See example below <time of received error>: xx:yy:zz:aaa xx-hour:0-24 yy-min zz-sec aaa-msec Note: after power cycle, the list resets
AT+MIPERR?	+ MIPERR: <n> OK	
AT+MIPERR =?	+ MIPERR: (List of supported <n>) OK	1 or 2

**Note**

- The +MIPERR error list is cleared only on a power cycle or when AT+RESET command is executed.
- The +MIPERR list does not include multiple occurrences of the same error code in a row. If the same error occurs in one attempt, then only the time is updated but a new instance is not added to the list.
- The list of error reports includes a report of MIP success also:
MIP_REGISTRATION_ACCEPTED_.... (error number 0 or 1), whenever an MIP data session gets connected..

Error List

The following shows the available errors.

Table 121. Error List

Error String	Error Value	Remarks
MIP_REGISTRATION_ACCEPTED	0	MIP success
MIP REGISTRATION ACCEPTED SIMULTANEOUS BINDINGS UNSUPPORTED	1	MIP success-one server only
MIP RRQ SEND FAILED	256	Fail due to C-18 internal error
MOBILE IP NOT SUPPORTED	257	
1XRTT PACKET SERVICE IS NOT AVAILABLE	258	
NO SERVICE	259	
COULD NOT ACQUIRE TRAFFIC CHANNEL	260	No rf channel capacity
MOBILE NOT REGISTERED	261	
REGISTRATION REQUEST REJECTED BY BASE STATION	262	
MIP REGISTRATION DENIED BY FA:REASON UNSPECIFIED	64	
MIP REGISTRATION DENIED BY FA:ADMINISTRATIVELY PROHIBITED	65	
MIP REGISTRATION DENIED BY FA:INSUFFICIENT RESOURCES	66	NO PDSN CAPACITY
MIP REGISTRATION DENIED BY FA:MOBILE FAILED AUTHENTICATION	67	AUTHENTICATION FAILURE
MIP REGISTRATION DENIED BY FA:HA FAILED AUTHENTICATION	68	AUTHENTICATION FAILURE
MIP REGISTRATION DENIED BY FA:REQUESTED LIFETIME TOO LONG	69	
MIP REGISTRATION DENIED BY FA:POORLY FORMED REQUEST	70	

Table 121. Error List (Continued)

Error String	Error Value	Remarks
MIP REGISTRATION DENIED BY FA:POORLY FORMED REPLY	71	
MIP REGISTRATION DENIED BY FA:REQUESTED ENCAPSULATION UNAVAILABLE	72	
MIP REGISTRATION DENIED BY FA:RESERVED AND UNAVAILABLE	73	
MIP REGISTRATION DENIED BY FA:REQUESTED REVERSE TUNNEL UNAVAILABLE	74	
MIP REGISTRATION DENIED BY FA:REVERSE TUNNEL MANDATORY, T BIT NOT SET	75	
MIP REGISTRATION DENIED BY FA:MOBILE NODE TOO DISTANT	76	
MIP REGISTRATION DENIED BY FA:INVALID CARE-OF ADDRESS	77	
MIP REGISTRATION DENIED BY FA:REGISTRATION TIMEOUT	78	
MIP REGISTRATION DENIED BY FA:HOME NETWORK UNREACHABLE	80	
MIP REGISTRATION DENIED BY FA:HOME AGENT HOST UNREACHABLE	81	
MIP REGISTRATION DENIED BY FA:HOME AGENT PORT UNREACHABLE	82	
MIP REGISTRATION DENIED BY FA:HOME AGENT UNREACHABLE	88	
MIP REGISTRATION DENIED BY FA:FOREIGN AGENT	98	
MIP REGISTRATION DENIED BY FA:UNKNOWN CHALLENGE	104	
MIP REGISTRATION DENIED BY FA:MISSING CHALLENGE	105	
MIP REGISTRATION DENIED BY FA:STALE CHALLENGE	106	
MIP REGISTRATION DENIED BY HA:REASON UNSPECIFIED	128	
MIP REGISTRATION DENIED BY HA:ADMINISTRATIVELY PROHIBITED	129	
MIP REGISTRATION DENIED BY HA:INSUFFICIENT RESOURCES	130	NO PDSN CAPACITY

Table 121. Error List (Continued)

Error String	Error Value	Remarks
MIP REGISTRATION DENIED BY HA:MOBILE FAILED AUTHENTICATION	131	AUTHENTICATION FAILURE
MIP REGISTRATION DENIED BY HA:FA FAILED AUTHENTICATION	132	AUTHENTICATION FAILURE
MIP REGISTRATION DENIED BY HA:REGISTRATION IDENTIFICATION MISMATCH	133	
MIP REGISTRATION DENIED BY HA:POORLY FORMED REQUEST	134	
MIP REGISTRATION DENIED BY HA:TOO MANY SIMULTANEOUS MOBILITY BINDINGS	135	
MIP REGISTRATION DENIED BY HA:UNKNOWN HOME AGENT ADDRESS	136	
MIP REGISTRATION DENIED BY HA:REQUESTED REVERSE TUNNEL UNAVAILABLE	137	
MIP REGISTRATION DENIED BY HA:REVERSE TUNNEL MANDATORY , T BIT NOT SET	138	
MIP REGISTRATION DENIED BY HA:REQUESTED ENCAPSULATION UNAVAILABLE	139	

Example

AT+ MIPERR?

+ MIPERR:1 * this is the default numeric state

OK

* set the MIPERR for numeric mode *

AT+ MIPERR=1

OK

AT+ MIPERR?

+ MIPERR:1

OK

AT+MIPERR

+ MIPERR: "23:45:33.500", 257, "23:45:34.634",258, "23:45:33.278","0

OK

* Set the MIPERR for text mode *

AT+ MIPERR=2

OK

AT+ MIPERR?

+ MIPERR:2

OK

AT+MIPERR

+ MIPERR: "23:45:33.500"," MOBILE IP NOT SUPPORTED", "23:45:34.634","1XRTT PACKET SERVICE IS NOT AVAILABLE ", "23:45:35.278", "MIP_REGISTRATION_ACCEPTED"

OK

* Get range of the command *

AT+ MIPERR =?

+ MIPERR: (1-2)

4.15.1.9 \$QCPKND, Enable/Disable Automatic Packet Detection



Note

The information in this section applies to release 3.0B and above.

This command enables/disables automatic packet detection after a dial command.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
\$QCPKND	OK	Set to default (default is 0)
\$QCPKND=<flag>	OK or: ERROR	Enables/disable the Packet No Dial
\$QCPKND?	\$QCPKND: <flag> OK	
\$QCPKND=?	\$QCPKND: (0-1) OK	

The following table shows the \$QCPKND parameters.

Table 122. \$QCPKND Parameters

<Parameter>	Description
<n>	<p>0 Disable Packet No Dial. If a PPP packet is received by the mobile without a just prior dial command (that is, AtdX #), then the mobile will originate a Packet (or QNC) data call.</p> <p>1 Enable Packet No Dial. Reception of a PPP packet without a just prior dial command will NOT Originate a PPP packet (or QNC) call.</p>

Example

AT\$QCPKND?

\$QCPKND: 1

OK

AT\$QCPKND=?

\$QCPKND: (0-1)

OK

4.15.1.10 \$QCVAD=, Prearrangement Setting



Note

The information in this section applies to release 3.0B and above.

This command responds to a page message that has a voice service option with a page response that has a data service option.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
AT\$QCVAD	OK	Set to default (default is 0)
AT\$QCVAD=<n>	OK or: ERROR	
AT\$QCVAD?	\$QCVAD: <n> OK	
AT\$QCVAD=?	\$QCVAD: (0-4) OK	

The following table shows the \$QCVAD= parameters.

Table 123. \$QCVAD= Parameters

<Parameter>	Description
<n>	0 Off 1 Fax for next call 2 Fax for all calls 3 Async for next call 4 Async for all calls

Example

at\$QCVAD?

\$QCVAD: 0

OK

AT\$QCVAD=?

\$QCVAD: (0-4)

OK

AT\$QCVAD=1

OK

4.15.1.11 \$QCMTOM, Originate Mobile-to-Mobile Packet Data Call

This command originates a Mobile-to-Mobile Packet Data call using a QUALCOMM proprietary Service Option number.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
\$QCMTOM	OK or: ERROR	The complete command is AT\$QCMTOM = <number>, where <number> is the phone number to dial. This command originates a Mobile-to-Mobile Packet Data call using the QUALCOMM-proprietary Service Option number 0x8003. This is a Rate Set 1 call.

The following table shows the \$QCMTOM parameters.

Table 124. \$QCMTOM Parameters

<Parameter>	Description
<number>	The phone number to dial.

Example

```
at$QCMTOM
```

```
OK
```

4.15.1.12 +CTA, Set/Read/Test U_m Packet Data Inactivity Timer**Note**

The information in this section applies to release 3.0B and above.

This command sets/reads/tests the U_m packet data inactivity timer.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
+CTA	OK	Set to default (default is 0)
+CTA=<value>	OK or: ERROR	Set the release traffic channel timer when no data is receive/transmit. 0 - means the timer is disable
+CTA?	+CTA: <value> OK	
+CTA=?	+CTA: (0-255) OK	

The following table shows the +CTA parameters.

Table 125. +CTA Parameters

<Parameter>	Description
<value>	<p>0 Traffic Channel not released during inactivity periods.</p> <p>1-255 Release the Traffic Channel after <value> 1-second intervals have elapsed since last sending or receiving RLP data frames on the U_m interface.</p> <p>Default is 0.</p>

Example

```
at+mode=0
```

OK

at+cta?

+CTA: 0

OK

at+cta=?

+CTA: (0-255)

OK

at+cta=59

OK

at+cta?

+CTA: 59

OK

4.15.1.13 +CAD?, Query Analog or Digital Service

This command queries the analog or digital service.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
+CAD?	OK or: ERROR	Not implemented on the inferior digital technology. If both CDMA and AMPS are available, then 1 is returned.

The following table shows the +CAD? parameters.

Table 126. +CAD? Parameters

<Parameter>	Description
<value>	0 If no service is available. 1 If CDMA Digital service is available. 2 If TDMA Digital service is available. 3 If Analog service is available (values 4 to 255 are reserved).

Example

```
at+mode=0
```

```
OK
```

```
at+cad?
```

```
+CAD: 1
```

```
OK
```

4.15.1.14 +CDR, U_m Interface Data Compression Reporting**Note**

The information in this section applies to release 3.0B and above.

This command controls whether the extended-format +CDR: intermediate result code is transmitted by the MT2. The result code is the same as for the TIA/EIA/ IS-131 +DR: result code.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
+CDR	OK or: ERROR	Data compression reporting intermediate codes: +DR:NONE Data compression is not in use +DR:V42B V.42bis is in use in both directions +DR:V42B RD V.42bis is in use in receive direction only +DR:V42B TD V.42bis is in use in transmit direction only - Set to default (default is 0)
+CDR=X	OK or: ERROR	Set if compression reporting is on of off.
+CDR?	+CDR: X OK	Returns if compression reporting is enable.
+CDR=?	+CDR: (0-1) OK	

Example

at+mode=0

OK

at+cdr?

+CDR: 0

OK

at+cdr=?

+CDR: (0-1)

OK

at+cdr=1

OK

4.15.1.15 +CDS, U_m Interface Data Compression



Note

The information in this section applies to release 3.0B and above.

This command controls the V.42bis data compression function on the U_m interface. The command format is the same as for the TIA/EIA/IS-131 +DS command.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
AT+CDS	OK	Set to default (default is 0,1,2048,6)
AT+CDS=<direction>, <compression_negotiation>, <max_dict>,<max_string>	OK Or ERROR	Controls the V.42bis data compression function on the U _m interface.
AT+CDS=?	+CDS: (0-0),(1-1),(512-65535),(6-250) OK	Displays the supported values for <direction>,<compression_negotiation>,<max_dict>, and <max_string>
AT+CDS?	+CDS: <direction>,<compression_negotiation>,<max_dict>,<max_string> OK	Displays the current settings

The following table shows the +CDS parameters.

Table 127. +CDS Parameters

<Parameter>	Description
<direction>	Specifies the desired directions of operations of the data compression function from the DTE's point of view. 0 Negotiated, no compression (V.42bis P0=0)
<compression_negotiation>	Specifies whether the DCE should continue to operate if the desired result is not obtained. 1 Disconnect if V.42 bis is not negotiated by the remote DCE as specified in <direction>.
<max_dict>	Specifies the maximum number of dictionary entries which should be negotiated. 512-65563
<max_string>	Specifies the maximum string length to be negotiated (V.42bis P2). 6-250

Example

at+mode=0

OK

at+cds?

+CDS: 0,1,2048,6

OK

at+cds=?

+CDS: (0-0),(1-1),(512-65535),(6-250)

OK

at+cds=0,1,4096,250

OK

at+cds?

+CDS: 0,1,4096,250

OK

4.15.1.16 +CRM, Set R_m Interface Protocol

This command enables the user to set the protocol on the R_m interface.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
+CRM	OK or: ERROR	A mobile station returns ERROR if it is provided with a value that is not within the valid range.

The following table shows the +CRM parameters.

Table 128. +CRM Parameters

<Parameter>	Description
<value>	0 Asynchronous Data or Fax 1 Packet data service, Relay Layer R _m interface 2 Packet data service, Network Layer R _m interface, PPP Note: The default value for the +CRM parameter is 0 if this value is supported by the MT2. If 0 is not supported, the default +CRM value will be manufacturer-specific.

Example

at+mode=0

OK

at+crm?

+CRM: 2

OK

at+crm=?

+CRM: (0-2)

OK

at+crm=0

ERROR

at+crm=1

ERROR

at+crm=2

OK

4.15.1.17 +CQD, Command State Inactivity Timer

This command sets the timer value that specifies the period of inactivity before a Data call is released.

Mode Activation

Mode = 0.

AT Command	Response/Action
+CQD=<value>	OK or: ERROR

The following table shows the +CQD parameters.

Table 129. +CQD Parameters

<Parameter>	Description
<value>	0 Ignored 1-255 Release call after 5x<value> seconds have elapsed without activity. Default value is 10. (50 seconds)

Example

```
at+mode=0
```

```
OK
```

```
at+cqd?
```

```
+CQD: 10
```

```
OK
```

```
at+cqd=?
```

```
ERROR
```

```
at+cqd=5
```

```
OK
```


4.15.1.18 +CMIP?, Mobile Station IP Address

This read-only command returns the mobile station's temporary IP address.

Mode Activation

Mode = 0.

AT Command	Response/Action
+CMIP?	OK or: ERROR

Example

```
at+mode=0
```

```
OK
```

```
at+cmip?
```

```
OK
```

4.15.1.19 +CBIP?, Base Station IP Address

This read-only command returns the base station's temporary IP address.

Mode Activation

Mode = 0.

AT Command	Response/Action
+CBIP?	OK or: ERROR

Example

```
at+mode=0
```

```
OK
```

```
at+cbip?
```

```
OK
```

4.15.1.20 +CMUX, Select Multiplex Option

This command sets the multiplex option to be proposed during the service negotiation procedures for connecting a STU-III secure service option.

Mode Activation

Mode = 0.

AT Command	Response/Action
AT+CMUX=<n>	OK or: ERROR

The following table shows the +CMUX parameters.

Table 130. +CMUX Parameters

<Parameter>	Description
<n>	1 Multiplex Option 1 2 Multiplex Option 2

Example

```
at+mode=0
OK
at+cmux?
+CMUX: C,2
OK
at+cmux=?
+CMUX: (1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, F),(1, 2)
OK
at+cmux=B,1
OK
at+cmux?
+CMUX: B,1
OK
```

4.15.1.21 +CFG, Configuration String

This command enables the storage of a string (up to and including the termination character) by the MT2 and its transmission to the base station prior to dialing. Each transmission of an AT+CFG command from the TE2 replaces the contents of the previous string. The string may be up to 248 characters.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
AT+CFG	OK or: ERROR	<string> The string may be up to 248 characters.

Example

```
at+mode=0
OK
at+cfg?
+CFG: ""
OK
at+cfg="*43"
OK
at+cfg?
+CFG: "*43"
OK
```

4.15.1.22 +CXT, Cellular Extension



Note

The information in this section applies to release 3.0B and above.

This command controls the handling of unrecognized commands by the MT2. After establishing the transport layer connection and transmitting the configuration information, the MT2 sends the unrecognized command to the IWF. The default mode on power on is AT+CXT=0.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
+CXT	OK	Set to default (default is 0)
+CXT=<value>	OK Or ERROR	If the TE2 issues AT+CXT=0, the MT2 returns the ERROR result code when it is in the command state and it receives an unrecognized AT command on the Rm interface. If the TE2 issues AT+CXT=1, the MT2 opens a transport layer connection to the IWF if it receives an unrecognized command on the Rm interface.
+CXT?	+CXT: 0 OK	
+CXT=?	+CXT: (0-1) OK	

The following table shows the +CXT parameters.

Table 131. +CXT Parameters

<Parameter>	Description
<value>	0 Do not pass unrecognized commands to the IWF. 1 When detecting an unrecognized AT command, open transport layer connection and pass the unrecognized command to the IWF.

Example

```
at+mode=0
```

```
OK
```

```
at+cxt?
```

```
+CXT: 0
```

```
OK
```

```
at+cxt=?
```

```
+CXT: (0-1)
```

```
OK
```

```
at+cxt=1
```

```
OK
```

4.15.1.23 MV18S, V.18 Selection

This command controls the manner of operation of the V.18 capabilities (if present in the IWF).

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
AT+MV18S=[<mode>[, <dflt_ans_mode>[,<fbk_time_enable>]]]	OK	Controls the manner of operation of the V.18 if present in the DCE
AT+MV18S=?	ERROR	Displays available value ranges
AT+MV18S?	+MV18S: <mode>,<dflt_ans_mode>, <fbk_time_enable> OK	Displays the current settings

The following table shows the +MV18S parameters.

Table 132. +MV18S Parameters

<Parameter>	Description
<mode>	Specifies the calling mode of operation. 0 Disables V.18 operation 1 V.18 operation, auto detect mode 2 V.18 operation, connect in 5-bit mode 3 V.18 operation, connect in DTMF mode 4 V.18 operation, connect in EDT mode 5 V.18 operation, connect in V.21 mode 6 V.18 operation, connect in V.23 mode 7 V.18 operation, connect in Bell 103-type mode
<dflt_ans_mode>	Specifies the preferred fallback mode of operation when the DCE is operating as the call receiver. 0 Disables V.18 answer operation 1 no default specified (auto detect) 2 V.18 operation connect in 5-bit mode 3 V.18 operation connect in DTMF mode 4 V.18 operation connect in EDT mode
<fbk_time_enable>	Specifies the enabling of re-acquisition after 2 seconds of no transmission. 0 Disable 1 Enable

Example

```

at+mode=0
OK
at+mv18s?
+MV18S: 0,0,0
OK
at+mv18s=?
ERROR
at+mv18s=7,4,1
OK
at+mv18s=8,4,1
ERROR
at+mv18s=7,4,0
OK
at+mv18s?
+MV18S: 7,4,0
OK

```

4.15.1.24 +MV18R, V.18 Reporting Control

This command controls whether the extended-format +MV18R: result code is transmitted from the IWF to the mobile station.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
+MV18R	OK or: ERROR	

Example

```

at+mode=0
OK
at+mv18r?
+MV18R: 1
OK
at+mv18r=0
OK

```

4.15.1.25 +MS, Modulation Selection

This command controls the manner of operation of the modulation capabilities in the IWF.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
+MS		

4.15.1.26 +MR, Modulation Reporting Control



Note

The information in this section applies to release 3.0B and above.

This command controls whether the extended-format +MCR:<carrier> and +MRR:<rate> intermediate result codes are transmitted from the IWF to the mobile station.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
+MR	OK	Set to default (default is 0)
+MR=X	OK or ERROR	Set on/off the option to transmit carrier and rate to the mobile station.
+MR?	+MR: X OK	

Example

AT+MODE=0

OK

AT+MR?

+MR: 0

OK

AT+MR=1

OK

AT+MR?

+MR: 1

OK

AT+MR

OK

AT+MR?

+MR: 0

OK

4.15.1.27 +MA, Modulation Automode Control

This command lists the modulations that the base station may use to connect with the remote DCE in Automode operation, for answering or originating data calls, as additional alternatives to the modulation specified in the +MS command.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
+MA		

4.15.1.28 +ETBM, Data Handling



Note

The information in this section applies to release 3.0B and above.

This command designates the action for data that remains in the DCE internal buffers when a call is terminated. For example, discard, attempt delivery until remote disconnect, and so on.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
AT+ETBM	OK	Set to default (default is 1,1,20)

AT Command	Response/Action	Remarks
AT+ETBM=<pending_TD> [,<pending_RD>],[<timer>]	OK Or ERROR	Controls the handling of data remaining in the DCE (IWF) buffers upon call termination. Aysnc: Required Packet Data: Optional Remote: Yes
AT+ETBM?	+ETBM:<pending_TD>, <pending_RD>,<timer> OK	Displays the current settings.

The following table shows the +ETBM parameters.

Table 133. +ETBM Parameters

<Parameter>	Description
<pending_TD>	Specifies how previously-transmitted data remaining in the DCE buffers should be handled when the local DTE disconnects the call. 0 Discard all buffered data immediately and disconnect. 1 Attempt delivery until all data is delivered and acknowledged (ignore timer). If the remote DCE disconnects, discard the remaining data. 2 Attempt delivery until all data is delivered and acknowledged. If the timer expires or the remote DCE disconnects, discard the remaining data.
<pending_RD>	Specifies how previously-received data remaining in the DCE buffers should be handled when the remote DCE disconnects the call. 0 Discard all buffered data immediately and disconnect. 1 Attempt delivery until all data is delivered and acknowledged (ignore timer). If the local DTE disconnects, discard the remaining data. 2 Attempt delivery until all data is delivered. If the timer expires or the local DTE disconnects, discard the remaining data.
<timer>	Sets a maximum time limit on how long the DCE will attempt to deliver the buffered data before abandoning the attempt and discarding the remaining data. 0-30 Delivery time in seconds Other Higher values may be supported

Example

at+etbm?
+ETBM: 1,1,20

OK
at+etbm=1,1,30
OK
at+etbm?
+ETBM: 1,1,30

OK

4.15.1.29 +ESR, Selective Repeat Option Controller



Note

The information in this section applies to release 3.0B and above.

This command controls the use of the selective repeat (SREJ) option in V.42 on the PSTN link (if present in the IWF).

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
+ESR	OK	Set to default (default is 1)
+ESR=<value>	OK or: ERROR	Controls the V.42bis data.
+ESR?	+ESR: <value> OK	

The following table shows the +ESR parameters.

Table 134. +ESR Parameters

<Parameter>	Description
<value>	Specifies the SREJ value. 0 Do not use SREJ. 1 Use SREJ if available in remote DCE. If not, continue without it. 2 Use SREJ if available in remote DCE. If not, disconnect.

Example

```
at+mode=0
```

```
OK
```

```
at+esr?
```

```
+ESR: 2
```

```
OK
```

```
at+esr=1
```

```
OK
```

```
at+esr?
```

```
+ESR: 1
```

```
OK
```

4.15.1.30 +ES, Error Control Selection**Note**

The information in this section applies to release 3.0B and above.

This command controls the manner of operation of the V.42 protocol on the PSTN link (if present in the IWF).

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
AT+ES	OK	Set to default. (default is 3,0,2)
AT+ES=<orig_rqst>[,<orig_fbk> [,<ans_fbk>]]	OK Or ERROR	Controls the V.42bis data.
AT+ES?	+ES:<orig_rqst>,<orig_fbk>, <ans_fbk> OK	Displays the current error control settings.

The following table shows the +ES parameters.

Table 135. +ES Parameters

<Parameter>	Description
<orig_rqst>	<p>Specifies the initial requested mode of operation when the DCE operates as the originator.</p> <ul style="list-style-type: none"> 0 Direct mode 1 Initiate call with Buffered mode only 2 Initiate V.42 without Detection Phase. 3 Initiate V.42 with Detection Phase 4 Initiate Alternative Protocol
<orig_fbk>	<p>Specifies the acceptable fallback mode of operation when the DCE operates as the originator.</p> <ul style="list-style-type: none"> 0 Error control optional (either LAPM or alternative acceptable). If error control is not established, maintain DTE-DCE data rate and use V.14 buffered mode with flow control during non-error-control operation. 1 Error control optional (either LAPM or alternative acceptable). If error control is not established, change the DTE-DCE data rate to match the line rate and use Direct mode. 2 Error control required (either LAPM or alternative acceptable). If error control is not established, disconnect. 3 Error control required (only LAPM acceptable). If error control is not established, disconnect. 4 Error control required (only alternative acceptable). If error control is not established, disconnect.
<ans_fbk>	<p>Specifies the acceptable fallback mode of operation when the DCE operates as the destination.</p> <ul style="list-style-type: none"> 0 Direct mode. 1 Error control disabled, use Buffered mode. 2 Error control optional (either LAPM or alternative acceptable). If error control is not established, maintain the DTE-DCE data rate and use the V.14 buffered mode with flow control during non-error-control operation. 3 Error control optional (either LAPM or alternative acceptable). If error control is not established, change the DTE-DCE data rate to match the line rate, and use Direct mode. 4 Error control required (either LAPM or alternative acceptable). If error control is not established, disconnect. 5 Error control required (only LAPM acceptable). If error control is not established, disconnect. 6 Error control required (only alternative acceptable). If error control is not established, disconnect.

Example

```
at+mode=0
```

```
OK
```

```
at+es?
```

```
+ES: 3,0,2
```

```
OK
```

```
at+es=4,3,2
```

```
OK
```

```
at+es?
```

```
+ES: 4,3,2
```

```
OK
```

4.15.1.31 +ER, Error Control Reporting**Note**

The information in this section applies to release 3.0B and above.

This command controls whether the extended-format +ER: intermediate result code is transmitted from the IWF over the U_m interface.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
+ER	OK	Set to default (default is 0)
+ER=<value>	OK or: ERROR	See parameter table.
+ER?	+ER: <value> OK	

The following table shows the +ER parameters.

Table 136. +ER Parameters

<Parameter>	Description
<value>	0 Error control reporting disabled 1 Error control reporting enabled

Example

at+mode=0

OK

at+er=1

OK

at+er?

+ER: 1

4.15.1.32 +DS, Compression



Note

The information in this section applies to release 3.0B and above.

This command controls the V.42bis data compression function on the PSTN link if provided in the IWF.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
AT+DS	OK	Set to default (Default is 3,0,2048,6)
AT+DS=<direction>, <compression_negotiation>, <max_dict>,<max_string>	OK or ERROR	Controls the V.42bis data compression function on the PSTN link if provided in the IWF.
AT+DS?	+DS: <direction>, <compression_negotiation>, <max_dict>,<max_string> OK	Displays the current settings.

The following table shows the +DS parameters.

Table 137. +DS Parameters

<Parameter>	Description
<direction>	Specifies the desired direction of operations of the data compression function from the DTE's point of view. 0 Negotiated, no compression (V.42bis P0=0). 1 Transmit only. 2 Receive only. 3 Both directions, accept any direction. Default is 3.
<compression_negotiation>	Specifies whether the DCE should continue to operate if the desired result is not obtained. 0 Do not disconnect if V.42 bis is not negotiated by the remote DCE as specified in <direction>. 1 Disconnect if V.42 bis is not negotiated by the remote DCE as specified in <direction>. Default is 0.
<max_dict>	Specifies the maximum number of dictionary entries which should be negotiated. 512-65563 Default is determined by the manufacturer.
<max_string>	Specifies the maximum string length to be negotiated (V.42bis P2). 6-250 Default is 6.

Example

```
at+mode=0
```

```
OK
```

```
at+ds?
```

```
+DS: 3,0,2048,6
```

```
OK
```

```
at+ds=?
```

```
ERROR
```

```
at+ds=1,1,2048,250
```

```
OK
```

```
at+ds?
```

```
+DS: 1,1,2048,250
```

```
OK
```

4.15.1.33 +DR, Compression Reporting


Note

The information in this section applies to release 3.0B and above.

This command controls whether the extended-format +DR: intermediate result code is transmitted from the IWF over the U_m interface.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
+DR	OK	Set to default (default is 0)
+DR=<value>	OK or: ERROR	Data compression reporting intermediate codes. +DR:NONE Data compression is not in use. +DR:V42B V.42bis is in use in both directions. +DR:V42B RD V.42bis is in use in receive direction only. +DR:V42B TD V.42bis is in use in transmit direction only..
+DR?	+DR: <value> OK	

Example

```
at+mode=0
```

```
OK
```

```
at+dr=?
```

```
ERROR
```

```
at+dr=1
```

```
OK
```

```
at+dr?
```

```
+DR: 1
```

```
OK
```


4.15.1.34 +EFCS, FCS Values**Note**

The information in this section applies to release 3.0B and above.

This command controls the use of the 32-bit frame check sequence option in V.42 on the PSTN link (if present in the IWF).

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
+EFCS	OK	Set to default (default is 1)
+EFCS=<value>	OK or: ERROR	<value> Frame check sequence values. 0 Use 16 bit FCS. 1 Use 32-bit FCS, if available in the remote DCE, otherwise use 16-bit FCS. 2 Use 32-bit FCS if available in the remote DCE..
+EFCS?	+EFCS: <value> OK	

Example

```
at+mode=0
```

```
OK
```

```
at+efcs?
```

```
+EFCS: 0
```

```
OK
```

```
at+efcs=1
```

```
OK
```

```
at+efcs?
```

```
+EFCS: 1
```

```
OK
```

4.16 TCP/IP

4.16.1 TCP/IP Commands

4.16.1.1 \$QCPREV, Protocol Revision In Use

This command returns the protocol revision in use.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
\$QCPREV	OK or: ERROR	Returns one of the following codes: 1 JSTD008 3 IS_95A 4 IS_95B 6 IS_2000

Example

```
at+mode=0
```

```
OK
```

```
at$qcprev
```

```
$QCPREV: 4
```

```
OK
```

4.16.1.2 \$QCRLPD, Dump RLP Protocol Statistics

This command dumps the RLP statistics in ASCII format to the TE2. This does not apply to RLP 3 statistics (see \$QCRL3D).

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
\$QCRLPD	OK or: ERROR	

Example

```
at+mode=0
```

```
OK
```

```
at$qcrlpd
```

```
$QCRLPD:
```

```
Rx Data Cnt    :00E7 Tx Data Cnt    :0118Single Naks    :0000 Double Naks    :0000Triple Naks    :0000 ReXmits
:0003Seq Timeout Cnt :0000 ReXmits Missed :0000ReXmits Not Found:0000 Largest ReXmit :0001Fill Frames Rx'ed:0000
Idle Fr Errs    :0000Full Type Errs :0000 Rx Seg Frame Errs:0000Erasures    :0040 Lrgst Cntg. Erase:0001Generic Errors
:0000 Last RTT    :000BResets        :0000Last Call Synced:ESTABLISHED
```

```
OK
```

4.16.1.3 \$QCRLPR, Reset RLP Protocol Statistics

This command zeroes all the RLP statistics counters. This does not apply to RLP 3 statistics (Refer to “\$QCRL3R, Reset RLP 3 Protocol Statistics” on page 292).

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
\$QCRLPR	OK or: ERROR	

Example

```
at+mode=0
```

```
OK
```

```
at$qcrlpr
```

```
$QCRLPR:
```

```
OK
```

```
at$qcrlpd
```

```
$QCRLPD:
```

```
Rx Data Cnt    :0000 Tx Data Cnt    :0000Single Naks    :0000 Double Naks    :0000Triple Naks    :0000 ReXmits
:0000Seq Timeout Cnt :0000 ReXmits Missed :0000ReXmits Not Found:0000 Largest ReXmit :0000Fill Frames Rx'ed:0000
Idle Fr Errs    :0000Full Type Errs :0000 Rx Seg Frame Errs:0000Erasures    :0000 Lrgst Cntg. Erase:0000Generic Errors
:0000 Last RTT    :0000Resets        :0000Last Call Synced:RLP_NOT_ESTABLISHED
```

```
OK
```

4.16.1.4 \$QCPPPD, Dump PPP Protocol Statistics

This command dumps the PPP statistics in ASCII format to the TE2.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
\$QCPPPD	Ok or: ERROR	

Example

at+mode=0

OK

at\$qcpppd

\$QCPPPD:

```
In LCP      :0007 Out LCP      :0009In IPCP      :0019 Out IPCP      :0019Um Framed Pkts :0000 Rm Framed Pkts
:0000Um Unframed Pkts :0000 Rm Unframed Pkts :0000Um Total Pkts :0000 Rm Total Pkts :0000In Unicast :00C3
Out Unicast :00FBIn Discards :0000 Out Discards :0000In Errors :0000 Out Errors :0000In Unknown :0000
In Checksum :0000InOctets : 00001113 OutOctets : 00000DE6InGoodOctets: 00001113
```

OK

4.16.1.5 \$QCPPPR, Reset PPP Protocol Statistics

This command zeroes all the PPP statistics counters.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
\$QCPPPR	OK or: ERROR	

Example

at+mode=0

OK

at\$qcpppr

\$QCPPPR:

OK

at\$qcpppd

\$QCPPPD:

\$QCPPPD:

In LCP :0000 Out LCP :0000In IPCP :0000 Out IPCP :0000Um Framed Pkts :0000 Rm Framed Pkts :0000Um Unframed Pkts :0000 Rm Unframed Pkts :0000Um Total Pkts :0000 Rm Total Pkts :0000In Unicast :0000 Out Unicast :0000In Discards :0000 Out Discards :0000In Errors :0000 Out Errors :0000In Unknown :0000 In Checksum :0000InOctets : 00000000 OutOctets : 00000000InGoodOctets: 00000000

OK

4.16.1.6 \$QCIPD, Dump IP Protocol Statistics

This command dumps the IP statistics in ASCII format to the TE2.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
\$QCIPD	OK or: ERROR	

Example

at+mode=0

OK

at\$qcipd

\$QCIPD:

IP:

InReceives :00AD InHdrErrors :0000InUnknownProtos:0000 InDelivers :00ADOutPackets :00E3ICMP:InMsgs :0000 OutMsgs :0000InInvalid :0000 InBroadcast :0000InChecksum :0000 InEchoRequest :0000InTimestamp :0000 InInfoRequest :0000

OK

4.16.1.7 \$QCIPR, Reset IP Protocol Statistics

This command zeroes all the IP statistics counters.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
\$QCIPR	OK or: ERROR	

Example

```
at+mode=0OKat$qcipr$QCIPR:OKat$qcipd$QCIPD:IP:InReceives :0000 InHdrErrors :0000InUnknownProtos:0000
InDelivers :0000OutPackets :0000ICMP:InMsgs :0000 OutMsgs :0000InInvalid :0000 InBroadcast
:0000InChecksum :0000 InEchoRequest :0000InTimestamp :0000 InInfoRequest :0000
OK
```

4.16.1.8 \$QCUDPD, Dump UDP Protocol Statistics

This command dumps the UDP statistics in ASCII format to the TE2.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
\$QCUDPD	OK or: ERROR	

Example

```
at$qcudpd
$QCUDPD:
InDatagrams :0000 OutDatagrams :0000InErrors :0000
OK
```

4.16.1.9 \$QCUDPR, Reset UDP Protocol Statistics

This command zeroes all the UDP statistics counters.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
\$QCUDPR	OK or: ERROR	

Example

```
at+mode=0
```

```
OK
```

```
at$qcudpr
```

```
$QCUDPR:
```

```
OK
```

```
at$qcudpd
```

```
$QCUDPD:
```

```
InDatagrams :0000 OutDatagrams :0000InErrors :0000
```

```
OK
```

4.16.1.10 \$QCTCPD, Dump TCP Protocol Statistics

This command dumps the TCP statistics in ASCII format to the TE2.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
\$QCTCPD	OK or: ERROR	

Example

```
at+mode=0
```

```
OK
```

```
at$gctcpd
```

```
$QCTCPD:
```

```
ActiveOpens :0001 PassiveOpens :0000AttemptFails :0000 EstabResets :0000InSegs :009C OutSegs
:00D1RetransSegs :0000 InErrs :0000OutRsts :0000 RxOutOfOrderSeg:0000Payload Sent : 0000012B Payload
Received: 000001BEBackoffs : 0000000000
```

```
OK
```

4.16.1.11 \$QCTCPR, Reset TCP Protocol Statistics

This command zeroes all the TCP statistics counters.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
\$QCTCPR	OK or: ERROR	

Example

```
at+mode=0
```

```
OK
```

```
at$gctcpr
```

```
$QCTCPR:
```

```
OK
```

```
at$gctcpd
```

```
$QCTCPD:ActiveOpens :0000 PassiveOpens :0000AttemptFails :0000 EstabResets :0000InSegs :0000 OutSegs
:0000RetransSegs :0000 InErrs :0000OutRsts :0000 RxOutOfOrderSeg:0000Payload Sent : 00000000B Payload
Received: 00000000Backoffs : 0000000000
```

```
OK
```


4.16.1.12 \$QCRL3D, Dump RLP 3 Protocol Statistics


Note

The information in this section applies to release 3.0B and above.

This command dumps the RLP 3 statistics in ASCII format to the TE2. This does not apply to other versions of RLP (Refer to “\$QCRLPD, Dump RLP Protocol Statistics” on page 285).

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
\$QCRL3D	OK or: ERROR	

Example

```
at+mode=0
```

```
OK
```

```
at$qcrl3d
```

```
$QCRL3D:
```

```
Rx Data Cnt :00001783 Tx Data Cnt :00000B47
```

```
Single Naks :00000005 Double Naks :00000000
```

```
Triple Naks :00000000 Rx Naks :00000034
```

```
Tx Total Bytes :0001003B Rx Total Bytes :000301E7
```

```
ReXmits Not Found:00000000 Fill Frames Rx'ed:00000A9E
```

```
Rlp Erasures :00000000 Mux Erasures :00000186
```

```
Lrgst Cntg. Erase:00000004 Last RTT :00000000
```

```
Resets :00000002 Aborts (Nak) :00000000
```

```
Rlp State :00000000
```

```
Last Call Synced:RLP_NOT_ESTABLISHED
```

4.16.1.13 \$QCRL3R, Reset RLP 3 Protocol Statistics


Note

The information in this section applies to release 3.0B and above.

This command zeroes all of the RLP 3 statistics counters. This does not apply to other versions of RLP (Refer to “\$QCRLPR, Reset RLP Protocol Statistics” on page 286).

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
\$QCRL3R	OK or: ERROR	

Example

at+mode=0

OK

at\$qcrl3r

\$QCRL3R:

OK

Rx Data Cnt :00000000 Tx Data Cnt :00000000

Single Naks :00000000 Double Naks :00000000

Triple Naks :00000000 Rx Naks :00000000

Tx Total Bytes :00000000 Rx Total Bytes :00000000

ReXmits Not Found:00000000 Fill Frames Rx'ed:00000000

Rlp Erasures :00000000 Mux Erasures :00000000

Lrgst Cntg. Erase:00000000 Last RTT :00000000

Resets :00000000 Aborts (Nak) :00000000

Rlp State :00000000

Last Call Synced:RLP_NOT_ESTABLISHED

OK

4.17 MOBILE IP

Mobile IP provides a method of allowing IP traffic to find nodes, whose point of attachment to the Internet changes. An IP address implies a geographical or topological location for a particular node. For example, all of the IP packets with a destination address of 911.50.x.x will be forwarded to New York, as all of the addresses in this block belong to NYPD. If a mobile wants to use one of these addresses and connects to the Internet via an other Internet Service Provider (ISP), then that address would be topologically incorrect, and the packets would never find the mobile in question, as they would be sent to the NYPD network, and not to the network that belongs to the ISP where the mobile has attached itself. Mobile IP provides a mechanism for forwarding these packets to the mobile node, regardless of its location.

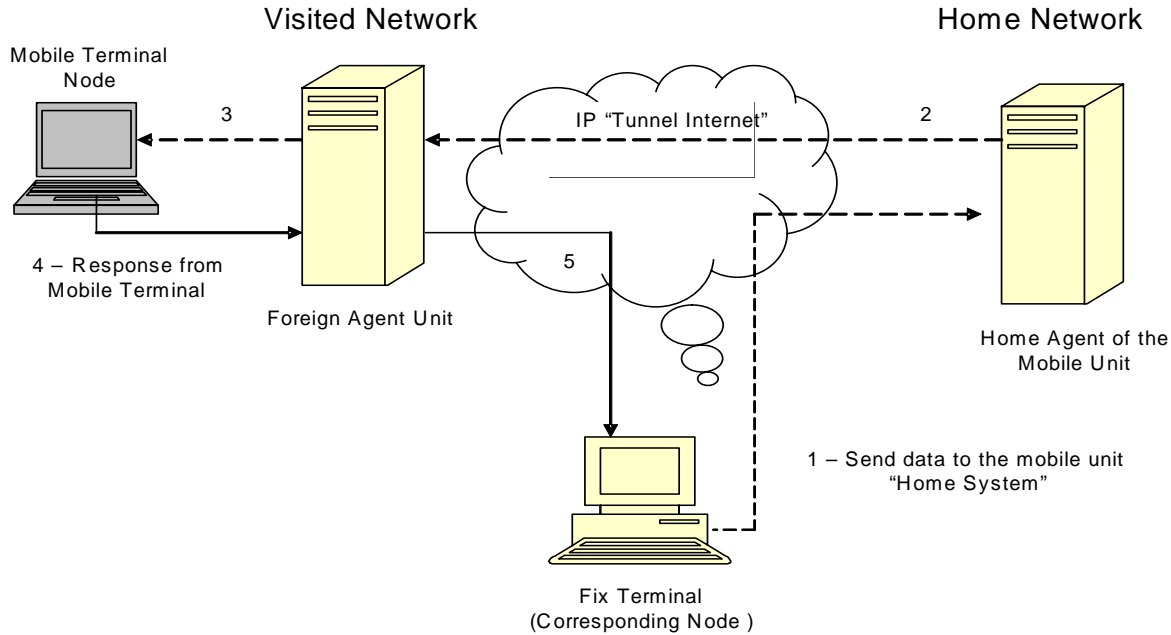


Figure 3. Mobile IP System Scheme

4.17.1 +MIPERR, Mobile IP Error Report

This command returns an extended error report when Mobile IP session is failed. The error report (maximum 20 errors) provides detailed description of the failure reason. The errors format can be textual or numeric.

Mode Activation

Mode = 0

AT Command	Response/Action	Remarks
AT+MIPERR=[<n>]	OK	n=1 numeric default n=2 text
AT+MIPERR	+ MIPERR: : <time of received error> , < ERROR (string or value) > OK	Maximum 20 errors, see example below. <time of received error>: xx:yy:zz:aaa xx-hour:0-24 yy-min zz-sec aaa-msec Note: after power cycle the list resets.
AT+MIPERR?	+ MIPERR: <n> OK	
AT+MIPERR =?	+ MIPERR: (List of supported <n>) OK	1 or 2



Note

- The +MIPERR error list is cleared only on a power cycle or when AT+RESET command is executed.
- The +MIPERR list does not include multiple occurrences of the same error code in a row. If the same error occurs in one attempt, then only the time is updated but a new instance is not added to the list.
- Supported and tested in 04.07 SW version and above.
- The list of error report will include also a report of MIP success: MIP_REGISTRATION_ACCEPTED_.... (error number 0 or 1) ,whenever an MIP data session gets connected.

Table 138 shows all possible errors.

Table 138. Error List

ERROR STRING	ERROR VALUE	REMARKS
MIP_REGISTRATION_ACCEPTED	0	MIP success
MIP REGISTRATION ACCEPTED SIMULTANEOUS BINDINGS UNSUPPORTED	1	MIP success - one server only
MIP RRQ SEND FAILED	256	fail due to C-18 internal error
MOBILE IP NOT SUPPORTED	257	
1XRTT PACKET SERVICE IS NOT AVAILABLE	258	

Table 138. Error List (*Continued*)

NO SERVICE	259	
COULD NOT ACQUIRE TRAFFIC CHANNEL	260	No rf channel capacity
MOBILE NOT REGISTERED	261	
REGISTRATION REQUEST REJECTED BY BASE STATION	262	
MIP REGISTRATION DENIED BY FA:REASON UNSPECIFIED	64	
MIP REGISTRATION DENIED BY FA:ADMINISTRATIVELY PROHIBITED	65	
MIP REGISTRATION DENIED BY FA:INSUFFICIENT RESOURCES	66	NO PDSN CAPACITY
MIP REGISTRATION DENIED BY FA:MOBILE FAILED AUTHENTICATION	67	AUTHENTICATION FAILURE
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MIP REGISTRATION DENIED BY HA:ADMINISTRATIVELY PROHIBITED	129	
MIP REGISTRATION DENIED BY HA:INSUFFICIENT RESOURCES	130	NO PDSN CAPACITY
MIP REGISTRATION DENIED BY HA:MOBILE FAILED AUTHENTICATION	131	AUTHENTICATION FAILURE
MIP REGISTRATION DENIED BY HA:FA FAILED AUTHENTICATION	132	AUTHENTICATION FAILURE
MIP REGISTRATION DENIED BY HA:REGISTRATION IDENTIFICATION MISMATCH	133	
MIP REGISTRATION DENIED BY HA:POORLY FORMED REQUEST	134	
MIP REGISTRATION DENIED BY HA:TOO MANY SIMULTANEOUS MOBILITY BINDINGS	135	
MIP REGISTRATION DENIED BY HA:UNKNOWN HOME AGENT ADDRESS	136	
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MIP REGISTRATION DENIED BY HA:REVERSE TUNNEL MANDATORY , T BIT NOT SET	138	
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Example

AT+ MIPERR?

+ MIPERR:1 * this is the default numeric state

OK

* set the MIPERR for numeric mode *

AT+ MIPERR=1

AT Commands Reference

OK

AT+ MIPERR?

+ MIPERR:1

OK

AT+MIPERR

+ MIPERR: "23:45:33.500", 257, "23:45:34.634",258, "23:45:33.278","0

OK

* Set the MIPERR for text mode *

AT+ MIPERR=2

OK

AT+ MIPERR?

+ MIPERR:2

OK

AT+MIPERR

+ MIPERR: "23:45:33.500"," MOBILE IP NOT SUPPORTED", "23:45:34.634","1XRTT PACKET SERVICE IS NOT AVAILABLE ", "23:45:35.278", "MIP_REGISTRATION_ACCEPTED"

OK

* Get range of the command *

AT+ MIPERR =?

+ MIPERR: (1-2)

OK

4.17.2 \$QCMIPREG

This command configures the Mobile IP related parameters that are common to all the MIP user profiles currently saved inside the c18 NVM.

Mode Activation

Mode = 0.

AT command	Response	Remark
AT\$QCMIPREG=<max allowed retries>,<retry timeout>,<PRE - registration timeout in minutes>,<send RRQ only if there has been traffic>,<dormant handoff QC optimization>	OK	<p>Maximum allowed retries is 0-2 retry timeout: retry timeout = <value>*250 msec + 1000 msec PRE - registration timeout in minutes: 0-63 minutes Send RRQ only if there was traffic</p> <ul style="list-style-type: none"> • 0 - send RRQ in any case • 1 - send RRQ only if data was transferred since last RRQ. <p>Dormant handoff QC optimization</p> <ul style="list-style-type: none"> • 0 - disable QC optimization • 1 - enable QC optimization
AT\$QCMIPREG?	\$QCMIPREG: <max allowed retries>,<retry timeout>,<PRE - registration timeout in minutes>,<send RRQ only if there has been traffic>,<dormant handoff QC optimization> OK	
AT\$QCMIPREG=?	\$QCMIPREG: (0-2),(0-4),(0-63),(0-1),(0-1) OK	<p>Shows the legal value ranges for:</p> <ul style="list-style-type: none"> • < for Max allowed retries> • <retry timeout> • <PRE - registration timeout in minutes> • <send RRQ only if there has been traffic> • <dormant handoff QC optimization>



Note

The values set by this AT command are common to all six Mobile IP user profiles.

4.17.3 \$QCMIP, Enable /Disable Mobile IP

This command enables or disables the support for Mobile IP.

AT\$QCMIP=<Val>

Val	Definition
0	Mobile IP Disabled. Simple IP Only. This is the default.
1	Mobile IP Preferred. In the initial MIP registration, if the network does not support MIP, then the mobile automatically reverts to Simple IP (forces a PPP renegotiation by sending a LCP C-Req). However, if the mobile enters a network that does not support an MIP, after the MIP session was registered, the mobile will drop the session and will inform the upper layers of the failure.
2	Mobile IP only. The mobile will make data calls only when MIP is supported in the network. During an MIP session, if the mobile hands off to a network that does not support MIP, the mobile will drop the session and will inform the upper layers of the failure (for example, by dropping DCD). This value is stored in NV.



Note

- When the AT\$QCMIP value is changed to '1' or to '2', the value of AT+CRM is changed to '2'. AT+CRM with a value of '2' enables network model operation. Changing the value to '0' will reset the AT+CRM to its original value.
- When the AT\$QCMIP value is changed to '1' or to '2', the value of AT\$QCMDR is changed to '3'. AT\$QCMDR=3 means that the mobile tries Service Option number 33 when it is in a cdma2000 network that advertises P_REV6 or higher. When AT\$QCMIP>0 and an attempt is made to set AT\$QCMDR to less than '3', the mobile will return ERROR.
- When the AT\$QCMIP value is set to '1' or to '2', the value of AT\$QCPKND is changed to '0'. This means that the mobile must see a dial string (such as #777 – the actual string is configurable) on the serial interface before it originates packet data calls. When AT\$QCMIP>0 and an attempt is made to set AT\$QCPKND to '1', the mobile will return ERROR.

Type of Command	AT Command	Response/Action
Set	AT\$QCMIP=< value>	OK OR ERROR
Read	AT\$QCMIP?	\$QCMIP: <value> OK
Test	AT\$QCMIP=?	\$QCMIP: (0-2) OK

Example

```
AT$QCMIP=1 // Set to Mobile IP preferred
```

```
OK
```

```
$QCMIP?
```

```
$QCMIP: <value>
```

```
OK
```

```
$QCMIP=?
```

```
$QCMIP: (0-2)
```

```
OK
```

4.17.4 \$QCMIPP, Select MIP User Profile

This command selects one of the MIP user profiles as the current active profile. The command chooses a profile number between '0' and '5'. This value is stored in NV. \$QCMIPP command is used for configuring Dial-Up Networking.

AT\$QCMIP=<Val>

<Val>	Definition
0	Select User Profile 0 (default)
1	Select User Profile 1
2	Select User Profile 2
3	Select User Profile 3
4	Select User Profile 4
5	Select User Profile 5

Type of Command	AT Command	Response/Action
Set	AT\$QCMIPP=< val>	OK OR ERROR
Read	AT\$QCMIPP?	\$QCMIPP: <val> OK
Test	AT\$QCMIPP=?	\$QCMIPP: (0-5) OK

Example

AT\$QCMIPP=1 // Set to select MIP user profile 1

OK

If no error occurred, the MIP profile 1 is selected.

4.17.5 \$QCMIPT, Enable the Use of rfc2002.bis Authentication

This command enables or disables the use of rfc2002bis authentication, which is a required part of the Registration Request (RRQ). A bug exists in RFC 2002 where it fails to include the SPI in the calculation of the MN-HA authenticator. RFC 2002bis fixes this bug and most existing Mobile IP implementations. Follow the RFC 3 2002bis in this matter.

When AT\$QCMIPT=1, the mobile will use RFC 2002bis style authentication. When AT\$QCMIPT=0, the Mobile will use RFC 2002 style authentication.

**Note**

This AT command is for test purposes only. It is expected that carriers will not allow users to use this AT command to change the Mobile IP configuration, and that this will be changed only through the use of service provisioning tools for modifying the value of the corresponding NV item.

AT\$QCMIPT=<Val>

<Val>	Definition
0	Use of rfc2002bis authentication is disabled, rfc2002 style authentication is used instead.
1	Use of rfc2002bis authentication is enabled.

Type of Command	AT Command	Response/Action
Set	AT\$QCMIPT=< val>	OK OR ERROR
Read	AT\$QCMIPT?	\$QCMIPT: <val> OK
Test	AT\$QCMIPT=?	\$QCMIPT: (0-1) OK

Example

AT\$QCMIPT=1 Use of rfc2002bis authentication is enabled.

OK

4.17.6 \$QCMIEP, Enable or Disable Currently Active Profile

This command enables or disables the currently active profile details.

Disabling a profile is not the same as erasing a profile. Disabling a profile makes the profile unavailable for use until it is re-enabled. It only takes a single numeric argument (either '0' or '1'), which indicates whether or not a profile is enabled (0 indicates it should be disabled).

AT\$QCMIEP=<Val>

<Val>	Definition
0	Disable the currently active profile (profile is unavailable until it is re-enabled).
1	Enable the currently active profile.

Type of Command	AT Command	Response/Action
Set	AT\$QCMIEP=< val>	OK OR ERROR
Read	AT\$QCMIEP?	\$QCMIEP: <val> OK
Test	AT\$QCMIEP=?	\$QCMIEP: (0-1) OK

Example

AT\$QCMIEP=1 Enable the currently active profile

OK

4.17.7 \$QCMIPGETP, Return All Info for the Specified Profile Number

This command returns all the information corresponding to the particular profile number entered. If a profile number is not entered then the AT command will return all the information corresponding to the currently active profile. If a profile corresponding to a particular profile number does not exist, then an error is returned.

AT\$QCMIPGETP=<Val>

<Val>	Definition
	Default (Blank) returns all information corresponding to the currently active profile.
0	Return all information corresponding to profile 0. If no profile 0, return error.
1	Return all information corresponding to profile 1. If no profile 1, return error.
2	Return all information corresponding to profile 2. If no profile 2, return error.
3	Return all information corresponding to profile 3. If no profile 3, return error.
4	Return all information corresponding to profile 4. If no profile 4, return error.
5	Return all information corresponding to profile 5. If no profile 5, return error.

Type of Command	AT Command	Response/Action
Set	AT\$QCMIPGETP=< val>	(See response in example) OK OR ERROR
Read	AT\$QCMIPGETP?	ERROR
Test	AT\$QCMIPGETP=?	\$QCMIPGETP: (0-5) OK

Example

AT\$QCMIPGETP=1 //Return all information corresponding to profile 1

Profile1 Enabled

NAI:user@domain.com

Home Addr: 10.12.34.56

Primary HA: 10.1.1.2

Secondary HA: 255.255.255.255

MN-AAA SPI: 2

MN-HA SPI: 3

Rev Tun: 0

MN-AAA SS: Unset

MN-HA SS: Unset

4.17.8 \$QCMIPNAI, Set the NAI for the Currently Active Profile

This command sets the NAI for the currently active profile. It takes two arguments, a string corresponding to the NAI to be stored and a number (either '0' or '1') indicating whether or not to commit this value to NV, where zero indicates not to commit to NV.

AT\$QCMIPNAI=<String>, <Val>

String Definition
The string is the Network Access Identifier (NAI). This is essentially the user identifier for logging into the Mobile IP Home Agent (HA). If the NAI string contains a comma, it must be enclosed in double quotes.

<Val>	Definition
0	Do not commit to NV RAM. Values will be deleted at the end of the subsequent session or if \$QCMIPP is executed.
1	Commit to NV RAM

Type of Command	AT Command	Response/Action
Set	AT\$QCMIPNAI=<String>, <Val>	OK OR ERROR
Read	AT\$QCMIPNAI?	\$QCMIPNAI: <String>, <Val> OK
Test	AT\$QCMIPNAI=?	\$QCMIPNAI: (20,21,23-7E), (0-1) OK

Example

```
AT$QCMIPNAI="DIAD12345@carrier.ups.com", 1 //Set the NAI and commit to NV RAM
OK
```

4.17.9 \$QCMIPRT, Set the Reverse Tunneling for the Currently Active Profile

This command sets the reverse tunneling for the currently active profile. It takes two arguments, both numbers (either '0' or '1'). The first argument indicates whether reverse tunneling should be requested, and the second argument indicates whether or not to commit this value to NV. In both cases zero indicates a negative.

AT\$QCMIPRT=<Val1>,<Val2>

<Val1>	Definition
0	Do not request reverse tunneling
1	Request reverse tunneling

<Val2>	Definition
0	Do not commit to NV RAM. Values will be deleted at the end of the subsequent session or if \$QCMIPP is executed.
1	Commit to NV RAM

Type of Command	AT Command	Response/Action
Set	AT\$QCMIPRT=<Val1>,<Val2>	OK OR ERROR
Read	AT\$QCMIPRT?	\$QCMIPRT: <Val1>,<Val2> OK
Test	AT\$QCMIPRT=?	\$QCMIPRT: (0-1),(0-1) OK

Example

AT\$QCMIPRT=1,1 set the reverse tunneling of the currently active profile and put in NV

OK



Note

- For this AT command and all other \$QCMIP commands that take string arguments, the double quotes () are only required if the string contains a comma. The double quotes identify the string as being a single argument to the AT command and not two comma-separated arguments.
- For this AT command and for all of the following AT commands: if the value provisioned is not committed to NV, the temporary values will be deleted at the end of the following call, or if \$QCMIPP is called.

4.17.10 \$QCMIPMASS, Set MN-AAA Shared Secrets for the Currently Active Profile

This command sets the MN-AAA shared secrets for the currently active profile. \$QCMIPMASS command takes two arguments, a string corresponding to the shared secret to be stored and a number (either '0' or '1') indicating whether or not to commit this value to NV, where zero indicates not to commit to NV.

AT\$QCMIPMASS=<String>, <Val>

String Definition
The string is the MN-AAA shared secret for the currently active profile. This is essentially the user password for logging into the Mobile network. If the string contains a comma, it must be enclosed in double quotes.

<Val>	Definition
0	Do not commit to NV RAM. Values will be deleted at the end of the subsequent session or if \$QCMIPP is executed.
1	Commit to NV RAM

Type of Command	AT Command	Response/Action
Set	AT\$QCMIPMASS=<String>, <Val>	OK OR ERROR
Read	AT\$QCMIPMASS?	\$QCMIPMASS: Set OK
Test	AT\$QCMIPMASS=?	\$QCMIPMASS: (20,21,23-7E), (0-1) OK

Example

```
AT$ QCMIPMASS =shared secret,1
OK
```


4.17.11 \$QCMIPMHSS, Set MN-HA Shared Secrets for the Currently Active Profile

This command sets the MN-HA shared secrets for the currently active profile. AT\$QCMIPMMHSS AT command takes two arguments, a string corresponding to the shared secret to be stored and a number (either '0' or '1') indicating whether or not to commit this value to NV, where zero indicates not to commit to NV.

AT\$QCMIPMHSS=<String>, <Val>

String Definition
The string is the MN-HA shared secret for the currently active profile. This is essentially the user password for logging into the Mobile network. If the string contains a comma, it must be enclosed in double quotes.

<Val>	Definition
0	Do not commit to NV RAM. Values will be deleted at the end of the subsequent session or if \$QCMIPP is executed.
1	Commit to NV RAM

Type of Command	AT Command	Response/Action
Set	AT\$QCMIPMHSS=<String>, <Val>	OK OR ERROR
Read	AT\$QCMIPMHSS?	\$QCMIPMHSS: Set OK
Test	AT\$QCMIPMHSS=?	\$QCMIPMHSS: (20,21,23-7E), (0-1) OK

Example

```
AT$ QCMIPMHSS =shared secret,1
OK
```

4.17.12 \$QCMIPMASPI, Set MN-AAA SPIs

This command sets the MN-AAA SPIs for the currently active profile. This AT command takes two arguments, both numbers. The first is the SPI value and the second is a number (either '0' or '1') indicating whether or not to commit this value to NV, where zero indicates not to commit to NV.

AT\$QCMIPMASPI=<SPI>, <Val>

SPI Definition
The Security Parameter Index (SPI) specifies the particular secret and algorithm (shared between the Mobile and the AAA Server) that must be used to perform the authentication. This SPI can be set to a value from 0 to 4294967295.

<Val>	Definition
0	Do not commit to NV RAM. Values will be deleted at the end of the subsequent session or if \$QCMIPP is executed.
1	Commit to NV RAM

Type of Command	AT Command	Response/Action
Set	AT\$QCMIPMASPI=<Val1>,<Val2>	OK OR ERROR
Read	AT\$QCMIPMASPI?	\$QCMIPMASPI: <Val1>,<Val2> OK
Test	AT\$QCMIPMASPI=?	\$QCMIPMASPI: (0-1),(0-1) OK

Example

AT\$QCMIPMASPI=10,1

OK

4.17.13 \$QCMIPMHSPI, Set MN-HA SPIs

This command sets the MN-HA SPIs for the currently active profile. This AT command takes two arguments, both numbers. The first is the SPI value and the second is a number (either 0 or 1) indicating whether or not to commit this value to NV, where zero indicates not to commit to NV.

AT\$QCMIPMHSPI=<SPI>, <Val>

SPI Definition
The Security Parameter Index (SPI) specifies the particular secret and algorithm (shared between the Mobile and the HA) that must be used to perform the authentication. This SPI can be set to a value from 0 to 4294967295.

<Val>	Definition
0	Do not commit to NV RAM. Values will be deleted at the end of the subsequent session or if \$QCMIPP is executed.
1	Commit to NV RAM

Type of Command	AT Command	Response/Action
Set	AT\$QCMIPMHSPI=<Val1>,<Val2>	OK OR ERROR
Read	AT\$QCMIPMHSPI?	\$QCMIPMHSPI: <Val1>,<Val2> OK
Test	AT\$QCMIPMHSPI=?	\$QCMIPMHSPI: (0-4294967295), (0-1) OK

Example

AT\$QCMIPMHSPI =10,1

OK

4.17.14 \$QCMIPPHA, Set the IP Addresses of the Primary HA

This command sets the IP addresses of the mobile's primary HA for the currently active profile. This command takes two arguments, a string corresponding to the IP address of the HA to be stored and a number (either '0' or '1') indicating whether or not to commit this value to NV, where zero indicates not to commit to NV.

AT\$QCMIPPHA=<String>, <Val>

STRING Definition	
The IP address should be formatted in the standard dotted-decimal notation, for example, 10.1.1.20.	

<Val>	Definition
0	Do not commit to NV RAM. Values will be deleted at the end of the subsequent session or if \$QCMIPP is executed.
1	Commit to NV RAM

Type of Command	AT Command	Response/Action
Set	AT\$QCMIPPHA==<String>, <Val>	OK OR ERROR
Read	AT\$QCMIPPHA?	AT\$QCMIPPHA: =<String>, <Val> OK
Test	AT\$QCMIPPHA=?	AT\$QCMIPPHA : (0-255).(0-255).(0-255).(0-255)), (0-1) OK

Example

AT\$QCMIPPHA =10.10.1.2,1

OK

4.17.15 \$QCMIPSHA, Set the IP Addresses of the Secondary HA

This command sets the IP addresses of the mobile's secondary HA for the currently active profile. This command takes two arguments, a string corresponding to the IP address of the HA to be stored and a number (either '0' or '1') indicating whether or not to commit this value to NV, where zero indicates not to commit to NV.

AT\$QCMIPSHA=<String>, <Val>

STRING Definition	
The IP address should be formatted in the standard dotted-decimal notation, for example, 10.1.1.20.	

Val	Definition
0	Do not commit to NV RAM. Values will be deleted at the end of the subsequent session or if \$QCMIPP is executed.
1	Commit to NV RAM

Type of Command	AT Command	Response/Action
Set	AT\$QCMIPSHA==<String>, <Val>	OK OR ERROR
Read	AT\$QCMIPSHA?	AT\$QCMIPSHA: =<String>, <Val> OK
Test	AT\$QCMIPSHA=?	AT\$QCMIPSHA :(0-255).(0-255).(0-255).(0-255)), (0-1) OK

Example

AT\$QCMIPSHA =10.10.1.2,1

OK

4.17.16 \$QCMIPHA, Set the IP Addresses of the Mobile Home Address

This command sets the IP addresses of the mobile's home address for the currently active profile. This command takes two arguments, a string corresponding to the IP address of the HA to be stored and a number (either '0' or '1') indicating whether or not to commit this value to NV, where zero indicates not to commit to NV.

AT\$QCMIPHA=<String>, <Val>

STRING Definition	
The IP address should be formatted in the standard dotted-decimal notation, for example, 10.1.1.20.	

Val	Definition
0	Do not commit to NV RAM. Values will be deleted at the end of the subsequent session or if \$QCMIPP is executed.
1	Commit to NV RAM

Type of Command	AT Command	Response/Action
Set	AT\$QCMIPHA==<String>, <Val>	OK OR ERROR
Read	AT\$QCMIPHA?	AT\$QCMIPHA: =<String>, <Val> OK
Test	AT\$QCMIPHA=?	AT\$QCMIPHA :(0-255).(0-255).(0-255).(0-255)), (0-1) OK

Example

AT\$QCMIPHA =10.10.1.2,1

OK

4.18 SLEEP MODE

If the c18 has no accessories, it is able to enter sleep mode (current save mode). In sleep mode, the radio is switched to minimum activity, the clock is removed from the RF section and it is reduced from 19.2MHz to 32KHz in the Logic section.

The unit can be configured to sense UART Rx line Edge Interrupt during sleep mode or can be configured to periodically exit sleep mode and detect UART Rx line data.

Using the Sleep Mode Timer is recommended, for the AT command handler, to enter sleep mode after entering IDLE state. For example, if the terminal sends AT+ST24=5 and there are no radio and UART activities, the c18 enters sleep mode after five seconds.

In the case of a call (MO/MT) of type (Voice, CSD, Fax, SMS or Packet), the unit exits sleep mode, but reserves the right to reenter sleep mode whenever it detects it is possible. Reentering sleep mode does not terminate an SO33 session.

Sleep Mode Timer is irrelevant in the following cases:

- SMS sending because of signaling activities. After sending SMS and entering Idle state, the module reenters Sleep Mode. Furthermore, Sleep Mode Timer is irrelevant to SMS receive. The S24 Timer is relevant to AT command only.
- Keypad Press. The Keypad Press also activate the "BACKLIGHT" Timer then enters sleep mode. For example, if BACKLIGHT Timer is Zero after Key Press, the default time interval is 7 [sec] until IDLE state and then the unit enters sleep mode.
- Packet Dormant. The S24 Timer is relevant to AT command only. The Packet Call Dormant Timer stays awake for Dormant Timer BACKLIGHT Timer in total before entering sleep mode. When setting "BACKLIGHT" Timer to Zero after entering Dormant state, the BACKLIGHT Timer duration will be eliminated before entering sleep mode.

Changing the Ignition line to Active state will put the module out off sleep mode since ignition handles properly only in Car Kit (ZIHf) mode, and in this mode the sleep mode is not allowed.

During sleep mode, the RS232 should not respond to any commands from the DTE device. UART is disabled and no response will be received via the RX Line except Rx Interrupt.

While the unit connects to a terminal via USB, it shall exit sleep mode since the USB requires the 48Mhz clock to be active and the processor driver to be running.

The Platform 2000 architecture has been designed to support sleep mode and low power operations.

4.18.1 Sleep Mode - Process Diagram

On the ADB, the WAKE_UP line is marked as "WAKE_IN" on connector P107.

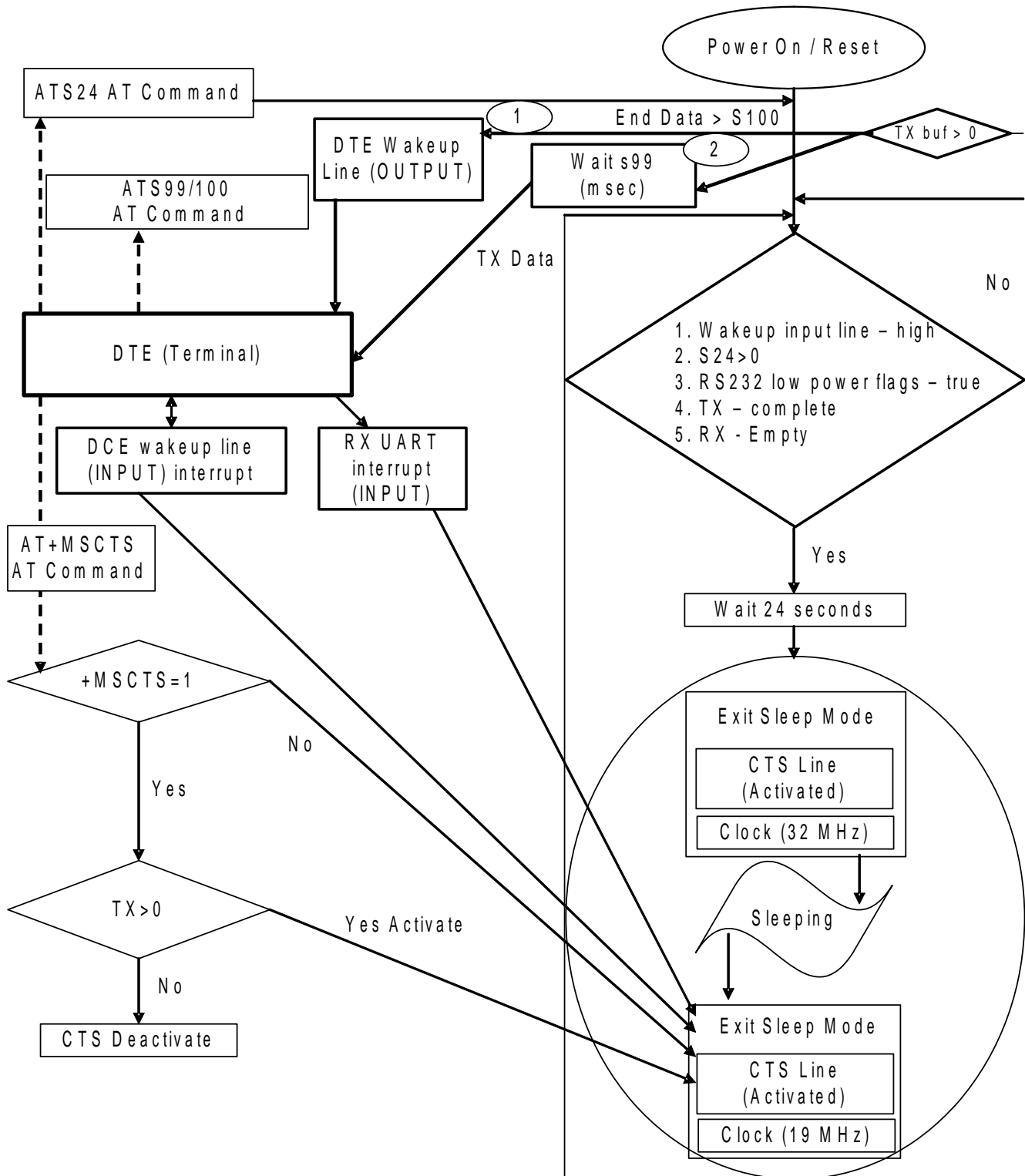


Figure 4. Sleep Mode - Process Diagram

4.18.2 Software Interface Data Requirements

The software interface is based on the RS232 DMSS, Transport module AT command interface and application.

4.18.3 Communication Interface Data Requirements

The RS232 communication with all its functionality lines are supported. The WAKE_UP line is supported as follows:

- Default value of S24 is '0' (also after power-up). The Value is not saved after power cycle.
- Setting the S24 with value greater than 255, returns an error.

AT Command	Response/Action	Remarks
ATS24=[<Value>]	OK	
ATS24?	<Value>	<ul style="list-style-type: none"> • 0 - disable sleep mode • n - number of seconds (1 <= n <= 255)
ATS24=?	(0-255)	

There are two options to wake up the c18, as follows:

Option 1:(AT+MSCTS=0)

At the beginning of your work, activate the sleep mode by sending ATS24=n (n=1,2,3,4 seconds). To disable sleep mode, use ATS24=0. Verify that AT+MSCTS? returns zero. The c18 will de-assert the CTS each time the unit enters sleep and will assert the CTS when it is awoken. When TxD/RxD data is present, the c18 will exit sleep mode. When the TxD/RxD data transmission ends, the c18 will wait S24 seconds and will reenter sleep mode.

Figure 5 shows the sleep mode timing diagram.

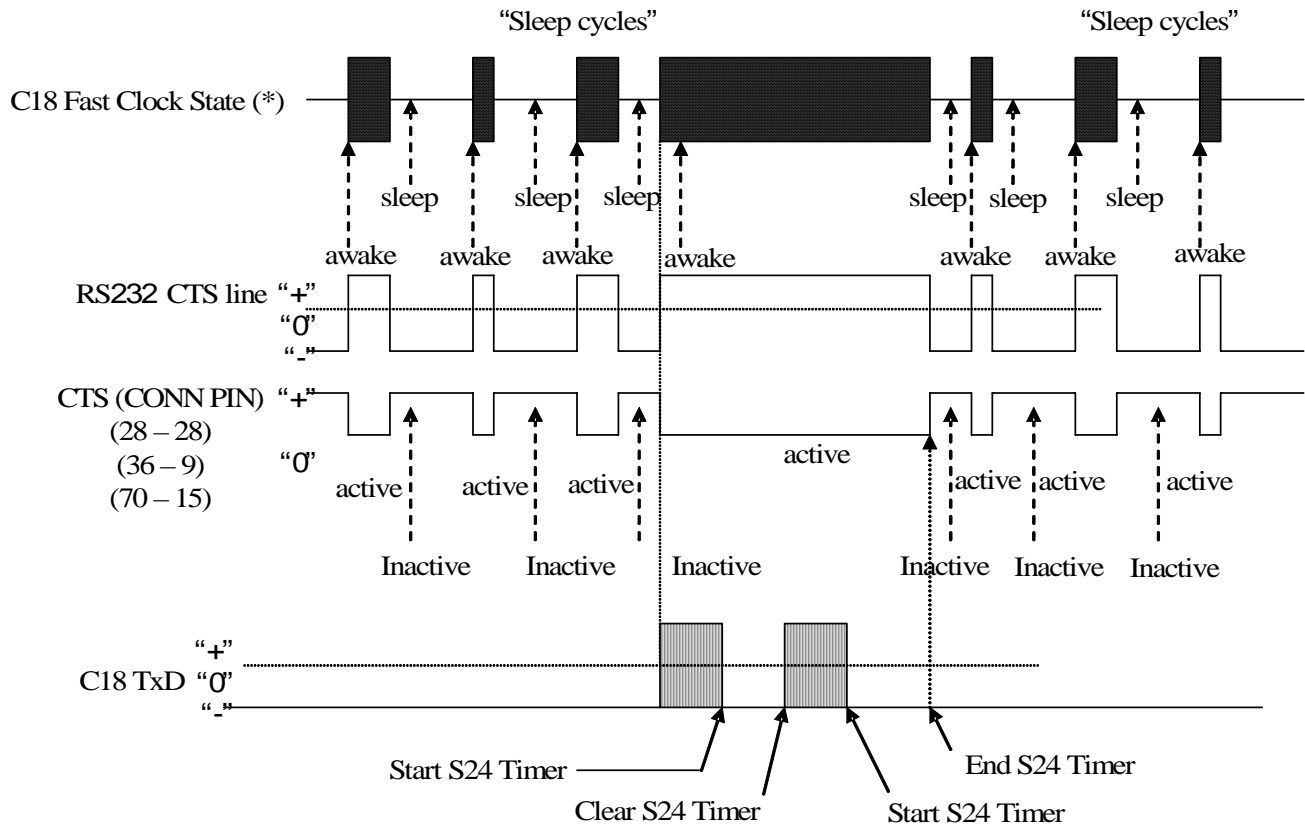


Figure 5. Sleep Mode Timing Diagram

(*) "Sleep cycles" are used for representation only, for the Main Clock Status when $S24 > 0$.



Note

- ATS24 factory preset value is '0'. This value is not saved in the NV. The value of ATS24 can be changed but will be lost after power recycling.
- DTE should look for active CTS before sending data (HW flow control).
- DTE UART should not send any character to c18, if CTS is inactive, otherwise this character might be lost. If the DTE processor handles the flow control, and not its UART, and there is a gap between checking the CTS state and sending the start bit, c18 might set CTS inactive during this gap, and the character sent to c18 might be lost.

Option 2: (AT+MSCTS=1)

At the beginning of your work, activate the sleep mode by sending `ATS24=n` ($n=1,2,3,4$ seconds) and set `AT+MSCTS=1`.

Whenever the DTE wants to send data, it will pull `WAKE_UP` line to low, will wait 30 ms (wakeup time required for the c18) and then will start sending data.

The `WAKE_UP` line should remain low during the entire data sending period. When the `WAKE_UP` line is low, the CTS is activated and the c18 is not allowed to enter sleep mode.

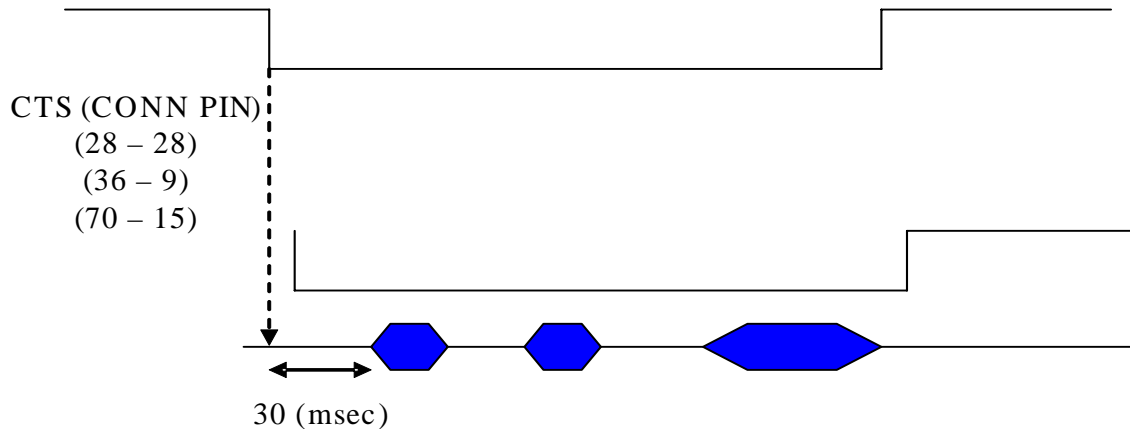


Figure 6. Waking Up the c18 when DTE Wants to Send Data

4.18.4 Waking Up the DTE

At the beginning of your work activate the sleep mode by sending `ATS24=n` ($n=1,2,3,4$ seconds). The c18 will generate a wakeup pulse for data sent to DTE in packet mode and in CSD mode. When c18 is awake and wants to send data to DTE, c18 will configure the `WAKE_UP` line as output and then will activate (poll to LOW) the `WAKE_UP` line to interrupt the DTE. After `S99` [msec] from `WAKE_UP` activation, c18 will deactivate (bring to HIGH) the `WAKE_UP` line. Only then, the c18 will initialize data transmission. The value of `S99` is determined by `ATS99` (the default value is 30 [msec]). When c18 data transmission ends, the c18 starts the `S100` Timer, during which any new TxD data block will not generate a new `WAKE_UP` pulse. The new data will be transmitted immediately without delay.

If the new TxD data block arrives after the `S100` Timer expires, the new TxD data block will be delayed for a period of `S99` [msec], during which the c18 will generate a pulse in the `WAKE_UP` line, with the exact `S99` [msec] duration. After the pulse ends, the c18 will transmit the new TxD data block.

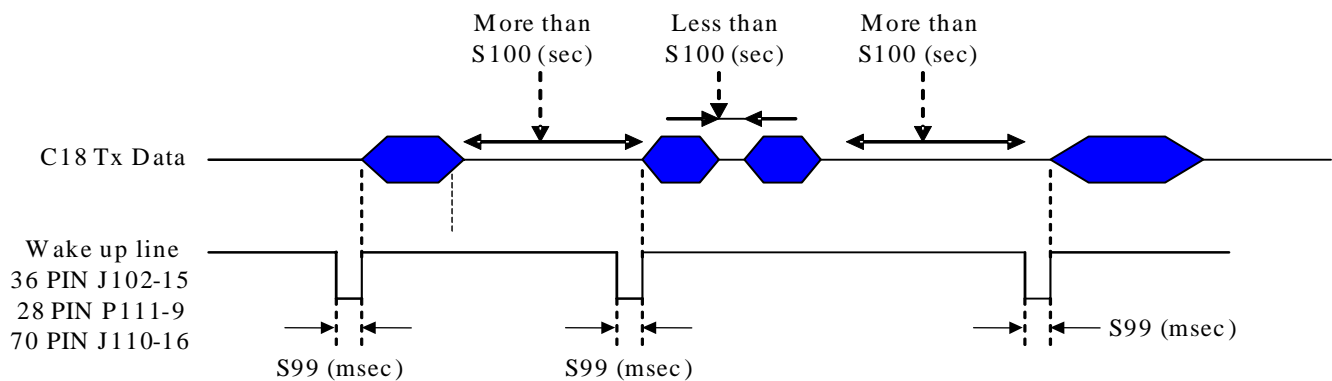


Figure 7. Waking Up the DTE when Data is Present Using the `WAKE_UP` Line

**Note**

The c18 generates a wakeup pulse whenever asynchronous data is sent to DTE. For example, +CIEV, +CLCC, +CCWA, +CMTI, +CMTI, +CDS, +CLIP, +COLP, +CRC, +CREG and +CNMI

4.18.5 ATS24

This command activates or disables the sleep mode.

c18 shall receive a request to activate or deactivate the sleep mode (when ATS24 is '0', the c18 cannot enter sleep mode. When ATS24 is greater than '0', the c18 will enter sleep mode after S24 seconds of inactivity).

The default value of S24 is '0' (also after power-up). The value is not saved after power cycle. Setting S24 with a value greater than 255, returns an error.

AT Command	Response/Action	Remarks
ATS24=[<Value>]	OK	<value>: <ul style="list-style-type: none"> 0 - disable sleep mode n - number of seconds (0 < n <= 255)
ATS24?	<Value>	
ATS24=?	(0-255)	

4.18.5.1 Processing

The Set command instructs c18 to wait <value> seconds (after all low-power flags and all conditions enabled c18 to enter sleep mode (see Figure 4 on page 315) and then to enter sleep mode. To disable sleep mode, <value> should be equal to 0.

4.18.5.2 Outputs

The Read command returns the current value.

4.18.6 ATS99

This command sets the value of the delay before sending data to DTE.

c18 shall receive the value to define the duration in [msec] of the delay for DTE wakeup. Default value of S99 is 30 [msec] (also after power-up). The value is not saved after power cycle. Setting S99 with a value greater than 255 or with '0' returns an error.

AT Command	Response/Action	Remarks
ATS99=[<Value>]	OK	<value>: 1 <= value <= 255
ATS99?	<Value>	
ATS99=?	(0-255)	

4.18.6.1 Processing

The Set command instructs the c18 that the delay before data sending to the DTE should be <value> ms. This command defines a period of time between sending the wakeup pulse signal and sending the data to DTE. The default value of the delay should be 30 ms.

4.18.6.2 Outputs

The Read command returns the current value.

4.18.7 ATS100

The S-Reg S100 is used to avoid frequent wakeup interrupts and low throughput. The c18 will use wakeup output indication for data only after S100 seconds, elapsed from the last sent character to the DTE. The default value of ATS100 is 1[sec] (also after power-up).

The value is not saved after power cycle. Setting S100 with a value greater than 255, or with '0' returns an error.

AT Command	Response/Action	Remarks
ATS100=[<Value>]	OK	<value>: 1 <= value <= 255
ATS100?	<Value>	
ATS100=?	(0-255)	

4.18.7.1 Processing

When data sending completes, the c18 should wait S100 seconds, during which a new TX Buffer will be immediately transferred with a minimal delay (without wakeup output pulse). When S100 timer elapsed, new TX buffer will be delayed for S99 [msec], during which a wakeup pulse will be generated. When the pulse is completed, the TX buffer will be transmitted.

4.18.7.2 Outputs

The Read command returns the current value.

4.18.8 +MSCTS, Enables/Disable WAKE_IN Line Control on C18 Sleep Mode



Note

The information in this section applies to releases 3.0F and above or 4.08 and above.

This command instructs the c18 to detect or to ignore the WAKE_IN line state changes and defines the behavior of the RS232 CTS line when the c18 is in sleep mode (or in normal mode). This command also affects RS232 CTS line behavior during wakeup/sleep periods.

When MSCTS is set to '1', the WAKE_IN line enables the DTE to be constant awake by shorting the WAKE_IN line to ground causing the CTS line to be constant asserted. When the DTE disconnects the WAKE_IN from ground (put it back to HIGH) the DCE (c18) can enter sleep mode according to S24 time and the CTS line becomes constant deasserted.



Note

- The command MSCTS=1 is functional only when S24>0.
- When MSCTS is set to '0', the WAKE_IN line is changed by the DTE and ignored by the DCE (c18).

Set Command

The Set command configures the c18 CTS behavior and WAKE_IN line interrupt handling.

Mode=0

Command	Response/Action
AT+MSCTS=<control>	OK

Read Command

The Read command returns the current control value.

Command	Response/Action
AT+MSCTS?	+MSCTS: <current control> OK

Test Command

The Test command returns the possible control values.

Command	Response/Action
AT+MSCTS=?	+MSCTS:(0-1) OK

The following table shows the +MSCTS parameters.

Table 139. +MSCTS Parameters

<bcs>	Description
0 (default)	<p>In active mode, when S24 is set to '0', the CTS is used as normal RS232 H/W Flow Control so CTS is usually asserted when RS232 is operational. Line WAKE_IN input changes are ignored by DTE (c18).</p> <p>In Sleep Mode, when S24>0, the CTS follow the Main Clock state, as follows:</p> <ul style="list-style-type: none"> • When the Main Clock is fast, the RS232 CTS line is asserted. • When the Main Clock is slow, the RS232 CTS line is deasserted. • Line WAKE_IN input changes are ignored by DTE (c18).

Table 139. +MSCTS Parameters (*Continued*)

<bc>	Description
1	<p>RS232 CTS line state depends on the WAKE_IN line state, as follows:</p> <ul style="list-style-type: none"> • When WAKE_IN line is active (short to ground), the RS232 CTS line is constant asserted and the c18 will be stayed awake all that time. • When WAKE_IN line is inactive (open - high), the RS232 CTS line is deasserted all that time (inactive), and c18 can enter sleep mode according to the S24 value.

Example

AT+MSCTS=?

+MSCTS:(0-1)

OK

AT+MSCTS?

+MSCTS:0

OK

AT+MSCTS=1

OK

AT+MSCTS?

1

OK

4.18.8.1 Processing

The Set command instructs the c18 that CTS should or should not be activated when the unit exits sleep mode.

**Warning**

- When the DTE uses the wakeup line, the recommend value is AT+MSCTS=1.
- When the DTE is not connected to the wakeup line, do not use this command.
- Using AT+MSCTS=1 will deactivate the CTS after c18 has entered sleep mode, and the DTE will not be able to communicate with c18 until power on.

To enable communication between the DTE and c18 when DTE's power is off:

- Change the DTE flow control to NONE, and then send AT+FCLASS=2.0;+IFC=0,0.
- Wait for OK and then send AT+IFC=2,2.
- Wait for OK and then change the DTE flow control to HW.

4.18.8.2 Outputs

- The Read command returns the current control value.
- The Test command returns the possible control values.

USING THE COMMANDS

5.1 POWER UP/POWER DOWN SUMMARY

Figure 8. below summarizes the AUDIO_OUT_ONOFF, KEYB_DRV, RS232 lines (Rx, CTS, DSR, DCD, RI, Tx, RTS, DTR) state while the c18-OEM-Module is powered up and powered down.

The c18-OEM-Module was placed inside the ADB board. The ADB board was connected to a PC running Hyper Terminal at a baud rate of 19200, and Hardware Flow Control.

The ADB was constantly POWERED ON from the Laboratory power supply with +4.3 v and GND leads.

Test Cases

1. The PWR button was pressed for 2 seconds, then released to power up.
2. The PWR button was pressed for 2 seconds, then released to power down.

Power Up Summary

1. A pulse of 2 seconds on the AUDIO_OUT_ON\OFF line (by momentary contact with ground) powers up the phone. As a result, the CTS line controlled by the DCE (c18 Module) has an increase in its TTL level for about 6-7 seconds. During this period the phone does not respond to AT commands.
2. When the TTL level of the CTS decreases, the phone responds to AT commands.
3. When releasing the PWR button on the rising edge of the AUDIO_OUT_ON_OFF line, the KEYB_DRV (pin 70 on the 70-pin connector) line changes from High to Low. This indicates that the c18 has started working.

Power Down Summary

1. A pulse of 2 seconds on the AUDIO_OUT_ONOFF line (by momentary contact with ground) powers down the phone. As a result, after 3-8 seconds (5 seconds on average), the KEYB_DRV line changes from Low to High. This indicates that the c18 is OFF.

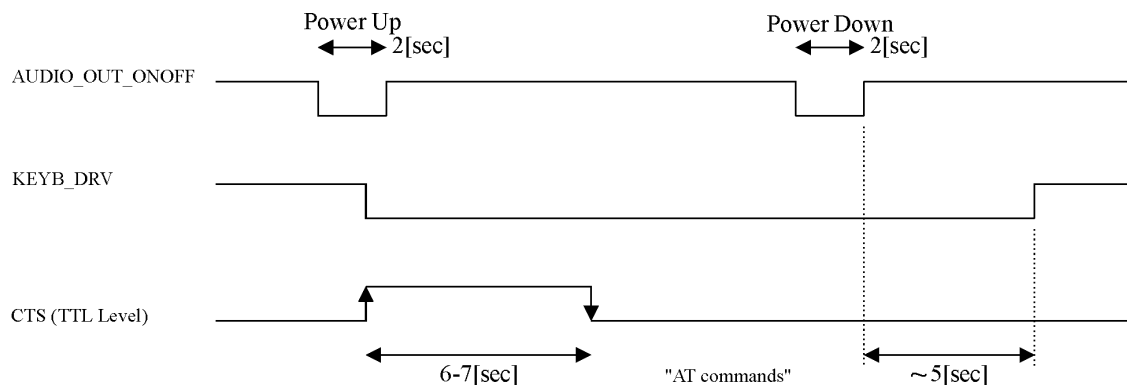


Figure 8. Power Up/Power Down

P1 board with ADB P1 (RS-232 sampled at their TTL levels (KEYD_DRV line was not supported by the ADB).

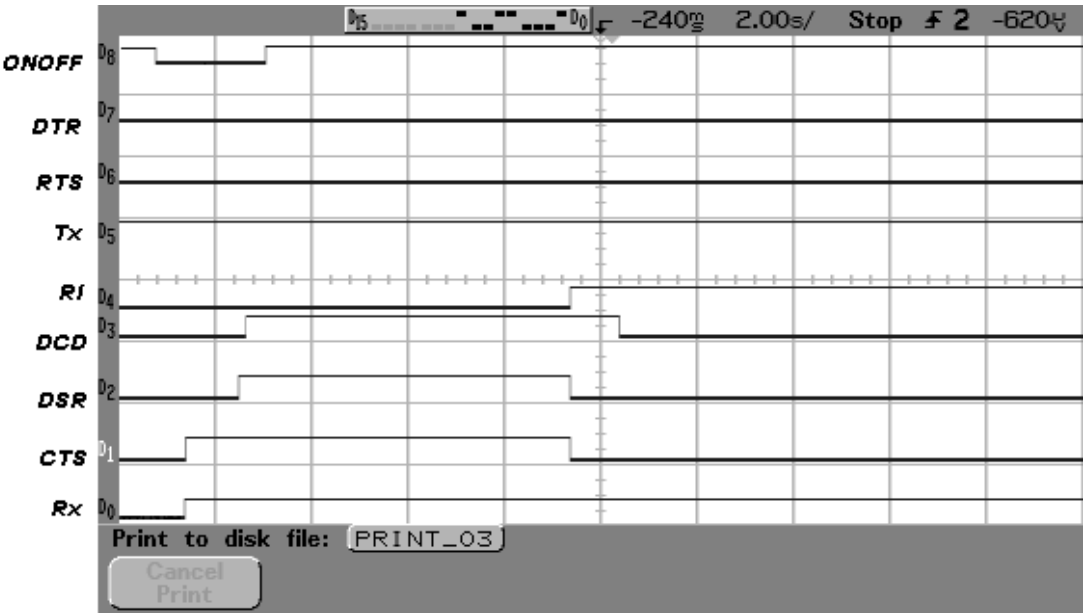


Figure 9. TTL Levels While the c18 is Powered from Off to On

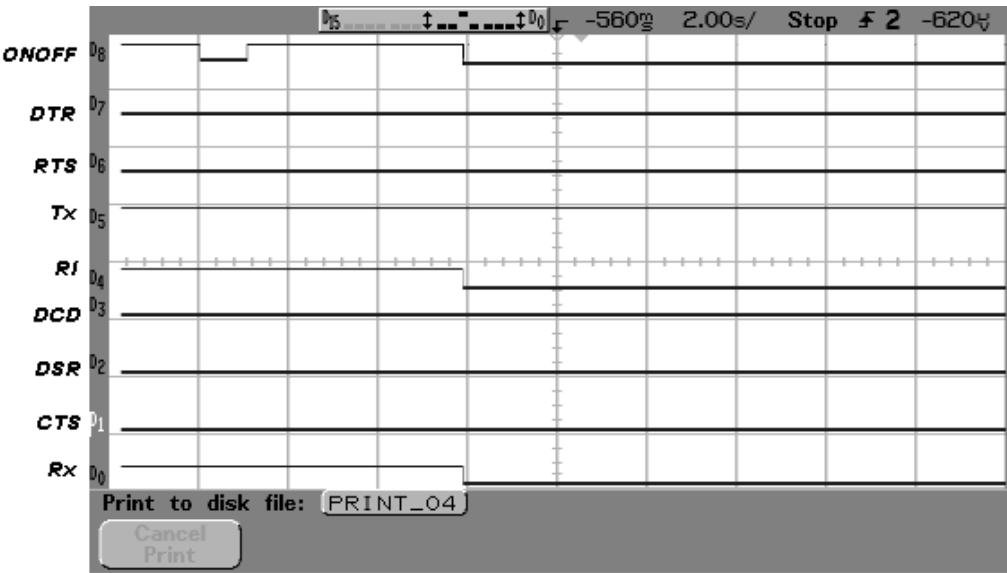


Figure 10. TTL Levels while the c18 is Powered from On to Off

Results: P2 board with ADB P2 -RS-232 levels

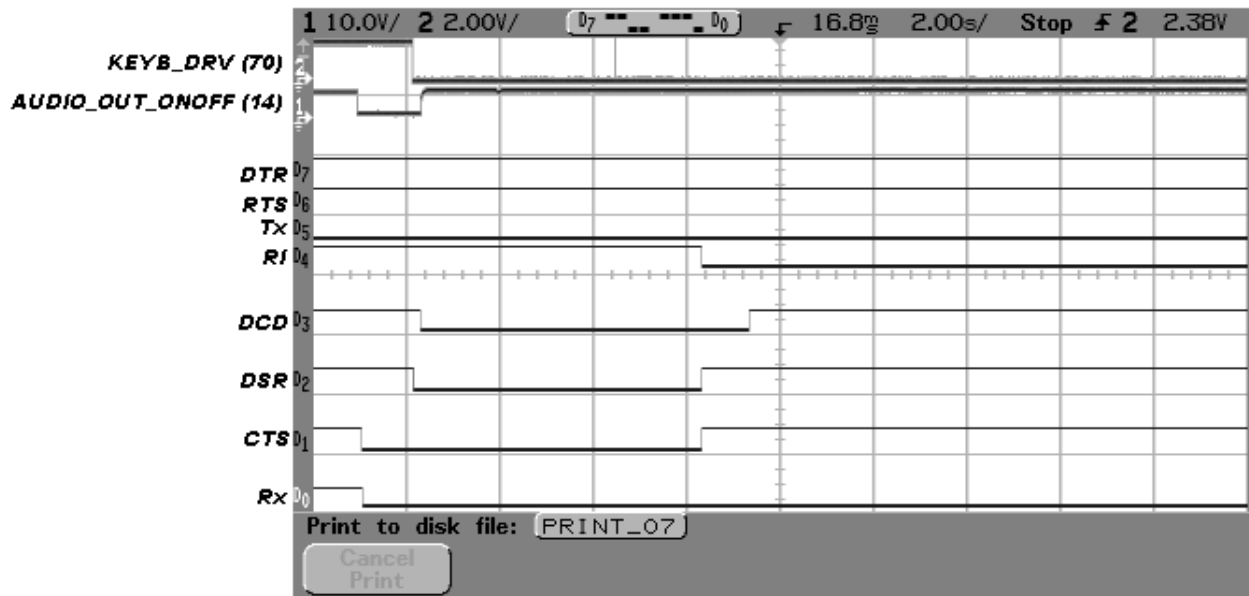


Figure 11. c18 Power Up from Off to On



Note

RS-232 lines sampled after TTL to RS-232 converter.

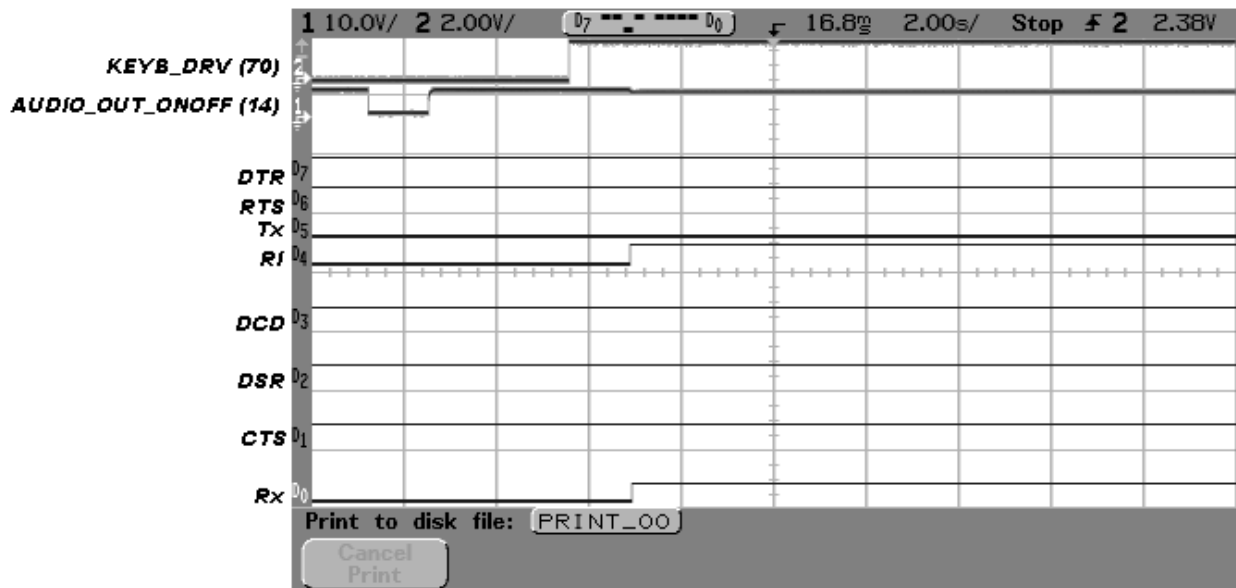


Figure 12. c18 Power Down from On to Off



Note

RS-232 lines sampled after TTL to RS-232 converter.

5.2 COMMANDS USAGE

5.2.1 Feedback from the System

This section provides general guidelines and some detail in regard to how to achieve various c18 functionality using the features of the c18 and the commands that are described in Chapter 4, “AT Commands Reference”, page 39.

AT Command	Response/Action	Remarks
at+cgmr	Returns the core software version string of the software contained within the SU.	+CGMR: "c18_X_0.9.0R"
at+cgmi	Provides hardware information.	+CGMI: Motorola CE, Copyright 2000.
at+cnum	Provides the subscriber number.	AT+CNUM +CNUM: ,2173848500,
at+cops?	Provides network operator information.	For example: +COPS: MA Type: CDMA Tag Name: , Network ID: 01 System ID: 8465
at+csq	Provides the signal strength indication.	Signal Quality Measure <SQM>: 0-31 Signal Quality Measurement (see the note on page 330). 99 SQM is not known or is not detectable. All other values are reserved.
at+cmee=1 or 2	Reports a mobile equipment error. It is recommended that this parameter always be set to 2.	0 Disabled. 1 Enabled. 2 Enabled.
at+cmer	Reports mobile equipment events to the TE.	For example, AT+CMER=0,0,1,1,0.

5.2.1.1 Test Results

The following table shows the test results for the CSQ, CIND and MSSSI commands.

Table 140. Test Results

Power	CSQ	CIND	MSSI
-120	99	1	1
-118	99	1	1
-116	3	1	1
-114	3	1	1

Table 140. Test Results (*Continued*)

Power	CSQ	CIND	MSSI
-112	4	1	1
-110	8	1	1
-108	8	1	1
-106	9	1	1
-105	9	1	1
-104	10	1	1
-102	11	2	25
-100	13	2	25
-98	14	2	25
-96	15	3	56
-95	16	3	56
-94	16	3	56
-92	17	3	56
-90	19	4	75
-88	20	4	75
-86	21	4	75
-85	21	4	75
-84	22	4	75
-82	23	5	90
-80	24	5	90
-78	26	5	90
-76	27	5	90
-75	28	5	90
-74	29	5	90
-72	31	5	90
-70	31	5	90
-68	31	5	90
-65	31	5	90
-60	31	5	90
-55	31	5	90
-50	31	5	90
-45	31	5	90
-40	31	5	90
-35	31	5	90
-21	31	5	90

5.3 ESTABLISHING A VOICE CALL

The following procedure lists the basic commands that must be sent to the c18 to establish a voice call.

AT Command	Response/Action	Remarks
	Power up the c18.	
At+mode=2	Moves the mode to 2 for a voice call.	OK.
ATD (phone number) or: AT*D (phone number) or: ATD> <index> or: ATD> <"name"> or: ATDS=n (n=0 to 3) or: ATD><"LIST TYPE">,INDEX	Dials the phone number (voice call). For example: ATD123456; ATD>102; or: ATD>"DAN" or: ATDS=1; or: ATDS=0 ATD>"DC",1	D:VOICE OK
Atdl	Redials the last number.	D:VOICE OK
Ath	Hangs up.	Note: In Multi-party calls, the ATH ends all the calls. At+chld = 12: which releases a second call in multiparty conversation.



Note

In a voice call, when the other side hangs up, DTE receives a "NO CARRIER" message. Only the second OK in a voice call notifies the user that the call was established.

5.4 ANSWERING A VOICE CALL

The following procedure lists the basic commands that must be sent to the c18 to answer a voice call.

AT Command	Response/Action	Remarks
	Power up the c18.	
ata	Answers the call.	

5.5 FINDING A PHONE BOOK ENTRY

The following procedure lists the basic commands that must be sent to the c18 to find a phone book entry.

AT Command	Response/Action	Remarks
	Power up the c18.	
at+cpbs="ME"	Enables the SU internal phone book memory.	
at+cpbf= "Name"	The c18 shows the number to the specified position +cpbf: xxx, "phone number", yyy, "Name of the entry".	NAME A string of up to 3 characters. <xxx> The position in the memory. 0-100 The phone memory. <yyy> 129 Normal number. 145 International number.

5.6 WRITING A PHONE BOOK ENTRY

AT Command	Response/Action	Remarks
	Power up the c18.	
at+cpbs="ME"	Enables the SU internal phone book memory.	
at+cpbw=xxx,"Phone number", yyy, "Name of the entry"	The c18 writes the number to the specified position.	<xxx> The position in the memory. 0-100 The phone memory. <yyy> 129 Normal number. 145 International number. If xxx is left empty, the entry is written to the next free place.

5.7 READING A PHONE BOOK ENTRY

AT Command	Response/Action	Remarks
	Power up the c18.	
at+cpbs="ME"	Enables the SU internal phone book memory.	
at+cpbr= xxx	The c18 shows the number on the specified position +CPBR: xxx, "phone number", yyy, "Name".	<xxx> The position in the memory. 0-100 The phone memory. <yyy> 129 Normal number. 145 International number.

5.8 PHONE BOOK FUNCTION

AT Command	Response/Action	Remarks
at+cpbs="NN"	This should be the first AT command used to select the phone book.	"FD" SIM fix dialing phone book. "LD" Last dialing phone book. "ME" ME phone book. "DD" Direct-dial phone book. "RC" ME received calls list. "MC" ME missed calls list.
at+cpbs?	For example, +CPBS: "ME"	
at+cpbs=?	+CPBS: ("FD", "LD", "ME", "MT", "SM", "DD", "RC", "MC") List of supported memory.	
at+cpbr= xxx	For example: at+cpbr=101 +CPBR: 101,"123456",129,"AVI"	<xxx> A number from 0 to 100, used to read from ME phone books. A number from 101 to 220, used to read from SIM phone books.

5.9 SENDING AN SMS

AT Command	Response/Action	Remarks
	Power up the c18.	
at+csms=<service>	Selects the message service response: +CSMS: <mt>,<mo>,<bm> +CSMS: 001,001,001 OK.	<Service> 0 for phase 2 The only <service> supported in the c18 is 128 (manufacturer specific). <mt>,<mo>,<bm> 0 Not supported 1 Supported
at+cpms="sm" AT+CPMS=<mem1>[,<mem2>[,<mem3>]] AT+CPMS="IM","OM","IM"	Selects the preferred message storage response: +CPMS:<used1>,<total1>,<used2>,<total2>,<used 3>,<total3> +CPMS: 2,10,3,10,2,10 +CPMS: 001,0015,001,015 OK.	<mem1> The memory from which SMSs are read and deleted. <mem2> The memory to which SMSs are written and sent. <mem3> The memory to which received SMSs are stored.
AT+CMGW=<da><CR> text is entered<ctrl-Z/ESC>	at+cmgw="054414588" > Hi Eli > How Are you? > By >+CMGW: 103OK	The message body ends with ^Z (CTRL Z).
AT+CMSS=<index>	+CMSS=<index> +CMSS: 4 OK	

A.1 MNAM ERROR RESULTS

Table 141 in this appendix provides a list of the MNAM error results.

Table 141. MNAM Error Results

Code	String Error Results
51	BAD AMPS HOME SYSTEM ID
52	BAD OPTION BYTE 1
53	BAD MIN
54	BAD MDN
55	BAD SCM
56	BAD AOC
57	BAD SERVICE LEVEL
58	BAD OPTION BYTE 2
59	BAD OPTION BYTE 3
60	BAD AMPS INIT PAGING CH
61	FIRST DED. CONTROL CH. SYS. A
62	FIRST DED. CONTROL CH. SYS. B
63	BAD NUMBER OF CHANNELS TO SCAN
64	BAD OPTION BYTE 4
65	BAD OPTION BYTE 5
66	BAD CDMA SLOT CYCLE INDEX
67	BAD CDMA SID 1

Table 141. MNAM Error Results (Continued)

Code	String Error Results
68	BAD CDMA NID 1
69	BAD IMSI MCC
70	BAD IMSI 11 12
71	BAD SYSTEM MODE
72	BAD VOCODER TYPE
73	BAD TRUE IMSI ADDR. NUM.
74	BAD TRUE IMSI STATUS
75	BAD TRUE IMSI PROG/DEPROG
76	BAD TRUE IMSI MIN
77	BAD TRUE IMSI MCC
78	BAD TRUE IMSI 11 12
79	BAD CDMA PRIMARY CH. SYS. A
80	BAD CDMA PRIMARY CH. SYS. B
81	BAD CDMA SECONDARY CH. SYS. A
82	BAD CDMA SECONDARY CH. SYS. B

A

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 - \$QCMIP, Enable /Disable Mobile IP 300
 - \$QCMIP, Enables/Disables Mobile IP 252
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 - \$qcs0=X, Service Option Set Settings 250
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 - +CGMI, Request Manufacturer ID 40
 - +CGMM, Request Model 40
 - +CGMR Request Revision 42
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 - +CHV, Hang-up Voice Call 55
 - +CIMI, Request IMSI 45
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- +FBO, Phase-C Data-Bit-Order Parameter 235
- +FBS, Buffer Size 235
- +FBU, HDLC-Frame-Reporting Parameter 235
- +FCC, DCE-Capabilities Parameters 235
- +FCLASS, Service-Class Selection Parameter 235
- +FCQ, Copy-Quality-Checking Parameter 234
- +FCR, Capability-to-Receive Parameter 234
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- +FLI, Local-ID String Parameter 233
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- +FLP, Indicate-Document-to-Poll Parameter 233
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- +FMR, Report Revision ID 235
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- +FNR, Negotiation-Message-Reporting Parameter 234
- +FNS, Nonstandard-Frame FIF Parameter 234
- +FPA, Selective Polling Address Parameter 234
- +FPI, Local-Polling ID-String Parameter 234
- +FPR, Serial-Port Rate Control Parameter 234
- +FPS, Page Status Parameter 234
- +FPW, Password Parameter 234
- +FRY, ECM-Retry Value Parameter 234
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