Developer's Guide

Motorola c18 AT Commands

98-08901C65-A

MOTOROLA
intelligence everywhere™

REVISION HISTORY

Revision	Date	Purpose
O	June 2003	Initial Release
A	November 2003	Updates to existing AT commands. Addition of new AT commands.

MOTOROLA

c18 AT Commands

CONTENTS

November 2003
98-08901C65-A

USING THE COMMANDS

LIST OF FIGURES

LIST OF TABLES

PREFACE

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.

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:	• IS707: Max BR 14.4 Kbps • IS95B: Max BR 64 Kbps
SMS:	• 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	

Table 1. Product Specifications *(Continued)*

Features over RS-232
Embedded TCP/IP stack
AT Command Set
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.	51
$QCCLR	This command clears the mobile error log.	197
$QCDMG	This command enables the transition to Diagnostics Monitor (DM) operation.	204
$QCDMR=	This command sets the DM baud rate.	202
$QCMDR=	This command sets the Medium Data Rate (MDR) (also known as HSPD) setting.	201
$QCMIP	This command enables/disables Mobile IP functionality in the mobile.	209
$QCMIPP	This command selects the MIP user profile to be active.	209
$QCMIPT	This command enables/disables the use of rfc2002bis authentication.	208
$QCPKND	This command enables/disables automatic packet detection after a dial command.	211
$QCQNC	This command enables/disables Quick Net Connect (QNC).	204
$qcqnc=	This command enables/disables QNC capability.	207
$QCSCRM	This command enables/disables the mobile from SCRM'ing.	201
$qcscrm=	This command enables/disables IS2000 mobiles from SCRM'ing.	205
$qcso=	This command sets the service option settings.	206
$QCTRTL	This command enables/disables R-SCH throttling.	211
$qctrtl=	This command enables/disables IS2000 mobiles from throttling the R-SCHF.	205
$QCVAD=	This command responds to a page message that has a voice service option with a page response that has a data service option.	212
&C	This command provides information about the state of the DCE communications channel.	129
&D	This command drops the DCE communications channel.	130
&F	This command causes the configuration stored in the phone to revert to the configuration specified by the manufacturer's factory default setting.	151

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

AT Command	Description	Page
&V	This command dumps the status of all AT parameters.	151
+ MMRR	This unsolicited message is sent to the TE by the SU if a master reset occurs, and master reset events reporting is enabled.	186
+CBC	This command allows an accessory to query the charge level of the battery.	131
+CCFC	This command controls the call forwarding supplementary service. Activation, deactivation, and status query are supported.	72
+CCLK	This command reads/sets the SU's current date and time settings.	109
+CCWA	This command shall enable/disable the Call Waiting notification unsolicited result code.	77
+CDV	This command dials voice calls.	52
+CFC	This command returns the interface fax compression.	192
+CGMI	This command requests the manufacturer's identification.	38
+CGMM	This command requests the model's identification.	38
+CGMR	This command requests the revision's identification.	39
+CGSN	This command returns the serial number of the product, in decimal format only.	40
+CHLD	This command controls call-related services, such as HOLD and MPTY.	73
+CHUP	This command rejects an incoming call or hangs up a selected voice or data call, regardless of whether the accessory initiated the call.	47
+CHV	This command hangs up voice calls.	52
+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.	186
+CIMI	This command returns a text string that identifies the SU.	42
+CIMSI	This command enables a terminal to set the MT2 active IMSI.	199
+CIND	This command enables an accessory to request the status of certain display indicators currently available in the SU.	54
+CKEV	This command sends unsolicited messages when local key press echo is enabled and a key is pressed on the SU keypad.	187

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

AT Command	Description	Page
+CKPD	This command enables the emulated pressing of keys as if entered from the SU keypad or from a remote handset.	177
+CLCC	This command returns the list of current calls on the ME.	82
+CLIP	This command enables or disables the presentation of the CLI (Calling Line Identity) at the TE.	70
+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.	85
+CME	This command contains the codes that are returned for extended error status in response to a command that failed.	164
+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.	167
+CMER	This command enables an external accessory to receive key press information from the SU internal keypad.	181
+CMGD	This command enables the accessory to delete messages from the preferred SU message storage <mem1> location <index>.	111
+CMGF	This command sets the type of input and output format of message to use.	116
+CMGL	This command enables the accessory to read a list of all SMS messages with status value <stat> from SU message storage <mem1>.	119
+CMGR	This command enables the accessory to read SMS messages from the SU.	121
+CMGW	This command stores a message to memory storage <mem2>.	124
+CMS	This command contains the codes that are returned for extended error status in response to an SMS command that failed.	163
+CMSS	This command selects a pre-stored message from message storage <mem2> and sends it.	112
+CMTI	This command sends a message to the accessory upon receipt of an SMS message.	118
+CMUT	This command enable/disables muting during a voice call.	148
+CNMI	This command enables unsolicited notification of the accessory when an SMS message is received by the SU.	110

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

AT Command	Description	Page
+CNUM	This command returns the numbers entered by the subscriber into “My Phone Numbers” using the Handset menu.	43
+COLP	This command gets and changes the current setting of the Calling Line Presentation.	76
+COPS	This command enables an application to query the current Carrier Name (which would be displayed if the standard display were attached).	127
+CPARM	This command gets/sets the cellular system parameters.	173
+CPAS	This command returns the activity status of the MT.	80
+CPBF	This command enables the accessory to search for a specified entry, by name, in the phone book.	100
+CPBR	This command recalls information from the phone book by location number.	96
+CPBS	This command selects the memory to be used for reading and writing entries.	95
+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.	101
+CPMS	This command selects the memory storages <mem1>, <mem2>, and <mem3> to be used for various functions, such as reading or writing.	114
+CRC	This command controls whether to present the extended format of an incoming call indication.	67
+CREG	This command enables/disables an unsolicited result code from network status registration.	125
+CRING	This command generates a message whenever an incoming call (voice, data or fax) is indicated by the cellular network.	69
+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.	132
+CSCA	This GSM 07.05 command is used to update the Service Center Address. This field is required on GSM platform only.	124
+CSCS	This command selects the character set used on the SU.	41
+CSDH	This command controls whether detailed header information is shown in the text mode result code.	117
+CSMS	This command selects the message service and returns the types of messages that are supported by the ME.	113

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

AT Command	Description	Page
+CSO	This command specifies the service to be requested for the next originated or terminated call.	59
+CSQ	This command returns the Signal Quality Measure <SQM> and the Frame Error Rate <FER>.	127
+CSS?	This command returns the kind of system with which the g20 is registered.	53
+CTTY	This command controls the TTY supplementary service.	198
+CVHU	This command hangs up the call that is currently in progress, regardless of whether the accessory initiated the call.	47
+EB	This parameter controls the behavior of the V.42 operation on the PSTN link (if present in the IWF).	164
+FAA	This command returns the adaptive answer parameter.	192
+FAP	This command returns the addressing and polling capabilities parameter.	192
+FBO	This command returns the Phase-C data-bit-order parameter.	192
+FBS	This command returns the buffer size parameter.	192
+FBU	This command returns the HDLC-frame-reporting parameter.	192
+FCC	This command returns the DCE-capabilities parameters.	192
+FCLASS	This command returns the service class selection parameter.	192
+FCQ	This command returns the copy-quality-checking parameter.	192
+FCR	This command returns the cabability-to-receive parameter.	192
+FCS	This command returns the current-session results parameter.	192
+FCT	This command returns the DTE Phase-C timeout parameter.	192
+FEA	This command returns the Phase-C timeout parameter.	192
+FFC	This command returns the format-conversion parameter.	192
+FHS	This command returns the call-termination-status parameter.	192
+FIE	This command returns the procedure-interupt-enable parameter.	192
+FIS	This command returns the current-session negotiation parameter.	192

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

AT Command	Description	Page
+FKS	This command terminates the session.	192
+FLI	This command returns the local-ID-string parameter.	192
+FLO	This command returns the flow-control-select parameter.	192
+FLP	This command returns the indicate-document-to-poll parameter.	192
+FMI	This command requests the manufacturer's identification.	37
+FMM	This command requests the model's identification.	38
+FMR	This command requests the revision's identification.	39
+FMR	This command returns the revision identification.	39
+FMS	This command returns the minimum-Phase-C speed parameter.	192
+FNR	This command returns the negotiation-message-reporting control parameter.	192
+FNS	This command returns the nonstandard-frame FIF parameter.	192
+FPA	This command returns the selective polling address parameter.	192
+FPI	This command returns the local-polling-ID-string parameter.	192
+FPR	This command returns the serial-port-rate-control parameter.	192
+FPS	This command returns the page-status parameter.	192
+FPW	This command returns the password parameter for sending or polling.	192
+FRY	This command returns the ECM-retry-value parameter.	192
+FSA	This command returns the subaddress parameter.	192
+FSP	This command returns the request-to-poll parameter.	192
+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.	129
+GMI	This command requests the manufacturer's identification.	37
+GMM	This command requests the model's identification.	38
+GMR	This command requests the revision's identification.	39

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

AT Command	Description	Page
+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.	203
+GSN	This command requests the MT2 device's identification.	40
+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.	197
+IFC	This parameter controls the local flow control between the TE2 and MT2 [1].	194
+ILRR	This parameter controls whether the extended-format information text is transmitted from the MT2 to the TE2.	197
+IPR	This parameter specifies the data rate at which the MT2 accepts commands.	194
+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.	147
+MAID	This command returns the list of features available in the SU.	44
+MAMS	This command enables the host application to set the audio mode selection during a call.	145
+MAPC	This command sends an unsolicited message when asynchronous audio path change reporting is enabled and the audio path is changed.	144
+MAPS	This command sets and reports the radio's audio processing states.	140
+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).	145
+MAPV	This command returns the version of the accessory protocol that is supported in the SU.	46
+MARD	This command enables and disables the auto-redial capability of the SU.	51
+MARS	This command reports when auto redial starts or ends, when auto redial reporting is enabled.	50
+MASS	This command enables/disables the reporting of hands-free audio start/stop messages.	139
+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.	143
+MCHS	This private AT command reports radio's channel status.	183

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

AT Command	Description	Page
+MCRS	This command changes and displays the current ring style.	136
+MCST?	This command queries the call processing state.	79
+MDBAD	This command sets/reads the auto-delete user preference setting in the date book database.	108
+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	105
+MDBR	This command reads an entry or range of entries stored in the date book.	106
+MDBW	This command writes an entry to the date book.	104
+MDBWE	This command modifies event exception data for an entry in the date book.	103
+MEGA	This command updates the Email Gateway Address.	116
+MGCB	This command returns the current cellular band for which the radio is registered to.	184
+MHCS	This command indicates the state of an external handset or cradle to the SU.	174
+MHFP	This command is used for reporting current flip state synchronous or asynchronous.	182
+MHIG	This command allows an intelligent car kit to indicate the ignition state of the vehicle to the SU.	176
+MHMN	This command returns radio's home network name.	176
+MKPD	This command enables the accessories to control the press and release of key presses.	180
+MLCK	This command locks the phone after the appropriate unlock code has been provided.	149
+MLKC	This unsolicited message is sent when the asynchronous phone lock status change event reporting is enabled and the phone lock status is changed.	185
+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".	123
+MMDL	This command enables the accessory to request a mute/un-mute of the downlink audio paths.	142
+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).	120

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

AT Command	Description	Page
+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.	122
+MMTC	This command sends an unsolicited message when asynchronous microphone mute status change reporting is enabled, and the microphone mute status is changed.	141
+MNAM	This command gets/sets the NAM parameters.	168
+MNAM2	This command gets/sets the NAM2 parameters.	169
+MNAM3	This command gets/sets the NAM3 parameters.	170
+MODE	This command selects an operating mode on the selected serial connection.	195
+MOON	This command enables the accessory to obtain information about the current operating mode of the SU.	200
+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.	100
+MPBFN	This command allows the accessory to search in the phone book for a particular entry, by phone number.	90
+MPBR	This command recalls phone entries from the phone book by location number.	97
+MPBSC	This command reads an entry from the phone book via scrolling.	87
+MPBSCS	This command selects the sort order (alphabetical, by index, and so on) for phone book scroll operations.	89
+MPBVR	This command reads global data, model data or voice data for a phone book entry(ies).	91
+MPBVW	This command writes global data, model data or voice data for phone book entry(ies).	93
+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.	102
+MPDPM	This command reads the percentage of shared dynamic memory used in the phone book and date book.	46
+MPIN	This command enables the accessory application to unlock the phone when the appropriate unlock code has been provided.	149
+MSSI?	This command requests signal strength information.	49

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

AT Command	Description	Page
+MUPB	This command sends the output when a phone book entry is accessed or modified by the user or an accessory.	188
+MVMN	This command enables the user to change the voice mail number of the phone.	48
+SNAM	Selects/reads the current active NAM to which the NAM data will be written/retrieved using AT+MNAM [x].	172
+VTD	This command sets the value of an integer <duration>, which defines the length of tones emitted as a result of the +VTS command.	138
+VTS	This command allows the transmission of a list of specified DTMF tones.	136
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.	66
AT&W	This command stores 3 parameter values into the NV.	161
CLCK	This command locks, unlocks or queries an ME or network facility <fac>.	56
D/DV	This command places a fax/data/voice call on the current network.	60
D>	This command places a fax/data/voice call on the current network by dialing directly from the ME phone book.	62
DL	This command places a data/voice call to the last number dialed.	65
DS	This command retrieves a dial number from the user profile stored in the memory.	62
E	This command determines whether the TA echoes characters received from the TE during command state and on-line state.	153
H	This command hangs up a single mode call.	65
L	This command monitors the speaker volume.	189
M	This command monitors the speaker mode.	190
P	This command selects pulse dialing.	191
Q	This command enables/disables the DCE to transmit result codes to the DTE	153
S0	This S-parameter controls the automatic answering feature for the voice/data calls to the SU.	155
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.	159

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

AT Command	Description	Page
S11	This register provides the DTMF tone duration and spacing.	160
S3	This register returns the carriage return character.	156
S4	This register provides the response formatting/line feed code character.	156
S5	This register provides the backspace character.	157
S6	This register pauses before blind dialing.	157
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.	158
S8	This register is used by the IWF in multi-stage dialing to time the period of the “,” dial modifier.	158
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.	159
V	This command returns the DCE response format.	152
X	This command selects the result codes and monitors the call progress.	154
Z	This register resets the phone to the default configuration.	160

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.	37
+FMI	This command requests the manufacturer's identification.	37
+CGMI	This command requests the manufacturer's identification.	38
+GMM	This command requests the model's identification.	38
+FMM	This command requests the model's identification.	38
+CGMM	This command requests the model's identification.	38
+GMR	This command requests the revision's identification.	39
+CGMR	This command requests the revision's identification.	39
+FMR	This command requests the revision's identification.	39
+CGSN	This command returns the serial number of the product, in decimal format only.	40
+GSN	This command requests the MT2 device's identification.	40
+CSCS	This command selects the character set used on the SU.	41
+CIMI	This command returns a text string that identifies the SU.	42
+CNUM	This command returns the numbers entered by the subscriber into "My Phone Numbers" using the Handset menu.	43
Capability Reporting		
+MAID	This command returns the list of features available in the SU.	44
+MAPV	This command returns the version of the accessory protocol that is supported in the SU.	46
+MPDPM	This command reads the percentage of shared dynamic memory used in the phone book and date book.	46

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.	77
+CSO	This command specifies the service to be requested for the next originated or terminated call.	59
+CVHU	This command hangs up the call that is currently in progress, regardless of whether the accessory initiated the call.	47
+CHUP	This command rejects an incoming call or hangs up a selected voice or data call, regardless of whether the accessory initiated the call.	47
+MVMN	This command enables the user to change the voice mail number of the phone.	48
+MSSI?	This command requests signal strength information.	49
+MARS	This command reports when auto redial starts or ends, when auto redial reporting is enabled.	50
+MARD	This command enables and disables the auto-redial capability of the SU.	51
$QCCAV	This command provides a means to answer an incoming voice call using an AT command.	51
+CHV	This command hangs up voice calls.	52
+CDV	This command dials voice calls.	52
+CSS?	This command returns the kind of system with which the g20 is registered.	53
+CIND	This command enables an accessory to request the status of certain display indicators currently available in the SU.	54
CLCK	This command locks, unlocks or queries an ME or network facility <fac>.	56
+CSO	This command specifies the service to be requested for the next originated or terminated call.	59
D/DV	This command places a fax/data/voice call on the current network.	60
DS	This command retrieves a dial number from the user profile stored in the memory.	62
D>	This command places a fax/data/voice call on the current network by dialing directly from the ME phone book.	62

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

AT Command	Description	Page
DL	This command places a data/voice call to the last number dialed.	65
H	This command hangs up a single mode call.	65
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.	66
+CRC	This command controls whether to present the extended format of an incoming call indication.	67
+CRING	This command generates a message whenever an incoming call (voice, data or fax) is indicated by the cellular network.	69
+CLIP	This command enables or disables the presentation of the CLI (Calling Line Identity) at the TE.	70
+CCFC	This command controls the call forwarding supplementary service. Activation, deactivation, and status query are supported.	72
+CHLD	This command controls call-related services, such as HOLD and MPTY.	73
+COLP	This command gets and changes the current setting of the Calling Line Presentation.	76
Call Status Messages		
+MCST?	This command queries the call processing state.	79
+CPAS	This command returns the activity status of the MT.	80
+CLCC	This command returns the list of current calls on the ME.	82
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.	85
Phone and Date Books		
Directory Access Commands (Phone Book)		
+MPBSC	This command reads an entry from the phone book via scrolling.	87
+MPBSCS	This command selects the sort order (alphabetical, by index, and so on) for phone book scroll operations.	89
+MPBFN	This command allows the accessory to search in the phone book for a particular entry, by phone number.	90

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).	91
+MPBVW	This command writes global data, model data or voice data for phone book entry(ies).	93
+CPBS	This command selects the memory to be used for reading and writing entries.	95
+CPBR	This command recalls information from the phone book by location number.	96
+MPBR	This command recalls phone entries from the phone book by location number.	97
+CPBF	This command enables the accessory to search for a specified entry, by name, in the phone book.	100
+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.	100
+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.	101
+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.	102
Date Book Access Commands		
+MDBWE	This command modifies event exception data for an entry in the date book.	103
+MDBW	This command writes an entry to the date book.	104
+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	105
+MDBR	This command reads an entry or range of entries stored in the date book.	106
+MDBAD	This command sets/reads the auto-delete user preference setting in the date book database.	108
System Date and Time Access Commands		
+CCLK	This command reads/sets the SU's current date and time settings.	109

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.	110
+CMGD	This command enables the accessory to delete messages from the preferred SU message storage <mem1> location <index>.	111
+CMSS	This command selects a pre-stored message from message storage <mem2> and sends it.	112
+CSMS	This command selects the message service and returns the types of messages that are supported by the ME.	113
+CPMS	This command selects the memory storages <mem1>, <mem2>, and <mem3> to be used for various functions, such as reading or writing.	114
+CMGF	This command sets the type of input and output format of message to use.	116
+MEGA	This command updates the Email Gateway Address.	116
+CSDH	This command controls whether detailed header information is shown in the text mode result code.	117
+CMTI	This command sends a message to the accessory upon receipt of an SMS message.	118
+CMGL	This command enables the accessory to read a list of all SMS messages with status value <stat> from SU message storage <mem1>.	119
+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).	120
+CMGR	This command enables the accessory to read SMS messages from the SU.	121
+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.	122
+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”.	123
+CSCA	This GSM 07.05 command is used to update the Service Center Address. This field is required on GSM platform only.	124

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

AT Command	Description	Page
+CMGW	This command stores a message to memory storage <mem2>.	124
Network Service		
Network Service Commands		
+CREG	This command enables/disables an unsolicited result code from network status registration.	125
+COPS	This command enables an application to query the current Carrier Name (which would be displayed if the standard display were attached).	127
+CSQ	This command returns the Signal Quality Measure <SQM> and the Frame Error Rate <FER>.	127
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.	129
&C	This command provides information about the state of the DCE communications channel.	129
&D	This command drops the DCE communications channel.	130
+CBC	This command allows an accessory to query the charge level of the battery.	131
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.	132
+MCRS	This command changes and displays the current ring style.	136
+VTS	This command allows the transmission of a list of specified DTMF tones.	136
+VTD	This command sets the value of an integer <duration>, which defines the length of tones emitted as a result of the +VTS command.	138
+MA Audio Control Commands		
+MASS	This command enables/disables the reporting of hands-free audio start/stop messages.	139

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

AT Command	Description	Page
+MAPS	This command sets and reports the radio's audio processing states.	140
+MMTC	This command sends an unsolicited message when asynchronous microphone mute status change reporting is enabled, and the microphone mute status is changed.	141
+MMDL	This command enables the accessory to request a mute/un-mute of the downlink audio paths.	142
+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.	143
+MAPC	This command sends an unsolicited message when asynchronous audio path change reporting is enabled and the audio path is changed.	144
+MAMS	This command enables the host application to set the audio mode selection during a call.	145
+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).	145
+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.	147
+CMUT	This command enable/disables muting during a voice call.	148
Access		
Access Control Commands		
+MLCK	This command locks the phone after the appropriate unlock code has been provided.	149
+MPIN	This command enables the accessory application to unlock the phone when the appropriate unlock code has been provided.	149
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.	151
&V	This command dumps the status of all AT parameters.	151
AT&W	This command stores 3 parameter values into the NV.	161
V	This command returns the DCE response format.	152

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

AT Command	Description	Page
Q	This command enables/disables the DCE to transmit result codes to the DTE	153
E	This command determines whether the TA echoes characters received from the TE during command state and on-line state.	153
X	This command selects the result codes and monitors the call progress.	154
S0	This register disables automatic answering, and enables automatic answering after (Value - 1) × 6 sec.	155
S3	This register returns the carriage return character.	156
S4	This register provides the response formatting/line feed code character.	156
S5	This register provides the backspace character.	157
S6	This register pauses before blind dialing.	157
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.	158
S8	This register is used by the IWF in multi-stage dialing to time the period of the “,” dial modifier.	158
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.	159
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.	159
S11	This register provides the DTMF tone duration and spacing.	160
Z	This register resets the phone to the default configuration.	160
Error Handling Commands		
+CMS	This command contains the codes that are returned for extended error status in response to an SMS command that failed.	163
+EB	This parameter controls the behavior of the V.42 operation on the PSTN link (if present in the IWF).	164
+CME	This command contains the codes that are returned for extended error status in response to a command that failed.	164
+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.	167
MNAM Programming		

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

AT Command	Description	Page
+MNAM	This command gets/sets the NAM parameters.	168
+MNAM2	This command gets/sets the NAM2 parameters.	169
+MNAM3	This command gets/sets the NAM3 parameters.	170
+SNAM	Selects/reads the current active NAM to which the NAM data will be written/retrieved using AT+MNAM [x].	172
+CPARM		
+CPRAM	This command gets/sets the cellular system parameters.	173
User Interface		
+MH Handset Status/Control		
+MCHS	This private AT command reports radio's channel status.	183
MGCB	This command returns the current cellular band for which the radio is registered to.	184
+MHCS	This command indicates the state of an external handset or cradle to the SU.	174
+MHFP	This command is used for reporting current flip state synchronous or asynchronous.	182
+MHMN	This command returns radio's home network name.	176
+MHIG	This command allows an intelligent car kit to indicate the ignition state of the vehicle to the SU.	176
+CKPD	This command enables the emulated pressing of keys as if entered from the SU keypad or from a remote handset.	177
+MKPD	This command enables the accessories to control the press and release of key presses.	180
+CMER	This command enables an external accessory to receive key press information from the SU internal keypad.	181
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.	185
+ MMRR	This unsolicited message is sent to the TE by the SU if a master reset occurs, and master reset events reporting is enabled.	186

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.	186
+CKEV	This command sends unsolicited messages when local key press echo is enabled and a key is pressed on the SU keypad.	187
+MUPB	This command sends the output when a phone book entry is accessed or modified by the user or an accessory.	188
NOP Compatible		
"Ignored" (Compatible Only) Commands		
L	This command monitors the speaker volume.	189
M	This command monitors the speaker mode.	190
P	This command selects pulse dialing.	191
Fax		
Fax Commands		
+CFC	This command returns the interface fax compression.	192
+FKS	This command terminates the session.	192
+FIE	This command returns the procedure-interupt-enable parameter.	192
+FIS	This command returns the current-session negotiation parameter.	192
+FLI	This command returns the local-ID-string parameter.	192
+FLO	This command returns the flow-control-select parameter.	192
+FLP	This command returns the indicate-document-to-poll parameter.	192
+FMS	This command returns the minimum-Phase-C speed parameter.	192
+FNR	This command returns the negotiation-message-reporting control parameter.	192
+FNS	This command returns the nonstandard-frame FIF parameter.	192
+FPA	This command returns the selective polling address parameter.	192
+FPI	This command returns the local-polling-ID-string parameter.	192

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

AT Command	Description	Page
+FPR	This command returns the serial-port-rate-control parameter.	192
+FPS	This command returns the page-status parameter.	192
+FPW	This command returns the password parameter for sending or polling.	192
+FRY	This command returns the ECM-retry-value parameter.	192
+FSA	This command returns the subaddress parameter.	192
+FSP	This command returns the request-to-poll parameter.	192
+FHS	This command returns the call-termination-status parameter.	192
+FFC	This command returns the format-conversion parameter.	192
+FEA	This command returns the Phase-C timeout parameter.	192
+FCT	This command returns the DTE Phase-C timeout parameter.	192
+FCS	This command returns the current-session results parameter.	192
+FCR	This command returns the cabability-to-receive parameter.	192
+FCQ	This command returns the copy-quality-checking parameter.	192
+FCC	This command returns the DCE-capabilities parameters.	192
+FBU	This command returns the HDLC-frame-reporting parameter.	192
+FBS	This command returns the buffer size parameter.	192
+FBO	This command returns the Phase-C data-bit-order parameter.	192
+FAP	This command returns the addressing and polling capabilities parameter.	192
+FAA	This command returns the adaptive answer parameter.	192
+FCLASS	This command returns the service class selection parameter.	192
+FMR	This command returns the revision identification.	39
+IPR	This parameter specifies the data rate at which the MT2 accepts commands.	194
+IFC	This parameter controls the local flow control between the TE2 and MT2 [1].	194
Interface		

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

AT Command	Description	Page
Interface Commands		
+MODE	This command selects an operating mode on the selected serial connection.	195
$QCCLR	This command clears the mobile error log.	197
+ILRR	This parameter controls whether the extended-format information text is transmitted from the MT2 to the TE2.	197
+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.	197
+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 TYY status. The Test command returns values supported by the TA as a compound value.	198
Information and Identification		
Information and Identification Commands		
+CIMSI	This command enables a terminal to set the MT2 active IMSI.	199
+MOON	This command enables the accessory to obtain information about the current operating mode of the SU.	200
$QCSCRM	This command enables/disables the mobile from SCRM'ing.	201
$QCMDR=	This command sets the Medium Data Rate (MDR) (also known as HSPD) setting.	201
$QCDMR=	This command sets the DM baud rate.	202
+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.	203
Data Capability		
Data Capability Commands		
$QCQNC	This command enables/disables Quick Net Connect (QNC).	204
$QCDMG	This command enables the transition to Diagnostics Monitor (DM) operation.	204
$qctrtl=	This command enables/disables IS2000 mobiles from throttling the R-SCHF.	205
$qcscrm=	This command enables/disables IS2000 mobiles from SCRM'ing.	205

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

AT Command	Description	Page
$qcso=	This command sets the service option settings.	206
$qcqnc=	This command enables/disables QNC capability.	207
$QCMIPT	This command enables/disables the use of rfc2002bis authentication.	208
$QCMIPP	This command selects the MIP user profile to be active.	209
$QCMIP	This command enables/disables Mobile IP functionality in the mobile.	209
$QCTRTL	This command enables/disables R-SCH throttling.	211
$QCPKND	This command enables/disables automatic packet detection after a dial command.	211
$QCVAD=	This command responds to a page message that has a voice service option with a page response that has a data service option.	212
$QCSO=	This command saves the Data Service Option number to non-volatile memory.	213
$QCMTOM	This command originates a Mobile-to-Mobile Packet Data call using a QUALCOMM proprietary Service Option number.	214
+CTA	This command sets/reads/tests the U_m packet data inactivity timer.	214
+CAD?	This command queries the analog or digital service.	216
+CDR	This command controls whether the extended-format +CDR: intermediate result code is transmitted by the MT2.	216
+CDS	This parameter controls the V.42bis data compression function on the U_m interface.	217
+CRM	This command enable the user to set the protocol on the R_m interface.	219
+CQD	This command sets the timer value that specifies the period of inactivity before a data call is released.	220
+CMIP?	This command returns the mobile station’s temporary IP address.	221
+CBIP?	This command returns the base station’s temporary IP address.	221
+CMUX	This command sets the multiplex option to be proposed during the service negotiation procedures for connecting a STU-III secure service option.	222
+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.	223
+CXT	This command controls the handling of unrecognized commands by the MT2.	223

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

AT Command	Description	Page
MV18S	This command controls the manner of operation of the V.18 capabilities (if present in the IWF).	225
+MV18R	This command controls whether the extended-format +MV18R: result code is transmitted from the IWF to the mobile station.	226
+MS	This command controls the manner of operation of the modulation capabilities in the IWF.	227
+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.	227
+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.	227
+ETBM	This command designates the action for data that remains in the DCE internal buffers when a call is terminated.	228
+ESR	This command controls the use of the selective repeat (SREJ) option in V.42 on the PSTN link (if present in the IWF).	229
+ES	This command controls the manner of operation of the V.42 protocol on the PSTN link (if present in the IWF).	230
+ER	This command controls whether the extended-format +ER: intermediate result code is transmitted from the IWF over the U_m interface.	232
+DS	This command controls the V.42bis data compression function on the PSTN link if provided in the IWF.	233
+DR	This command controls whether the extended-format +DR: intermediate result code is transmitted from the IWF over the U_m interface.	234
+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).	235
TCP/IP		
TCP/IP Commands		
$QCPREV	This command returns the protocol revision in use.	236
$QCRLPD	This command dumps the RLP statistics in ASCII format to the TE2.	236
$QCRLPR	This command zeroes all the RLP statistics counters.	237
$QCPPPD	This command dumps the PPP statistics in ASCII format to the TE2.	238

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

AT Command	Description	Page
$QCPPPR	This command zeroes all the PPP statistics counters.	238
$QCIPD	This command dumps the IP statistics in ASCII format to the TE2.	239
$QCIPR	This command zeroes all the IP statistics counters.	240
$QCUDPD	This command dumps the UDP statistics in ASCII format to the TE2.	240
$QCUDPR	This command zeroes all the UDP statistics counters.	241
$QCTCPD	This command dumps the TCP statistics in ASCII format to the TE2.	241
$QCTCPR	This command zeroes all the TCP statistics counters.	242
$QCRL3D	This command dumps the RLP 3 statistics in ASCII format to the TE2.	242
$QCRL3R	This command zeroes all of the RLP 3 statistics counters.	243

3.1 AT COMMAND SET PROTOCOL

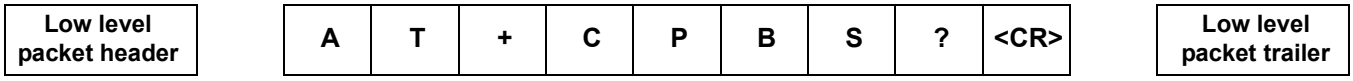
3.1.1 General Protocol

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 33. 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?



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:

ATV0E0I*4<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+CIMIV*0<cr>*

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

AT+CIMI;V*0<cr>*or ATV0+CIM*I<cr>*

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

ATV0I4E0+CIM*I<cr>*

ATV0+CIMI;I4E*0<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 70, +COLP, page 76 and +CLIR, page 85) 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

<class*x*>: (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.

4.1 MODEM ID

4.1.1 Subscriber Unit Identity

4.1.1.1 +GMI, Request Manufacturer 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 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.

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

Example

AT+GMI

+GMI: Motorola CE, Copyright 2000

4.1.1.2 +FMI, Request Manufacturer ID

This command returns the name/identification of the manufacturer.

Mode Activation

Mode = 0.

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

Example

AT+FMI

+FMI: Motorola CE, Copyright 2000

4.1.1.3 +CGMI, Request Manufacturer ID

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.
AT+CGMI=?	OK	Shows whether the command is supported.

Example

AT+CGMI

+CGMI: Motorola CE, Copyright 2000

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

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.
AT+GMM=? AT+FMM=? AT+CGMM=?	OK or: ERROR	Indicates whether the command is supported.

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

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

<Parameter>	Description
“CDMA800”	IS-95 at 800 MHz
“CDMA1900”	IS-95 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

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

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
AT+GMR AT+CGMR AT+FMR	<revision>	Returns the software revision identification.
AT+GMR=? AT+CGMR=? AT+FMR=?	OK or: ERROR	Indicates whether the command is supported.

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

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.
AT+CGSN=?	OK	Indicates whether the command is supported.

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: 2182231126 //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

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 41.

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.
“8859-A”	Arabic (ISO 8859-6)	Quoted string.
“8859-H”	Hebrew (ISO 8859-8)	Quoted string.

Example

AT+CSCS=?

+CSCS: (“ASCII”,”UCS2”,”UTF8”,”8859-1”,”8859-C”,”8859-A”,”8859-H”)

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

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		Returns the numbers that were entered into “My Phone Numbers” from the Handset menu.

Example

at+CNUM=?

OK

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.
<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.

Table 8. +MAID Features Description *(Continued)*

<Parameter>	Description
<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

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: “01.10”

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.

atd051743732D: 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 248 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

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
+CSS	<Band Class>,<Band>,<SID>.	This is a read-only command.

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: ?, 8465

OK

4.2.1.11 CIND, Display the Current Service Status

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
<state>	1 Enables auto-redial 0 Disables auto-redial
<ind>	Indicates the indicator order number. Motorola telematics devices use a 0-based indicator order number. All other devices use a 1-based indicator order number.
<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

<ind>	<value>	<descr>	Description	Type
1a	0-1	“voice mail”	Indicates the presence of a voice message(s).	Binary
2	0-1	“service”	Indicates whether the SU has network services available.	Binary
3	0-1	“call”	Indicates whether the SU is currently in use.	Binary
4	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
5	0-5	“signal”	Indicates the signal strength, in bars (0-lowest, 5-highest), received by the SU.	Non-negative integer

Motorola telematics devices were developed using a 0-based indicator order number. In order to avoid the need to upgrade Motorola telematics devices in the field, Motorola telematics devices continue to use a 0-based indicator order number, while a 1-based indicator order number is used for all other devices.

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 248, to view the +CIND test results.

4.2.1.12 CLCK, Lock Unlock SU or Network Facility

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
Set +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.
Test +CLCK=?	List of Supported <type> and <mode>	+CLCK:("AO","AI","AB"),(0-8)
Read +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 is "1234".
- Default value for <mode> is 1

Example:

at+mode=2

OK

+MBAN: Copyright 2000-2002 Motorola, Inc.

at+cmee=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 service to be requested for the next originated or terminated call.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
AT+CSO=<[SO>]	OK	Sets the c18 requested service option for mobile originating (MO) and mobile terminating (MT) calls.
AT+CSO?	+CSO: <SO>	Reads the current setting.
AT+CSO=?	+CSO: (0-33)	Indicates whether the command is supported, and defines the valid values for <SC>, <ORIG_SO>.

Note

The entered values must be in decimal format

Defined Parameter Values:

The following are the supported service options:

ASYNC Data:

0x4 Pre-707, RS1 (RS1 = Rate Set 1)

0x1004 IS-707, RS1

0xC	Pre-707, RS2
0x8021	QC (QC = Qualcomm) proprietary, RS2

Fax:

0x5	Pre-707, RS1
0x1005	IS-707, RS1. Group 3 fax service
0xD	Pre-707, RS2
0x8022	QC proprietary, RS2

Packet Data:

0x21	1x data
0x19	MDR (MDR = Medium Data Rate), RS2 fwd, RS2 rev
0x16	MDR, RS1 fwd, RS1 rev
0x8020	QC proprietary, RS2
0xF	Pre-707 & IS-707, RS2
0x1007	IS-707, RS1. Internet standard packet data service
0x7	Pre-707, RS1

Others:

0x8002	Markov,
0x801C	Markov, 13k
0x801E	8k Markov
0x801F	13k Markov,
0x2	LOOPBACK, IS126
0x9	13k LOOPBACK, IS126

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).

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>	1st Response: Call place begins: ATDS: "Dial Digits" 2nd 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 60.

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 41. <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 95. **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 60.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
ATDL[;]	+CME ERROR: <err> 1st Response: Call place begins: ATDL: "DIAL DIGITS" 2nd Response: Data/Fax call connected D: Data D: Fax 2nd 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

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.

Mode Activation

Mode = 2.

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

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.

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 70).

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)
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 datacall. DIRECT ASYNC directAsynchronousdatacall FAX Fax class 2.0 DIGITAL VOICE Digital voice ANALOG VOICE Analog voice


Note

+CRC is implemented in activation mode 0 in a limited fashion and only for incoming data and fax calls (not for voice calls). It is advised to use activation mode 2 in order to use the full implementation of +CRC.

Examples

at+mode=2

OK

+MBAN: Copyright 2000-2002 Motorola, Inc.

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+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 call

RING // Incoming Da

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 guarantied 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

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.

The Test command returns values supported by the TA as a compound value. CLI presentation on an unsolicited incoming call indication is as follows:

+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>	
Test: +CLIP=?	+CLIP: (list of supported <n>s)	
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 128 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"

AT+CLIP=?

+CLIP=(0-1)

4.2.1.23 +CCFC, Call Forwarding Number and Conditions

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
Set 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
Read: AT+CCFC?	Returns for each reason the current active mode, e.g. AT+CCFC? +CCFC: 0,1 1,1 2,0	
Test: AT+CCFC=?	Return supported reasons and modes.	(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

1,1

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>	<n> - call hold operation: 0 Releases all held calls or: Sets User Determined User Busy for a waiting call. 1x Releases specific call x, where x is the serial number of a call participating in an active MTPY call. (only supports x=2.) 2 Places all active calls on hold, and accepts the held or waiting call. 3 Adds a held call to the conversation - MTPY. **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.
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 guarantied 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).

AT Command	Response/Action	Remarks
+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

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 60, for more detailed examples.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+MCST?	+MCST: <state>	Requests current call processing engine state.
+MCST=<n>	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>	Call processing state codes 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

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 Ready 6 Alerting 20 Scanning
<band>	0 800 MHz 1 900 MHz 3 1900 MHz4 Unknown
<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

Table 25. +CPAS Parameters *(Continued)*

<Parameter>	Description
<service>	0 No service 1 Voice/speech service 2 Async 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:0

AT+CPAS=2

CPAS:3,0,FCH,1

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>, <mpty>[,<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 <mpty> 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.

Call type identification by the terminating side is guarantied 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 95.

The sort order for the phone book is determined by the +MPBSCS command, described in "+MPBSCS, Select Phone Book Scroll Sort Order" on page 89.

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>	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>	Maximum number of entries to be returned. Default value is 1. **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.

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

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 95.

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>,...) +MPBSCS=? (<sort_range>) 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.
<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 95.

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,”000C0514F0EDFEFCFEFDFFFF01010101FBF8FBF5FF030004020E
00FD1508F6F7F4F210140203FE0301FF020FF9FF01FB05060CFDFC0000FFFA03F0EC110
A040A0705F8FE0D0F00FFFAFF06FE”

OK

+MPBVW=3,1,1,3,152,”"F4FA02FFFDF70813E9EEFEF30D04040703061014FF0FFFFBF8E
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 95.)

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).
<number>	Phone number of a given entry. ASCII string of max length <nlength>.
<type>	Address type of a phone number. Integer.

Table 31. +CPBR Parameters *(Continued)*

<Parameter>	Description
<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 95 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.
<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.

Table 32. +MPBR Parameters *(Continued)*

<Parameter>	Description
<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, Select Phone Book Memory

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 95, 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 41.

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 95 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.

AT Command	Possible Responses	Remarks
+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

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

OK

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

OK

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.
<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.

Table 36. +MDBW Parameters *(Continued)*

<Parameter>	Description
<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

Table 38. +MDBR Parameters *(Continued)*

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

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

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.

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]. If this value is not specified, the timezone offset will default to the value currently stored in the SU.

Example

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

OK

AT+CCLK?

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

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

OK

AT+CCLK?

+CCLK: "01/07/04,21:00:34+43"

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 118).
<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

This command enables the accessory to delete messages from the preferred SU message storage <mem1> location <index>. (<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.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+CMGD=<index>	OK	Deletes the message.

The following table shows the +CMGD parameters.

Table 42. +CMGD Parameters

<Parameter>	Description
< index>	This is the index in the SMS memory of the message to be deleted.

Example

AT+CMGD=4

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 114.

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
+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.
+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. Only TEXT mode is supported.

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: (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 (Not supported) 1 Indicates TEXT mode

Example

AT+CMGF=1

OK

AT+CMGF?

+CMGF: 1

AT+CMGF=?

+CMGF: (1)

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>, <dcs>, <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 110.

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 115.
<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 114.) 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
+CMGL [=<stat>]	+CMGL: <index>,<stat>,<oa/da> <CR><LF><data><CR><LF>	Reads a list of all SMS messages with status value <stat>.
+CMGL=?	Lists all supported <stat>s.	Queries the list of supported <stat>s.

The following table shows the +CMGL parameters.

Table 51. +CMGL Parameters

<Parameter>	Description	
<stat>	"REC UNREAD"	Received unread (i.e. new) message. (Default)
	"REC READ"	Received read message.
	"STO UNSENT"	Stored unsent message.
	“STO SENT”	Stored sent message.
	“ALL”	All messages (only applicable to +CMGL)
<index>	The index number of the message.	
<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.	
<data>	Message data	

Example

AT+CMGL="ALL" //Read all SMS messages

+CMGL: 1,"REC READ","+358501234567"

This is a test "Hello world" //This is the body of the message.

+CMGL: 2,"STO UNSENT","+358501234567"
//This is the body of the reply

OK

AT+CMGL=?

+CMGL: ("REC UNREAD","REC READ","STO UNSENT","STO SENT","ALL")

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 114.) 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
+MMGL=<stat>, where <stat> = "HEADER ONLY".	+MMGL="<any value but HEADER ONLY>" +MMGL: <index>,<stat>,<oa/da>,<CR><LF><data><CR><LF> +MMGL="HEADER ONLY" +MMGL: <index>,<stat>,<oa/da>,<CR><LF>	**Note:** "HEADER ONLY" implies that "ALL" messages will be returned.
+MMGL=?	Lists all supported <stat>s.	Queries the list of supported <stat>s.

The following table shows the +MMGL parameters.

Table 52. +MMGL Parameters

<Parameter>	Description
<stat>	"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 (only applicable to +CMGL). "HEADER ONLY" Message headers without attendant message data.
<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.

Example

AT+MMGL="HEADER ONLY" //Read the headers of all SMS messages

+MMGL: 1,"REC READ","+358501234567"

+MMGL: 2,"STO UNSENT","+358501234567"

OK

AT+MMGL=?

+MMGL: ("REC UNREAD","REC READ","STO UNSENT","STO SENT",

"ALL","HEADER ONLY")

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
+CMGR=<index>	+CMGR: <stat>,<oa/da>[,<scts>] <CR><LF><data><CR><LF>	Reads SMS messages from the SU.

The following table shows the +CMGR parameters.

Table 53. +CMGR Parameters

<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.
<data>	Message data.

Example

AT+CMGR=2 //Read the message

+CMGR: "REC UNREAD","+358507654321","95/07/03,17:38:15+04"

This is Mr. Jones testing

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
+MMGR=<index>	+CMGR: <stat>,<oa/da>[,<scts>] <CR><LF><data><CR><LF>	Reads SMS messages from the SU.

The following table shows the +MMGR parameters.

Table 54. +MMGR Parameters

<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 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.
<data>	Message data.

Example

AT+MMGR=2 (read the message)

+MMGR: "REC UNREAD","+358507654321","95/07/03,17:38:15+04"

This is Mr. Jones testing

OK

4.4.1.14 +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 55. +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 114.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+CMGW=<da><CR>text is entered<ctrl-Z/ESC>		Writes a message.

The following table shows the +CMGW parameters.

Table 56. +CMGW Parameters

<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.

Example

AT+CMGW="5124335432"

This is the message body. ^Z

+CMGW: 7

OK

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>]		<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). <tosca> - Type of Service Center Address is the current address format setting.
+CSCA?		

Example

AT+CSCA="4252833433"

OK

AT+CSCA?

+CSCA: "4252833433",129

OK

4.5 NETWORK SERVICE

4.5.1 Network Service Commands

4.5.1.1 +CREG, Network Registration Status

This command enables/disables an unsolicited result code from network status 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 <> that shows whether the network has currently indicated the registration of the ME. Location information elements <SID> and <NID> are returned when the ME is registered in the network.

Mode Activation

Mode = 0.

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

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> 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.

Example

at+creg=?

+CREG: (0-1)

OK

at+creg?

+CREG: 11,6535

OK

at+creg=0

OK

at+creg?

+CREG: 11,6535

OK

at+creg=1

OK

at+creg?

+CREG: 11,6535

OK

at+creg=2,5

ERROR

4.5.1.2 +COPS, Operator Selection

This command enables an application to query the current Carrier Name (which would be displayed if the standard display were attached). The Carrier Name is displayed as a text string.

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.
AT*COPS=?	OK	Indicates whether the command is supported.

The following table shows the +COPS parameters.

Table 57. +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

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.

The following table shows +CSQ parameters.

Table 58. +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.

Example

AT+CSQ

+CSQ: 98,1

Refer to “Test Results” on page 248, to view the +CSQ test results.

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

This command enables the carrier detect pin (RS-232 signal pin) to inform the DTE device (laptop) of the state of the DCE device communications channel.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
AT&CX	<X>	

The following table shows &C parameters.

Table 59. &C Parameters

<Parameter>	Description
<X>	X=0 Leave Carrier Detect pin asserted at all times. X=1 Carrier Detect pin asserted when mobile is on the Traffic Channel, otherwise deasserted. X=2 Carrier Detect asserted at all times but will wink (deassert briefly then re-Assert) when the Traffic Channel drops. Default is 1.

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

This command enables the Data Terminal Ready (DTR) pin (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>	

The following table shows &D parameters.

Table 60. &D Parameters

<Parameter>	Description
<X>	X=0 Leave Carrier Detect pin asserted at all times. X=1 Carrier Detect pin asserted when mobile is on the Traffic Channel, otherwise deasserted. X=2 Carrier Detect asserted at all times but will wink (deassert briefly then re-Assert) when the Traffic Channel drops. Default is 1.

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 velues.

Table 61. Battery status values

<bcs>	Description
0	Battery Powered.
1	Externally powered, battery connected.
2	Externally powered, no battery connected.
3	Invalid power supply.

Example

at+mode=2

OK

21

AT+CBC

+CBC: 0,57

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: • Sets a ring type to a specific field. • Plays one cycle of a specified ring type. • Stops the played ring type.

AT Command	Response/Action	Remarks
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: • List of supported operations. • List of supported ring types numbers. • List of supported alert fields.

The following table shows the +CRTT parameters.

Table 62. +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 62. +CRTT Parameters *(Continued)*

<Parameter>	Description
<RingTypeNumber>	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

Table 62. +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 ambiguos 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 63. +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 64. +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 65. +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 66. +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 67. +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 68. +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

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 = 2.

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 69. +MAMS Parameters

<Parameter>	Description
<voice_alg>	2 Full Duplex (default)
<noise_reduct>	0 Off 1 On
<side_tone>	0 Off
<echo_suppress>	0 Off 1 VOC_EC_ESEC 2 VOC_EC_HEADSET 3 VOC_EC_AEC (default) 4 VOC_EC_SPEAKER

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 70. +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 71. +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?

+MAVFL: 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 72. +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 73. +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 74. +MPIN Parameters

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

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

This command dumps the status of all AT parameters, including the single-letter parameters not otherwise readable, but does not include the +QC parameters.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
&V	<Status AT commands List>	

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: 0,1,0,0,0,0,0,0; +FIS: 0,1,0,0,0,0,0,0 +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

OK

4.9.1.3 V, DCE Response Format

This command returns the DCE response format.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
ATV	<V0> <V1>	

The following table shows the V parameters.

Table 75. V Parameters

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

Example

at+mode=0

OK

atv1

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 76. 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

This command determines whether the TA echoes characters received from the TE during command state and on-line command state.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
ATE	<E0> <E1>	

The following table shows the E parameters.

Table 77. E Parameters

<Parameter>	Description
<E0>	Do not echo commands in command state or online command state.
<E1>	Echo commands in command state or online command state.

Example

at+mode=0

OK

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 78. 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.

Table 78. X Parameters *(Continued)*

<Parameter>	Description
<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 CARRRIER 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 3 parameter values into the NV.

- The value of S0 register (set by ATS0) - factory default is 0.
- The value of the RS232 communication rate between the MT2 and the SU(set by AT+IPR) - factory default is 19200 B.P.S.
- The incoming call type (set by AT$QCVAD) - factory default is 0.

At power up, the 3 parameters are configured with the values that were stored in the NV.

Note

ATZ does not resets the 3 parameters stored by this command to their default values.

In order to restore the default values for these 3 parameters, AT&F command should be used.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
AT&W	OK	

Example

at+ipr?

+IPR: 19200

OK

at+ipr=2400

OK

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

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 79. +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
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

Table 79. +CMS Error Codes *(Continued)*

Code	Description
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 80. +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
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

Table 80. +CME Error Codes *(Continued)*

Code	Description
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+cmee=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+cmee=<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. 1 Enable +CME ERROR: <err> and +CMS ERROR: <err> result code. Use numeric <err> values. Refer to Table 79, “+CMS Error Codes” on page 163, and Table 80, “+CME Error Codes” page 165. 2 Enable +CME ERROR: <err> and +CMS ERROR: <err> result code. Use verbose <err> values. Refer to Table 79, “+CMS Error Codes” on page 163, and Table 80, “+CME Error Codes” on page 165.
at+CMEE?	Returns the current <n> value.	
at+CMEE=?	Returns supported values for <n>.	

Example

at+cmee?

+CMEE: 000

OK

at+cmee=?

+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 gives the ability to read and set the NAM parameters in the same way as the PST tool.

4.9.3.1 +MNAM

This command gets/sets the NAM parameters describe in the next table.

Table 81. NAM parameters relevant for +MNAM

Parameter Name	Parameter Values	Description
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
8	0-255	Option Byte 2
9	0-255	Option Byte 3

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
read: AT+MNAM?	Parameter Value Description: < 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>. with: OK - The command executed successfully.	
set: AT+MNAM= < 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>.	OK The command executed successfully. ERROR <name of the wrong parameter> (Refer to “Appendix A”, page 255). The parameter was out of range or the numbers of the entered or one of the parameters is more or less than the existing. See Table 81	• 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. • Number of parameters entered must be 9 exactly. • To make sure the changes are determined in the NV - turn the phone Off and restart it.

4.9.3.2 +MNAM2

This command gets/sets the NAM2 parameters describe in the next table.

Table 82. NAM2 parameters relevant for +MNAM2

Parameter Name	Parameter Values	Description
1	0-1023	AMPS initial paging channel
2	0-9999	AMPS First Dedicated Channel System A
3	0-9999	AMPS First Dedicated Channel System B
4	0-9999	AMPS Number Of Channels To scan
5	0-255	Option Byte 4
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.

AT Command	Response/Action	Remarks
read: AT+MNAM2?	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: AT+MNAM2=< 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 255). The parameter was out of range or the numbers of the entered or one of the parameters is more or less than the existing. See Table 82	• 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. • Number of parameters entered must be 10 exactly. • To make sure the changes are determined in the NV - turn the phone Off and restart it.

4.9.3.3 +MNAM3

This command gets/sets the NAM3 parameters describe in the next table.

Table 83. NAM3 parameters relevant for +MNAM3

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

Table 83. NAM3 parameters relevant for +MNAM3

Parameter Name	Parameter Values	Description
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 secondary channel system A
12	0000-1023	cdma primary channel system B
13	0000-1023	cdma secondary channel system B

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
read: AT+MNAM3?	Parameter Value Description: < 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 11 12> < cdma primary channel system A > < cdma secondary channel system A > < cdma primary channel system B > < cdma secondary channel system B > with: OK - The command executed successfully.	

AT Command	Response/Action	Remarks
set: 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 11 12>,< cdma primary channel system A >,< cdma secondary channel system A >,< cdma primary channel system B >,< cdma secondary channel system B >	OK The command executed successfully. ERROR <name of the wrong parameter> (Refer to “Appendix A”, page 255). The parameter was out of range or the numbers of the entered or one of the parameters is more or less than the existing. See Table 83	• 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. • 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 , 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). So, in order to program the True imsi ,< true imsi programmed/deprogrammed > must be set to 1(see IS683A , page 3-1 , paragraph 20) • Number of parameters entered must be 10 exactly. • To make sure the changes are determined in the NV - turn the phone Off and 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.	The number of the maximum allowed NAM profiles is currently 2 . To choose the maximum allowed NAM profile, bits 6 and 7 of option byte 3 must be configured: 1. If bit 6 = 0 and bit 7=0 then 1 NAM profile is allowed. 2. If bit 6 = 1 and bit 7=0 then 2 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

This command +CPARM command/query enables a terminal to set/query the cellular system parameters to MT2

4.9.4.1 +CPARM

This command gets/sets the cellular system parameters that described in the next table.

Table 84. Cellular System Parameters Relevant for +CPARM

Parameter Name	Parameter Values	Description
1	0-32767	Cellular System ID
2	0-65535	Cellular Network ID
3	0-15	Access Overload class
4	0-1	The Cellular band, as described in 3GPP2 C.S0002,
5	0-2047	Primary channel A
6	0-2047	Primary channel B
7	0-2047	Secondary channel A
8	0-2047	Secondary channel B
9	0-999	Lock Code
10	0-999999	Security Code
11	0-999	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	
set: AT+CPARM = <SID>, <NID>, <Slot_I>, <ACLOC>, <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.

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.

4.10 UI

4.10.1 +MH Handset Status/Control

4.10.1.1 +MHCS, Cradle State

This command indicates the state of an external handset or cradle to the SU. It is also used for accessories to request the current cradle state set from SUs, or for SUs to report the updated cradle state asynchronously to accessories. The operation is often different, particularly in the area of in-call audio, based on the current state of the cradle (On-hook or Off-hook). The default state is On-hook.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+MHCS?	+MHCS: <state>	Queries current cradle state.
+MHCS=[<mode>][,<state>]	OK	Sets cradle state.

The following table shows the +MHCS parameters.

Table 85. +MHCS Parameters

<Parameter>	Description
<state>	0 On-hook 1 Off-hook
<mode>	0 Disable output of unsolicited cradle state messages. 1 Enable output of unsolicited cradle state messages. The default is 0.

Example

AT+MHCS=1,0

OK //Enable output and set cradle state to On-hook

AT+MHCS?

+MHCS: 0 Current cradle state is On-hook

+MHCS: 1 Unsolicited report (Off-hook)

AT+MHCS=,1

OK //Set state Off-hook without changing output

AT+MHCS=1

OK //Enable output without changing hook state

4.10.1.2 +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 86. +MHMN Parameters

<Parameter>	Description
<name>	A quoted string indicating home network name.

Example

AT+MHMN?

+MHMN: "Home Only"

4.10.1.3 +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 87. +MHIG Parameters

<Parameter>	Description
<state>	0 Vehicle ignition off 1 Vehicle ignition on

Example

AT+MHIG=1

OK

4.10.1.4 +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 88, 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 88. 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	Center softkey
]	93	Right 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

Table 88. Virtual Keycodes *(Continued)*

Character	ASCII	Description
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
:B/:b	58,66/58/98	Menu Scroll Backward
Q/q	81/113	MUTE key
:K/:k	58,75/58,107	Multiband Knifeswitch
: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 89. +CKPD Parameters

<Parameter>	Description
<keys>	A virtual keycode.
<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

4.10.1.5 +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 88, “Virtual Keycodes,” on page 177, 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 90. +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
```

4.10.1.6 +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 91. +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
<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

4.10.1.7 +MHFP, Flip Status

This command is used for reporting current flip state synchronous or asynchronous.

Mode Activation

Mode = 2.

AT Command	Response/Action	Remarks
+MHFP?	+MHFP: <state>	<state> - Current flip state
+MHFP=<mode>	OK	<mode> - Enable/disable unsolicited reports for flip state changes

The following table shows the +CMER parameters.

Table 92. <mode> Values for +MHFP

<mode>	Description
0	Disable output of unsolicited flip state messages (Default)
1	Enable output of unsolicited flip state messages

Table 93. <state> Values for +MHFP

<state>	Description
0	Flip is open (Default)
1	Flip is closed

Example

AT+MHFP?

+MHFP: 1 Flip is currently closed

AT+MHFP=1 Enable unsolicited reports

OK

+MHFP: 0 Flip state is changed to Open

4.10.1.8 +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 94. <mode> Values for +MCHS

<mode>	Description
0	Disable output of unsolicited channel status messages
1	Enable output of unsolicited channel status messages

Table 95. <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
"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)

Table 95. <status> Values for +MCHS *(Continued)*

<state>	Description
“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

4.10.1.9 +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 96. <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 149, and "+MPIN, Unlock Phone" on page 149) 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 97. +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 98. +MMRR Parameters

<Parameter>	Description
<mode>	0 Disable master reset event reporting. 1 Enable master reset event reporting. Default is 0.

Example

AT+MMRR=1

OK //Master reset event

+MMRR

4.10.2.3 + CIEV, Indicator Reporting

This command sends an usolicited 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 99. +CIEV Parameters

<Parameter>	Description
<ind>	Indicates the indicator order number as defined in Table 16, “+CIND Available Indicators,” on page 55. The indicator order number is 0-based for Motorola Telematics devices and 1-based for all other devices.
<value>	The value of the indicator. For binary indicators: 0 OFF 1 ON. Non-binary integers can have any non-negative integer value.

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 100. +CKEV Parameters

<Parameter>	Description
<key>	The key that changed state, as defined in Table 88, “Virtual Keycodes,” on page 177.
<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 101. +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 102. +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 103. 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 104. M Parameters

<Parameter>	Description
<M0>	Speaker off

Table 104. M Parameters *(Continued)*

<Parameter>	Description
<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 105. 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.
+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.

Table 105. Fax Commands *(Continued)*

AT Command	Response/Action	Remarks
+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.
+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.

Table 105. Fax Commands *(Continued)*

AT Command	Response/Action	Remarks
+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 39.

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.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
+IPR?	OK or: Error	The R_m rate is fixed at 19200 bps. The Mobile accepts 19200 bps as the only valid parameter.

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 Command	Response/Action	Remarks
AT+MODE=<mode>[, <parameters>]	+MODE: (list of <mode>s) or: ERROR +CME ERROR: <err>	Sets the interface mode to <mode>, and returns the list of modes supported on this interface. This enables the expansion of the modes to other interfaces, and the addition of new interface modes in the future. Optional parameters vary according to the mode selected. An ERROR is returned if the interface does not support that mode, or if the interface does not enable the mode to be changed. If the interface does not support changing the mode in this manner, all attempts to use this command on that interface returns an 'Unsupported Command' error.
AT+MODE=?		Returns the list of available modes for this interface.

The following table shows the +Mode parameters.

Table 106. +MODE Parameters

<Parameter>	Description
<mode>	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. 1 Reserved Test Commands. 2 Motorola Accessory Mode. This mode provides access only to the AT command set.

Example

AT+MODE=?

+MODE: (0,2)

AT+MODE?

+MODE: 0

AT+MODE=2

OK

AT+MODE=1

ERROR

4.13.1.2 $QCCLR, Clear Mobile Error Log

This command clears the mobile error log.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
$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

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 194).

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
+ICF	OK or: ERROR	QUALCOMM R_m interface is fixed at 8 data bits. No parity, 1 stop bit. Error is returned for any other parameters.

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

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
Set +CTTY=<mode>	On Error: <err> When Command successful:<OK>	<mode> 0 - Voice mode 1 - TTY mode 2 - VCO mode 3 - HCO mode

AT Command	Response/Action	Remarks
Read +CTTY?	+CTTY:<mode>	
Test +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.

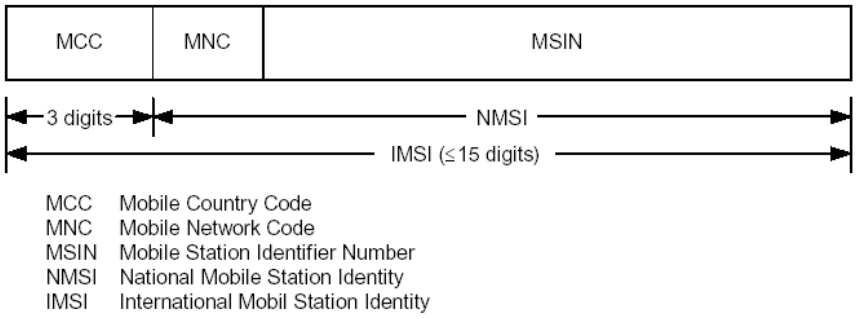
AT Commands	Response/Action	Remarks
AT+CIMSI = <IMSI>	OK	The command enables a terminal to set the MT2 active IMSI.
AT+CIMSI?	MT2 returns its IMSI and ESN parameters.	Queries the MT2 IMSI and ESN parameters.

The following table shows the +CIMSI parameters.

Table 107. +CIMSI 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:



MCC Mobile Country Code
MNC Mobile Network Code
MSIN Mobile Station Identifier Number
NMSI National Mobile Station Identity
IMSI International Mobil Station Identity

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 108. +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

This command enables/disables the mobile from SCRM'ing.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
$QCSCRM	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.

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

This command sets the Medium Data Rate (MDR) (also known as HSPD) setting.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
$QCMDR=	OK or: ERROR	Valid values are 0 to 3: 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. 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. 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. 3 SO 33, if available. The mobile will negotiate to MDR or Low-Speed Packet service options if SO 33 is not available.

Example

AT$QCMDR?

$QCMDR: 3

OK

AT$QCMDR=2

OK

4.14.1.5 $QCDMR=, Set DM Baud Rate

This command sets the DM baud rate.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
$QCDMR=	OK or: ERROR	Set DM baud rate. 19200, 38400, 57600, 115200

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)

This command enables/disables Quick Net Connect (QNC).

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
$QCQNC	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.

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 $qctrtl=X, R-SCH Throttling Enable/Disable

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$qctrtl=X		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. *For MSM500, MSM5105, and MSM5100 ASICs only.

Example

at+mode=0

OK

at$qctrtl?

$QCTRTL: 0

OK

at$qctrtl=?

$QCTRTL: (0-1)

OK

at$qctrtl=1

OK

4.15.1.4 $qcscrm=X, SCRM Enable/Disable

This command enables/disables IS2000 mobiles from SCRM’ing.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
at$qcscrm=X		0 Mobile never SCRMs. 1 Mobile can SCRM as needed. The default is 1. The command only applies to SO 33 calls. This value is stored in NV. *For MSM500, MSM5105, and MSM5100 ASICs only.

Example

at+mode=0

OK

at$qcscrm=?

$QCSCRM: (0-1)

OK

at$qcscrm?

$QCSCRM: 1

OK

at$qcscrm=0

OK

at$qcscrm?

$QCSCRM: 0

OK

4.15.1.5 $qcso=X, Service Option Set Settings

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=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)

Example

at+mode=0

OK

at$qcso=?

$QCSO: (0-2)

OK

at$qcso=1

OK

at$qcso?

$QCSO: 1

OK

4.15.1.6 $qcqnc=X, Enables/Disables QNC Capability

This command enables/disables QNC capability. Quick Net Connect (QNC) is a different means of performing basic packet data service.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
at$qcqnc=X		X=0 Disable QNC (use Packet Data service option numbers) (default for HSPD builds) X=1 Enable QNC (use Async Data Service Option numbers for Packet Data calls)

Example

at$qcqnc?

$QCQNC: 0

OK

at$qcqnc=?

$QCQNC: (0-1)

OK

at$qcqnc=1

OK

4.15.1.7 $QCMIPT, Enables/Disables RFC2002bis Authentication

This command enables/disables the use of rfc2002bis authentication.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
$QCMIPT	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.

Example

at$QCMIPT?

$QCMIPT: 0

OK

AT$QCMIPT=?

$QCMIPT: (0-1)

OK

4.15.1.8 $QCMIPP, Select MIP User Profile To Be Active.

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 or: ERROR	

Example

AT$QCMIPP?

$QCMIPP: 0

OK

AT$QCMIPP=?

$QCMIPP: (0-5)

OK

4.15.1.9 $QCMIP, Enables/Disables Mobile IP

This command enables/disables Mobile IP functionality in the mobile.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
$QCMIP	OK or: ERROR	0 Mobile IP disabled, Simple IP only. 1 Mobile IP preferred. In the initial MIP registration, if the network does not support Mobile IP, then the mobile automatically reverts to Simple IP (forces a PPP renegotiation by sending a LCP C-Req). However, if a Mobile IP session is registered and then the mobile enters a network that does not support Mobile IP, the mobile will drop the session and inform the upper layers of the failure (for example, by dropping DCD to a laptop). 2 Mobile IP only. The mobile will make data calls only when Mobile IP is supported in the network. During a MIP session, if the mobile hands off to a network that does not support MIP, then the mobile will drop the session and inform the upper layers of the failure (for example, by dropping DCD to a laptop). This value is stored in NV. The default value is 0. **Note:** When the AT$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. **Note:** This change is *not* supported by DMSS 5105 Release 1.0 Commercial.

Example

AT$QCMIP?

$QCMIP: 0

OK

AT$QCMIP=?

$QCMIP: (0-2)

OK

4.15.1.10 $QCTRTL, Enable/Disable R-SCH Throttling

This command enables/disables R-SCH throttling.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
$QCTRTL	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. *For MSM500, MSM5105, and MSM5100 ASICs only.

Example

AT$QCTRTL?

$QCTRTL: 0

OK

AT$QCTRTL=?

$QCTRTL: (0-1)

OK

AT$QCTRTL=1

OK

4.15.1.11 $QCPKND, Enable/Disable Automatic Packet Detection

This command enables/disables automatic packet detection after a dial command.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
$QCPKND	OK or: ERROR	

The following table shows the $QCPKND parameters.

Table 109. $QCPKND Parameters

<Parameter>	Description
<n>	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. 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.

Example

AT$QCPKND?

$QCPKND: 1

OK

AT$QCPKND=?

$QCPKND: (0-1)

OK

4.15.1.12 $QCVAD=, Prearrangement Setting

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
$QCVAD	OK or: ERROR	

The following table shows the $QCVAD= parameters.

Table 110. $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

4.15.1.13 $QCSO=, Set Data Service Option Number

This command saves the Data Service Option number to the non-volatile memory.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
$QCSO=	OK or: ERROR	

The following table shows the $QCSO= parameters.

Table 111. $QCSO= Parameters

<Parameter>	Description
<n>	0 Pre-707 SO numbers (RS 1: Async 4, G3 Fax 5, packet 7; RS 2: Async 12, G3 Fax 13, packet 15) 1 Proprietary SO numbers (RS 1: Async 4, G3 Fax 5, packet 7; RS 2: Async 0x8021, G3 Fax 0x8022, packet 0x8020) 2 IS-707 SO numbers (RS 1: Async 0x1004, G3 Fax 0x1005, packet 0x1007; RS 2: Async 12, G3 Fax 13, packet 15)

Example

at$QCSO?

$QCSO: 2

OK

AT$QCSO=?

$QCSO: (0-2)

OK

4.15.1.14 $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 112. $QCMTOM Parameters

<Parameter>	Description
<number>	The phone number to dial.

Example

at$QCMTOM

OK

4.15.1.15 +CTA, Set/Read/Test U_m Packet Data Inactivity Timer

This command sets/reads/tests the U_m packet data inactivity timer.

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
+CTA	OK or: ERROR	

The following table shows the +CTA parameters.

Table 113. +CTA Parameters

<Parameter>	Description
<value>	0 Traffic Channel not released during inactivity periods. 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. Default is 20.

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

4.15.1.16 +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 114. +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

4.15.1.17 +CDR, U_m Interface Data Compression Reporting

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

Example

at+mode=0

OK

at+cdr?

+CDR: 0

OK

at+cdr=?

+CDR: (0-1)

OK

at+cdr=1

OK

4.15.1.18 +CDS, U_m Interface Data Compression

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=<direction>, <compression_negotiation>, <max_dict>,<max_string>	OK	Controls the V.42bis data compression function on the U_m interface.

AT Command	Response/Action	Remarks
AT+CDS=?	+CDS: (0-3),(1-1),(512-65563),(6-32) 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 115. +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

4.15.1.19 +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 116. +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

4.15.1.20 +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	Remarks
+CQD=<value>	OK or: ERROR	

The following table shows the +CQD parameters.

Table 117. +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

4.15.1.21 +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	Remarks
+CMIP?	OK or: ERROR	

Example

at+mode=0

OK

at+cmip?

OK

4.15.1.22 +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	Remarks
+CBIP?	OK or: ERROR	

Example

at+mode=0

OK

at+cbip?

OK

4.15.1.23 +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	Remarks
AT+CMUX=<n>	OK or: ERROR	

The following table shows the +CMUX parameters.

Table 118. +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

4.15.1.24 +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

4.15.1.25 +CXT, Cellular Extension

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		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 R_m 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 R_m interface.

The following table shows the +CXT parameters.

Table 119. +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

4.15.1.26 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 120. +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

4.15.1.27 +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

4.15.1.28 +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		

4.15.1.29 +MR, Modulation Reporting Control

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
+MS		

4.15.1.30 +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		

4.15.1.31 +ETBM, Data Handling

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=<pending_TD> [,<pending_RD>],[<timer>]	OK	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 121. +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.

Table 121. +ETBM Parameters *(Continued)*

<Parameter>	Description
<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

4.15.1.32 +ESR, Selective Repeat Option Controller

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 or: ERROR	

The following table shows the +ESR parameters.

Table 122. +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

4.15.1.33 +ES, Error Control Selection

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=<orig_rqst>[,<orig_fbk>[,<ans_fbk>]]	OK	Controls the V.42bis data compression manner on the PSTN link if provided in the IWF.
AT+ES?	+ES:<orig_rqst>,<orig_fbk>,<ans_fbk> OK	Displays the current error control settings.

The following table shows the +ES parameters.

Table 123. +ES Parameters

<Parameter>	Description
<orig_rqst>	Specifies the initial requested mode of operation when the DCE operates as the originator. 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>	Specifies the acceptable fallback mode of operation when the DCE operates as the originator. 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>	Specifies the acceptable fallback mode of operation when the DCE operates as the destination. 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

4.15.1.34 +ER, Error Control Reporting

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 or: ERROR	

The following table shows the +ER parameters.

Table 124. +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

4.15.1.35 +DS, Compression

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=<direction>, <compression_negotiation>, <max_dict>,<max_string>	OK	Controls the V.42bis data compression function on the PSTN link if provided in the IWF. Aysnc: Required Packet Data: Optional Remote: Yes
AT+DS?	+DS: <direction>, <compression_negotiation>, <max_dict>,<max_string> OK	Displays the current settings.

The following table shows the +DS parameters.

Table 125. +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.

Table 125. +DS Parameters *(Continued)*

<Parameter>	Description
<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

4.15.1.36 +DR, Compression Reporting

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 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.

Example

at+mode=0

OK

at+dr=?

ERROR

at+dr=1

OK

at+dr?

+DR: 1

OK

4.15.1.37 +EFCS, FCS Values

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 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. 3 Disconnect if 32-bit FCS is not available in the remote DCE.

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 243).

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$qctcpd

$QCTCPD:

ActiveOpens :0001 PassiveOpens :0000AttemptFails :0000 EstabResets :0000InSegs :009C OutSegs :00D1RetransSegs :0000 InErrs :0000OutRsts :0000 RxOutOfOrderSeg:0000Payload Sent : 0000012BPayload 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$qctcpr

$QCTCPR:

OK

at$qctcpd

$QCTCPD:ActiveOpens :0000 PassiveOpens :0000AttemptFails :0000 EstabResets :0000InSegs :0000 OutSegs :0000RetransSegs :0000 InErrs :0000OutRsts :0000 RxOutOfOrderSeg:0000Payload Sent : 00000000Payload Received: 00000000Backoffs : 0000000000

OK

4.16.1.12 $QCRL3D, Dump RLP 3 Protocol Statistics

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 236).

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
$QCRL3D	OK or: ERROR	

Example

at+mode=0

OK

at$qcrl3d

$QCRL3D:

Rx Data Cnt :00000000 Tx Data Cnt :00000000Single Naks :00000000 Double Naks :00000000Triple Naks :00000000 Rx Naks :00000000Tx Total Bytes :00000000 Rx Total Bytes :00000000ReXmits Not Found:00000000 Fill Frames Rx'ed:00000000Rlp Erasures :00000000 Mux Erasures :00000000Lrgst Cntg. Erase:00000000 Last RTT :00000000Resets :00000000 Aborts (Nak) :00000000Rlp State :00000000Last Call Synced:TCP_NOT_ESTABLISHED

OK

4.16.1.13 $QCRL3R, Reset RLP 3 Protocol Statistics

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 237).

Mode Activation

Mode = 0.

AT Command	Response/Action	Remarks
$QCRL3R	OK or: ERROR	

Example

at+mode=0

OK

at$qcrl3r

$QCRL3R:

OK

5.1 POWER UP/POWER DOWN SUMMARY

Figure 3. 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.

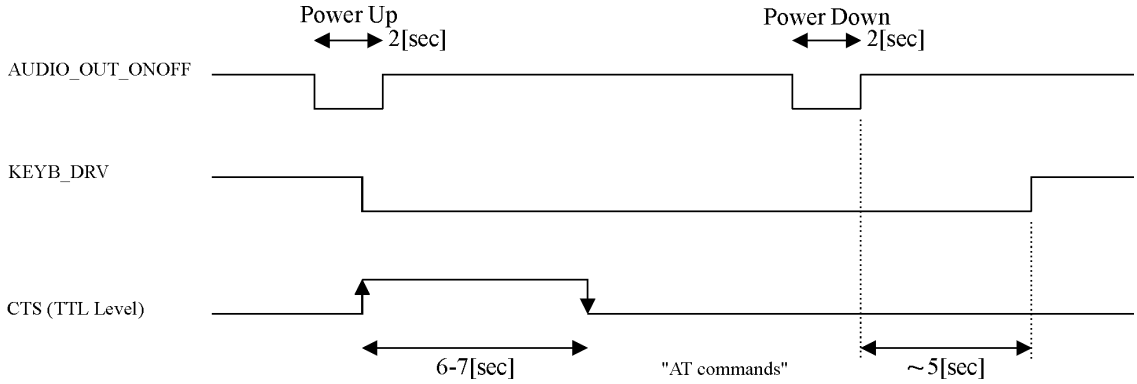


Figure 3. Power Up/Power Down

P1 board with ADB P1 (RS-232 sampled at their TTL levels (KEYD_DRV line was not supported by the ADB).

.

Figure 4. TTL Levels While the c18 is Powered from Off to On

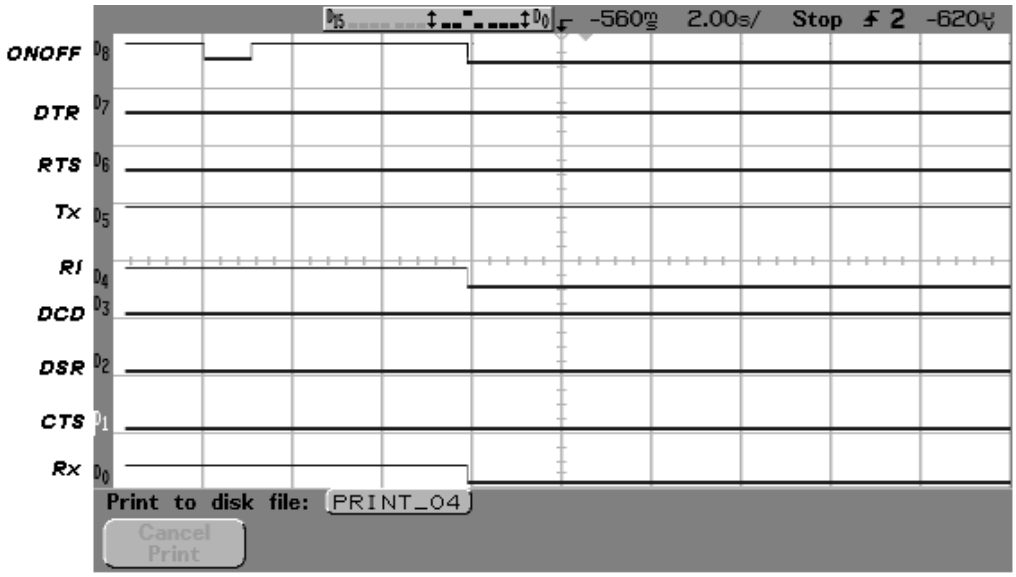


Figure 5. TTL Levels while the c18 is Powered from On to Off

Results: P2 board with ADB P2 -RS-232 levels

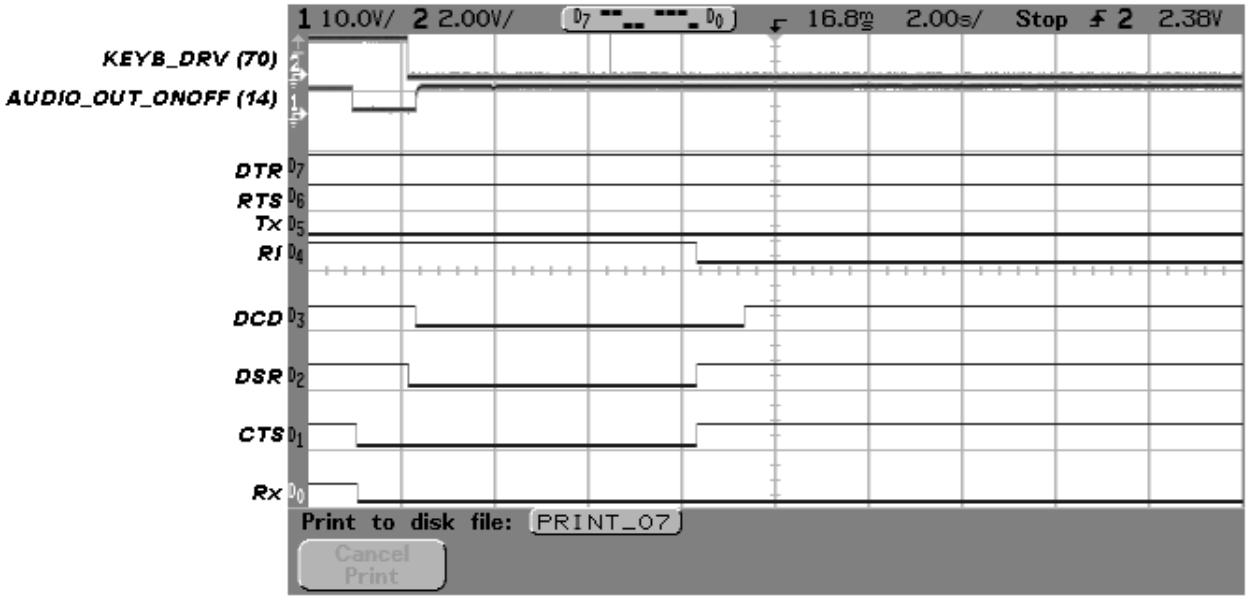


Figure 6. c18 Power Up from Off to On

Note

RS-232 lines sampled after TTL to RS-232 converter.

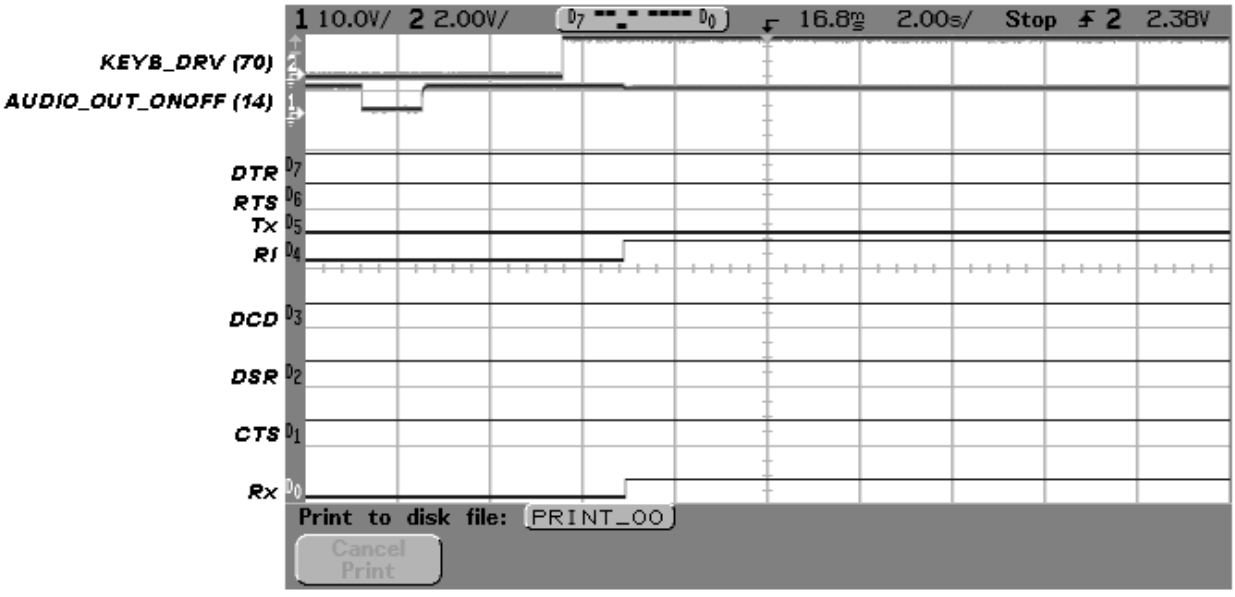


Figure 7. c18 Power Down from On to Off

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 37.

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 250). 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 MSSI commands.

Table 126. Test Results

Power	CSQ	CIND	MSSI
-120	99	1	1
-118	99	1	1
-116	3	1	1
-114	3	1	1

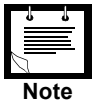
Table 126. Test Results *(Continued)*

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	

APPENDIX A

A.1 MNAM ERROR RESULTS

Table 127 in this appendix provides a list of the MNAM error results.

Table 127. 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 127. 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

INDEX

A

B

C

D

E

F

H

I

L

M

N

O

P

Q

R

S

T

U

V