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Modem AT Command Set: Description Part 1/2 (6/95)

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TOPIC ---

This is part one of a two part article that includes a description of modem
states as well as the AT command set.

DISCUSSION --

MODEM STATES
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Moving between command and online states
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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 appendix gives
complete descriptions of all commands supported by the Express Modem software.

• 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.

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 appendix, the modem's default value and description are shown in boldface type.

Special Commands
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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
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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 (CCITT 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   CCITT mode
    1   Bell 103 and Bell 212A, instead of V.21 and V.22, in case of fallback
    2   CCITT 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 (;), 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

Same as W. 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 5 seconds of silence. This period of silence confirms that the call has been answered. Once 5 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. You may also force the modem to ignore the dial tone (blind dialing) by starting the dial string with ";D". 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.

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En  Echo off/on
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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.


Ln  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
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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 CCITT 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).

NOTE: Refer to the TIL article titled "Modem AT Command Set: S Registers" for a
complete list of the S registers.

T Enable tone (DTMF) dialing

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

Support Information Services

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