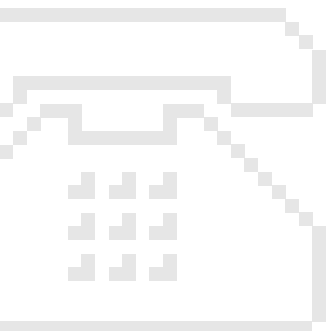




Apple Telecom AT Command Set

.....
for use in United States & Canada

Apple Computer, Inc.

© 1996 Apple Computer, Inc. and its licensors. All rights reserved.

© 1996 AirGo Communications, Inc. and Dayna Communications, Inc. All rights reserved.

Under the copyright laws, this manual may not be copied, in whole or part, without the written consent of Apple. Your rights to the software are governed by the accompanying software license agreement.

The Apple logo is a trademark of Apple Computer, Inc., registered in the U.S. and other countries. Use of the “keyboard” Apple logo (Option-Shift-K) for commercial purposes without the prior written consent of Apple may constitute trademark infringement and unfair competition in violation of federal and state laws.

Every effort has been made to ensure that the information in this manual is accurate. Apple is not responsible for printing or clerical errors.

© 1996 Apple Computer, Inc.

1 Infinite Loop

Cupertino, CA 95014-6299

(408) 996-1010

Apple, the Apple logo, AppleScript, GeoPort, Macintosh, the Mac OS logo, PowerTalk, PlainTalk and Power Macintosh are trademarks of Apple Computer, Inc., registered in the U.S.A. and other countries.

Finder, the GeoPort logo, Mac, and System 7 are trademarks of Apple Computer, Inc.

Adobe, Acrobat, the Acrobat logo, Adobe Illustrator, Adobe Photoshop, and PostScript are trademarks of Adobe Systems Incorporated or its subsidiaries and may be registered in certain jurisdictions.

Hayes is a trademark of Hayes Microcomputer Products, Inc.

QuarkXPress is a registered trademark of Quark, Inc.

Mention of third-party products is for informational purposes only and constitutes neither an endorsement nor a recommendation. Apple assumes no responsibility with regard to the performance or use of these products.



Preface v

Chapter 1 AT Command Set 1

Modem states 2

Moving between command and online states 2

Commands documented in this manual 3

Integrated (non-serial port) modems 3

AT command set 4

Special commands 4

Standard AT commands 5

S registers 12

\MNP specific AT commands 26

Chapter 2 Troubleshooting 29

Common problems 30

P R E F A C E

This manual provides complete information for controlling GeoPort Telecom Adapter, GeoPort Internal Modem, and Express Modem using AT commands in your country. If you are using software like Apple Fax, Apple Phone, Apple Remote Access, or the software provided to access many online services, you may not need the information in this chapter. These programs generally handle all of the setup and configuration using menus and dialog boxes so that you never need to use AT commands directly. If you want to use AT commands to control your modem, using a terminal emulation program, for example, the information in this manual will help you.

1

AT Command Set

In this manual

This manual informs you about

- Modem States
- Using AT Commands
- The AT Command set

Modem states

Moving between command and online states

The modem always goes to command state when turned on or after reset. It automatically enters online state after successfully making a connection with a remote modem, either when answering or originating a call.

While the modem is in online state, you can issue a command that takes it back to command state. When you control the modem in this fashion, it is in local command state. While in local command state you can send commands to the modem from your keyboard. During a connection you can switch between online and command state as needed.

In order to issue AT commands to the modem, you will need to determine the setting within your communications program that allows you to control a modem directly using AT commands. Consult the user's guide that came with your software to find out how to enter AT commands from your keyboard.

The most important AT commands are listed below. The rest of this manual gives complete descriptions of all supported commands.

- To enter command state while connected, type the escape sequence ++ +.
- To go back to online state, type ATO<CR>.
- To hang up, type ATH<CR>.

The <CR> is a notational convention for carriage return. Most commands are not actually sent to the modem until you type the carriage return.

Commands documented in this manual

This manual documents the command set recognized by your modem. The command set is compatible with the V series Hayes AT command set, a subset of the Microcom AX series MNP command set, and the class 2 TR-29/89-21R7 AT + F Fax extension set. This document does not describe the Fax AT + F subset.

Integrated (non-serial port) modems

Traditional modems—for example external modems—use a serial connection between the CPU (Data Terminal Equipment—DTE) and the modem (Data Circuit-terminating Equipment—DCE). Your modem does not use this type of serial connection.

Since your modem has no DTE-DCE serial interface, commands related to the serial interface have no effect, but still exist for script compatibility reasons.

AT command set

AT refers to the command prefix (attention sequence) that precedes each command to the modem. With the exception of A/, all commands must be preceded by AT and end with a carriage return <CR>. In this document, the modem's default value and description are shown in boldface type.

Special Commands

A/ **Repeat last command** The A/ command instructs the modem to repeat the last command line. A command line termination character <CR> is not required for the execution of this command: that is, the command is executed as soon as the slash is typed.

+++ **Return to command state** (escape sequence) The escape sequence is used to force the modem back to local command state from online state. Do not type any other commands or make entries before or after the escape sequence for a period equal to the guard time set in register S12 (default is one second).

The modem sends an OK result code to the terminal and switches to command state.

The actual escape character is specified by register S2, expressed as the ASCII value of the escape character (default is 43, '+').

Standard AT commands

AT The attention command prefix The prefix AT must precede every command. The remainder of the command line contains commands for the modem. The command line must end with a carriage return. If AT is sent alone (that is, it is followed by a <CR>), then no command is executed but an OK result code is returned.

A Answer The A command forces the modem to go off-hook in answer mode. The modem then starts sending the answer tone (ITU answer tone independent from the B setting), unless the modem is set for leased line (&L command) state. If no carrier signal is received from the telephone line within the number of seconds specified by register S7, the modem goes on-hook.

This command must be the last on a command line. Sending any character to the modem during call establishment will abort the command and generate a NO CARRIER result code.

Bn Communication protocol category preference This command determines which communication standard will be used for the next connection.

0 ITU mode

1 Bell 103 and Bell 212A, instead of V.21 and V.22, in case of fallback

2 ITU V.23 only

D Dial This command signals the modem that the numbers, letters, and commas that follow are all part of the telephone number it should dial.

You may include other dial command characters in combination with the D command: T, P, comma (,), W, colon (:), “at” sign (@), exclamation point (!), R, semicolon (;), the caret (^) sign, and S=n. Each of these optional modifiers is described in the following sections. For clarity’s sake, you may also use other characters or symbols (for example, parentheses, hyphens, or spaces) without affecting the number.

In addition to the digits 0 through 9, your modem can also dial the six special characters (*, #, A, B, C, D) found on some Touch-Tone dial telephones.

T *Touch-Tone dialing* All subsequent numbers are Touch-Tone dialed until the P command (for pulse dialing) is selected.

P *Pulse dialing* Selects pulse dialing, with the dialing speed fixed at 10 pulses per second.

You can mix Touch-Tone and pulse dialing within the same telephone number. The digits immediately following a P command will be pulse dialed; those following a T command will be Touch-Tone dialed.

, ***Pause*** The comma modifier introduces a delay time before dialing the next dial character or executing the next character in the dial string. The pause time is the value of the S8 register (default=2 seconds).

W Dial tone detect The W modifier is used to make the modem detect a dial tone before sending the next digit. If the tone has been detected by the modem before the S7 register time delay, the modem continues dialing the rest of the characters in the dial string. If no tone is detected, the modem goes on-hook, returns the NO DIAL TONE result code to the host, and enters the command state.

This modifier can be embedded anywhere in the dial string. Example: ATDT9W5551234.

: *Calling card tone detect* The colon can detect most calling card tones. Place the colon in the dial string when you want to detect a wider range of frequencies.

@ *Wait for quiet answer before dialing* For the time specified in the S7 register (default=50 seconds), the modem attempts to detect several seconds of silence. This period of silence confirms that the call has been answered. Once several seconds of silence have been detected, the modem dials the remaining numbers in the command line. The remaining numbers may be a security code, another telephone number, or an extension. If no quiet time is detected, the modem hangs up and returns NO ANSWER. The following is an example using the @ modifier:

atdt312555-1432@4622

! *Flash* This modifier causes the modem to go on-hook then back off-hook, as if the hook button on the telephone set had been pressed momentarily. This modifier can be placed anywhere in the dial string.

R *Reverse mode* The R modifier changes the modem from originate mode to answer mode once the dialing process has been completed. This command is used only at the end of the dial string.

This modifier is used for compatibility with old originate-only modems.

; *Return to local command state after dialing* The semicolon (;) modifier may be put at the end of the dialing command. It forces the modem back to the local command state after dialing a number. The modem does not attempt a connection. This allows you to use the modem as a dialer (you must pick up the telephone handset at the end of the dial command) or to dial numbers in two or more steps. This modifier may also be used in Fax Sender, AppleLink, and other communications applications.

S=*n Dial telephone number stored at location n* Dials telephone number stored in location n, where n is 0, 1, or 2. You must have previously saved the value with the AT&Z command.

L *Dial last telephone number* Redials the last number dialed when placed after the D command.

^ *Enables calling tone emission for the current dial attempt* The modifier, the caret (^) sign, can be anywhere in the dial string. When present, the calling tone will be emitted after dialing. In countries where the calling tone is mandatory the caret sign will have no effect. Using this modifier does not affect the S113 setting.

En **Echo off/on** When the echo is turned on, the characters sent to the modem in command state are echoed back by the modem to the host computer. The E command is functional only when the modem is in command state.

0 Turns off echo.

1 **Turns on echo.** This allows you to verify that characters you have sent to the modem have been received and sent back.

Hn **Hook (hang up)** When the modem is online, you must first enter the + + + escape sequence to take the modem back to command state before issuing the hang up command ATH.

0 Forces the modem on-hook. Hangs up the modem's connection to the telephone line.

1 Forces the modem off-hook.

In **Information**

0 Returns the modem's product ID code.

1 Returns a modem code.

2 Returns OK.

3 Returns the modem's country code.

4 Returns a list of modem features.

9 Returns Apple product code and firmware version of the modem.

In **Speaker volume** This command has no effect, as the speaker is a component of the Macintosh and set in the Sound control panel. The command is included for compatibility purposes.

Mn Speaker on/off/auto This command sets the usage of the speaker during connections.

0 Disables speaker.

1 Turns on the speaker until carrier is established.

2 Leaves the speaker on throughout the entire connection.

3 Turns the speaker on until a carrier is detected, except during dialing.

Nn Communication protocol preference This command determines the desired connection speed, in conjunction with register S37.

0 Use S37 for speed selection. If S37=0, connect at highest possible speed. Otherwise, connect at speed specified in S37.

1 Connect at highest possible speed according to value of S37. Fall back if necessary.

2 Same as N1 for compatibility reasons.

Note: For N1 or S37=0, the setting of ATB is ignored. The modem automatically determines Bell or ITU mode.

On Return to online state Returns modem to online state from command state.

0 Is used to return to the online state after having entered the command state using the escape sequence.

1 Same as above and will retrain the carrier (possibly at a lower speed) before reentering online state.

P Enable pulse dialing Sets the default dialing mode to pulse mode.

This command can also be used as a subcommand of the D command.

Qn Quiet (refer to command Vn)

0 Allows result codes to be sent to your screen.

- 1 Turns off the result code messages.
- 2 Returns result codes when originating a call but not when answering.

Sn Select an S register The S registers refer to memory locations used for configuration.

Most of the S registers deal with some aspect of timing. The S commands are used to assign values to various registers in the modem's memory.

n? The **Sn?** command (n =register number) is used for checking the contents of a register. The result is always expressed as a three-digit number, where the leading digits or all digits may be 0.

Sn=r is used to change an S register value (where n is the number of the register and r is the assigned value).

S registers

Default	Range	Units
---------	-------	-------

S0 Auto answer

0	0:255	Number of rings to auto answer
---	-------	--------------------------------

The S0 register sets auto-answer. If the parameter value is non-zero, auto-answer is enabled at the program level. If the number of rings is zero, auto-answer is disabled at the program level.

S1 Ring counter

0	0:255	Number of rings
---	-------	-----------------

The S1 register is cleared if no rings are detected throughout an 8-second interval. S1 is automatically set by the modem.

S2 Escape Character

43 <+>	0:127	ASCII Decimal
--------	-------	---------------

The S2 register determines the ASCII character to be used as the escape character. The escape sequence is used to force the modem from the online state to the local command state.

S3 Line-termination character

13 <CR>	0:127	ASCII Decimal
---------	-------	---------------

The S3 register determines the ASCII character to be used as the line-termination character.

S4 Line-feed character

10 <LF>	0:127	ASCII Decimal
---------	-------	---------------

The modem returns the ASCII character programmed in the S4 register as the line-feed character when the modem sends response codes to the computer.

S5 Backspace character

8 <BS> 0:127 ASCII Decimal

The S5 register determines the ASCII character to be used as the backspace character.

S6 Initial blind dialing wait

2 2:255 Seconds

The S6 register determines the number of seconds your modem waits between the time it takes the telephone off-hook and when it actually begins dialing. If the modem is not blind dialing, this register is ignored.

S7 Carrier wait

50 1:255 Seconds

The S7 register determines how many seconds the modem waits for a carrier signal from a remote modem after the dial command line is executed, or when answering an incoming call. If your modem does not receive a carrier tone from the remote modem in the specified amount of time, it hangs up and sends the NO CARRIER message.

S8 Pause time

2 0:255 Seconds

The S8 register determines the delay time for each comma (,) encountered in the dial command line during the execution of the D (dial) command.

S9 Carrier detect response time

6 1:255 1/10 second

The S9 register determines how long the carrier must be present before it is recognized by the modem.

S10 Disconnect timing

14 1:255 1/10 second

The S10 register allows you to specify how long an interruption is necessary before the modem interprets the disruption as a loss of carrier and hangs up.

If you enter 255, the modem ignores carrier detect status.

S11 Duration and spacing for DTMF dialing

95 50:255 Milliseconds

Register S11 is preset and should remain unchanged to ensure correct dialing.

S12 Escape code guard time

50 20:255 1/50 second

This value determines the length of time to wait for typing commands before and after issuing the escape sequence, as well as between the escape characters.

S18 Self-test duration

0 0:255 Seconds

The S18 register determines the duration of the AT&T diagnostic self-tests. If a non-zero value is chosen, the modem automatically halts the test after the time period specified and returns to command state. You must then issue an AT&T0 to actually exit the test. If S18 is zero, the self-test continues until it is ended by issuing the escape sequence to return to command mode followed by AT&T0.

S36 Negotiation failure treatment

5 0/3/4/5 Settings

Specifies action that should be taken when an attempt to connect in error-control mode fails.

- 0 Attempts V.42 connection. Hangs up if remote modem does not support V.42.
- 3 Makes asynchronous connection. No error control. Same as AT&Q0.
- 4 Attempts V.42 connection. If this fails, attempts MNP 2–4 connection. If this fails, hangs up.
- 5 Attempts V.42 connection.** If this fails, attempts MNP 2–4 connection. If this fails, attempts asynchronous connection.

S37 **Desired DCE connection speed**

0 0/3/5:11 Settings

This value is used in conjunction with the ATN and ATB values to determine which modulations are attempted when connecting.

- 0 Auto-mode** Attempts to connect at the highest possible speed.
- 3 Attempts to connect at 300 bps.
- 5 Attempts to connect at 1200 bps.
- 6 Attempts to connect at 2400 bps.
- 7 Attempts to connect at 4800 bps.
- 8 Attempts to connect at 7200 bps.
- 9 Attempts to connect at 9600 bps.
- 10 Attempts to connect at 12000 bps.
- 11 Attempts to connect at 14400 bps.
- 12 Attempts to connect at 16800 bps.
- 13 Attempts to connect at 19200 bps.
- 14 Attempts to connect at 21600 bps.

- 15 Attempts to connect at 24000 bps.
- 16 Attempts to connect at 26000 bps.
- 17 Attempts to connect at 28800 bps.
- 18 Attempts to connect at 31200 bps.
- 19 Attempts to connect at 33600 bps.

S38 Delay before hang up

0 0:254 Seconds

Specifies the delay before hanging up when the user issues the ATH command. When S38 is set to 255, the modem delivers all the data in its buffers before hanging up.

S46 V.42 bis data compression selection

138 136/138 Settings

136 V.42 only

138 V.42 with V.42 bis compression

S48 Feature negotiation action

7 0/3/7/128 Settings

Selects which error control features are allowed when making connections.

0 Negotiation disabled: try only V.42.

3 Negotiation enabled without detection phase.

7 Negotiation enabled with detection phase.

128 Negotiation disabled: try MNP only. V.42 disabled.

S95 Error control negotiation message option

32 4/8/32 Bit Mapped Options

A bit map to enable different result codes. Linked to ATW when ATW=1.

Bit	Value	Meaning
0–1	1	Not used.
2	4	Enables CARRIER messages only.
3	8	Enables CARRIER + PROTOCOL messages only.
4	16	Not used.
5	32	Enables CARRIER + PROTOCOL + COMPRESSION messages.

S110 Modulation selector

2 0/1/2/7 Settings

0 V32/V32bis enabled, V34/V34 (33.6) disabled

1 V32/V32bis enabled, V34/V34 (33.6) disabled

2 Full modulation set available

7 V34 (33.6) only enabled

S113 Data calling tone

0 0/1 Settings

0 No data calling tone

1 Enables data calling tone

T Enable tone (DTMF) dialing Sets the default dialing mode to Touch-Tone mode. Can be used in dial string.

Vn Verbalize The V command allows you to choose whether result codes are displayed as code numbers or English words. Unless these messages are being read by a program that does not easily recognize strings of characters, the default setting (V1) is recommended.

0 Displays result messages as code numbers (non-verbal).

1 Displays result messages as English words (verbal).

Verbalize result codes

0 OK Command is correct and has been completed

1 CONNECT Connection established

2 RING Incoming ring detected

3 NO CARRIER No connection or lost the carrier

4 ERROR Bad command

5 CONNECT 1200 Connection established at 1200 bps

6 NO DIALTONE Dial tone not detected in S7 seconds

7 BUSY Busy tone detected

8 NO ANSWER See ATD...@...

10 CONNECT 2400 Connection established at 2400 bps

11 CONNECT 4800 Connection established at 4800 bps

12 CONNECT 9600 Connection established at 9600 bps

13 CONNECT 14400 Connection established at 14400 bps

14 CONNECT 16800 Connection established at 16800 bps

15 CONNECT 7200 Connection established at 7200 bps

16 CONNECT 12000 Connection established at 12000 bps

17 CONNECT 19200 Connection established at 19200 bps
18 CONNECT 21600 Connection established at 21600 bps
19 CONNECT 24000 Connection established at 24000 bps
20 CONNECT 26400 Connection established at 26400 bps
21 CONNECT 28800 Connection established at 28800 bps
41 CONNECT 31200 Connection established at 31200 bps
42 CONNECT 33600 Connection established at 33600 bps
22 CONNECT 1200/75 Connection established at 1200/75 bps
23 CONNECT 75/1200 Connection established at 75/1200 bps
24 CONNECT 300/REL Connection with MNP 300 bps
25 CONNECT 1200/REL Connection with MNP 1200 bps
26 CONNECT 2400/REL Connection with MNP 2400 bps
27 CONNECT 4800/REL Connection with MNP 4800 bps
28 CONNECT 9600/REL Connection with MNP 9600 bps
29 CONNECT 7200/REL Connection with MNP 7200 bps
30 CONNECT 12000/REL Connection with MNP 12000 bps
31 CONNECT 14400/REL Connection with MNP 14400 bps
32 CONNECT 16800/REL Connection with MNP 16800 bps
33 CONNECT 19200/REL Connection with MNP 19200 bps
34 CONNECT 21600/REL Connection with MNP 21600 bps
35 CONNECT 24000/REL Connection with MNP 24000 bps
36 CONNECT 26400/REL Connection with MNP 26400 bps
37 CONNECT 28800/REL Connection with MNP 28800 bps
38 CONNECT 31200/REL Connection with MNP 31200 bps
39 CONNECT 33600/REL Connection with MNP 33600 bps

Protocol negotiation progress enabled by ATW1 and S95.

40 CARRIER 300 Carrier detected at 300 bps
44 CARRIER 1200/75 Carrier established at 1200/75 bps
45 CARRIER 75/1200 Carrier established at 75/1200 bps
46 CARRIER 1200 Carrier established at 1200 bps
47 CARRIER 2400 Carrier established at 2400 bps
48 CARRIER 4800 Carrier established at 4800 bps
49 CARRIER 7200 Carrier established at 7200 bps
50 CARRIER 9600 Carrier established at 9600 bps
51 CARRIER 12000 Carrier established at 12000 bps
52 CARRIER 14400 Carrier established at 14400 bps
53 CARRIER 16800 Carrier established at 16800 bps
54 CARRIER 19200 Carrier established at 19200 bps
55 CARRIER 21600 Carrier established at 21600 bps
56 CARRIER 24000 Carrier established at 24000 bps
57 CARRIER 26400 Carrier established at 26400 bps
58 CARRIER 28800 Carrier established at 28800 bps
59 CARRIER 31200 Carrier established at 31200 bps
60 CARRIER 33600 Carrier established at 33600 bps
66 COMPRESSION: CLASS 5 MNP class 5
67 COMPRESSION: V.42BIS V.42 bis compression
69 COMPRESSION:NONE No compression
70 PROTOCOL:NONE Asynchronous mode
77 PROTOCOL:LAP-M Error control mode with LAP-M protocol
80 PROTOCOL:ALT Error control mode with MNP protocol

128 MODEM IN USE Modem already in use for this or another application

Wn Progress result codes The ATW setting determines whether progress result codes are displayed in addition to the ATX setting. Register S95 determines which progress result codes will be displayed.

0 Progress codes 40 through 80 disabled.

1 Progress codes 40 through 80 enabled.

2 Progress codes enabled; identical to W1.

When writing a CCL script, pay attention to result codes for scripts that require a specific response. If progress codes are enabled, the following strings appear on the screen during a connection (in this example, V.22 bis connection with no error control):

```
CARRIER 2400  
PROTOCOL:NONE  
CONNECT 2400
```

Xn Active result code The result codes listed in Vn are divided into subsets that can be selected by the X command. Dial tone detection is enabled by X2 or X4. Busy tone detection is enabled by X3 or X4. The commands X0, X1, and X3 are appropriate for blind dialing. Blind dialing means the modem dials out even though a dial tone is not detected.

0 Selects result codes 0 through 4 and 8.

1 Selects result codes 0 through 5, 8, and 10 through 28.

2 Selects result codes 0 through 6, 8, and 10 through 28.

3 Selects result codes 0 through 5, 7, 8, and 10 through 28.

4 Selects all result codes.

Yn Remote break handling This command sets modem behavior for responding to a long break signal received from a remote modem:

- Greater than 1.6 seconds for an asynchronous connection.
- An attention frame for MNP or V.42.

0 The modem ignores any long breaks received from the remote modem.

- 1 On receiving a long break from the remote modem, the modem goes on-hook (hangs up) and returns to command state.
- 2 On receiving a long break from the remote modem, the modem returns to command state but remains connected to the remote modem (does not hang up).

Zn Reset The Z command tells the modem to perform a software reset.

- 0 Loads Profile 0 into the active profile.
- 1 Loads Profile 1 into the active profile.

&Cn DCD options Since GeoPort/Express modem has no DTE-DCE serial interface, this command has no effect and remains for scripting compatibility.

0-2 Return OK.

&Dn DTR options the GeoPort/Express modem does not have a DTR line. For GeoPort/Express modem, an on-to-off DTR transition occurs when you close the connection tool or the application currently using the modem. In this case, the modem goes on-hook.

This command has no effect and remains for scripting compatibility.

0-3 Return OK. Default value is 3.

&F Recall default profile The current active profile is replaced by the default factory configuration.

&Gn Guard tones This command specifies whether guard tones should be transmitted. Guard tones are used in some telephone systems to allow proper data transfer over the network.

0 Disables guard tone.

- 1 Same as 2.
- 2 Sends 1800 Hz guard tone.

&Kn Local flow control This command specifies which kind of local flow control is used. Since GeoPort/Express modem has built-in flow control mechanisms between the DTE and the DCE, this command has no effect. Flow control characters generated by the application software are always passed to the line.

This command has no effect and remains for scripting compatibility.

0-5 Respond OK, no action taken.

&Ln Switched/Leased line This command affects the modem's behavior during the call setup and carrier handshake phases at the beginning of a connection.

0 Selects switched (dial-up) line.

- 1 Selects conditioned leased line.

&Pn Pulse mode make/break ratio

0 Sets the dial pulse/break ratio at 39%/61%.

- 1 Sets the dial pulse/break ratio at 33%/67%.

&Qn Connection mode This command allows you to enable and disable error control mode. The &Q command setting has precedence over \N command setting and registers S36 and S48.

0 Asynchronous mode (no error control, disables V.42 and MNP).

5 Error control mode Instructs the modem to make a connection using V.42/MNP and fallback as necessary (see S36 and S48 registers).

6 Same as 0.

&Rn CTS/RTS Since integrated modems have no DTE-DCE serial interface, this command has no effect and remains for scripting compatibility.

0–1 Return OK.

&Sn DSR Since integrated modems have no DTE-DCE serial interface, this command has no effect and remains for scripting compatibility.

0–2 Return OK.

&Tn Self-tests The following diagnostic tests are provided. These tests are available only when no error protocol is engaged. The duration of each test is controlled by register S18.

0 *Terminate the test* Used to terminate (escape from) a test in progress and return to command state, if S18=0.

1 *Local analog loopback* Initiates a local analog loopback test. The escape sequence must be entered to terminate this test. This mode tests the local modem and data terminal equipment.

- 3 *Local digital loopback* Initiates a local digital loopback test. The modem echoes characters back to the remote modem exactly as received.
- 4 *Enable the remote digital loopback* Enables the modem to respond to a remote modem attempting to place it in digital loopback test. If a remote modem places the local modem in remote digital loopback mode, the local modem echoes characters back to the remote modem exactly as received from the remote modem.
- 5 *Disable the remote digital loopback* Prevents the modem from responding to a remote modem attempting to place it in the digital loopback mode.
- 6 *Remote digital loopback test* In this mode, characters sent to the remote modem are echoed back to the local modem exactly as they were received by the remote modem. This mode tests both local and remote modems and telephone circuits.
- 7 *Remote digital loopback with self-test* Initiates a Remote Digital Loopback (like &T6) with self-test data pattern generation and error checking.
- 8 *Local analog loopback with self-test* Initiates a Local Analog Loopback (like &T1) with self-test data pattern generation and error checking.

The tests terminate when an AT&T0 command is issued or when register S18 expires. In the self-test mode, an error counter counts the number of errors and sends the final result to the host at the end of the test. The maximum number of errors that can be counted is 255.

Note: &T1 takes an optional parameter (a single character, A or O) to indicate whether the analog loopback must be done in originate (default) or answer mode.

&Vn Display profiles Displays the following information

- Active profile
- Stored profile 0
- Stored profile 1
- Stored telephone numbers (see AT&Z).

&Wn Profile saving This command saves the current active profile.

0 Saves the active profile into profile 0.

1 Saves the active profile into profile 1.

&Xn Synchronous clock source Ignored. Always returns OK. The modem does not support synchronous modes.

&Yn Specify start-up profile Allows choosing between two different configurations at start-up.

0 Specifies saved profile 0 as start-up configuration.

1 Specifies saved profile 1 as start-up configuration.

&Zn=s Store phone number

Stores the dial string **s** (64 characters maximum) in location *n*. The value of *n* can be equal to 0, 1 or 2. Note that the dial string **s** is constructed in the same fashion as the ATD command. It therefore must be the last command on the command line and no other characters should follow it in the dial string.

MNP-specific AT commands

\Bn Send break Sends a break on the line for n times 100 milliseconds (n ranges from 1 to 9).

%Cn Compression enable Enables/disables MNP Class 5 data compression during MNP reliable connections.

0 Disables MNP 5 data compression.

1 Enables MNP 5 data compression.

\Gn DCE flow control Enables/disables modem-to-modem flow control. Coupled with \X, it determines whether flow control characters are passed through or filtered.

0 Disables modem-to-modem flow control.

1 Enables modem-to-modem flow control.

\Nn MNP feature selection Determines whether MNP error control is used in connections. The \N command setting also updates register S36. The &Q command setting has precedence over \N command setting and registers.

0-1 Normal mode MNP disabled.

2 *Reliable mode* The modem will interrogate the remote modem for MNP capabilities. If the remote modem does not support MNP, the local modem hangs up.

3 *Auto-reliable mode* The modem interrogates the remote modem for MNP capabilities. If the remote modem supports MNP, a reliable connection is established. If the remote modem does not support MNP, a normal connection is established.

\O MNP link negotiation Treated as ATO0 command.
Modem returns to online state. MNP Link is not negotiated.

\Tn Inactivity timer Where n is a decimal integer between 0 and 90 specifying minutes. Sets the number of minutes the modem waits before automatically hanging up when data is not sent or received. The default option n=0 disables the timer.

\U MNP link negotiation Treated as ATO0 command. Modem returns to online state. MNP link is not terminated.

\Vn MNP result codes

0 Disables modified MNP result codes.

- 1 Enables modified standard MNP result codes 24 to 28.
- 2 Returns OK. No effect.

\Xn Flow control processing

0 No pass-through flow control If modem-to-modem flow control is enabled, AT\G1, XON/XOFF characters received from the line are filtered out of the data stream; they are not passed to the DTE.

- 1 Pass-through flow control If modem-to-modem flow control is enabled, AT\G1, XON/XOFF flow control characters received from the line are passed through to the DTE.

\Y MNP link signaling Treated as ATO0 command. Modem returns to online state. MNP link is not negotiated.

\Z MNP termination Treated as ATO0 command. Modem returns to online state. MNP link is not negotiated.

2

Troubleshooting

In this chapter

- Resolving common problems with data connections

Common problems

This chapter addresses common problems that can arise during a data connection. Where appropriate, an answer to a question includes the AT command to use.

Problems with a connection are sometimes due to a fault in the hardware or software installation. For tips about checking your hardware and software installation, see Appendix B, “Tips and Troubleshooting” in *Getting Started With Apple Telecom*.

Q: *In terminal mode, I type AT and press Return once, but don't get an OK response.*

- 1 Try resetting your modem (see below).

If you still have trouble getting your modem to work, see the service and support information that came with your computer for a number to call.

Q: *How do I reset my modem.*

You can reset your modem—that is, return it to the original factory default setting—by using an AT command. Once reset, your modem tries to connect at the highest speed and best error control and data compression settings.

- 1 To reset your modem, type the direct command AT&F.

The AT commands may not be echoed on the screen when you type them. Resetting the modem should also correct this problem.

Q: *I see unreadable characters mixed in with normal ones.*

You may see a strange mix of characters in an otherwise readable message. This may be due to noise or interference on the telephone line.

- 1 Wait a while. The problem may go away by itself. If the problem persists, hang up then redial.

Q: *I see a complete screen full of unreadable characters.*

A complete screen of random text may be caused by a bad connection, or may occur when your modem's automatic settings don't match those required by the remote computer. The settings for number of data bits and stop bits (for asynchronous connections), and parity must match at both ends of the connection.

Possible solutions include

- 1** Reconnect your telephone cable firmly. It doesn't happen often, but an improper connection can turn your data into unreadable text.

If the problem persists, hang up and dial again.

- 2** If you are sure you have a normal connection but the problem persists, check with your communications software user's guide to confirm that your modem is set correctly for speed, error checking, and data compression.
- 3** Check with the person (or information service) at the other end of the line to be sure your transmission rates (33600, 28800, 14400, 9600, 4800, 2400, 1200, 300 bps) are the same.
- 4** Try another parity setting until the transmission is normal.
- 5** If you can't see what you type, turn on your local echo setting (some software applications call this the duplex setting). If you see two of everything you type, turn off your local echo setting. An incompatible echo setting can cause double lines of text to appear on your screen; it can also prevent any text from appearing on the screen.
- 6** Keep trying another setting until the transmission is normal.

Q: *I have Call Waiting and experience loss of connection.*

If you use your modem on a telephone line with Call Waiting, you run the risk of being disconnected or losing data when someone else tries to call you. The best solution is to temporarily disable Call Waiting if possible. In certain cases, you may solve the problem by placing *70 or *71 in your dial string, either before or after the number you are dialing (this may vary according to your telephone service provider).

Call Waiting will return as soon as you hang up. You will have to disable it for each telephone call. Call Waiting can also be disabled for fax.

Q: *I have trouble connecting to the remote modem.*

- 1** Make sure you are calling the correct telephone number. Verify that the number has not been disconnected.

You may need to type a digit, such as a 0 or 9 followed by a pause character (,), at the beginning of the telephone number to get an outside line.

- 2** Make sure the number you're dialing connects to a modem and not to a regular telephone. Try calling the modem number from a regular telephone. If you hear a high-pitched tone after you dial, you have reached another modem.
- 3** You may be in a location where the modem is having difficulty recognizing the dial tone on a PBX. Try blind dialing the number, if you have this feature. See Chapter 5, "Using Your Modem" in *Getting Started With Apple Telecom* to set the Express Modem control panel for blind dialing.

- 4** The other modem may not be able to negotiate the connection speed automatically. Try forcing a lower speed by setting register S37 to 9 or 6.

Important Do not reconnect a faulty modem until it has been repaired. If you leave a faulty modem connected when it is adversely affecting the telephone line, the telephone company may disconnect your service until you have corrected the problem.

Q: *I am using a communications program that does not support the Communications ToolBox (CTB). What settings must I make?*

If you are using the Express Modem hardware, be sure that “Use internal modem instead of Modem Port” is checked in the Express Modem control panel. This will route commands your program sends to the Modem Port to the Express Modem hardware. If you are using the GeoPort Telecom Adapter or GeoPort Internal Modem, this is automatic. You do not need to do anything.

When you use a non CTB-compatible program, settings for Baud rate and hardware handshake (DTR/CTS/RTS) are ignored. These settings only pertain to modems that use a serial interface. The only “Handshake” setting that may be useful is XON/XOFF. This is a software flow control method that is sometimes used in asynchronous connections.

See also: Chapter 5, “Using Your Modem” in *Getting Started With Apple Telecom* and the AT\G command (for XON/XOFF) in Chapter 1 of this manual.

Q: *When connecting to a remote modem that does not support data compression, how do I save time on long file transfers?*

Try compressing the file in advance using a standalone compression program.

Q: *How do I disable data compression?*

Use AT%C0 to disable MNP 5 compression and ATS46=136 to disable V.42 bis compression.

Q: *How do I connect to online services that do not support data compression or error correction?*

- 1** First check to see if your software uses a “modem initialization string.” If so, locate and remove “S48=0,” if it appears in the string. If this does not work or it is not present, add “%C0S46=136” to the end of your modem initialization string (this disables compression). If this still does not work, try adding “&Q0” instead (this disables compression and error correction).
- 2** Another potential connection problem is your application getting confused by the CARRIER message. Some applications misinterpret this as a CONNECT message and begin sending data. This will cause the Express Modem software to drop the connection. Since it is still negotiating the connection, it will abort the call if it receives any data prior to the CONNECT message. If this is the case, you may want to add a W0 command in the application’s initialization string (this suppresses the CARRIER message).

Q: *How do I reset a blacklisting error message?*

Regulations in France, Japan, and a few other countries require that the Express Modem software blacklist recently dialed numbers when the connection fails. If you receive a “BLACKLISTED” error message when dialing, you can reset the BLACKLISTED condition by turning the Express Modem control panel off and then on. This software reset, equivalent to turning on and off a hardware modem, is compliant with PTT regulations.

The Apple Publishing System

This Apple manual was written, edited, and produced on a desktop publishing system using Apple Macintosh computers and QuarkXPress. Technical illustrations were drawn in Adobe Illustrator; screen shots were created and modified with system software and Adobe Photoshop. Proof pages were created on Apple LaserWriter printers. Final online documentation was created with Adobe Acrobat Distiller and Adobe Acrobat Exchange.

Text type is Apple Garamond. Display type is Helvetica Black. Ornaments are custom symbols designed for Apple Computer.

PostScript, the LaserWriter page-description language, was developed by Adobe Systems Incorporated.