Apple Telecom

Country Information

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Modem Command Set

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Modem states

The Express Modem has two functional states: command state and online state. Command state allows you to enter commands that control the modem, such as configuration parameters. In command state, the modem is not capable of sending or receiving data. In online state, the modem sends and receives data through the telephone system. To enter commands from the AT command set, the modem must be in command state.

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 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.

Using AT commands

One or more commands can be grouped and sent to the modem as a command line. A command line example is:

```
AT&Q5DT2125556767
```

This command line sets the modem to attempt a V.42 bis connection, then dials the number (212) 555-6767.

In this example, the modem's command line interpreter issues instructions to the modem using AT commands. If you look these commands up in this manual, you will find:

AT   The attention prefix

&Q5   Attempt V.42 bis connection

DT   Use Touch-Tone dial

212... Make this string the dialed number

Entering `AT` commands from a terminal emulator program

If you have a Communications ToolBox (CTB) compatible terminal emulator program, you can enter `AT` commands as follows:

1 **Choose Connection from the Settings menu.**

The Connection Settings dialog box appears.

2 **Select the Express Modem.**

The lower half of the dialog box changes.
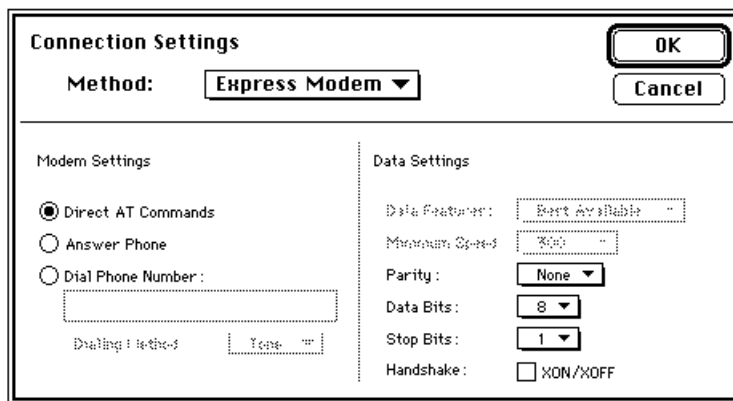
3 **Select Direct `AT` Commands in Modem Settings, then click OK.**
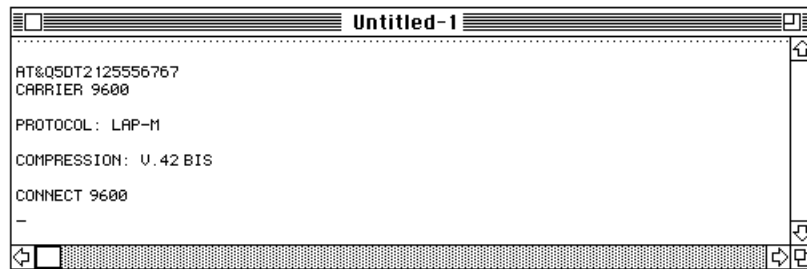
This indicates that you will control the modem directly with `AT` commands.

4 **Choose Open Connection from the Session menu.**

This establishes a logical connection between your program and the modem. The modem is now in command state and ready to receive `AT` commands.

5 Enter the command string `AT&Q5DT2125556767` on your keyboard, then press Return.

The modem will dial the number and make the connection. The messages displayed on your screen will be similar to the following:

```
≣□≣≣≣≣≣≣≣≣≣≣≣≣≣≣ Untitled-1 ≣≣≣≣≣≣≣≣≣≣≣≣≣≣□≣
AT&Q5DT2125556767
CARRIER 9600

PROTOCOL: LAP-M

COMPRESSION: V.42 BIS

CONNECT 9600

-
```

6 To hang up

- enter +++ to go to command state

- type `ATH`

- press Return.

Commands documented in this manual

This manual documents the command set recognized by the Express 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—external modems or even modems that plug into a slot on a main logic board—use a serial connection (RS-232, for example) 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.

Command set rules

The command line can contain any number of commands and their options as long as the total number of characters (not including the attention characters or the line termination character) does not exceed 64, the length of the command line buffer. With only a few exceptions, described later in this manual, the command line begins with the attention characters `AT` and ends with a return character, called a carriage return `<CR>`.

If the command line exceeds 64 characters, the result code `ERROR` is returned and no commands are executed. If the number of characters is less than or equal to 64, the commands are processed in order from the `AT` to the `<CR>`. If a command is invalid or unrecognized, processing of the command line ends at that command. Any commands following the error are ignored and the result code is returned to your program.

The commands can be either uppercase or lowercase characters. However, both attention characters must be in the same case (for example, AT or at). The modem must be in command state to recognize and execute these commands, with the exception of the escape sequence.

When a line of commands is executed, only the last result code for the command is displayed. If a command displays information different from the result code, the information is displayed along with the result code. All intermediate result codes are canceled.

Actions, settings, and parameters

AT commands fall into two broad categories—actions and settings. Action commands, such as the command to return to online state (ATO), take immediate effect and are used during a connection. Setting commands, such as the command to control the speaker (ATM), generally apply to the next connection and are used from command state prior to making a connection.

Many commands, particularly those that affect settings, take parameters that can have any value within a specific range. In this manual, an italic n appears beside the title of a command to indicate that the command has an associated parameter.

Interpreting the default

If a parameter value required for a particular command is not supplied, your modem will normally interpret the value as 0. The value supplied by the modem when you do not alter it is called the default. This is the value the modem assumes when you first start it up or after the original factory settings are restored. You can restore the original settings by using the AT&F command described later.

Interpreting valid parameter ranges

Command parameters are checked according to valid ranges. The range of valid values is given for each command that has an associated parameter. Ranges vary according to the command, but no value can exceed 255. Parameter values above 255 are evaluated modulo 256. For example, ATE257 yields the same result as ATE1 because (257 modulo 256) = 1. After evaluating the argument modulo 256, if the value is not supported, then ERROR is returned. Any argument greater than 999 in a command will generate an ERROR result code.

Setting the S registers

The S command is used to assign values to various registers in the modem's memory. Most of the S registers deal with certain aspects of timing. You can customize the behavior of the modem by setting the values in the S registers. Whatever the setting of register S3, the <CR> character (ASCII 13) is always recognized. The option in the Set Register command (Sn=) is also evaluated modulo 256 before setting the register to the new value. See the S registers for details of the effects of setting a given register value out of range.

Any attempt to set or read a reserved or unused register will generate an ERROR.

`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 manual, 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 (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.

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.

E*n* **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.

H*n*   **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.

I*n*   **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.

L*n*   **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.

M*n*   **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.

N*n*   **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 CCITT mode.

O*n*   **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.

Q*n*   **Quiet** (refer to command V*n*)

   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.

S*n*   **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 S*n?* 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.

S*n*=*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**

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. Auto-answer at the system level is controlled in the Express Modem control panel. The number of rings is also set in the Express Modem control panel. For the S0 setting, values from 1 to 255 are equivalent.

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. No matter what value S3 is set to, ASCII 13 is always recognized.

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.

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	Bits

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.**

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

V*n* **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

15 `CONNECT 7200` Connection established at 7200 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

Protocol negotiation progress codes that work with `ATW1` and `S95`.

40 `CARRIER 300` Carrier detected at 300 bps

46 `CARRIER 1200` Carrier detected at 1200 bps

47 `CARRIER 2400` Carrier detected at 2400 bps

48 `CARRIER 4800` Carrier detected at 4800 bps

49 `CARRIER 7200` Carrier detected at 7200 bps

50 `CARRIER 9600` Carrier detected at 9600 bps

51 `CARRIER 12000` Carrier detected at 12000 bps

52 `CARRIER 14400` Carrier detected at 14400 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`

*X*n **Active result code** The result codes listed in V*n* 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.

*Y*n **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).

*Z*n **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.

&*C*n **DCD options** Since bus modems have no DTE-DCE serial interface, this command has no effect and remains for scripting compatibility.

    0–2 Return OK.

&D*n* **DTR options** Bus modems do not have a DTR line. For bus modems, 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.

&G*n* **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. They are not used in the United States.

0   **Disables guard tone.**

1   Same as 2.

2   Sends 1800 Hz guard tone.

&K*n* **Local flow control** This command specifies which kind of local flow control is used. Since bus modems have 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.

&L*n* **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.

&P*n* **Pulse mode make/break ratio**

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

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

&Q*n* **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.

&R*n* **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.

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

    0-2 Return OK.

&T*n* **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.

&U*n* **Trellis coding** Enables/disables Trellis code modulation in V.32.

   0   **Enable Trellis coding.**

   1   Disable Trellis coding.

&V*n* **Display profiles** Displays the following information

   ■   Active profile

   ■   Stored profile 0

   ■   Stored profile 1

   ■   Stored telephone numbers (see AT&Z).

&W*n* **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.

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

&Y*n* **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.

&Z*n*=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

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

%C*n* **Compression enable** Enables/disables MNP Class 5 data compression during MNP reliable connections.

  0 Disables MNP 5data compression.

  1 Enables MNP 5 data compression.

\G*n* **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.

\N*n* **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.

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