
AT Commands for ComStar 56K

AT commands communicate directly with the modem when it is in command mode. This appendix is a quick reference for experienced modem users. We do not recommend that you use AT commands unless you are familiar with them. It is possible to disable your faxmodem inadvertently.

To summarize AT command syntax:

- Multiple commands can be strung together in one line.
- Command lines cannot exceed 40 upper- or lower-case characters. (Do not mix upper- and lower-case.) The modem ignores space and hyphen characters.
- Command lines must start with AT and end with a carriage return (Return or Enter).
- A missing command parameter is assumed to be a zero. For example, ATH is the same as ATH0.
- A/ on a line by itself without a carriage return causes the modem to repeat the previous command.

To switch to AT command mode from data mode, wait at least one second, type +++ (the default escape characters), and wait at least one second before entering other characters. After the OK message from the modem, you can enter AT commands. To return to data mode, type AT0 and press Return (or Enter).

Bold indicates the default setting. (Not all commands have defaults.)

Command	Function
A	Answers incoming call immediately
B0	Uses V.22 connection at 1200 bps
B1	Uses Bell 212A connection at 1200 bps
Dn	Dials telephone number <i>n</i> <i>You can combine D with one or more of the following modifiers:</i>
L	Redials last number
P	Uses pulse dialing
T	Uses tone dialing
R	Command accepted but not acted upon

Command	Function
S=(0-3)	Dial one of 4 numbers stored with &Z <i>n</i>
!	Goes on hook (time specified in S29)
W	Waits for dial tone
@	Waits for at least 5 seconds of silence
&	Waits for credit card dialing tone (bong tone)
,	Pauses during dial as specified in register S8 (default: 2 sec.)
;	Returns to command mode after dialing (put after dial string)
^	Turn on calling tone (data only)
E0	Command characters not echoed
E1	Command characters echoed
H0	Forces modem to hang up
H1	Forces modem off-hook
I0	Returns product code (for example: 33600)
I1	Returns ROM checksum
I2	Computes checksum, compares with value in ROM, and returns OK or ERROR
I3	Returns firmware revision code
I4	Returns modem identifier string
I5	Returns country code
I6	Returns data pump model and revision code
I98	Returns modem features description
I99	Returns modem features in hex bitmap
L1	Low speaker volume
L2	Medium speaker volume
L3	Highest speaker volume
M0	Speaker always off
M1	Speaker on until carrier detected
M2	Speaker always on
M3	Speaker off during dialing, then on until carrier
N0	Disables auto-mode (automatic modulation negotiation); uses connection speed specified in S37 (equivalent to +MS <automode> set to 0)
N1	Enables auto-mode (equivalent to +MS <automode> set to 1)
O0	Enters data mode
O1	Enters data mode and retrains modem to phone line conditions
P	Pulse dialing until T command

Command	Function
Q0	Enables responses to computer (DTE)
Q1	Disables responses to computer
S <i>n</i>	Establishes S-register <i>n</i> as the default register
S <i>n</i> = <i>v</i>	Sets register <i>n</i> to value <i>v</i>
S <i>n</i> ?	Returns the value of register <i>n</i>
T	Tone dialing until P command
V0	Send numeric (terse) responses
V1	Send word (verbose) responses
W0	Reports DTE (computer-to-modem) speed only
W1	Reports DCE (modem-to-modem) speed, error correction protocol, and DTE speed
W2	Reports DCE (modem-to-modem) speed only
X0	Sends OK, CONNECT, RING, NO CARRIER, ERROR and NO ANSWER
X1	Sends X0 messages and CONNECT speed
X2	Sends X1 messages and NO DIALTONE
X3	Sends X1 messages and BUSY
X4	Sends all responses
Y0	Disables long space disconnect
Y1	Enables long space disconnect; with error correction, hangs up after 1.6 second signal break; without error correction, sends 4 second space before hanging up
Z0	Resets modem to profile 0 (see &W0)
Z1	Resets modem to profile 1 (see &W1)
&C0	Forces RLSD (DCD) on
&C1	RLSD (DCD) follows remote carrier
&D0	DTR is assumed on. Allows operation with DTEs that do not provide DTR signal.
&D1	Modem interprets DTR drop as if it received the escape sequence. Returns to command mode without disconnecting.
&D2	DTR drop causes modem to hang up. Auto-answer is inhibited.
&D3	DTR drop causes modem to do soft reset; &Y setting determines which profile is loaded.
&F	Loads factory profile
&G0	Disables guard tone
&G1	Disables guard tone
&G2	Enables 1800 Hz guard tone

Command	Function
&K0	Disables flow control
&K3	Enables RTS/CTS (hardware) flow control
&K4	Enables XON/XOFF flow control
&K5	XON/XOFF with passthrough
&K6	Enables both RTS/CTS and XON/XOFF flow control
&M0	Selects asynchronous mode (&Q0)
&P0 &P1, &P2, &P3	Make/break dial ratio of 39/61 at 10 pps Commands accepted, but not acted upon
&Q0	Selects direct asynchronous mode (no error correction or speed buffering)
&Q5	Modem negotiates error-correcting connection
&Q6	Selects asynchronous mode with speed buffering (no error correction)
&S0 &S1	Forces Data Set Ready (DSR) on continuously DSR active after answer tone detected and inactive after carrier loss
<i>For engineering testing only</i>	
&T0	Ends test in progress
&T1	Starts local analog loopback test
&T2	Returns error
&T3	Starts local digital loopback test
&T4	Responds to remote modem request for digital loopback
&T5	Ignores remote modem request for digital loopback
&T6	Requests remote digital loopback without self-test
&T7	Same as &T6 with self-test
&T8	Starts local analog loopback with self-test
&V	Displays the current (active) and stored profiles, and stored numbers
&W0 &W1	Saves active configuration as profile 0 Saves active configuration as profile 1
&Y0 &Y1	Modem uses profile 0 on powerup (see &W0) Modem uses profile 1 on powerup (see &W1)
&Zn=x	Stores telephone number (up to 35 digits) x in nonvolatile memory location n (0-3)
%C0	Disable data compression
%C1	Enable MNP5 compression
%C2	Enable V.42bis compression
%C3	Enables both MNP5 and V.42bis compression
%E0	Disables line-quality monitoring and auto-retraining
%E1	Enables monitoring and retraining
%E2	Enables monitoring and fallback/fall forward
%E3	Enables monitoring, retraining, and fast hang up
%L	Reports received signal level in -dBm
%Q	Reports line signal quality

Command	Function		
\A0	64-character maximum MNP block size		
\A1	128-character maximum MNP block size		
\A2	192-character maximum MNP block size		
\A3	256-character maximum MNP block size		
\Bn	In non-error correction mode, transmits line break to remote modem in 100 ms units (1-9 with 3 as default)		
\G0	Disables XON/XOFF (modem-to-modem) flow control		
\G1	Enables XON/XOFF (modem-to-modem) flow control		
\Kn	Defines break type		
\N0	Normal data link with speed buffering; no error correction		
\N1	Selects serial interface; same as &Q0		
\N2	Selects reliable (error correction) mode (first LAPM, then MNP)		
\N3	Selects auto-reliable mode (LAPM, MNP, Normal)		
\N4	LAPM error correction only		
\N5	MNP error correction only		
\V=0	Disables Single Line Connect Message		
\V=1	Enables Single Line Connect Message, where the format is: CONNECT <DTE speed></Modulation></Protocol></Compression></Line speed>		
-SDR=0	Disables Distinctive Ring.	Ring Type	Cadence
-SDR=1	Enables Type 1	1	2 sec. ON, 4 sec. OFF
-SDR=2	Enables Type 2	2	0.8 sec. ON, 0.4 sec. OFF, 0.8 sec. ON, 4 sec. OFF
-SDR=3	Enables Type 1 & 2	3	0.4 sec. ON, 0.2 sec. OFF, 0.4 sec. ON, 0.2 sec. OFF, 0.8 sec. ON, 4 sec. OFF
-SDR=4	Enables Type 3		
-SDR=5	Enables Type 1 & 3		
-SDR=6	Enables Type 2 & 3		
-SDR=7	Enables Type 1, 2, & 3		
\$\$R0	Disables Distinctive Ring.		
\$\$R2	Enables Distinctive Ring. Cadences are: A = 2 seconds on, 4 seconds off B = 0.8 sec. ON, 0.4 sec. OFF; 0.8 sec. ON, 4 sec. OFF D = 0.4 sec. ON, 0.2 sec. OFF; 0.4 sec. ON, 0.2 sec. OFF; 0.8 sec. ON, 4 sec. OFF or D = 0.3 sec. ON, 0.2 sec. OFF; 1 sec. ON, 0.2 sec. OFF; 0.3 sec. ON, 4 sec. OFF		
-K0	Disables V.42 LAPM to MNP10 conversion		
-K1	Enables V.42 LAPM to MNP10 conversion		
-K2	Enables V.42 LAPM to MNP10 conversion; inhibits MNP Extended Services initiation during V.42 LAPM answer mode detection		

Command	Function																																	
-Q0	Disables MNP 10 fallback to 2400 bps																																	
-Q1	Enables MNP 10 fallback to 2400 bps																																	
-SEC=0	Disables MNP10-EC operation																																	
-SEC=1	Enables MNP10-EC operation																																	
:E0	Disables V.32 compromise equalizer																																	
:E1	Enables V.32 compromise equalizer																																	
+MS=<mod>[,<automode>,<min_rate>,<max_rate>]]]	See NOTE. Selects modulation; optionally enables or disables automatic modulation negotiation with the remote modem or faxmodem; optionally sets minimum and/or maximum rates																																	
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	<p>NOTE: Use a comma (,) to separate optional subparameters. For example: +MS=11,1,300,28800 (+MS command with the default settings). Subparameters that you do not enter remain at their current value. (Type a comma only to skip a subparameter or carriage return to skip the last subparameter) For example: +MS=,0,<Enter> disables auto mode and keeps all other settings at their current value.</p>																																	

AT Commands for SVD

The following tables describe the AT commands supported by simultaneous voice and data (analog SVD). We provide these commands for the benefit of programmers and other developers who can use them; if you are not familiar with the special use of AT commands, we suggest that you not try to use them.

Command	Function	
-SMS=0	Data Mode only (default)	
-SMS=2	Enables SVD Mode	
-SMS=3	Automatic Mode Select (DSVD/SVD/data only)	
-SMS=y or z (optional)	y or z value	Modulation selected (See -SQS command, below)
		V.61
3 means enabled	2400	—
	4800	3 (y and z default)
	7200	—
	9600	—
	12000	—
	14400	—
	16800	—
	21600	—
	24000	—
	26400	—
28800	—	
-SQS=x,y	Where x selects the modulation mode: 0=V.61(default) and where y enables/disables automode: 0=SVD automode disabled (default) 1=SVD automode enabled (default)	

Command Options	Selected Device Type and Considerations
#VLS=1	Transmit/receive device (other than telephone line). This is a handset, headset, or speakerphone powered directly by the modem. Select this device before recording a greeting message.
#VLS=2	Transmit only device. Normally, this is the speaker. Select this device before playing back any message.
#VLS=3	Receive only device. Normally, this is the microphone. Select this device before recording a message.
#VLS=5	Telephone emulation. This is a headset or speakerphone powered directly by the modem.
#VLS=6	Speakerphone. This is a speakerphone or headset powered directly by the modem.
#VLS=7	Muting the speakerphone during phone conversation. Mutes the speakerphone by switching it out of the telephone line path if in #VLS=6 mode.

Using AT Commands with the Speakerphone Feature

If you are familiar with the use of AT commands to control your faxmodem, you can develop customized ways of using the faxmodem's features that your communications software may not directly support.

We do not recommend that you use AT commands unless you are familiar with them. It is possible to disable your faxmodem inadvertently.

To use the speakerphone feature with AT commands, you must first go to terminal mode. Once you are in terminal mode, you can use the speakerphone feature by following the procedures explained in this appendix.

Turning On The Speakerphone Feature

To use the speakerphone feature, you must first be in voice mode. To do this:

- In terminal mode, type AT#CLS=8 and press Enter.

Once you are in voice mode, you can turn on the speakerphone feature:

- In terminal mode, type AT#VLS=6 and press Enter.

To answer an incoming call,

- In terminal mode, type ATA and press Enter.

To originate a call, you first must set the Ringback Never Came timer to zero, and then dial a call:

- In terminal mode, type AT#VRN=0 and press Enter.
- In terminal mode, type AT18005551212 and press Enter. In this example, you would be dialing the number 1 (800) 555-1212.

To end the speakerphone connection once you are finished with the call:

- In terminal mode, type ATHZ and press Enter.

Changing The ComStar 56K's Settings

You can control the speakerphone parameter settings by changing them with the following AT command string (only valid if the modem already is in voice mode):

AT#SPK=<mode>,<speaker atten.>,<mic. gain>

For the <mode> setting, use the following values:

- 0 Mutes microphone
- 1 Normal talk/listen (default)
- 2 Microphone on maximum, speaker off

- For the <speaker atten.> setting, assign a value between 0 and 16. The higher the number, the quieter the speaker's volume will be. For example, assigning the value 16 will turn the speaker off. 5 is the default value for this setting.
- For the <mic. gain> setting, assign a value between 0 and 3. The higher the value, the more sensitive the microphone. 1 is the default value for this setting.

An Example of Changing the ComStar 56K's Settings

Here is an example of using the AT commands to change the ComStar 56K's settings:

AT#SPK=1,0,2

- This keeps the speakerphone's mode at its default setting of normal talk and listen,
- Sets the volume of the speakerphone to its highest setting, and
- Sets the sensitivity of the microphone to its second most sensitive setting.

S Registers for ComStar 56K

This appendix summarizes S registers. You can change the setting of an S register using an AT command. For example, `ATS6=4`. The appendix assumes you are already familiar with how to reset S registers.

Register	Range/Value	Default	Function
S0	0-255 rings	0	Number of rings to auto-answer
S1	0-255 rings	0	Counts incoming rings
S2	0-255 ASCII	43	Escape character
S3	0-127 ASCII	13	Carriage return character
S4	0-127 ASCII	10	Line feed character
S5	0-255 ASCII	8	Backspace character
S6	2-255 seconds	2	Dial tone wait time before blind dialing
S7	1-255 seconds	50	Remote carrier wait time
S8	0-255 seconds	2	Comma pause time
S9	1-255 100 ms	6	Carrier detect response time
S10	1-255 100 ms	14	Delay between carrier loss and hang up
S11	50-255 1 ms	95	Tone duration in DTMF dialing
S12	0-255 20 ms	50	Escape code guard time
S13			RESERVED
S14			BIT MAPPED OPTIONS
S15			RESERVED
S16			TEST MODE BIT MAPPED OPTIONS
S17			RESERVED
S18	0-255 seconds	0	Modem test timer
S19-20			RESERVED
S21			V.24 BIT MAPPED OPTIONS
S22			SPEAKER BIT MAPPED OPTIONS
S23			BIT MAPPED OPTIONS
S24	0-255 seconds	0	Sleep inactivity timer
S25	0-255 10 ms	5	Data Terminal Ready delay
S26	0-255 10 ms	1	RTS-to-CTS delay
S27			BIT MAPPED OPTIONS
S28			BIT MAPPED OPTIONS
S29	0-255 10 ms	70	Flash dial modifier time
S30	0-255 10 seconds	0 (disabled)	Inactivity time before hang up

Register	Range/Value	Default	Function
S31			BIT MAPPED OPTIONS
S32	0-255 ASCII	17	XON character
S33	0-255 ASCII	19	XOFF character
S34-35			RESERVED
S36	0, 3, 4, 7	7	LAPM failure control
	0		Modem disconnects
	3		Modem stays on line and establishes a Normal mode (speed buffering) connection
	4		Attempts MNP connection; if fails, disconnects
	7		Attempts MNP connection; if fails, establishes a Normal mode (speed buffering) connection
S37	0-12	0	Desired DTE connection speed
	0		Attempt automode connection (F0)
	1-3		Attempt to connect at 300 bps (F1)
	4		Reserved
	5		Attempt to connect at 1200 bps (F4)
	6		Attempt to connect at 2400 bps (F5)
	7		Attempt to connect at 75 bps send/ 1200 bps receive V.23 (F3)
	8		Attempt to connect at 4800 bps (F6)
	9		Attempt to connect at 9600 bps (F8)
	10		Attempt to connect at 12000 bps (F9)
	11		Attempt to connect at 14000 bps (F10)
	12		Attempt to connect at 7200 bps (F7)
S38	0-255 seconds	20	Delay before forced disconnect

Register	Range/Value	Default	Function
S39	0-6	3	FLOW CONTROL
	0		No flow control
	3		RTS/CTS (&K3)
	4		XON/XOFF
	5		Transparent XON (&K5)
	6		Both methods (&K6)
S40-41			BIT MAPPED OPTIONS
S42-45			RESERVED
S46	136 or 138	138	Data compression selection
	136		Error correction with no compression
	138		Error correction and compression
S48	0, 7, or 128	7	V.42 negotiation action
	0		No negotiation; bypass detection and negotiation phases; proceed with LAPM
	7		Negotiation
	128		No negotiation; bypass detection and negotiation phases; proceed with S36 fallback action
S80			RESERVED
S82	3, 7, or 128	128	Break handling options
	3		Break immediate; data integrity maintained ahead of and after break
	7		Break immediate; data at time of break destroyed
	128		Break in sequence with any transmitted data; data integrity maintained ahead of and after break

Register	Range/Value	Default	Function
S86	0, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14	none	Call failure reason code
	0		Normal disconnect, no error
	4		Loss of carrier
	5		V.42 negotiation failed to detect error correction modem at remote end
	6		No response to feature negotiation
	7		This modem is asynch only; remote modem is synch only
	8		No framing technique in common
	9		Modems could not find a common protocol
	10		Bad response to feature negotiation
	11		No synch information from remote modem
	12		Remote modem initiated a normal disconnect
	13		Remote modem does not respond after 10 message re-transmissions
	14		Protocol violation
	S95	Add numbers below for desired messages:	0
0			CONNECT gives computer-to-modem (DTE) speed
1			CONNECT gives DCE speed
2			/ARQ after CONNECT if error correction is active
4			CARRIER message
8			PROTOCOL message
32			COMPRESSION message

Result Codes for ComStar 56K

The table of result codes below indicates the verification messages that the modem generates depending on the currently active Xn option. The default setting is $X4$. To select short form messages, enter the command $AT V0$. To select long form messages, enter the command $AT V1$. The default setting is $V1$.

A check in a column indicates that the message is generated by the modem when you have chosen the value shown at the top of the column with $ATXn$ command. If the column is blank, the modem does not generate a message for that X option. A "1" or "3" after a check mark indicates the less explicit message that the modem generates for that option. For example, if the modem is set for long form messages, the value of Xn is $X0$, and the computer-to-modem speed is 1200 bps, the modem generates the message "CONNECT" and not "CONNECT 1200."

Short Form	Long Form	n Value in $ATXn$ Command				
		0	1	2	3	4
0	OK	✓	✓	✓	✓	✓
1	CONNECT	✓	✓	✓	✓	✓
2	RING	✓	✓	✓	✓	✓
3	NO CARRIER	✓	✓	✓	✓	✓
4	ERROR	✓	✓	✓	✓	✓
5	CONNECT 1200	✓ ¹	✓	✓	✓	✓
6	NO DIALTONE	✓ ¹	✓ ³	✓	✓	✓
7	BUSY	✓ ³	✓ ³	✓ ³	✓	✓
8	NO ANSWER	✓	✓	✓	✓	✓
9	CONNECT 0600	✓ ¹	✓	✓	✓	✓
10	CONNECT 2400	✓ ¹	✓	✓	✓	✓
11	CONNECT 4800	✓ ¹	✓	✓	✓	✓
12	CONNECT 9600	✓ ¹	✓	✓	✓	✓
13	CONNECT 7200	✓ ¹	✓	✓	✓	✓
14	CONNECT 12000	✓ ¹	✓	✓	✓	✓
15	CONNECT 14400	✓ ¹	✓	✓	✓	✓
16	CONNECT 19200	✓ ¹	✓	✓	✓	✓

Short Form	Long Form	<i>n</i> Value in ATX <i>n</i> Command				
		0	1	2	3	4
17	CONNECT 38400	✓ ¹	✓	✓	✓	✓
18	CONNECT 57600	✓ ¹	✓	✓	✓	✓
19	CONNECT 115200	✓ ¹	✓	✓	✓	✓
20	CONNECT 234000	✓ ¹	✓	✓	✓	✓
22	CONNECT 75TX/1200RX	✓ ¹	✓	✓	✓	✓
23	CONNECT 1200TX/75RX	✓ ¹	✓	✓	✓	✓
33	FAX	✓	✓	✓	✓	✓
35	DATA	✓	✓	✓	✓	✓
40	CARRIER 300					✓
44	CARRIER 1200/75					✓
45	CARRIER 75/1200					✓
46	CARRIER 1200					✓
47	CARRIER 2400					✓
48	CARRIER 4800					✓
49	CARRIER 7200					✓
50	CARRIER 9600					✓
51	CARRIER 12000					✓
52	CARRIER 14400					✓
54	CARRIER 19200					✓
55	CARRIER 21600					✓
56	CARRIER 24000					✓
57	CARRIER 26400					✓
58	CARRIER 28800					✓
59	CONNECT 16800	✓ ¹	✓	✓	✓	✓
61	CONNECT 21600	✓ ¹	✓	✓	✓	✓
62	CONNECT 24000	✓ ¹	✓	✓	✓	✓
63	CONNECT 26400	✓ ¹	✓	✓	✓	✓
64	CONNECT 28800	✓ ¹	✓	✓	✓	✓
66	COMPRESSION: CLASS 5					✓
67	COMPRESSION: V.42 bis					✓
69	COMPRESSION: NONE					✓
70	PROTOCOL: NONE					✓
77	PROTOCOL: LAPM					✓
78	CARRIER 31200					✓

Short Form	Long Form	<i>n</i> Value in ATX <i>n</i> Command				
		0	1	2	3	4
79	CARRIER 33600					✓
80	PROTOCOL: ALT					✓
84	CONNECT 33600	✓ ¹	✓	✓	✓	✓
91	CONNECT 31200	✓ ¹	✓	✓	✓	✓
150	CARRIER 32000					✓
151	CARRIER 34000					✓
152	CARRIER 36000					✓
153	CARRIER 38000					✓
154	CARRIER 40000					✓
155	CARRIER 42000					✓
156	CARRIER 44000					✓
157	CARRIER 46000					✓
158	CARRIER 48000					✓
159	CARRIER 50000					✓
160	CARRIER 52000					✓
161	CARRIER 54000					✓
162	CARRIER 56000					✓
165	CONNECT 32000	✓ ¹	✓	✓	✓	✓
166	CONNECT 34000	✓ ¹	✓	✓	✓	✓
167	CONNECT 36000	✓ ¹	✓	✓	✓	✓
168	CONNECT 38000	✓ ¹	✓	✓	✓	✓
169	CONNECT 40000	✓ ¹	✓	✓	✓	✓
170	CONNECT 42000	✓ ¹	✓	✓	✓	✓
171	CONNECT 44000	✓ ¹	✓	✓	✓	✓
172	CONNECT 46000	✓ ¹	✓	✓	✓	✓
173	CONNECT 48000	✓ ¹	✓	✓	✓	✓
174	CONNECT 50000	✓ ¹	✓	✓	✓	✓
175	CONNECT 52000	✓ ¹	✓	✓	✓	✓
176	CONNECT 54000	✓ ¹	✓	✓	✓	✓
177	CONNECT 56000	✓ ¹	✓	✓	✓	✓
+F4	+FCERROR	✓	✓	✓	✓	✓