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**AT Commands**  
**S-Registers**  
**Result Codes**

**for the**  
**5634 Modem Series**

MT5634IND  
MT5634ZBA Series  
MT5634ZBA-USB  
MT5634ZBA-DID  
MT5634ZLX Series  
MT5634ZPX-ISA  
MT5634ZPX-PCI Series  
ISI5634PCI Series

**A Reference Guide**

## AT Commands Reference Guide

**Products:** MT5634IND, MT5634ZBA Series including USB and DID, MT5634ZPX-PCI Series, MT5634ZPX-ISA, MT5634ZLX Series, ISI5634PCI.

## PN S000272E, Version E

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### Revisions

Revision Level	Date	Description
<b>A</b>	10/30/02	Initial release.
<b>B</b>	02/24/03	Change +PIG=0 to enable PCM upstream with default 1. Add #CBS4. Add +VRID.
<b>C</b>	10/01/03	The guide is now applicable to the ISI5634PCI.
<b>D</b>	11/17/03	This guide is now applicable to the MT5634ZPX-ISA. Explained the default for the S-Register S0: the default for internal modems is 0 while the default external modems is 1.
<b>E</b>	01/04/05	Removed <b>\X</b> command. Added <b>&amp;L</b> for the MT5634IND. Added Index cross-references. Changed font.

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### World Headquarters

Multi-Tech Systems, Inc.  
 2205 Woodale Drive  
 Mounds View, Minnesota 55112  
 Phone: 763-785-3500 or 800-328-9717  
 Fax: 763-785-9874

### Technical Support

Country	By Email	By Phone
France:	support@multitech.fr	(33) 1-64 61 09 81
India:	support@multitechindia.com	91 (124) 6340778
U.K.:	support@multitech.co.uk	(44) 118 959 7774
U.S. and Canada:	support@multitech.com	(800) 972-2439
Rest of the World:	support@multitech.com	(763) 717-5863

Internet Address: <http://www.multitech.com>

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# Chapter 1 - AT Commands

## Introduction

The AT commands are used to control the operation of your modem. They are called *AT* commands because the characters **AT** must precede each command to get the *AT*tention of the modem.

*AT* commands can be issued only when the modem is in command mode or online command mode. The modem is in *command mode* whenever it is not connected to another modem. The modem is in *data mode* whenever it is connected to another modem and ready to exchange data. *Online command mode* is a temporary state in which you can issue commands to the modem while connected to another modem. To put the modem into online command mode from data mode, you must issue an *escape sequence* (+++) followed immediately by the *AT* characters and the command, e.g., +++ to hang up the modem. To return to data mode from online command mode, you must issue the command **ATO**.

To send AT commands to the modem you must use a communications program, such as the HyperTerminal applet in Windows 98/95 and NT 4.0, or some other available terminal program. You can issue commands to the modem either directly, by typing them in the terminal window of the communications program, or indirectly, by configuring the operating system or communications program to send the commands automatically. Fortunately, communications programs make daily operation of modems effortless by hiding the commands from the user. Most users, therefore, need to use AT commands only when reconfiguring the modem, e.g., to turn autoanswer on or off.

The **format for entering an AT command** is **ATXn**, where *X* is the command and *n* is the specific value for the command, sometimes called the command *parameter*. The value is always a number. If the value is zero, you can omit it from the command; thus, **AT&W** is equivalent to **AT&W0**. Most commands have a *default* value, which is the value that is set at the factory.

You must press ENTER (depending on the terminal program it could be some other key) to send the command to the modem. Any time the modem receives a command, it sends a response known as a **result code**. The most common result codes are *OK*, *ERROR*, and the *CONNECT* messages that the modem sends to the computer when it is connecting to another modem.

You can issue several commands in one line, in what is called a **command string**. The command string begins with **AT** and ends when you press ENTER. Spaces to separate the commands are optional; the command interpreter ignores them. The most familiar command string is the **initialization string**, which is used to configure the modem when it is turned on or reset, or when your communications software calls another modem.

## List of General Commands

Command	Description
AT	Attention Code
A	Answer
A/	Repeat Last Command
B	Communication Standard Setting – Bell or CCITT
D	Dial
%M	Enable Dialing Message
DS= <i>n</i>	Dial Stored Telephone Number
E	Echo Command
F	Echo Online Data Characters
H	Disconnect (Hang Up)
I	Information Request
L	Not Applicable
M	Monitor Speaker Mode
N	Modulation Handshake
O	Return to Online Data Mode
P	Set Pulse Dial Default
Q	Result Codes Enable/Disable
Sr= <i>n</i>	Set Register Value
Sr?	Read Register Value
T	Set Tone Dial Default
V	Result Code Format
W	Result Code Options
X	Result Code Selection
Z	Modem Reset
&C	Data Carrier Detect (DCD) Control
&D	Data Terminal Ready (DTR) Control
&E	XON/OFF Pacing Control
&F	Restore Factory Settings (Configuration)
&G	Select Guard Tone Control
&K	Flow Control Selection
&L	Leased-Line Operation
&Q	Asynchronous Communication Mode (same as \N Error Correction Mode)
&S	Data Set Ready (DSR) Control
&T	Loopback Tests
&V	Display Current Settings (Configuration and Stored Profiles)
&W	Store Current Settings (Configuration and Stored Profiles)
&Zn= <i>x</i>	Store Dialing Command
\A	Select Maximum MNP Block Size
\B	Transmit Break to Remote
\K	Break Control
\N	Error Correction Mode Selection
\Q	Flow Control Selection
\T	Inactivity Timer
\V	Protocol Result Code
-C	Data Calling Tone
%A	Adaptive Answer Result Code Enable
%B	View Numbers in Blacklist
%C	Data Compression Enable/Disable
%DC	AT Command Control
%DT	“AT” Command Timer
%E	Fallback and Fall Forward Control
%H	Direct Connect Enable
%R	Cisco Configuration
%S	Response Speed
\$D	DTR Dialing
\$EB	Asynchronous Word Length
\$LB	Long Break
\$RP	Response Priority
\$SB	Serial Port Baud Rate

## List of V.92 Commands

Command	Description
+PCW= <i>n</i>	Call Waiting Enable
+PIG= <i>n</i>	PCM Upstream Enable
+PMH= <i>n</i>	Modem-on-Hold Enable
+PMHF	V.92 Modem Hook Flash
+PMHR= <i>n</i>	Modem-on-Hold Initiate
+PMHTR= <i>n</i>	Modem-on-Hold Timer
+PQC= <i>n</i>	Quick Connect Control
+DCS= <i>x,y</i>	Select V.44 Data Compression
+DR= <i>n</i>	V.44 Data Compression Reporting
+DS44= <i>n</i>	V.44 Data Compression
+MS	Modulation Selection
\$FC	Quick Connect

## List of Caller ID Commands

Command	Description
+VCID	Caller ID Enable/Disable
+VDR= <i>x,y</i>	Distinctive Ring Report "ERROR"
+VRID	Allows query of modem's last call received

## List of Callback Commands

These commands are used with modems that support Callback Security

Command	Description
#CBA	Callback Attempts
#CBD	Callback Delay
#CBF?	Callback Failed Attempts Display
#CBFR	Callback Failed Attempts Reset
#CBI	Local Callback Inactivity Timer
#CBNy= <i>x</i>	Store Callback Password
#CBP	Callback Parity
#CBR	Callback Security Reset
#CBS	Callback Enable/Disable
#P	Set 11-bit Parity
#Sx	Enter Setup Password
#S= <i>x</i>	Store Setup Password

## List of Escape Commands

Command	Description
+++AT	Escape Sequence
%%%ATMTSMODEM	Remote Configuration Escape Sequence

## List of DID Commands

Command	Description
*DD	Digit Format
*DF	Format for Reporting Incoming DID Number
*DS	Start Protocol
*DT	Wait for Digit Time-Out Time
*DW	Busy Out After Call Completion
*DN	Number of DID Digits
*DW	Busy Out After Call Completion
*DN	Number of DID Digits



## AT Commands Detail

<b>Command:</b>	<b>AT</b>	<b>Attention Code</b>
Values:		n/a
Description:		The attention code precedes all command lines except <b>A/</b> and escape sequences.
<b>Command:</b>	<b>A</b>	<b>Answer</b>
Values:		n/a
Description:		Answer an incoming call before the final ring.
<b>Command:</b>	<b>A/</b>	<b>Repeat Last Command</b>
Values:		n/a
Description:		Repeat the last command string. Do not precede this command with <b>AT</b> . Do not press ENTER to execute.
<b>Command:</b>	<b>Bn</b>	<b>Communication Standard Setting</b>
Values:		$n = 0-3, 15, 16$
Default:		1 and 16
Description:		<p>B0 Select ITU-T V.22 mode when modem is at 1200 bps</p> <p>B1 Select Bell 212A when modem is 1200 bps.</p> <p>B2 Deselect V.23 reverse channel (same as <b>B3</b>).</p> <p>B3 Deselect V.23 reverse channel (same as <b>B2</b>).</p> <p>B15 Select V.21 when modem is at 300 bps.</p> <p>B16 Select Bell 103 when modem is at 300 bps.</p>
<b>Command:</b>	<b>Ds</b>	<b>Dial</b>
Values:		$s =$ dial string (phone number and dial modifiers)
Default:		none
Description:		<p>Dial telephone number <math>s</math>, where <math>s</math> may be up to 40 characters long and include these characters: 0-9, *, #, A, B, C, D</p> <p>Can also include these Dial String Modifiers: <b>L, P, T, W, S</b>, comma (,), semicolon (;), !, @, ^, and \$.</p> <p><b>Dial String Characters and Modifiers</b></p> <p><b>0-9</b> DTMF digits 0 to 9.</p> <p><b>*</b> The 'star' digit (tone dialing only).</p> <p><b>#</b> The 'gate' digit (tone dialing only).</p> <p><b>A-D</b> Some countries may prohibit sending of these digits during dialing (tone dialing only)</p> <p><b>L</b> Redial last number. (Must be placed immediately after <b>ATD</b>.)</p> <p><b>P</b> Selects pulse dialing until a <b>T</b> is encountered. Affects current and subsequent dialing. Some countries prevent changing dialing modes after the first digit is dialed.</p> <p><b>T</b> Selects tone dialing until a <b>P</b> is encountered. Affects current and subsequent dialing. Some countries prevent changing dialing modes after the first digit is dialed.</p> <p><b>W</b> Wait for a new dial tone before continuing to dial. (<b>X2, X4, X5, X6</b>, or <b>X7</b> must be selected).</p> <p><b>S=n</b> Dial the number stored in the directory (<math>n = 0</math> to 3). (See &amp;Z.)</p> <p><b>,</b> Pause during dialing for set set in in register <b>S8</b>.</p> <p><b>;</b> Return to command mode after dialing. Place at the end of dial string.</p> <p><b>!</b> Hook Flash. Causes the modem to go on-hook for a time defined by the value of S29, then off-hook again. Country requirements may limit the time imposed.</p> <p><b>@</b> Wait for quiet answer (silence). Causes the modem to wait for a ring back, then 5 seconds of silence before processing the next part of the command. If silence is not detected, the modem returns a NO ANSWER code.</p> <p><b>^</b> Toggles the calling tone between enable/disable. Applicable to current dial attempt only.</p> <p><b>\$</b> Detect AT&amp;T call card "bong" tone. The character should follow the phone number and precede the user's call card number:</p> <p><b>ATDT1028806127853500\$123456789</b></p>

**Ignored Characters**

- ( ) Ignored: may be used to format the dial string.
- Ignored: may be used to format the dial string.
- <space> Ignored: may be used to format the dial string.
- <i> Invalid character: will be ignored.

**Command: %M Enable Dialing Message**

Values: 0, 1

Default: 0

Description: Enables dialing message. It will display when the ATDL=*n* command is used and dialing from memory or DTR dialing.  
 0 = Disabled - turns dialing message off  
 1 = Enabled - turns dialing message on

**Command: DS=*n* Dial Stored Telephone Number**Values: *n* = 0, 1, 2

Default: none

Description: Dials a number previously stored in the directory by the **&Z*n*=*x*** command. Ex: **ATDS=2**.**Command: En Echo Command**Values: *n* = 0 or 1

Default: 1

Description: E0 Disables echo command.  
 E1 Enables echo command.

**Command: Fn Echo Online Data Characters**Values: *n* = 0, 1

Default: 1

Description: F0 Enables online data character echo. (Not supported.)  
 F1 Disables online data character echo (included for backward compatibility).

**Command: Hn Disconnect (Hang Up)**Values: *n* = 0 or 1

Default: 0

Description: H0 The modem goes on-hook (hangs up).  
 H1 The modem goes off-hook (makes the phone line busy).

**Command: In Information Request**Values: *n* = 0–5, 9, 11

Default: None

Description: I0 Displays default speed and controller firmware version.  
 I1 Calculates and displays ROM checksum (e.g., B399).  
 I2 Checks ROM and verifies the checksum, displaying *OK* or *ERROR*.  
 I3 Displays default speed and controller firmware version.  
 I4 Displays firmware version for data pump (e.g., 17)..  
 I5 Displays the board ID: software version, hardware version, and the country ID in hexadecimal format (e.g., s0503a01V, 0,34).  
 I7 Displays release information and V.92 capabilities.  
 I9 Displays the country code in decimal format (e.g., 52).  
 I11 Displays diagnostic information for the last modem connection, such as DSP and firmware version, link type, line speed, serial speed, type of error correction/data compression, number of past retrains, etc.

**Command: Ln Not Applicable****Command: Mn Monitor Speaker Mode**Values: *n* = 0, 1, 2, or 3

Default: 1

Description: M0 Speaker always off.  
 M1 Speaker on until carrier signal detected.  
 M2 Speaker always on when modem is off-hook.  
 M3 Speaker on until carrier is detected, except while dialing.

<b>Command:</b>	<b>Nn</b>	<b>Modulation Handshake</b>
Values:		<i>n</i> = 0 or 1
Default:		1
Description:		N0 Modem performs handshake only at communication standard specified by <b>S37</b> and the <b>B</b> command. N1 Modem begins handshake at communication standard specified by <b>S37</b> and the <b>B</b> command. During handshake, fallback to a lower speed can occur.
<b>Command:</b>	<b>On</b>	<b>Return to Online Data Mode</b>
Values:		0, 1, 3
Default:		None
Description:		O0 Exits online command and returns to data mode (see +++AT escape sequence). O1 Issues a retrain and returns to online data mode. O3 Issues a rate renegotiation and returns to data mode.
<b>Command:</b>	<b>P</b>	<b>Set Pulse Dial Default</b>
Values:		P, T
Default:		T
Description:		Configures the modem for pulse (non-touch-tone) dialing. Dialed digits are pulsed until a <b>T</b> command or dial modifier is received.
<b>Command:</b>	<b>Qn</b>	<b>Result Codes Enable/Disable</b>
Values:		<i>n</i> = 0 or 1
Default:		0
Description:		Q0 Enables result codes. Q1 Disables result codes. Q2 Dumb Answer Mode (also known as No Response Answer). Q2 sets the answer mode to be handled without responses and echo turned off; however, the originate mode remains intelligent.
<b>Command:</b>	<b>Sr=n</b>	<b>Set Register Value</b>
Values:		<i>r</i> = S-Register number; <i>n</i> varies
Default:		None
Description:		Sets the value of the register <b>Sr</b> to the value of <i>n</i> , where <i>n</i> is entered in decimal format: Example: <b>S0=1</b> .
<b>Command:</b>	<b>Sr?</b>	<b>Read Register Value</b>
Values:		<i>r</i> = S-Register number
Default:		None
Description:		Reads the value of the register <b>Sr</b> and displays it in 3-digit decimal form. Example: <b>S2?</b> gives the response <b>043</b> .
<b>Command:</b>	<b>T</b>	<b>Set Tone Dial Default</b>
Values:		P, T
Default:		T
Description:		Configures the modem DTMF (touch-tone) dialing. Dialed digits are tone dialed until a <b>P</b> command or dial modifier is received.
<b>Command:</b>	<b>Vn</b>	<b>Result Code Format</b>
Values:		<i>n</i> = 0 or 1
Default:		1
Description:		V0 Displays result codes as digits (short form or terse). V1 Displays result codes as words (long-form or verbose).
<b>Command:</b>	<b>Wn</b>	<b>Result Code Options</b>
Values:		<i>n</i> = 0, 1, 2
Default:		2
Description:		W0 CONNECT result code reports serial port speed, disables protocol result codes. W1 CONNECT result code reports serial port speed, enables protocol result codes. W2 CONNECT result code reports line speed, enables protocol result codes.

**Command: Xn      Result Code Selection**

Values: n = 0–7  
 Default: 4  
 Description: X0 Basic result codes (e.g., CONNECT); does not look for dial tone or busy signal.  
 X1 Extended result codes (e.g., CONNECT 46000 V42bis); does not look for dial tone or busy signal.  
 X2 Extended result codes with NO DIALTONE; does not look for busy signal.  
 X3 Extended result codes with BUSY; does not look for dial tone.  
 X4 Extended result codes with NO DIALTONE and BUSY.  
 X5 Extended result codes with NO DIALTONE and BUSY.  
 X6 Extended result codes with NO DIALTONE and BUSY.  
 X7 Basic result codes with NO DIALTONE and BUSY.

**Command: Zn      Modem Reset**

Values: n = 0 or 1  
 Default: None  
 Description: Z0 Resets modem to profile saved by the last **&W** command.  
 Z1 Same as **Z0**.

**Command: &Cn      Data Carrier Detect (DCD) Control**

Values: n = 0, 1, or 2  
 Default: 1  
 Description: &C0 Forces the DCD circuit to be always high.  
 &C1 DCD goes high when the remote modem's carrier signal is detected, and goes low when the carrier signal is not detected.  
 &C2 DCD drops on disconnect for time set by **S18**, then goes high again (for some PBX phone systems).

**Command: &Dn      Data Terminal Ready (DTR) Control**

Values: n = 0, 1, 2, or 3  
 Default: 2  
 Description: &D0 Modem ignores the true status of the DTR signal and responds as if it is always on.  
 &D1 If DTR drops while in online data mode, the modem enters command mode, issues an OK, and remains connected.  
 &D2 If DTR drops while in online data mode, the modem hangs up. If the signal is not present, the modem will not answer or dial.  
 &D3 If DTR drops, the modem hangs up and resets as if an **ATZ** command were issued.

**Command: &En      XON/XOFF Pacing Control**

Values: n = 12 or 13  
 Default: 12  
 Description: &E12 Disables XON/XOFF pacing.  
 &E13 Enables XON/XOFF pacing. (&K4 must also be set.)  
**Note:** &E13 has no effect if hardware control (&K3) is selected.

**Command: &Fn      Load Factory Settings**

Values: n = 0  
 Default: None  
 Description: &F0 Loads factory settings as active configuration.  
**Note:** See also the Z command.

**Command: &Gn      V.22bis Guard Tone Control**

Values: n = 0, 1, or 2  
 Default: 0  
 Description: &G0 Disables guard tone.  
 &G1 Sets guard tone to 550 Hz.  
 &G2 Sets guard tone to 1800 Hz.  
**Note:** The **&G** command is not used in North America.

**Command: &Kn Flow Control Selection**

Values: n = 0, 3, or 4  
 Defaults: 3  
 Description: &K0 Disables flow control.  
 &K3 Enables CTS/RTS hardware flow control.  
 &K4 Enables XON/XOFF software flow control.

**Command: &Ln Leased-Line Operation**

Note: This command applies to the MT5634IND (Industrial Temperature Modem)  
 Values: n = 0, 1, or 2  
 Defaults: 0  
 Description: &L0 The modem is set for standard dial-up operation.  
 &L1 The modem is set for leased line operation in originate mode.  
 &L2 The modem is set for leased line operation in answer mode.  
**Note:** For &L1 and &L2, there is a 30-second window between power up and the starting of the leased line handshake. During this time, you can turn off the command, if desired.

**Command: &Qn Asynchronous Communications Mode**

Values: n = 0, 5, 6, 8, or 9  
 Default: 5  
 Description: &Q0 Asynchronous with data buffering. Same as \N0.  
 &Q5 Error control with data buffering. Same as \N3.  
 &Q6 Asynchronous with data buffering. Same as \N0.  
 &Q8 MNP error control mode. If MNP error control is not established, the modem falls back according to the setting in **S36**.  
 &Q9 V.42 or MNP error control mode. If neither error control is established, the modem falls back according to the setting in **S36**.

**Command: &Sn Data Set Ready (DSR) Control**

Values: n = 0 or 1  
 Default: 0  
 Description: &S0 DSR is always high (on).  
 &S1 DSR goes high only during a connection.

**Command: &Tn V.54 Test Commands**

Values: n = 0, 1, 3 or 6  
 Default: None  
 Description: &T0 Abort. Stops any test in progress.  
 &T1 Initiates local analog loopback test.  
 &T3 Initiates local digital loopback test.  
 &T6 Initiates remote digital loopback test.  
**Note:** To stop a test, use the escape sequence (+++AT) before typing &T0.

**Command: &V Display Current Settings**

Values: n/a  
 Description: Displays the active modem settings, including the callback security settings if callback security is enabled. If the setup password has been entered, it also displays the callback security passwords.

**Command: &Wn Store Current Configuration**

Values: n = 0, 1  
 Default: 1  
 Description: &W0 Stores current modem settings in nonvolatile memory and causes them to be loaded in place of the factory defaults at power-on or following the ATZ command. See also the &F command.  
 &W1 Clears user default settings from nonvolatile memory and causes the factory defaults to be loaded at power-on or following the ATZ command.

**Command: &Zn=x Storing a Dialing Command**

Values: n = 0–3. Callback security disabled. 0, 1 used by MultiModemZPX/ZLI.  
 0, 1, 2 used by MultiModemZBA.  
 0–29. Callback security enabled.  
 x = Stored telephone number

Default: None

Description: Stores dialing command x in memory. Dial the stored number using the command ATDS=n.  
 See also the #CBSn command.

**Command: \An Select Maximum MNP Block Size**

Values: n = 0, 1, 2, or 3

Default: 3

Description: \A0 64-character maximum.  
 \A1 128-character maximum.  
 \A2 192-character maximum.  
 \A3 256-character maximum.

**Command: \Bn Transmit Break**

Values: n = 0–9 in 100 ms units

Default: 3

Description: In non-error-correction mode only, sends a break signal of the specified length to a remote modem. Works in conjunction with the \K command.

**Command: \Kn Break Control**

Values: n = 0–5

Default: 5

Description: Controls the modem's response to a break received from the computer, the remote modem, or the \B command. The response is different for each.

**Data mode. Modem receives the break from the computer:**

\K0 Enters online command mode, no break sent to the remote modem.  
 \K1 Clears data buffers and send break to the remote modem.  
 \K2 Same as \K0.  
 \K3 Sends break immediately to the remote modem .  
 \K4 Same as \K0.  
 \K5 Sends break to the remote modem in sequence with the transmitted data.

**Data mode. Modem receives the break from the remote modem:**

\K0 Clears data buffers and sends break to the computer.  
 \K1 Same as \K0.  
 \K2 Sends break immediately to the computer.  
 \K3 Same as \K2.  
 \K4 Sends break to the computer in sequence with the received data.  
 \K5 Same as \K4.

**Online command mode. Modem receives a \Bn command from the computer:**

\K0 Clears data buffers and sends break to the remote modem.  
 \K1 Same as \K0.  
 \K2 Sends break immediately to the remote modem.  
 \K3 Same as \K2.  
 \K4 Sends break to the remote modem in sequence with the transmitted data.  
 \K5 Same as \K4.

**Command: \Nn Error Correction Mode Selection**

Values: n = 0–5, or 7

Default: 3

Description: \N0 Non-error correction mode with data buffering (same as &Q6).  
 \N1 Direct mode.  
 \N2 MNP reliable mode. If modem cannot make MNP connection, it disconnects.  
 \N3 V.42/MNP auto-reliable mode. The modem attempts first to connect in V.42 error correction mode, then in MNP mode, and finally in non-error-correction (buffer) mode with continued operation.  
 \N4 V.42 reliable mode.If the modem cannot make a V.42 connection, it disconnects.  
 \N5 V.42, MNP, or non-error correction (same as \N3).  
 \N7 V.42, MNP, or non-error correction (same as \N3).

**Command: \Qn Flow Control Selection**

Values: n = 0, 1, or 3  
 Default: 3  
 Description: \Q0 Disables flow control (same as &K0).  
 \Q1 XON/XOFF software flow control (same as &K4).  
 \Q2 CTS-only flow control. Not supported.  
 \Q3 RTS/CTS hardware flow control (same as &K3).

**Command: \Tn Inactivity Timer**

Values: n = 0, 1–255  
 Default: 0  
 Description: \Tn Sets the time (in minutes) that the modem waits after the last character is sent or received before it disconnects. A value of zero disables the timer. Applies only in buffer mode.  
**Note:** You can also set the inactivity timer by changing the value of S30.

**Command: \Vn Protocol Result Code**

Values: n = 0, 1, or 2  
 Default: 1  
 Description: \V0 Disables the appending of the protocol result code to the DCE speed.  
 \V1 Enables the appending of the protocol result code to the DCE speed.  
 \V2 Same as \V1.

**Command: -Cn Data Calling Tone**

Values: n = 0 or 1  
 Defaults: 0  
 Description: -C0 Disables V.25 data calling tone to deny remote data/fax/voice discrimination.  
 -C1 Enables V.25 data calling tone to allow remote data/fax/voice discrimination.

**Command: %A Adaptive Answer Result Code Enable**

Values: n = 0 or 1  
 Default: 0  
 Description: The %A command controls whether the DATA and FAX result codes will be sent by the modem. The modem must be in fax mode for this command to work. Also, the modem must be set to +FAA=1, which enables the modem to distinguish between a fax and a data call. When these commands are enabled, the modem sends DATA to the computer when it detects data tones, and FAX when it detects fax tones. These strings are used by some servers to select the appropriate communication program.  
 %A0 Disables adaptive answer result codes.  
 %A1 Enables adaptive answer result codes.  
**Note:** For descriptions of the +FAA= and other fax commands, see the Multi-Tech Fax Class 2.1 Developer's Guide.

**Command: %B View Numbers in Blacklist**

Values: n/a  
 Description: If blacklisting is in effect, AT%B displays the numbers for which the last call attempted in the previous two hours failed. In countries that do not require blacklisting, the ERROR result code appears.

**Command: %Cn Data Compression Control**

Values: n = 0 or 1  
 Default: 1  
 Description: %C0 Disable sV.42bis/MNP 5 data compression.  
 %C1 Enables V.42bis/MNP 5 data compression.

**Command: %DCn AT Command Control**

Values: n = 0 or 1  
 Default: 0  
 Description: %DC0 The modem responds to AT commands.  
 %DC1 The modem ignores AT commands.  
**Note:** The modem will respond to AT%DC for 10 seconds after it is turned on.

**Command: %DTn Set Command Mode Time**

Values: 0-255 in 1 second increments  
 Default: 0  
 Description: Sets the length of time that the command mode will be disabled when set for %DC1 (the modem ignores AT commands).

**Command: %En Fallback and Fall Forward Control**

Values: n = 0, 1, or 2  
 Default: 2  
 Description: %E0 Disables fallback and fall-forward.  
 %E1 Enables fallback, disables fall-forward.  
 %E2 Enables fallback and fall-forward.

**Command: %Hn Direct Connect Enable**

Values: n = 0, 1  
 Default: 0  
 Description: %H0 Sets callback security to normal operation.  
 %H1 All callback security calls will be direct connect regardless of whether the password or phone number has the - character.

**Command: %Rn Cisco Configuration**

Values: n = 0, 1  
 Default: 0  
 Description: %R0 Disables Cisco configuration.  
 %R1 Sets E0, Q1, &D0, \N0, \$SB9600, and %S1 for operation with a Cisco router.

**Command: %Sn Command Speed Response**

Values: n = 0, 1  
 Default: 0  
 Description: %S0 Sets modem to respond to AT commands at all normal speeds.  
 %S1 AT commands accepted at 115200 bps only. Other speeds are ignored.

**Command: \$Dn DTR Dialing**

Values: n = 0 or 1  
 Default: 0  
 Description: \$D0 Disables DTR dialing.  
 \$D1 Dials the number in memory location 0 when DTR goes high.

**Command: \$EBn Asynchronous Word Length**

Values: n = 0 or 1  
 Default: 0  
 Description: \$EB0 Enables 10-bit mode.  
 \$EB1 Enables 11-bit mode.

**Command: \$FC Quick Connect**

Values: n = 0, 1, or 2  
 Default: 1  
 Description: \$FC0 - Sets quick connect at 1200 baud  
 \$FC1 - No quick connect  
 \$FC2 - Sets quick connect at 2400 baud

**Command: \$LB Long Break**

Values: 0-255 in 10 ms increments  
 Default: 30 (300 ms break)  
 Description: Sets the length of a long break transmitted by the modem if set up by the modem.



**Command: \$MBn Modem Baud Rate**

Values: 75, 300, 1200, 2400, 4800, 9600, 14400, 19200, 28800, 33600

Default: 33600

Description: Presets the **transmission** baud rate for originate operations (i.e., the speed of the modem's transmissions over the telephone lines when originating a call). With speed conversion, transmission speed can be a different baud rate than the serial port speed. When the modem receives a call from another modem, it automatically switches its phone line transmission speed to match the calling mode. However, if the MultiModem originates a call to another modem that is unable to connect at the MultiModem's baud rate, it automatically drops to the lower baud rate in an attempt to match that modem's speed. For example, if the MultiModem is set for 19200 baud and calls a modem with a top speed of 2400 baud, it drops to 2400 baud.

```
AT$MB75    = V.23
AT$MB300   = 300 bps
AT$MB1200  = 1200 bps
AT$MB2400  = 2400 bps
AT$MB4800  = 4800 bps
AT$MB9600  = 9600 bps
AT$MB14400 = 14400 bps
AT$MB19200 = 19200 bps
AT$MB28800 = 28800 bps
AT$MB33600 = 33600 bps
```

**Command: \$RP Response Priority**

Values: n = 0, 1

Default: 1

Description: Configures whether an incoming ring or an AT command will have priority.  
 \$RP0 - AT command will have priority  
 \$RP1 - Incoming call (ring) will have priority

**Command: \$SBn Serial Port Baud Rate**

Values: n = speed in bits per second

Default: 57600

Description:

\$SB300	Set serial port to 300 bps.
\$SB1200	Set serial port to 1200 bps.
\$SB2400	Set serial port to 2400 bps.
\$SB4800	Set serial port to 4800 bps.
\$SB9600	Set serial port to 9600 bps.
\$SB19200	Set serial port to 19200 bps.
\$SB38400	Set serial port to 38400 bps.
\$SB57600	Set serial port to 57600 bps.
\$SB115200	Set serial port to 115200 bps.
\$SB230400	Set serial port to 230400 bps. (V.92 models only)

## V.92 Commands

### Command: +PCW=*n* Call Waiting Enable

Values: *n* = 0, 1, or 2  
 Default: 0  
 Description: Controls the action to be taken upon detection of a call waiting tone in V.92 mode. Values specified by this command are not modified when an AT&F command is issued.  
 +PCW=0 Toggles V.24 Circuit 125 and collects Caller ID if enabled by +VCID  
 +PCW=1 Hangs up  
 +PCW=2 Ignores V.92 call waiting  
 +PCW=? Displays the allowed values  
 +PCW? Displays the current value

### Command: +PIG=*n* PCM Upstream Enable

Values: *n* = 0 or 1  
 Default: 1  
 Description: Controls the use of PCM upstream during V.92 operation. PCM upstream allows faster upload speeds to a V.92 server.  
 +PIG=0 Enable PCM upstream  
 +PIG=1 Disable PCM upstream  
 +PIG=? Displays the allowed values  
 +PIG? Displays the current value

### Command: +PMH=*n* Modem on Hold Enable

Values: *n* = 0 or 1  
 Default: 1  
 Description: Controls if modem on hold procedures are enabled during V.92 operation. Normally controlled by a modem on hold program. Values specified by this command are not modified when an AT&F command is issued.  
 +PMH=0 Enables V.92 modem on hold  
 +PMH=1 Disables V.92 modem on hold  
 +PMH=? Displays the allowed values  
 +PMH? Displays the current value

### Command: +PMHF V.92 Modem Hook Flash

Values: n/a  
 Default: n/a  
 Description: Causes the DCE to go on-hook for a specified period of time, and then return off-hook for at least a specified period of time. The specified period of time is normally one-half second, but may be governed by national regulations. "ERROR" is returned if MOH is not enabled.

### Command: +PMHR=*n* Modem on Hold Initiate

Values: *n* = 0–13  
 Default: 0  
 Description: +PMHR is an action command that causes the modem to initiate MOH with the central site modem. It returns the following values to indicate negotiated values. Valid only if MOH is enabled and the modem is off-hook or in data mode. Otherwise, ERROR will be returned.  
 +PMHR=0 Deny MOH request  
 +PMHR=1 Grant MOH request with 10 second timeout  
 +PMHR=2 Grant MOH request with 20 second timeout  
 +PMHR=3 Grant MOH request with 30 second timeout  
 +PMHR=4 Grant MOH request with 40 second timeout  
 +PMHR=5 Grant MOH request with 1 minute timeout  
 +PMHR=6 Grant MOH request with 2 minute timeout  
 +PMHR=7 Grant MOH request with 3 minute timeout  
 +PMHR=8 Grant MOH request with 4 minute timeout  
 +PMHR=9 Grant MOH request with 6 minute timeout  
 +PMHR=10 Grant MOH request with 8 minute timeout  
 +PMHR=11 Grant MOH request with 12 minute timeout  
 +PMHR=12 Grant MOH request with 16 minute timeout  
 +PMHR=13 Grant MOH request with indefinite timeout  
 +PMHR=? Displays the allowed values  
 +PMHR? Displays the current value

**Command: +PMHT=n Modem on Hold Timer**

Values:	n = 0–13
Default:	0
Description:	Determines if the modem will accept a V.92 Modem on Hold request; sets the MoH timeout.
	+PMHT=0 Deny MOH request
	+PMHT=1 Grant MOH request with 10 second timeout
	+PMHT=2 Grant MOH request with 20 second timeout
	+PMHT=3 Grant MOH request with 30 second timeout
	+PMHT=4 Grant MOH request with 40 second timeout
	+PMHT=5 Grant MOH request with 1 minute timeout
	+PMHT=6 Grant MOH request with 2 minute timeout
	+PMHT=7 Grant MOH request with 3 minute timeout
	+PMHT=8 Grant MOH request with 4 minute timeout
	+PMHT=9 Grant MOH request with 6 minute timeout
	+PMHT=10 Grant MOH request with 8 minute timeout
	+PMHT=11 Grant MOH request with 12 minute timeout
	+PMHT=12 Grant MOH request with 16 minute timeout
	+PMHT=13 Grant MOH request with indefinite timeout
	+PMHT=? Displays the allowed values
	+PMHT? Displays the current value

**Command: +PQC=n Quick Connect Control**

Values:	n = 0, 1, 2, or 3
Default:	3
Description:	Controls the V.92 shortened Phase 1 and Phase 2 startup procedures (Quick Connect). When line conditions are stable, quick connect results in shortened connect times; however, significant fluctuation in line conditions from call to call can result in longer connect times, in which case it may be advisable to disable quick connect.
	+PQC=0 Enables Short Phase 1 and Short Phase 2 (Quick Connect)
	+PQC=1 Enables Short Phase 1
	+PQC=2 Enables Short Phase 2
	+PQC=3 Disables Short Phase 1 and Short Phase 2
	+PQC=? Displays the allowed values
	+PQC? Displays the current value

**Command: +DCS=x,y Select V.44 Data Compression**

Values:	x = 0 or 1 (V.42bis)
	y = 0, 1, or 2 (V.44)
Default:	1, 2
Description:	Selects V.42bis/V.44 data compression.
	+DCS=0,0 V.42bis and V.44 data compression are both disabled.
	+DCS=0,1 V.42bis is disabled; V.44 data compression is acceptable.
	+DCS=0,2 V.42bis is disabled; V.44 only when connected to a V.92 server.
	+DCS=1,0 V.42bis is acceptable; V.44 data compression is disabled.
	+DCS=1,1 V.42bis is acceptable; V.44 data compression is acceptable.
	+DCS=1,2 V.42bis is acceptable; V.44 only when connected to a V.92 server.
	+DCS=? Displays the allowed values.
	+DCS? Displays the current value.

**Command: +DR=n V.44 Data Compression Reporting**

Values:	n = 0 or 1
Default:	0
Description:	Enables or disables the V.44 data compression report. If the compression report is enabled, the +DR:<type> intermediate result code reports the current DCE-DCE data compression type. It is issued after the Error Control Report (+ER) and before the final result code (e.g., CONNECT). The intermediate result code descriptions are shown after the command - descriptions.
	+DR=0 Disables the V.44 compression report.
	+DR=1 Enables the V.44 compression report.
	+DR=? Displays the allowed values.
	+DR? Displays the current value.
	+DR: NONE Data compression not in use.
	+DR: V42B V.42bis is in use in both directions.
	+DR: V44 V.44 is in use in both directions.

**Command: +DS44=*n* V.44 Data Compression**

Values: See description

Default: See description

Description: Controls the V.44 data compression function.

The command syntax is +DS44=[direction][,*[0]*][,*[0]*

[,*[max\_codewords\_tx]*][,*[max\_codewords\_rx]*][,*[max\_string\_tx]*

[,*[max\_string\_rx]*][,*[max\_history\_tx]*][,*[max\_history\_rx]*]]]]]]]]]]]]<CR>

Subparameters that are not entered retain their current value. Commas separate optional subparameters, and must be inserted to skip a subparameter. Example: +DS44=,,,2048,2048<CR> changes the maximum number of code words in both directions, and keeps all other settings at their current values.

+DS44=? Reports supported options in the format (list of supported direction values), (0), (0), (list of supported max\_codewords\_tx values), (list of supported max\_codewords\_rx values), (list of supported max\_string\_tx values), (list of supported max\_string\_rx values), (list of supported max\_history\_tx values), (list of supported max\_history\_rx values).

Example: +DS44: (3, 0), (0), (0), (256-2048), (256-2048), (31-255), (31-255), (512-11008), (512-11008).

+DS44? Reports current options in the following format:

direction, 0, 0, max\_codewords\_tx, max\_codewords\_rx, max\_string\_tx, max\_string\_rx, max\_history\_tx, max\_history\_rx.

Example: +DS44: 3, 0, 0, 1024, 1024, 255, 255, 5120, 4096.

**Subparameters**

<i>direction</i>	Specifies the DTE direction of the data compression. 0 No compression. 3 Compression in both directions (default).
<i>max_codewords_tx</i>	Specifies the maximum number of code words to be negotiated in the transmit direction. 1024 Default. 256–2048 Maximum number of code words in transmit direction.
<i>max_codewords_rx</i>	Specifies the maximum number of code words to be negotiated in the receive direction. 1024 Default. 256–2048 Maximum number of code words in receive direction.
<i>max_string_tx</i>	Specifies the maximum string length to be negotiated in the transmit direction. 255 Default. 31–255 Maximum string length in transmit direction.
<i>max_string_rx</i>	Specifies the maximum string length to be negotiated in the receivedirection. 255 Default. 31–255 Maximum string length in receivedirection.
<i>max_history_tx</i>	Specifies the maximum length of the history buffer to be negotiated in the transmit direction. 5120 Default. 512–11008 History buffer size in transmit direction.
<i>max_history_rx</i>	Specifies the maximum length of the history buffer to be negotiated in the receive direction. 4096 Default. 512–11008 History buffer size in receive direction

**Command: +MS= Modulation Selection**

Values: See description.

Defaults: See description.

Description: This extended-format command selects modulation, enables or disables automode, and specifies the highest downstream and upstream connection rates using one to four subparameters.

The command syntax is:

**+MS=** [*mod*],[*automode*],[*0*],[*max\_rate*],[*0*],[*max\_rx\_rate*]]<CR>Subparameters that are not entered retain their current value. Commas separate optional subparameters, and must be inserted to skip a subparameter. Example: **+MS=,0<CR>** disables automode and keeps all other settings at their current values.**+MS=?** Reports supported options in the format (list of supported *mod* values),(list of supported *automode* values),(0),(list of supported *max\_rate* values),(0),(list of supported *max\_rx\_rate* values). Example: **+MS: (BELL103, V21, BELL212A, V22, V22B, V23C, V32, V32B, V34, V90, V92), (0, 1), (0), (0-33600), (0), (0-56000)****+MS?** Reports current options in the format *mod, automode, 0, max\_rate, 0, max\_rx\_rate*.Example: **+MS: V92, 1, 0, 31200, 0, 56000**.**Subparameters**

<i>mod</i>	Specifies the preferred modulation (automode enabled) or the modulation to use in originating or answering a connection (automode disabled). The default is V92.																																				
	<table border="1"> <thead> <tr> <th><b>mod</b></th> <th><b>Modulation</b></th> <th><b>Possible rates (bps)<sup>1</sup></b></th> </tr> </thead> <tbody> <tr> <td>V92<sup>2</sup></td> <td>V.92</td> <td>56000, 54666, 53333, 52000, 50666, 49333, 48000, 46666, 45333, 44000, 42666, 41333, 40000, 38666, 37333, 36000, 34666, 33333, 32000, 30666, 29333, or 28000</td> </tr> <tr> <td>V90<sup>3</sup></td> <td>V.90</td> <td>56000, 54666, 53333, 52000, 50666, 49333, 48000, 46666, 45333, 44000, 42666, 41333, 40000, 38666, 37333, 36000, 34666, 33333, 32000, 30666, 29333, or 28000</td> </tr> <tr> <td>V34</td> <td>V.34</td> <td>33600, 31200, 28800, 26400, 24000, 21600, 19200, 16800, 14400, 12000, 9600, 7200, 4800, or 2400</td> </tr> <tr> <td>V32B</td> <td>V.32bis</td> <td>14400, 12000, 9600, 7200, or 4800</td> </tr> <tr> <td>V32</td> <td>V.32</td> <td>9600 or 4800</td> </tr> <tr> <td>V22B</td> <td>V.22bis</td> <td>2400 or 1200</td> </tr> <tr> <td>V22</td> <td>V.22</td> <td>1200</td> </tr> <tr> <td>V23C</td> <td>V.23</td> <td>1200</td> </tr> <tr> <td>V21</td> <td>V.21</td> <td>300</td> </tr> <tr> <td>Bell212A</td> <td>Bell 212A</td> <td>1200</td> </tr> <tr> <td>Bell103</td> <td>Bell 103</td> <td>300</td> </tr> </tbody> </table> <p><b>Notes:</b></p> <ol style="list-style-type: none"> <li>See optional &lt;automode&gt;, &lt;max_rate&gt;, and &lt;max_RX_rate&gt; subparameters.</li> <li>Selects V.92 modulation as first priority. If a V.92 connection cannot be established, the modem attempts V.90, V.34, V.32bis, etc.</li> <li>Selects V.90 modulation as first priority. If a V.90 connection cannot be established, the modem attempts V.34, V.32bis, etc.</li> </ol>	<b>mod</b>	<b>Modulation</b>	<b>Possible rates (bps)<sup>1</sup></b>	V92 <sup>2</sup>	V.92	56000, 54666, 53333, 52000, 50666, 49333, 48000, 46666, 45333, 44000, 42666, 41333, 40000, 38666, 37333, 36000, 34666, 33333, 32000, 30666, 29333, or 28000	V90 <sup>3</sup>	V.90	56000, 54666, 53333, 52000, 50666, 49333, 48000, 46666, 45333, 44000, 42666, 41333, 40000, 38666, 37333, 36000, 34666, 33333, 32000, 30666, 29333, or 28000	V34	V.34	33600, 31200, 28800, 26400, 24000, 21600, 19200, 16800, 14400, 12000, 9600, 7200, 4800, or 2400	V32B	V.32bis	14400, 12000, 9600, 7200, or 4800	V32	V.32	9600 or 4800	V22B	V.22bis	2400 or 1200	V22	V.22	1200	V23C	V.23	1200	V21	V.21	300	Bell212A	Bell 212A	1200	Bell103	Bell 103	300
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V23C	V.23	1200																																			
V21	V.21	300																																			
Bell212A	Bell 212A	1200																																			
Bell103	Bell 103	300																																			
<i>automode</i>	An optional numeric value that enables or disables automatic modulation negotiation using V.8 bis/V.8 or V.32 bis Annex A. Automode is disabled if values are specified for the <i>max_rate</i> and <i>max_rx_rate</i> parameters. The options are: 0 Disable automode 1 Enable automode (default)																																				
<i>max_rate</i>	An optional number that specifies the highest rate at which the modem may establish an upstream (transmit) connection. The value is decimal coded in units of bps, for example, 33600 specifies the highest rate to be 33600 bps. 0 Maximum rate value limited by the modulation selected in <i>mod</i> (default). 300–33600 Maximum rate value limited by the modulation selected in <i>mod</i> . For valid <i>max_rate</i> values for each <i>mod</i> value, see the following table:																																				
	<table border="1"> <thead> <tr> <th><b>mod value</b></th> <th><b>Valid max-rate values (bps)</b></th> </tr> </thead> <tbody> <tr> <td>V92, V90, V34</td> <td>31200, 28800, 26400, 24000, 21600, 19200, 16800, 14400, 12000, 9600, 7200, 4800, 2400</td> </tr> <tr> <td>V32B</td> <td>19200, 16800, 14400, 12000, 9600, 7200, 4800</td> </tr> <tr> <td>V32</td> <td>14400, 12000, 9600, 7200, 4800</td> </tr> <tr> <td>V22B</td> <td>2400</td> </tr> <tr> <td>V22, V23C, Bell212A</td> <td>1200</td> </tr> <tr> <td>V21, Bell103</td> <td>300</td> </tr> </tbody> </table>	<b>mod value</b>	<b>Valid max-rate values (bps)</b>	V92, V90, V34	31200, 28800, 26400, 24000, 21600, 19200, 16800, 14400, 12000, 9600, 7200, 4800, 2400	V32B	19200, 16800, 14400, 12000, 9600, 7200, 4800	V32	14400, 12000, 9600, 7200, 4800	V22B	2400	V22, V23C, Bell212A	1200	V21, Bell103	300																						
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V21, Bell103	300																																				
<i>max_rx_rate</i>	An optional number that specifies the highest rate at which the modem may establish a downstream (receive) connection. The value is decimal coded in bps units; e.g., 28800 specifies the highest rate to be 28800 bps. 0 Maximum rate determined by the modulation selected in <i>mod</i> (default). 300–56000 Maximum rate value limited by the modulation selected in <i>mod</i> . See “Possible rates” in the <i>mod</i> table.																																				

## Caller ID Commands

### Command: +VCID=n Caller ID Selection

Values: n = 0, 1, or 2  
 Default: 0  
 Description: Enables Caller ID detection and configures the reporting and presentation of the Caller ID data that is detected after the first ring. The reported data includes the date and time of the call, the caller's name and number, and a message. Set S0=2.

- +VCID=0 Disables Caller ID
- +VCID=1 Enables Caller ID with formatted data
- +VCID=2 Enables Caller ID with unformatted data
- +VCID=? Displays the allowed values
- +VCID? Displays the current value

### Command: +VDR=x,y Distinctive Ring Report

Values: x = 0, 1 Distinctive Ring report control. See description.  
 y = 0–255 Minimum ring interval in 100 ms units. See description.  
 Default: 0  
 Description: Enables reporting of ring cadence information to the DTE and specifies the minimum ring cadence that will be reported.

The report format is one line per silence period and one line per ring period. The length of the silence period is in the form *DROF=number in units of 100 ms<CR><LF>*, and the length of the ring is in the form *DRON=number in units of 100 ms<CR> <LF>*.

The modem may produce a Ring event code after the DRON message if enabled by the y parameter. The y parameter must be set to a value equal to or smaller than the expected ring cadence in order to pass the report to the DTE.

- +VDR=0, n/a Disables Distinctive Ring cadence reporting.
- +VDR=1, 0 Enables Distinctive Ring cadence reporting. Other call progress result codes (including RING) are reported as normal.
- +VDR=1, >0 Enables Distinctive Ring cadence reporting. The RING result code is reported after the falling edge of the ring pulse (i.e., after the DRON report).
- +VDR=? Displays the allowed values.
- +VDR? Displays the current value.

### Command: +VRID Caller ID Query

Values: na  
 Default: na  
 Description: Displays Caller ID information of the last call received.

## Callback Security Commands

### Command: #CBAn Callback Attempts

Values: n = 1–255  
 Default: 4  
 Description: Sets the number of callback attempts that are allowed after passwords have been exchanged between modems.

### Command: #CBDn Callback Delay

Values: n = 0–255  
 Default: 15  
 Description: Sets the length of time (in seconds) that the modem waits before calling back the remote modem.

### Command: #CBF? Callback Failed Attempts Display

Values: n/a  
 Default: n/a  
 Description: Requests the number of failed callback passwords since reset or power-up. This number can be stored to nonvolatile memory using the &W command.

### Command: #CBFR Callback Failed Attempts Reset

Values: n/a  
 Default: n/a  
 Description: Resets the number of failed callback passwords to 0. This does not reset the number stored in nonvolatile memory.

### Command: #CBIn Local Callback Inactivity Timer

Values: n = 1–255  
 Default: 20  
 Description: Sets the time (in minutes) that the modem waits for a command before forcing the user to enter the setup password again.

### – Store Callback PCommand: #CBNy=x Store Callback Password

Values: y = 0–29  
 x = password  
 Defaults: None  
 Description: Sets the callback security password for the y memory location. The password must have 6 to 10 characters, and cannot include the + or - characters.

### Command: #CBPn Callback Parity

Values: n = 0, 1, or 2  
 Default: 0  
 Description: Sets parity for the callback security messages.  
 #CBP0 No parity.  
 #CBP1 Odd parity.  
 #CBP2 Even parity.

### Command: #CBRy Callback Security Reset

Values: y = 0–29  
 Default: None  
 Description: Clears the password and phone number in the y memory location.

**Command: #CBSn Callback Enable/Disable**

Values: n = 0, 1, 2, or 3  
 Default: 0  
 Description: #CBS0 Disables callback security.  
 #CBS1 Enables local and remote callback security.  
 #CBS2 Enables remote callback security only.  
 #CBS3 Disables callback security until local hangup or reset.  
 #CBS4 Enables a callback security modem to originate a call without a connection password prompt.

**Command: #Pn Set 11-bit Parity**

Values: n = 0 or 1  
 Default: 2  
 Description: #P0 No parity.  
 #P1 Odd parity.  
 #P2 Even parity.

**Command: #Sx Enter Setup Password**

Values: x= password (1–8 characters, case sensitive)  
 Default: MTSMODEM  
 Description: Enters the callback security setup password.

**Command: #S=x Store Setup Password**

Values: x= password (1–8 characters, case sensitive)  
 Default: MTSMODEM  
 Description: Stores a new callback security and remote configuration setup password.

## Escape Sequence Commands

**Command: Escape Sequence+++AT<CR> Escape Sequence**

Values: n/a  
 Description: Puts the modem in command mode (and optionally issues a command) while remaining online. Type +++AT and up to six command characters, then press ENTER. Used mostly to issue the hang-up command: +++ATH<CR>.

**Command: Escape Configuration for Remote Configuration%%ATMTSMODEM<CR> Remote Configuration Escape Sequence**

Values: n/a  
 Description: Initiates remote configuration mode while online with remote modem. The remote configuration escape character (%) is defined in register S9.



## DID Commands

The DID modem uses **\*D** commands to configure the modem's DID features. The modem must be configured for the proper protocol, digit format, digit time out, digit report format, and number of digits. This configuration is determined by the company from which the DID line is ordered and the setup used by the phone company. The DID configuration parameter settings of the modem can be viewed as part of the report of the **AT&V** command and can be stored with **AT&X0** command.

### Command: **\*DS Start Protocol**

Values: n = 0, 1, 2 or 3  
 Default: 0  
 Description:

There are three different types of DID start protocols: **Wink**, **Immediate**, and **Delay Dial**.

In the **Wink Start** protocol, the central office closes the loop and draws current. The modem senses the current draw and will reverse the DC polarity for a short pulse to sign that it sees the incoming call and is ready to accept the DID digits.

**Delay Dial** is the same as Wink Start with the exception that the length of the reverse pulse is not defined. When the DID modem senses the current draw, it will reverse the DC voltage until it is ready to receive the DID digits.

On an **Immediate Start** DID line, the central office closes the loop for a short time and then sends the DID digits without waiting for a response from the DID modem.

After the central office sends the DID digits all three lines operate the same way. The modem will reverse the DC polarity to signal the beginning of the call and the central office will open the channel to the caller and begin billing. When the call is completed, the DID modem will return the DC voltage to normal polarity and the central office will open the circuit.

While the modem is monitoring the DID line for current draw, it is also monitoring the POTS line for incoming rings.

\*DS0 Disables DID detection of incoming DID calls (DC voltage still applies to DID line)  
 \*DS1 Wink Start  
 \*DS2 Immediate Start  
 \*DS3 Delay Dial

### Command: **\*DT Wait for Digit Time-Out Time**

Values: DTn - n=0-30 seconds  
 Default: 0  
 Description:

This command is used to configure the time between each digit the modem will wait. If the modem has not received the proper number of digits when the timer expires, it will report the digits it has received so far and move on to the answering sequence described in the **\*DN** command.

### Command: **\*DD Digit Format**

Values: 0, 1, 2  
 Default: 0  
 Description:

This command is used to configure the modem for the format the central office will send the incoming digits. At this time, only DTMF is supported.

\*DD0 DTMF  
 \*DD1 Pulse  
 \*DD2 MF (MultiFrequency)

### Command: **\*DN Number of DID Digits Expected**

Values: 0-7  
 Default: 0  
 Description:

This command is used to configure the modem for the expected number of digits from the central office (the central office will send the last few digits of the called number). When the proper number of digits are received, the modem will pass the digit information to the host computer. After passing the digits the modem will answer the incoming call if S0 is greater than 0. Otherwise the modem will wait for the host computer to issue an ATA command.

**Command: \*DW Busy-Out Timer at End of Call**

Values: 0-255

Default: 0

Description: This command defines the amount of time to busy out the modem upon disconnecting from a DID call. The delay is ended when the timer runs out or a \*DS command is received.

\*DW0 This command *disables* the delay. It ends the delay, but it also places the DID line a busy-out state.

\*DW255 This command will extend the delay indefinitely.

**About the Busy-Out Features and Functions**

A Direct Inward Dial (DID) line can be put in a “Busy Out” state by reversing the battery polarity the modem supplies to the line. This will cause a caller to receive either a busy signal in a single line system or roll over to the next line in a trunk system.

The line is busied out in the following cases.

- Modem is set to the factory default DID start format \*DS0
- Modem receives an incoming ring on the POTS line
- Modem is given the dial command ATD
- Modem is set with the \*DW command to busy-out delay after finishing a call

**Command: \*DF Format for Reporting Incoming DID Number**

Values: 0, 1, 2

Default: 0

Description: This command allows for three different reporting formats of the incoming number information. This information is output when either the proper number of digits have been received or the time out timer has expired and before the modem answers the call. When set to \*DF1, the modem will output one line for every digit received. For the other formats, the modem will only output one line per call.

\*DF0 “DID:xxx” - Default

\*DF1 “DTMFx” for each digit

\*DF2 “RINGxxx”

## Chapter 2 - S-Registers

Certain modem values, or parameters, are stored in memory locations called *S-Registers*. Use the **S** command to read or to alter the contents of S-Registers (see previous section).

<b><u>Register</u></b>	<b><u>Unit</u></b>	<b><u>Range</u></b>	<b><u>Default</u></b>	<b><u>Description</u></b>
<b>S0</b>	1 ring	0–255	0,1	Sets the number of rings until the modem answers. <b>ATS0=0</b> disables autoanswer completely. Range varies Set S0=2 for Caller ID. Internal Modem Default is 0 External Modem Default is 1
<b>S1</b>	1 ring	0–255	0	Counts the rings that have occurred.
<b>S2</b>	decimal	0–255	43 (+)	Sets ASCII code for the escape sequence character. Values greater than 127 disable escape.
<b>S3</b>	decimal	0–127	13 (^M)	Sets the ASCII code for the carriage return character.
<b>S4</b>	decimal	0–127	10 (^J)	Sets the ASCII code for line feed character.
<b>S5</b>	decimal	0–127	8 (^H)	Sets the ASCII code for the backspace character. Values over 32 disable it.
<b>S6</b>	seconds	2–65*	2*	Sets the time the modem waits after it goes off-hook before it begins to dial the telephone number.
<b>S7</b>	seconds	1–255*	50*	Sets the time the modem waits for a carrier signal before aborting a call. Also sets the wait-for-silence time for the @ dial modifier.
<b>S8</b>	seconds	2–65	2	Sets the length of a pause caused by a comma character in a dialing command.
<b>S9</b>	decimal	0–127	37 (%)	Sets ASCII code for remote configuration escape character. <b>S9=0</b> disables remote configuration.
<b>S10</b>	100 ms	1–255	20	Sets how long a carrier signal must be lost before the modem disconnects.
<b>S11</b>	1 ms	50–150*	95*	Sets spacing and duration of dialing tones.
<b>S18</b>	50 ms	0–255	20	Sets the time the Callback Delay signal drops before going high again. Used for some PBX and CBX phone systems. See <b>&amp;C2</b> command.
<b>S28</b>	decimal	0, 1–255	1	0 disables, 1–255 enables V.34 modulation.
<b>S30</b>	1 minute	0, 1–255	0	Sets the time the modem waits before it disconnects when no data is sent or received. A value of zero disables the timer. See also the <b>VT</b> command
<b>S35</b>	decimal	0–1	0	0 disables, 1 enables the V.25 data calling tone, which allows remote data/fax/voice discrimination.
<b>S36</b>	decimal	0–7	7	Specifies the action to take in the event of a negotiation failure when error control is selected. (See <b>S48</b> .)

<b><u>Register</u></b>	<b><u>Unit</u></b>	<b><u>Range</u></b>	<b><u>Default</u></b>	<b><u>Description</u></b>																																																		
<b>S37</b>	decimal	0–19	0	<p>Sets the maximum V.34 “upstream” speed at which the modem attempts to connect.</p> <table border="1"> <thead> <tr> <th><b>Value</b></th> <th><b>Speed</b></th> </tr> </thead> <tbody> <tr><td>0</td><td>maximum modem speed</td></tr> <tr><td>1</td><td>reserved</td></tr> <tr><td>2</td><td>1200/75 bps</td></tr> <tr><td>3</td><td>300 bps</td></tr> <tr><td>4</td><td>reserved</td></tr> <tr><td>5</td><td>1200 bps</td></tr> <tr><td>6</td><td>2400 bps</td></tr> <tr><td>7</td><td>4800 bps</td></tr> <tr><td>8</td><td>7200 bps</td></tr> <tr><td>9</td><td>9600 bps</td></tr> <tr><td>10</td><td>12000 bps</td></tr> <tr><td>11</td><td>14400 bps</td></tr> <tr><td>12</td><td>16800 bps</td></tr> <tr><td>13</td><td>19200 bps</td></tr> <tr><td>14</td><td>21600 bps</td></tr> <tr><td>15</td><td>24000 bps</td></tr> <tr><td>16</td><td>26400 bps</td></tr> <tr><td>17</td><td>28800 bps</td></tr> <tr><td>18</td><td>31200 bps</td></tr> <tr><td>19</td><td>33600 bps</td></tr> </tbody> </table>	<b>Value</b>	<b>Speed</b>	0	maximum modem speed	1	reserved	2	1200/75 bps	3	300 bps	4	reserved	5	1200 bps	6	2400 bps	7	4800 bps	8	7200 bps	9	9600 bps	10	12000 bps	11	14400 bps	12	16800 bps	13	19200 bps	14	21600 bps	15	24000 bps	16	26400 bps	17	28800 bps	18	31200 bps	19	33600 bps								
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<b>S38</b>	decimal	0–23	1	<p>Sets the maximum 56K “downstream” speed at which the modem attempts to connect. The default maximum speed is 56K bps.</p> <p><b>Note:</b> When using V.34 or V.32 client-to-client connections in poor conditions, setting <b>S38=0</b> may result in better performance.</p> <table border="1"> <thead> <tr> <th><b>Value</b></th> <th><b>Rate</b></th> </tr> </thead> <tbody> <tr><td>0</td><td>56K disabled</td></tr> <tr><td>1</td><td>56K autorate</td></tr> <tr><td>2</td><td>28000 bps</td></tr> <tr><td>3</td><td>29333 bps</td></tr> <tr><td>4</td><td>30666 bps</td></tr> <tr><td>5</td><td>32000 bps</td></tr> <tr><td>6</td><td>33333 bps</td></tr> <tr><td>7</td><td>34666 bps</td></tr> <tr><td>8</td><td>36000 bps</td></tr> <tr><td>9</td><td>37333 bps</td></tr> <tr><td>10</td><td>38666 bps</td></tr> <tr><td>11</td><td>40000 bps</td></tr> <tr><td>12</td><td>41333 bps</td></tr> <tr><td>13</td><td>42666 bps</td></tr> <tr><td>14</td><td>44000 bps</td></tr> <tr><td>15</td><td>45333 bps</td></tr> <tr><td>16</td><td>46666 bps</td></tr> <tr><td>17</td><td>48000 bps</td></tr> <tr><td>18</td><td>49333 bps</td></tr> <tr><td>19</td><td>50666 bps</td></tr> <tr><td>20</td><td>52000 bps</td></tr> <tr><td>21</td><td>53333 bps</td></tr> <tr><td>22</td><td>54666 bps</td></tr> <tr><td>23</td><td>56000 bps</td></tr> </tbody> </table>	<b>Value</b>	<b>Rate</b>	0	56K disabled	1	56K autorate	2	28000 bps	3	29333 bps	4	30666 bps	5	32000 bps	6	33333 bps	7	34666 bps	8	36000 bps	9	37333 bps	10	38666 bps	11	40000 bps	12	41333 bps	13	42666 bps	14	44000 bps	15	45333 bps	16	46666 bps	17	48000 bps	18	49333 bps	19	50666 bps	20	52000 bps	21	53333 bps	22	54666 bps	23	56000 bps
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<b>S42</b>	decimal	0–1	1	<p>Enables/disables the 56K auto rate. When 56K auto is disabled, fallback to V.34 is also disabled. 0 = disable; 1 = enable.</p>																																																		

<b><u>Register</u></b>	<b><u>Unit</u></b>	<b><u>Range</u></b>	<b><u>Default</u></b>	<b><u>Description</u></b>															
<b>S48</b>	decimal	7 or 128	7	<p>Enables (7) or disables (128) LAPM negotiation. The following table lists the <b>S36</b> and <b>S48</b> configuration settings for certain types of connections.</p> <table border="1"> <thead> <tr> <th></th> <th>S48=7</th> <th>S48=128</th> </tr> </thead> <tbody> <tr> <td>S36=0, 2</td> <td>LAPM or Hangup</td> <td>Do not use</td> </tr> <tr> <td>S36=1, 3</td> <td>LAPM or Async</td> <td>Async</td> </tr> <tr> <td>S36=4, 6</td> <td>LAPM, MNP, or Hangup</td> <td>MNP or Hangup</td> </tr> <tr> <td>S36=5, 7</td> <td>LAPM, MNP, or Async</td> <td>MNP or Async</td> </tr> </tbody> </table>		S48=7	S48=128	S36=0, 2	LAPM or Hangup	Do not use	S36=1, 3	LAPM or Async	Async	S36=4, 6	LAPM, MNP, or Hangup	MNP or Hangup	S36=5, 7	LAPM, MNP, or Async	MNP or Async
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<b>S89</b>	seconds	0, 5–255	0	Sets the length of time in the off-line command mode before the modem goes into standby mode. A value of zero prevents standby mode; a value of 1–4 sets the value to 5.															
<b>S108</b>	decimal	0–3, 6, 7	6	<p>Selects the 56K digital loss if using the modem thru a PBX line. The default value is -6 dB loss, the value used when calling from a typical POTS line long distance.</p> <table border="1"> <thead> <tr> <th>Value</th> <th>Digital loss</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>-0 dB digital loss, no robbed-bit signaling</td> </tr> <tr> <td>1</td> <td>-3 dB PBX digital loss</td> </tr> <tr> <td>2</td> <td>-2 dB digital loss</td> </tr> <tr> <td>3</td> <td>-3 dB digital loss</td> </tr> <tr> <td>6</td> <td>-6 dB digital loss</td> </tr> <tr> <td>7</td> <td>-0 dB digital loss with robbed-bit signaling</td> </tr> </tbody> </table>	Value	Digital loss	0	-0 dB digital loss, no robbed-bit signaling	1	-3 dB PBX digital loss	2	-2 dB digital loss	3	-3 dB digital loss	6	-6 dB digital loss	7	-0 dB digital loss with robbed-bit signaling	
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<b>S109</b>	decimal	0–2	1	<p>Selects the 56K operating mode.</p> <table border="1"> <thead> <tr> <th>Value</th> <th>56K mode</th> </tr> </thead> <tbody> <tr> <td>0</td> <td>56K mode (V.90 disabled)</td> </tr> <tr> <td>1</td> <td>Dual mode (56K or V.90)</td> </tr> <tr> <td>2</td> <td>V.90 mode (56K disabled)</td> </tr> </tbody> </table>	Value	56K mode	0	56K mode (V.90 disabled)	1	Dual mode (56K or V.90)	2	V.90 mode (56K disabled)							
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# Chapter 3 - Result Codes

In command mode your modem can send responses called *result codes* to your computer. Result codes are used by communications programs and are displayed on your monitor.

<u>Terse</u>	<u>Verbose</u>	<u>Description</u>
0	OK	Command executed
1	CONNECT	Modem connected to line
2	RING	Ring signal detected
3	NO CARRIER	Carrier signal lost or not detected
4	ERROR	Invalid command
5	CONNECT 1200 *	Connected at 1200 bps
6	NO DIALTONE	No dial tone detected
7	BUSY	Busy signal detected
8	NO ANSWER	No answer at remote end
10	CONNECT 2400 *	Connected at 2400 bps
11	CONNECT 4800 *	Connected at 4800 bps
12	CONNECT 9600 *	Connected at 9600 bps
13	CONNECT 14400 *	Connected at 14400 bps
14	CONNECT 19200 *	Connected at 19200 bps
24	CONNECT 7200 *	Connected at 7200 bps
25	CONNECT 12000 *	Connected at 12000 bps
26	CONNECT 16800 *	Connected at 16800 bps
40	CONNECT 300 *	Connected at 300 bps
55	CONNECT 21600 *	Connected at 21600 bps
56	CONNECT 24000 *	Connected at 24000 bps
57	CONNECT 26400 *	Connected at 26400 bps
58	CONNECT 28800 *	Connected at 28800 bps
59	CONNECT 31200 *	Connected at 31200 bps
60	CONNECT 33600 *	Connected at 33600 bps
70	CONNECT 32000 *	Connected at 32000 bps, 56K rate
71	CONNECT 34000 *	Connected at 34000 bps, 56K rate
72	CONNECT 36000 *	Connected at 36000 bps, 56K rate
73	CONNECT 38000 *	Connected at 38000 bps, 56K rate
74	CONNECT 40000 *	Connected at 40000 bps, 56K rate
75	CONNECT 42000 *	Connected at 42000 bps, 56K rate
76	CONNECT 44000 *	Connected at 44000 bps, 56K rate
77	CONNECT 46000 *	Connected at 46000 bps, 56K rate
78	CONNECT 48000 *	Connected at 48000 bps, 56K rate
79	CONNECT 50000 *	Connected at 50000 bps, 56K rate
80	CONNECT 52000 *	Connected at 52000 bps, 56K rate
81	CONNECT 54000 *	Connected at 54000 bps, 56K rate
82	CONNECT 56000 *	Connected at 56000 bps, 56K rate
88	DELAYED	Delay is in effect for the dialed number
89	BLACKLISTED	Dialed number is blacklisted
90	BLACKLIST FULL	Blacklist is full
100	CONNECT 28000 *	Connected at 28000 bps, 56K rate
101	CONNECT 29333 *	Connected at 29333 bps, 56K rate
102	CONNECT 30666 *	Connected at 30666 bps, 56K rate
103	CONNECT 33333 *	Connected at 33333 bps, 56K rate
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111	CONNECT 49333 *	Connected at 49333 bps, 56K rate
112	CONNECT 50666 *	Connected at 50666 bps, 56K rate
113	CONNECT 53333 *	Connected at 53333 bps, 56K rate
114	CONNECT 54666 *	Connected at 54666 bps, 56K rate
115	CONNECT 25333 *	Connected at 25333 bps, 56K rate
116	CONNECT 26666 *	Connected at 26666 bps, 56K rate

\* When the extended result code configuration option is enabled, one of the following codes is appended to the result code, depending on the type of error control connection:

V42bis – V.42 error control (LAP-M) and V.42bis data compression	V42 – V.42 error control (LAP-M) only
MNP5 – MNP 4 error control and MNP 5 data compression	MNP4 – MNP 4 error control only
NoEC – No error control protocol	

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