AT Command Reference

for K56flex TelePort 56 modems

GLOBAL VILLAGE

AT Command Reference for K56flex TelePort 56 modems, Version 1.0
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Contents

Commonly Used Commands:

Entering AT Commands

To enter an AT command, you must be using a terminal emulation application that provides you with a text area for entering commands and receiving command feedback. ProComm, HyperTerminal, ZTerm, and Microphone II are examples of this type of application.

Typing an AT Command

All AT commands, except for +++ and A/, must be preceded by the characters “AT” and followed by a carriage return (produced by pressing the Return key). The characters “A” and “T” must be the same case. “AT” signals the modem to come to attention; the carriage return indicates that the command is finished.

For example, to answer an incoming call using the A (answer) command, you type

```
ATA
```

and then press the Return key.

Using Command Parameters

Many commands require a parameter, which is usually a single digit that determines the command’s behavior. For example, the parameter ***n*** in the Hn command is either 0 (to hang up) or 1 (to go off-hook). To hang up using this command, you type

```
ATH0
```

and then press the Return key.

Some commands require parameters that are not single digits. For example, the Dn command accepts one or more single-character dialing modifiers, plus a telephone number. To use touch-tone dialing (T) to dial the telephone number 123-4567, you type

```
ATDT1234567
```

and then press the Return key.

Entering More Than One Command

You can enter multiple AT commands on the same line, as long as the line begins with "AT" and ends with a carriage return.

You usually use multiple commands on the same line to configure your modem. For example, to request that the modem use the factory default settings (&F command) and turn the modem speaker off (M command), you type

```
AT&F1M0
```

and then press the Return key.

Entering and Exiting Command Mode

Before you enter an AT command, the modem must be in the command state. If you are already connected to another modem, you can use the +++ command to switch to command state. (You can later return to your connection using the On command.)

For example, to enter an AT command when a connection is active, you type

```
+++
```

to enter command mode; then type the AT command and press the Return key; and finally type

```
ATO
```

to return to your connection.

AT Command Reference

AT commands control your modem's settings and operation. This section provides detailed information on all AT commands supported by the Global Village PC card.

+++ (switching to command mode)

The +++ command forces a modem that is already connected to enter the command state, so you can send commands to your modem without breaking its connection with the remote modem. In some cases, you must send "AT" after the +++ command.

Unlike other AT commands, the +++ command is not preceded by the "AT" prefix. The command is accepted when the "+++" is typed, so you do not follow this command with a carriage return.

In order to prevent the modem from responding to "+++" in transmitted data, the escape sequence may need to be surrounded by a one-second pause.

You can change the escape code sequence from +++ to another string of characters by setting the S2 register. You can change the pause time required for the escape code sequence by setting the S12 register.

A (answering an incoming call)

The A command forces the modem to go off-hook in answer mode. Use this command to manually answer an incoming call when you know that another modem is calling.

When the modem detects an incoming call, it sends the RING result code to your computer. If a telecommunications application is active, the result code appears on your screen.

EXAMPLE

ATA
This command answers an incoming call.

A/ (repeating the last command)

The A/ command repeats the previous command. This command is especially useful for re-issuing a dial command that failed because of a busy line or no answer.

Unlike other AT commands, the A/ command is not preceded with the "AT" prefix. The command is accepted as soon as the "A/" is typed, so you do not follow this command with a carriage return.

\An (setting maximum MNP block size)

When the modem establishes an MNP error-corrected connection, it will use the maximum block size set by this command.

\A0
64-character block size.

\A1 (the default)
128-character block size.

\A2
192-character block size.

\A3
256-character block size.

EXAMPLE

AT\A1
This command instructs the modem to use the default block size when negotiating an MNP error-corrected connection.

Bn (specifying protocol for 300 or 1200 bps)

The Bn command configures the modem to use either Bell or CCITT protocols for 300 or 1200 bps connections. Any other line speed will use a CCITT protocol.

For more comprehensive connection settings, refer to the +MS command.

B0 (default for modems sold outside the US)
Selects CCITT V.22 protocol for 1200 bps connections and CCITT V.21 protocol for 300 bps connections.

B1 (default for US modems)
Selects Bell 212A protocol for 1200 bps connections and Bell 103 protocol for 300 bps connections.

EXAMPLE

ATB0
This command instructs the modem to use CCITT modulation for line speeds of 300 or 1200 bps.

\Bn (transmitting a break signal)

The \Bn command transmits a break signal to the remote modem.

In non-error-correction mode, the modem transmits a break signal of length ***n***, in units of 100 milliseconds. In error-correction mode, the modem transmits a break signal of unspecified length through the error-correction protocol.

The ***n*** parameter specifies the length of time, in multiples of 100 milliseconds, that a break signal should be transmitted in non-error-correction mode. The value of ***n*** must be in the range 1–9.

The default value is \B3, specifying a break signal length of 300 milliseconds.

EXAMPLE

AT\B4
In non-error-correction mode, this command sends a 400-millisecond break signal to the remote modem. In error-correction mode, this command sends a break of unspecified length.

%Cn (selecting data-compression settings)

You use the %Cn command to enable or disable V.42bis data compression, MNP 5 data compression, or both.

The value you use affects the S41 and S46 registers.

%C0
Disables data compression.

%C1
Enables MNP 5 data compression.

%C2
Enables V.42bis data compression.

%C3 (the default)
Enables both V.42bis and MNP 5 data compression.

EXAMPLE

AT%C2
This command enables only V.42bis data compression.

&Cn (modifying the carrier detection response)

The &Cn command controls whether the modem indicates a carrier detection. (A lost carrier indicates that the connection has been terminated.)

It is recommended that you leave carrier detection on (&C1).

The parameter value, if valid, is written to bit 5 of the S21 register.

&C0
The carrier is always indicated to be on.

&C1 (the default)
The modem indicates the state of the carrier; the carrier indicator is turned off if the carrier is lost.

EXAMPLE

AT&C0
This command instructs the modem to indicate the carrier is on.

Dn (entering a dialing string)

The Dn command causes the modem to dial a telephone number.

n is the telephone number you want to dial. The telephone number can include the characters 0–9, A–D, #, and * (A, B, C, D, #, and * can be used only when touch-tone dialing is selected). Dashes, parentheses, and spaces are ignored.

EXAMPLE

ATD 123-4567
This command dials the telephone number 123-4567. The space and dash in the telephone number are ignored.

Dialing Modifiers

You can also include a number of dialing modifiers in the ***n*** parameter to change the way dialing is handled. The following dialing modifiers can be used with the Dn command:

! (flash on-hook)

The ! (flash) dialing modifier instructs the modem to go on-hook for the time specified by the S29 register and then back off-hook, as if the switch-hook button on the telephone had been pressed and released.

This modifier can be placed anywhere in the dialing string.

EXAMPLE

ATDT!123-4567
This command instructs the modem to go on-hook and back off-hook, and then use touch-tone dialing to dial the telephone number 123-4567.

@ (wait for quiet answer)

The @ dialing modifier instructs the modem to wait for five seconds of silence after it dials and detects rings. This period of silence, called "quiet answer," confirms that the call has been answered.

If the five seconds of silence are detected, the modem dials the remaining numbers in the command line. The remaining numbers might be a security code, another telephone number, or an extension.

If ringing does not stop, the modem returns the NO ANSWER result code.

Rings are detected reliably only when you are calling within the same country.

EXAMPLE

ATD1234567@5555
This command dials the telephone number 123-4567, waits for the call to be answered, and then dials the extension 5555.

, (pause during dial sequence)

The , dialing modifier instructs the modem to pause for the number of seconds specified by the S8 register.

To increase the pause time, you can use multiple commas or change the value of the S8 register. The default is 2 seconds.

EXAMPLE

ATDT123-4567,,,555
This command uses touch-tone dialing to dial the telephone number 123-4567. It then pauses for six seconds before dialing the telephone extension 555.

; (return to command mode after dialing)

The ; dialing modifier instructs the modem to return to command state after dialing a number.

You can use this modifier to issue additional AT commands while remaining off-hook. The semicolon must be placed at the end of the dial command, but can then be followed by other commands.

EXAMPLE

ATD1234567;X1DT,3
This command instructs the modem to dial the telephone number 123-4567 and then return to command state. Once the modem is in command state, it pauses (indicated by the comma) and then dials the number 3, without checking for a dial tone (X1).

& (wait for credit-card tone)

The & dialing modifier instructs the modem to wait for a credit-card dialing tone before continuing with the dialing string. If the tone is not detected within the time specified by the S7 register, the modem will hang up and generate an error message.

EXAMPLE

ATDT123-4567&445566
This command dials the telephone number 123-4567 and then waits for a credit card tone before dialing 445566.

^ (enable calling tones)

The ^ dialing modifier enables calling tones for the current dial attempt.

By default, calling tones are disabled for Global Village modems sold in North America. You might want to enable calling tones with the ^ modifier if, for instance, the device that you are calling uses calling tones to differentiate between a voice, fax, or data call.

EXAMPLE

ATDT^123-4567
This command instructs the modem to emit calling tones when the remote device answers the call.

K (enable cellular power adjustment)

The K dialing modifier enables the modem to automatically adjust the cellular transmit power level to accommodate the signaling requirements of the cellular telephone equipment.

EXAMPLE

ATDTJK123-4567
This command string dials the telephone number 123-4567, attempts to negotiate an MNP 10 connection at 1200 bps, and enables automatic adjustment of the cellular transmit power level.

L (redial the last telephone number)

The L dialing modifier instructs the modem to redial the last telephone number dialed.

The L modifier must be placed immediately after the D in the Dn command. The modem ignores any characters placed after the L modifier.

To display the last-dialed number (with a terminal emulation application), use the following command:

ATDL?

EXAMPLE

ATDT1234567
ATDL
The first command dials the telephone number 123-4567. The second command redials the telephone number.

P (pulse dial)

The P dialing modifier instructs the modem to use pulse dialing.

If you use P between the digits of a telephone number, the digits following P are pulse-dialed.

EXAMPLE

ATDP123-4567
This command uses pulse dialing to dial the telephone number 123-4567.

R (originate call in answer mode)

Your modem does not support the R dialing modifier; however, it accepts this modifier without error to ensure backward compatibility with applications that issue this modifier.

You can emulate the R dialing modifier, if necessary, by adding ";A" to the end of your dialing string.

T (touch-tone dial)

The T dialing modifier instructs the modem to use touch-tone dialing. The tone duration and the time between digits is specified by the S11 register.

EXAMPLE

ATDT123-4567
This command uses touch-tone dialing to dial the telephone number 123-4567.

W (wait for a dial tone)

The W dialing modifier instructs the modem to wait for a dial tone before sending the next digit in the dialing string.

If the dial tone is detected before the S7 register time delay, the modem continues dialing the rest of the characters in the dialing string.

If no dial tone is detected, the modem goes on-hook, returns the NO DIALTONE result code, and enters the command state.

EXAMPLE

ATDT9W123-4567
This command instructs the modem to dial 9, then wait for a dial tone before dialing the telephone number 123-4567.

Disabling call waiting

In most of North America, you can disable call waiting for an outgoing call by adding *70W to your dialing string. (The W modifier ensures that the modem waits for a dial tone before dialing the telephone number.)

If you are not in North America, or if *70W does not work, contact your local telephone company for more information.

EAMPLE

ATDT*70W123-4567
This command string instructs the modem to disable call waiting, then wait for a dial tone before dialing the telephone number 123-4567.

&Dn (disconnecting using DTR signaling)

The &Dn command specifies what action should be taken when the DTR signal from the computer to the modem switches from ON to OFF. (The most common use for the command is to enable hardware hangups.)

For each parameter value, the way DTR is interpreted depends on the setting of the &Qn command.

When you enter a valid command parameter, it is written to bits 3 and 4 of the S21 register.

&D0 (the default)
For &Q0, &Q5, &Q6: DTR is ignored (assumed ON). Allows operation with computers that don't provide DTR signaling.

For &Q1, &Q4: when DTR drops, the modem hangs up. Autoanswer is not affected.

For &Q2, &Q3: when DTR drops, the modem hangs up. Autoanswer is inhibited.

&D1
For &Q0, &Q1, &Q4, &Q5, &Q6: when DTR drops, the modem returns to the asynchronous command state without disconnecting, as if the asynchronous escape sequence had been entered.

For &Q2, &Q3: when DTR drops, the modem hangs up. Autoanswer is inhibited.

&D2
For &Q0–Q6: when DTR drops, the modem hangs up. Autoanswer is inhibited.

&D3
For &Q0, &Q1, &Q4, &Q5, &Q6: when DTR drops, the modem performs a soft reset (as if the Zn command had been received). The &Yn setting determines which profile is loaded.

For &Q2, &Q3: when DTR drops, the modem hangs up. Autoanswer is inhibited.

EXAMPLE

AT&D2
This command enables DTR hangup for all values of the &Qn command.

En (turning echo on and off)

The En command controls whether commands that you type are echoed back to your computer while the modem is in command mode.

E0
Disables echo to the computer in command mode.

E1 (the default)
Enables echo to the computer in command mode.

EXAMPLE

ATE1
This command instructs the modem to echo characters it receives from the computer while in command mode.

%En (controlling the renegotiation method)

The %En command controls whether the modem will automatically monitor the line quality and request a retrain (%E1) or fall back when line quality is insufficient or fall forward when line quality improves (%E2).

%E0
Disables line quality monitor and auto-retrain.

%E1
Enables line quality monitor and auto-retrain.

%E2 (the default)
Enables line quality monitor and fallback/fallforward.

EXAMPLE

AT%E1
This command tells the modem to monitor the line quality and request a retrain if the quality changes.

&Fn (loading a factory configuration)

The &Fn command returns the modem to its factory settings.

&F0
Restores the default values for each command and for a subset of S-registers.

&F1 (the default)
Same as &F0.

EXAMPLE

AT&F1
This command instructs the modem to restore factory configuration 1 (the recommended factory settings).

&Gn (selecting the guard tone)

The &Gn command determines whether the modem transmits a guard tone when answering.

&G0
Disables guard tones (US default).

&G1
Disables guard tones.

&G2
Selects 1800 Hz guard tone.

EXAMPLE

AT&G2
This command sets the modem to use an 1800 Hz guard tone. You might enter this command when using your modem in the United Kingdom.

Hn (disconnecting)

You use the Hn command to place the modem on-hook (hang up) or take the modem off-hook (equivalent to lifting the telephone receiver).

H0
Places the modem on-hook (hangs up).

H1
Takes the modem off-hook and places it in command mode.

EXAMPLE

+++

ATH0
Suppose that you want to end a connection that you have established with another modem. This example uses the +++ command to enter command mode, then uses H0 to hang up.

In (displaying information about the modem)

The In command instructs the modem to provide information about itself.

I0
Reports the manufacturer's name (Global Village Communication).

I1
Reports a previously computed checksum.

I2
Reports OK if ROM checksum is valid; otherwise, reports ERROR.

I3
Reports the model code, modem type, and version number.

I4
Reports data and fax capabilities, along with the international version (if any).

I5
Reports the Country Code parameter.

I6
Reports the model of the modem data pump and the internal revision code.

EXAMPLE

ATI3
This command instructs the modem to report its model code, modem type, and version number.

^I (displaying cellular driver information)

The ^I command reports the ID of the currently loaded cellular driver in the following format:

CELLULAR DRIVER: *CellularDriverName*
Copyright(c), *CompanyName*
Month Day, Year Version *XXX*
OK

\Jn (enabling DTE rate adjustment)

If you have a European modem, you can control whether the modem adjusts the DTE speed to match the line speed after making a connection.

Global Village recommends that you disable the adjustment of the DTE speed to match the line speed (\J0). Most telecommunications applications automatically set the DTE speed to the optimum rate of data transfer, which is often higher than the line speed.

\J0 (the default)
Disables adjustment of the DTE speed to match the line speed.

\J1
Enables adjustment of the DTE speed to match the line speed.

EXAMPLE

AT\J0
This command instructs the modem to disable adjustment of the DTE speed to match the line speed.

&Kn (controlling the flow control method)

You use the &Kn command to select the flow control method used for a connection between a computer and a modem.

When you enter a valid command parameter, it is written to bits 1–2 of the S39 register.

&K0
Disables flow control.

&K3 (the default)
Enables hardware flow control (RTS/CTS).

&K4
Enables software flow control (XON/XOFF).

&K5
Enables transparent XON/XOFF flow control.

&K6
Enables both RTS/CTS and XON/XOFF flow control.

EXAMPLE

AT&K3
This command sets the modem to its default handshaking setting by enabling hardware flow control (RTS/CTS).

\Kn (controlling break signal behavior)

The \Kn command controls the behavior of the modem when it receives a break signal. The meaning of each parameter value depends upon the context of the break signal.

Receiving a break from the computer (in on-line mode)

This section describes, for each parameter value, what the modem will do when it receives a break signal from the computer while in on-line mode.

\K0
A break received from the computer will cause the modem to enter command mode, without sending a break to the remote modem.

\K1
A break received from the computer will cause the modem to clear data buffers and send a break to the remote modem.

\K2
Same as \K0.

\K3
A break received from the computer will cause the modem to send a break to the remote modem immediately.

\K4
Same as \K0.

\K5
Sends a break to the remote modem in sequence with transmitted data.

Receiving a break from the computer (in command mode)

This section describes, for each parameter value, what the modem will do when it receives a break signal from the computer while in command mode.

\K0
A break received from the computer will cause the modem to clear data buffers, then send a break to the remote modem.

\K1
Same as \K0.

\K2
A break received from the computer will cause the modem to send a break to the remote modem immediately.

\K3
Same as \K2.

\K4
A break received from the computer will cause the modem to send a break to the remote modem in sequence with transmitted data.

\K5
Same as \K4.

Receiving a break from the remote modem

This section describes, for each parameter value, what the modem will do when it receives a break signal from the remote modem during a non-error-correcting connection.

\K0
A break received from the remote modem will cause the modem to clear data buffers, then send a break to the computer.

\K1
Same as \K0.

\K2
A break received from the remote modem will cause the modem to send a break to the computer immediately.

\K3
Same as \K2.

\K4
A break received from the remote modem will cause the modem to send a break to the computer in sequence with received data.

\K5
Same as \K4.

EXAMPLE

AT\K5
This command resets the modem to its default break signal behavior:

• When the modem receives a break from the computer, it sends a break to the remote modem in sequence with data.

• When the modem receives a break from the remote modem, it sends a break to the computer in sequence with data.

-Kn (enabling V.42 to MNP 10 conversion)

You use the -Kn command to enable or disable the conversion of a V.42 LAP-M connection to an MNP 10 connection.

When you enter a valid command, its parameter value is written to bits 0–1 of the S40 register.

-K0 (the default)
Disables V.42 LAP-M to MNP 10 conversion.

-K1
Enables V.42 LAP-M to MNP 10 conversion.

-K2
Enables V.42 LAP-M to MNP 10 conversion; inhibits the initiation of MNP extended services during V.42 LAP-M answer mode detection phase.

EXAMPLE

AT-K0
This command instructs the modem to disable V.42 LAP-M to MNP 10 conversion.

Ln (adjusting the speaker volume)

You use the Ln command to adjust the modem speaker volume. (If you want to turn the modem speaker on or off, see the Mn command.)

The parameter value, if valid, is written to bits 0 and 1 of the S22 register.

L0
Lowest speaker volume.

L1
Low speaker volume.

L2 (the default)
Medium speaker volume.

L3
High speaker volume.

EXAMPLE

ATL2
This command sets the speaker to a medium volume.

%L (reporting the line signal level)

The %L command returns a value indicating the line signal level in –dBms (for example, 009 = –9 dBm). The value returned is the received level at the MDP (DAA-dependent), not at the telephone line connector.

Mn (turning the speaker on or off)

You use the Mn command to turn the modem speaker on or off. (If you want to change the speaker volume, see the Ln command.)

The parameter value, if valid, is written to bits 2 and 3 of the S22 register.

M0
Speaker is always off.

M1 (the default)
Speaker is on until the modem detects a carrier tone.

M2
Speaker is always on.

M3
Speaker is off during dialing.

EXAMPLE

ATM0
This command turns off the modem speaker.

&Mn (selecting asynchronous mode)

You can use the &Mn command to determine the DTR operating mode. The modem treats the &Mn command as a subset of the &Qn command.

&M0 (default)
Selects direct asynchronous operation. (The command sequence &M0\N0 disables error correction, while the same two commands in the order \N0&M0 enable error correction.)

&M1
Selects synchronous on-line mode with asynchronous command mode.

&M2
Selects synchronous on-line mode with asynchronous command mode. Same as &M1, except that &M2 enables DTR dialing of directory slot 0. The modem will disconnect if DTR is off for more than the time specified by the S25 register.

&M3
Selects synchronous on-line mode. This mode allows DTR signaling to act as a talk/data switch. The call is manually initiated while DTR is inactive. When DTR becomes active, the handshake proceeds in originate or answer mode according to bit 7 of the S14 register.

EXAMPLE

AT&M0
This command sets the modem to its default operating mode by enabling direct asynchronous operation.

+MS (specifying protocol and speed)

The +MS command has an extended command format that selects the communications protocol, variable or fixed speed, minimum connection speed, and maximum connection speed.

The form of this command is:

+MS=*protocol*, *negotiation*, *min*, *max*

Protocol

0	V.21 (300 bps)	56	K56flex (32,000-56,000 bps)
1	V.22 (1200 bps)	64	Bell 103 (300 bps)
2	V.22bis (1200, 2400 bps)	69	Bell 212 (1200 bps)
3	V.23 (1200 bps)		
9	V.32 (4800, 9600 bps)		
10	V.32bis (4800-14,400 bps)		
11	V.34 (2400-28,800 bps) / V.34 annex 12 (28,800-33,600 bps)		

Negotiation

0 = Requires the modem to use the specified protocol.

1 = Allows the modem to negotiate a different protocol with the remote modem during a connection.

Min

Minimum connection speed in bps. This speed must be valid for the selected protocol.

Max

Maximum connection speed in bps. This speed must be valid for the selected protocol.

EXAMPLE

AT+MS=11,1,2400,28800

This command sets the modem to connect with the V.34 protocol and to negotiate the connection protocol if the remote modem does not support V.34. The modem will connect at a minimum speed of 2400 bps and a maximum speed of 28,800 bps.

Nn (selecting variable or fixed connection speed)

You can use the Nn command to instruct your modem to either connect at a fixed speed or to negotiate the speed and then connect.

However, it is recommended that you use the +MS command instead. (The Nn command is provided for compatibility reasons only.)

N0

Forces the modem to connect at the speed specified in the S37 register. If S37 is zero, the speed is the most recently detected DTE speed. With this setting, if the modem is unable to connect at the specified speed, it hangs up.

N1 (the default)

Allows the modem to connect at the highest speed supported by both modems.

EXAMPLE

ATS37=11

ATN0

The first command sets the S37 register to 11 to indicate that the connection speed should be 14,400 bps. The second command instructs the two modems to connect at only that speed.

\Nn (setting error-correction mode)

You use the \Nn command to specify the type of error correction to be negotiated.

Each parameter setting forces the corresponding setting for the &Qn command. Some parameter settings also set S-registers 36 and 48.

\N0
Selects normal speed-buffered mode; no error correction used. Forces &Q6.

\N1
Selects direct mode; no error correction used. Forces &Q0.

\N2
Selects reliable (error-correction) mode. The modem will first attempt a LAP-M connection and then an MNP connection. Failure to make a reliable connection results in the modem hanging up. Using this command forces &Q5, S36=4, and S48=7.

\N3 (the default)
Selects auto-reliable mode. This command operates the same as \N2, except that if the modem cannot make a reliable connection, it falls back to the speed-buffered normal mode. Using this command forces &Q5, S36=7, and S48=7.

\N4
Selects LAP-M error-correction mode. Failure to make a LAP-M error-correction connection results in the modem hanging up. Using this command forces &Q5 and S48=0.

\N5
Selects MNP error-correction mode. Failure to make an MNP error-correction connection results in the modem hanging up. Using this command forces &Q5, S36=4, and S48=128.

EXAMPLE

AT\N2
This command sets the modem to make a reliable connection. If the modem cannot make a reliable connection, it will not connect.

On (switching to on-line mode)

The On command returns the modem to the on-line state from the command state.

If the modem is not connected to another modem, the command returns the ERROR result code.

O0
Returns the modem to the on-line state without retraining.

O1
Returns the modem to the on-line state after retraining.

EXAMPLE

ATO1
This command returns the modem to the on-line state and requests retraining.

P (using pulse dialing)

The P command makes pulse dialing the default dialing method. To indicate that all subsequent dialing should be conducted in pulse dial mode, the P command sets bit 5 of the S14 register.

You can override the P command for a specific dial attempt by adding the T modifier to the dialing string.

EXAMPLE

ATP
ATD123-4567
This example sets the default dialing method to pulse dialing and then dials the telephone number 123-4567.

&Pn (selecting the pulse mode make/break ratio)

You use the &Pn command to specify the make/break ratio used for pulse dialing.

The parameter, if valid, is written to bits 3 and 4 of the S28 register.

&P0 (the default)
Make = 39% and Break = 61% at 10 pulses per second (for US and Canada).

&P1
Make = 33% and Break = 67% at 10 pulses per second (for UK and Hong Kong).

&P2
Make = 39% and Break = 61% at 20 pulses per second (for Japan).

&P3
Make = 33% and Break = 67% at 20 pulses per second.

EXAMPLE

AT&P0
This command instructs the modem to use the US values for the make/break ratio.

Qn (displaying result codes)

The Qn command determines whether the modem sends a result code back to the computer after performing each AT command. (The format of the result codes is determined by the Vn command.)

Q0 (the default)
Result codes enabled.

Q1
Result codes disabled.

EXAMPLE

ATQ0
This command sets the modem to display result codes after each AT command.

&Qn (setting synchronous/asynchronous mode)

The &Qn command selects the operating mode and determines how the modem will treat transmitted and received data while in the on-line state.

&Q0
Selects asynchronous mode (no error control, disables V.42 and MNP); returns OK result code.

&Q1
Selects synchronous on-line mode with asynchronous off-line command mode.

&Q2
Selects synchronous on-line mode with asynchronous off-line command mode and enables DTR dialing of directory 0.

&Q3
Selects synchronous on-line mode with asynchronous off-line command mode and enables DTR to act as Talk/Data switch.

&Q4
Selects AutoSync operation.

&Q5 (the default)
The modem will try to negotiate an error-corrected link in synchronous mode. You can set the S36 register to determine the result if the modem fails to establish an error-corrected link.

&Q6
Selects synchronous operation in normal mode (speed buffering).

EXAMPLE

AT&Q5
This command instructs the modem to use the default connection behavior. If S36=7 (the default value), the modem will attempt to negotiate an MNP 5 error-corrected link in synchronous mode. If it fails to do so, it will attempt to negotiate a normal (non-error-corrected) link.

%Q (reporting the line signal quality)

The %Q command reports the line signal quality (DAA-dependent), returning the higher-order byte of the EQM value. Based on the EQM value, the modem may initiate a retrain (if enabled by %E1) or fallback/fallforward (if enabled by %E2).

&Rn (controlling hardware RTS/CTS signaling)

The &Rn command selects how the modem controls CTS signaling when hardware flow control is selected. (The behavior of CTS depends on whether the connection is synchronous or asynchronous.)

The parameter value, if valid, is written to bit 6 of the S21 register.

&R0
In synchronous mode, CTS will track the state of RTS; the RTS-to-CTS delay is defined by the S26 register. In asynchronous mode, CTS will act according to the V.25bis handshake.

&R1 (the default)
In synchronous mode, CTS will always be on and RTS transitions will be ignored. In asynchronous mode, CTS will drop only if required by flow control.

EXAMPLE

AT&R1
This command instructs the modem to keep CTS on in synchronous mode, and use it only for flow control in asynchronous mode.

Sn=x (writing to and selecting an S-register)

The Sn=x command selects S-register ***n*** and sets it to the value ***x***.

The ***n*** parameter is the number of the S-register. Valid S-registers are numbered from 0 to 95.

The ***x*** parameter is the value to which you want to set the S-register, within the range 0–255.

EXAMPLE

ATS0=1
This command sets the S0 register to the value 1. This instructs the modem to answer a call after the first ring.

Sn? (reading an S-register)

The Sn? command displays the current value of S-register ***n***.

The ***n*** parameter is the number of the S-register, within the range 0–201.

If you attempt to read the value of an S-register that is unreadable, or one that is not implemented in this modem, this command returns an error.

EXAMPLE

ATS0?
This command instructs the modem to display the value of the S0 register. If the modem is set to answer a call after the first ring, the result of this command string will be “001”.

-SEC=n (enabling or disabling MNP10EC)

You use the -SEC=n command to enable or disable the MNP 10EC cellular protocol. If you enable MNP 10EC, you can also specify the cellular transmit level that you want to use for connections.

-SEC=0
Disables MNP 10EC.

-SEC=1,[tx]
Enables MNP 10EC. The modem will attempt to negotiate an MNP 10EC connection using the transmit level, ***tx***, if specified. The optional ***tx*** parameter can be in the range 0 to 30 (0 to –30 dBm).

EXAMPLE

AT-SEC=1,18
This command enables MNP 10EC with a cellular transmit level of –18 dBm.

T (using touch-tone dialing)

The T command makes touch-tone dialing the default dialing method. To indicate that all subsequent dialing should be conducted in touch-tone mode, the T command clears bit 5 of the S14 register.

You can override the T command for a specific dial attempt by adding the P modifier to the dialing string.

EXAMPLE

ATT
ATD123-4567
This example sets the default dialing method to touch-tone and then dials the telephone number 123-4567.

^T6 (displaying the status of the cellular phone)

The ^T6 command reports the status of the cellular telephone connected to the modem. The status is reported as a single byte formatted as a decimal number.

The status bits are as follows:

Bit 0 Cellular telephone is receiving a call.
Bit 1 Cellular telephone is in use.
Bit 3 There is no service for the cellular telephone.
Bit 4 Cellular telephone is powered on.
Bit 5 Cellular driver is initialized.
Bit 6 Reserved.
Bit 7 Cellular cable is detected.

Vn (setting result code format)

The Vn command determines whether result codes are displayed as numbers (numeric form) or words (verbose form).

Result codes in verbose form include “ERROR”, “RING”, “CONNECT”, and “OK”.

V0
Switches to numeric form. (No line feed character is issued following the code.)

V1 (the default)
Switches to verbose form. (A line feed character is issued following the code.)

EXAMPLE

ATV1
This command instructs the modem to display result codes as words.

&V (displaying a user profile)

The &V command displays the active profile, including command and S-register settings.

Wn (specifying connection result codes)

The Wn command determines which result codes are used to describe the type of connection and protocol that results from handshaking and negotiation. (You can set the S95 register to further modify result codes.)

W0 (the default)
Upon connection, the modem reports the DTE speed (for example, CONNECT 57600).

W1
Upon connection, the modem reports the line speed (for example, CARRIER 14400), error-control protocol (for example, PROTOCOL LAP-M), data-compression protocol (for example, COMPRESSION V.42BIS), and DTE speed (for example, CONNECT 57600).

W2
Upon connection, the modem reports the line speed (for example, CONNECT 14400).

EXAMPLE

ATW1
This command instructs the modem to display the most expansive result codes when it makes a connection.

Xn (using extended result codes)

You use the Xn command to set which result codes the modem can return.

This command also enables or disables busy-tone and dial-tone detection during the dialing process.

X0
Enables result codes 0–4, 8; disables busy- and dial-tone detection.

X1
Enables result codes 0–5, 8, 9–23; disables busy- and dial-tone detection.

X2
Enables result codes 0–6, 8, 9–23; disables busy-tone detection; enables dial-tone detection.

X3
Enables result codes 0–5, 7–8, 9–23; enables busy-tone detection; disables dial-tone detection.

X4 (the default)
Enables all result codes 0–23, busy-tone detection, and dial-tone detection.

EXAMPLE

ATX1DT5551212
This command disables busy-tone and dial-tone detection, enables all result codes, and dials the number 555-1212.

This can be a useful addition to a dial string when the modem is failing to make a connection because it is misinterpreting the ring as a busy tone or not recognizing the dial tone.

Yn (disconnecting at a long space)

The Yn command determines whether the modem will disconnect when it receives a long-space signal (1.6-second break) or transmit a 4.0-second space when it initiates a disconnect.

Y0 (the default)
Disables long-space disconnect; long spaces are ignored.

Y1
Enables long-space disconnect. In non-error-correction mode, the modem replies to a long space by sending a break of four seconds, disconnecting, and returning to command state. In error-correction mode, the modem replies to a long space by going on-hook.

EXAMPLE

ATY1
This command enables long-space disconnects.

Z (loading a user profile)

The Z command instructs the modem to perform a software and hardware reset, causing the modem to drop any active connection. After reset, the modem loads the factory defaults into the active profile.

S-Registers

S-registers store configuration options for your modem. You use the Sn=x command to change the value of an S-register, and the Sn? command to see an S-register's current setting.

Reserved bits are reserved for use by the modem manufacturer. Do not try to change reserved bits; doing so may cause your modem to misbehave.

S0 register (Number of rings before answering)

The S0 register specifies the number of the ring (between 1 and 255) on which the modem automatically answers an incoming call. The default value is 0, which disables automatic answering of incoming calls.

S1 register (Ring count)

The S1 register counts the number of incoming rings. When S0 and S1 are equal, the modem answers the call (unless both registers are set to zero). The S1 register is reset to zero when the modem answers or if no rings occur over a five-second interval.

S2 register (Escape character)

The S2 register specifies the ASCII value of the character used in the escape code sequence. (You use the escape code sequence to return to the command state after creating an active connection with another modem.) The default is S2=43, where 43 is the ASCII value of the + character.

Note: Changing this setting may adversely affect usage of standard communications applications.

S3 register (Carriage return character)

The S3 register specifies the ASCII value of the character that you send to terminate a command line. The default is S3=13, where 13 is the ASCII value of the Return character.

S4 register (Line feed character)

The S4 register specifies the ASCII value of the character the modem sends after at the end of a result code. (This character is only sent when V1 has been set — that is, when your modem returns a word result code, rather than a number.) The default is S4=10, where 10 is the ASCII value of the line feed character.

S5 register (Backspace character)

The S5 register specifies the ASCII value of the backspace — or delete — character. The default is S5=8, where 8 is the ASCII value of the backspace character. If a value between 128 and 255 is specified, the backspace is nondestructive (does not delete the previous character).

S6 register (Time to wait before blind dialing)

The S6 register specifies the amount of time (in seconds) that the modem should wait between going off-hook and dialing the telephone number of a remote modem. In this case, the modem "blind dials" — that is, it waits the specified number of seconds and then begins dialing without checking for a dial tone first.

S7 register (Time to wait for carrier)

The S7 register specifies the amount of time (in seconds) that the modem should wait for a carrier signal from a remote modem after dialing. If your modem does not receive a carrier signal within the time limit, it hangs up.

S8 register (Pause time for comma)

The S8 register defines the pause time (in seconds) for the comma dialing modifier. The default is 2.

S9 register (Carrier recovery time)

The S9 register specifies the amount of time (in tenths of a second) that the modem should listen to a remote modem's carrier signal before recognizing it as a valid carrier signal.

S10 register (Lost-carrier hang-up delay)

The S10 register specifies the amount of time (in tenths of a second) that the modem should wait between losing the carrier signal and hanging up.

S11 register (Touch-tone dialing speed)

The S11 register specifies the duration (in milliseconds) of dialing tones used in touch-tone dialing. (This register applies only to touch-tone dialing.)

S12 register (Guard time)

The S12 register specifies the maximum time (in fiftieths of a second) between the last data received and the return of the OK result code in response to the escape code sequence. This time, called the guard time, gives the modem time to recognize the escape sequence and determine that it is not data.

S14 register (General options)

The S14 register indicates the status of command options.

Bit 0

This bit is ignored.

Bit 1

0: Command echo disabled (E0).
1: Command echo enabled (E1). Default.

Bit 2

0: Send result codes (Q0). Default.
1: Do not send result codes (Q1).

Bit 3

0: Numeric result codes (V0).
1: Verbose result codes (V1). Default.

Bit 5

0: Tone dialing (T). Default.
1: Pulse dialing (P).

Bit 7

0: Answer.
1: Originate. Default.

S21 register (V.24 options)

The S21 register indicates the status of several command options.

Bit 0

Reserved.

Bit 2

0: CTS tracks RTS (&R0).
1: CTS always on (&R1). Default.

Bits 3, 4

0: &D0 is selected. Default.
1: &D1 is selected.
2: &D2 is selected.
3: &D3 is selected.

Bit 5
0: &C0 is selected. Default.
1: &C1 is selected.

Bit 6
Reserved.

Bit 7
0: Y0 is selected. Default.
1: Y1 is selected.

S22 register (Speaker/results options)
The S22 register indicates the status of several command options.

Bits 0, 1
0: Speaker volume is off (L0).
1: Speaker volume is low (L1).
2: Speaker volume is medium (L2). Default.
3: Speaker volume is high (L3).

Bits 2, 3
0: Speaker disabled (M0).
1: Speaker off when carrier is present (M1). Default.
2: Speaker always on (M2).
3: Speaker off during dialing (M3).

Bits 4–6
0: X0 is selected.
4: X1 is selected.
5: X2 is selected.
6: X3 is selected.
7: X4 is selected. Default.

S23 register (General options)
The S23 register indicates the status of several command options.

Bit 0
Reserved.

Bits 1–3
Assumed DTE rate. 0: 0–300 bps; 1: 600 bps; 2: 1200 bps; 3: 2400 bps (default); 4: 4800 bps; 5: 9600 bps; 6: 19,200 bps; 7: 38,400 bps or higher.

Bits 4, 5

0: Even parity.
1: Not used.
2: Odd parity.
3: None. Default.

Bits 6, 7

0: No guard tone (&G0). Default for US modems.
1: No guard tone (&G1).
2: 1800 Hz guard tone (&G2).

S24 register (Sleep inactivity timer)

The S24 register sets the length of time, in seconds, that the modem will operate in normal mode with no detected telephone line or DTE line activity before entering low-power sleep mode. The timer is reset upon any DTE line or telephone line activity. If the S24 value is zero, the modem never sleeps.

The range of values for this register is 0–255.

S25 register (Delay to DTR)

The S25 register sets the length of time that the modem will ignore DTR before taking the action specified by &Dn. Its units are seconds for synchronous modes and hundredths of seconds for other modes.

The range of values for this register is 0–255. The default value is 5.

S26 register (RTS to CTS delay)

The S26 register sets the time delay, in hundredths seconds, before the modem turns CTS ON after detecting an OFF-to-ON transition on RTS when &R0 is commanded. Pertains to synchronous operation only.

The range of values for this register is 0–255. The default value is 1.

S27 register (General options)

The S27 register indicates the status of several command options.

Bits 3, 1, 0

000: &M0 or &Q0.
001: &M1 or &Q1.
010: &M2 or &Q2.
011: &M3 or &Q3.
100: &Q4.
101: &Q5 (default).
110: &Q6.

Bit 2

0: (not used)

Bits 4, 5

Reserved.

Bit 6

0: CCITT mode (B0). Default for non-US modems.
1: Bell mode (B1).
2: Bell mode (B1). Default for modems sold in the US.

S28 register (General options)

The S28 register indicates the status of command options.

Bits 3, 4

Make/break ratio.

0: 39%/61% at 10 pulses per second (&P0). Default for modems sold in the US.
1: 33%/67% make/break ratio at 10 pulses per second (&P1).
2: 39%/61% make/break ratio at 20 pulses per second (&P2).
3: 33%/67% make/break ratio at 20 pulses per second (&P3).

Bits 6, 7

0: MNP 10 link negotiation at highest speed. Default.
1: MNP 10 link negotiation at 1200 bps.
2: MNP 10 link negotiation at 4800 bps.

S29 register (Flash dial modifier time)

The S29 register sets the length of time, in units of 10 milliseconds, that the modem will go on-hook when it encounters the flash (!) dial modifier in the dial string. By default, the modem goes on-hook for 65 milliseconds.

The range of values for this register is 0–255. The default is 10.

S30 register (Disconnect inactivity timer)

The S30 register sets the length of time, in tens of seconds, that the modem will stay on-line before disconnecting when no data is sent or received. Any data transmitted will reset the timer. The timer is inoperative in synchronous mode.

The range of values for this register is 0–255. If S30 equals 0, the function is disabled; this is the default setting.

S31 register (General options)

The S31 register indicates the status of command options.

Bit 0

0: Connect messages controlled by S95 register. Default.
1: Single line connect message.

Bit 1

0: Automode disabled (N0).
1: Automode enabled (N1). Default.

Bits 2, 3

0: DTE speed messages only (W0). Default.
1: Full message reporting (W1).
2: DCE speed only (W2).

Bits 4, 5

Reserved.

Bits 6, 7

Reserved.

S32 register (XON character)

The S32 register specifies the ASCII code of the character used for XON signaling. The range of values for this register is 0–255. The default is 17.

S33 register (XOFF character)

The S33 register specifies the ASCII code of the character used for XOFF signaling. The range of values for this register is 0–255. The default is 19.

S36 register (LAP-M failure control)

The S36 register determines how the modem should react to a LAP-M failure. The fallback options are initiated immediately upon connection if S48 = 128. If an invalid number is entered, the number is accepted into the register, but S36 will act as if the default value has been entered.

Bits 0–2

0: Modem disconnects.
1: Modem stays on-line and a direct mode connection is established.
2: Reserved.
3: Modem stays on-line and a normal mode connection is established.
4: An MNP connection is attempted and if it fails, the modem disconnects.
5: An MNP connection is attempted and if it fails, a direct mode connection is established.
6: Reserved.
7: An MNP connection is attempted and if it fails, a normal mode connection is established. (This is the default.)

Bits 3–7

Reserved.

S37 register (Preferred line speed)

The S37 register selects the preferred connection speed. Invalid entries are ignored.

When the S37 register is modified, the +MS command parameters are updated to reflect the selected speed and modulation.

Bits 0–4

0: Attempts to negotiate the most recently detected DTE speed (N0) or the highest possible speed (N1). Default.
1–3: Attempts to connect at 300 bps.
5: Attempts to connect at V.22 1200 bps.
6: Attempts to connect at V.22bis 2400 bps.
7: Attempts to connect at V.23.
8: Attempts to connect at V.32bis/V.32 4800 bps.
9: Attempts to connect at V.32bis/V.32 9600 bps.
10: Attempts to connect at V.32bis 12,000 bps.
11: Attempts to connect at V.32bis 14,400 bps.
12: Attempts to connect at V.32bis 7200 bps.

Bits 5–7

Reserved.

S38 register (Delay before hangup)

For all error-correcting connections, if the modem receives a command to hang up but data remains to be transmitted, the modem will attempt to transmit the remaining data before hanging up.

The S38 register specifies the maximum delay the modem will allow between receiving an H0 command (or DTR hangup request) and the actual disconnection. The range for this register is 0–255. The default is 20.

If S38 is between 0 and 254, the modem disconnects after the specified number of seconds. If the modem was in the process of transmitting data, the NO CARRIER result code is issued to indicate that data has been lost. If all data is transmitted prior to the disconnection, the OK result code is issued.

If S38 equals 255, the modem does not disconnect until all data is transmitted or the connection is lost.

S39 register (Flow control options)

The S39 register indicates the status of command options.

Bits 0–2

0: No flow control.
3: RTS/CTS (&K3). Default.
4: XON/XOFF (&K4).
5: Transparent XON (&K5).
6: Both methods (&K6).

Bits 3–7

Reserved.

S40 register (General options)

The S40 register indicates the status of command options.

Bits 0–1

0: -K0; 1: -K1; 2: -K2.

Bit 2

Reserved.

Bits 3–5

0: \K0; 1: \K1; 2: \K2; 3: \K3; 4: \K4; 5: \K5.

Bits 6, 7

0: 64 characters (\A0).
1: 128 characters (\A1). Default.
2: 192 characters (\A2).
3: 256 characters (\A3).

S41 register (General options)

The S41 register indicates the status of command options. The default is 195.

Bits 0–1

0: Data compression disabled (%C0).
1: MNP 5 data compression (%C1).
2: V.42bis data compression (%C2).
3: MNP 5 and V.42bis data compression (%C3). Default.

Bits 6, 2

00: Auto-retrain and fallback/fallforward disabled (%E0).
01: Auto-retrain enabled (%E1).
10: Fallback/fallforward enabled (%E2). Default.

Bits 3-5

Reserved.

Bit 7

Reserved.

S46 register (Data compression control)

The S46 register controls whether data compression is used. This register can have one of two values: 136 or 138.

136: Error correction with no data compression.

138: Error correction with data compression. Default.

S48 register (V.42 negotiation action)

The S48 register controls V.42 negotiation.

0: Disables negotiation and proceeds with LAP-M.

7: Enables negotiation. Default.

128: Disables negotiation and proceeds with the fallback action specified by S36.

S82 register (Break handling options)

The S82 register is included for compatibility purposes only. Changing this register has no effect.

S86 register (Reason for last disconnection)

When the NO CARRIER result code is issued, the S86 register records the reason for the failed connection. S86 records the first event that contributes to the NO CARRIER message.

0: Normal disconnect; no error occurred.
4: Loss of carrier.
5: V.42 negotiation failed to detect an error-correction modem at the other end.
9: The modems could not find a common protocol.
12: Normal disconnect, initiated by remote modem.
13: Remote modem did not respond after 10 retransmissions of the same message.
14: Protocol violation.

S91 register (Telephone transmit attenuation level)

The S91 register sets the transmit attenuation level from 10 to 15 dBm for the telephone mode, resulting in a transmit level from 10 to –15 dBm.

This S-register applies only to some non-US modems.

S92 register (Fax transmit attenuation level)

The S92 register sets the transmit attenuation level from 10 to 15 dBm for the fax mode, resulting in a transmit level from 10 to –15 dBm. The default is 10.

This S-register applies only to some non-US modems.

S95 register (Extended result codes)

The S95 register can be set to override Wn command options. A bit set to 1 enables the corresponding result code, regardless of the Wn setting.

Bit 0

CONNECT result code indicates DCE speed instead of DTE speed.

Bit 1

Appends "/ARQ" to the verbose CONNECT result code when an error-control connection is established.

Bit 2

Enables CARRIER XXXX result code where "XXXX" indicates the DCE rate.

Bit 3
Enables PROTOCOL XXXX result code where “XXXX” indicates the protocol identifier.

Bit 4
Reserved.

Bit 5
Enables COMPRESSION result code.

Bits 6, 7
Reserved.

Result Codes

When the modem receives and processes an AT command, it sends a result code to your computer. Telecommunications programs that send AT commands to the modem interpret the result codes to determine whether or not the command was successful.

The modem sends either the number or the phrase corresponding to the result code, depending on the setting of the Vn command. The Xn command affects which result codes are displayed.

0 **OK**
The command line executed with no errors.

1 **CONNECT**
A connection has been established.

2 **RING**
A ringing signal has been detected.

3 **NO CARRIER**
The carrier has been lost or was never present.

4 **ERROR**
Invalid command, error in the command line, or command line exceeds 48 characters.

5 **CONNECT 1200**
The computer to modem connection is 1200 bps.

6 **NO DIALTONE**
No dial tone is detected within the S7 register time limit.

7 **BUSY**
A busy signal has been detected.

8 **NO ANSWER**
Ringing did not stop, indicating that the remote modem did not answer.

9 **CONNECT 600**
The computer to modem connection is 600 bps.

10 **CONNECT 2400**
The computer to modem connection is 2400 bps.

11 **CONNECT 4800**
The computer to modem connection is 4800 bps.

12 **CONNECT 9600**
The computer to modem connection is 9600 bps.

13 CONNECT 7200
The computer to modem connection is 7200 bps.

14 CONNECT 12000
The computer to modem connection is 12,000 bps.

15 CONNECT 14400
The computer to modem connection is 14,400 bps.

16 CONNECT 19200
The computer to modem connection is 19,200 bps.

17 CONNECT 38400
The computer to modem connection is 38,400 bps.

18 CONNECT 57600
The computer to modem connection is 57,600 bps.

19 CONNECT 115200
The computer to modem connection is 115,200 bps.

20 CONNECT 230400
The computer to modem connection is 230,400 bps.

22 CONNECT 75TX/1200RX
The originating modem connected with 75 bps receiving and 1200 bps transmitting capabilities; the answering modem connected with 1200 bps receiving and 75 bps transmitting capabilities.

23 CONNECT 1200TX/75RX
The originating modem connected with 1200 bps receiving and 75 bps transmitting capabilities; the answering modem connected with 75 bps receiving and 1200 bps transmitting capabilities.

24 DELAYED [hh:mm:ss]
The connection failed, and because of country blacklisting requirements, the modem will not dial the number again until the required time (displayed after the result code) has elapsed.

32 BLACKLISTED
The connection failed, and because of country blacklisting requirements, the modem will not dial the number again until the modem is turned off and then on again.

33 FAX
A fax connection has been established in facsimile mode.

35 DATA
A data connection has been established in facsimile mode.

40 CARRIER 300
Carrier detected at 300 bps.

44 CARRIER 1200/75
Carrier detected at 1200 bps receiving and 75 bps transmitting (originating); carrier detected at 75 bps receiving and 1200 bps transmitting (answering).

45 CARRIER 75/1200
Carrier detected at 75 bps receiving and 1200 bps transmitting (originating); carrier detected at 1200 bps receiving and 75 bps transmitting (answering).

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 12,000 bps.

52 CARRIER 14400
Carrier detected at 14,400 bps.

53 CARRIER 16800
Carrier detected at 16,800 bps.

54 CARRIER 19200
Carrier detected at 19,200 bps.

55 CARRIER 21600
Carrier detected at 21,600 bps.

56 CARRIER 24000
Carrier detected at 24,000 bps.

57 CARRIER 26400
Carrier detected at 26,400 bps.

58 CARRIER 28800
Carrier detected at 28,800 bps.

59 CONNECT 16800
The computer to modem connection is 16,800 bps.

61 CONNECT 21600
The computer to modem connection is 21,600 bps.

62 CONNECT 24000
The computer to modem connection is 24,000 bps.

63 CONNECT 26400
The computer to modem connection is 26,400 bps.

64 CONNECT 28800
The computer to modem connection is 28,800 bps.

66 COMPRESSION: CLASS 5
MNP 5 data compression has been negotiated.

67 COMPRESSION: V.42BIS
V.42bis data compression has been negotiated.

69 COMPRESSION: NONE
No data compression has been negotiated.

70 PROTOCOL: NONE
No error correction has been negotiated.

77 PROTOCOL: LAP-M
LAP-M error correction has been negotiated.

78 CARRIER 31200
Carrier detected at 31,200 bps.

79 CARRIER 33600
Carrier detected at 33,600 bps.

80 PROTOCOL: ALT
MNP 4 error correction has been negotiated.

81 PROTOCOL: ALT-CELLULAR
MNP 10 error correction has been negotiated and cellular power-level adjustment has been enabled.

84 CONNECT 33600
The computer to modem connection is 33,600 bps.

91 CONNECT 31200
The computer to modem connection is 31,200 bps.

150 CARRIER 32000
Carrier detected at 32,000 bps.

151 CARRIER 34000
Carrier detected at 34,000 bps.

152 CARRIER 36000
Carrier detected at 36,000 bps.

153 CARRIER 38000
Carrier detected at 38,000 bps.

154 CARRIER 40000
Carrier detected at 40,000 bps.

155 CARRIER 42000
Carrier detected at 42,000 bps.

156 CARRIER 44000
Carrier detected at 44,000 bps.

157 CARRIER 46000
Carrier detected at 46,000 bps.

158 CARRIER 48000
Carrier detected at 48,000 bps.

159 CARRIER 50000
Carrier detected at 50,000 bps.

160 CARRIER 52000
Carrier detected at 52,000 bps.

161 CARRIER 54000
Carrier detected at 54,000 bps.

162 CARRIER 56000
Carrier detected at 56,000 bps.

165 CONNECT 32000
The computer to modem connection is 32,000 bps.

166 CONNECT 34000
The computer to modem connection is 34,000 bps.

167 CONNECT 36000
The computer to modem connection is 36,000 bps.

168 CONNECT 38000
The computer to modem connection is 38,000 bps.

169 CONNECT 40000
The computer to modem connection is 40,000 bps.

170 CONNECT 42000
The computer to modem connection is 42,000 bps.

171 CONNECT 44000
The computer to modem connection is 44,000 bps.

172 CONNECT 46000
The computer to modem connection is 46,000 bps.

173 CONNECT 48000
The computer to modem connection is 48,000 bps.

174 CONNECT 50000
The computer to modem connection is 50,000 bps.

175 CONNECT 52000
The computer to modem connection is 52,000 bps.

176 CONNECT 54000
The computer to modem connection is 54,000 bps.

177 CONNECT 56000
The computer to modem connection is 56,000 bps.

Glossary

asynchronous & synchronous modes

Two connected modems can communicate in either asynchronous or synchronous mode.

In asynchronous mode, both modems can send data at the same time and pause at any time. To ensure that data is not lost, extra bits — called start and stop bits — are used to frame each character sent.

In synchronous mode, only one modem can send data at a time. The modem sends a continuous stream and does not stop until it is finished; the other modem cannot send until the first modem is finished. No extra bits are used to frame characters.

Bell protocols

Bell 103 and Bell 212 are communications protocols that provide a US standard for communicating at specific speeds.

Bell 103 can be used for communicating at 300 bps.

Bell 212 can be used for communicating at 1200 bps.

bps (bits per second)

Bits per second (bps) is a measure of the speed of a connection, expressed as the number of bits that can be transferred per second. The higher the number, the faster the connection.

break signal

A break signal is a pause in the data flow that lasts longer than the amount of time required to send one character (including its start and stop bits).

calling tone

A calling tone is a high-pitched, intermittent sound that can be produced by a modem that is originating a data call.

Some international telephone agencies require that your modem emit a calling tone so that a person answering your modem's call can immediately identify your modem as a machine and not a human caller.

carrier

The carrier is the telephone line signal used to transfer data between two connected modems. The sound you hear through the modem's speaker when it connects is the carrier signal.

CCITT

The CCITT (International Telegraph and Telephone Consultative Committee) is an international organization which studies telecommunications technology and recommends international telecommunications standards. (See **ITU**.)

command mode

In command mode, the modem interprets data from the computer as AT commands, instead of transmitting the data to the remote modem.

When you first open a telecommunications application, the modem is automatically placed in command mode.

When you establish a connection with another modem, your modem switches to on-line mode. Before entering an AT command, you must use the +++ command to return the modem to command mode.

data compression

Data compression is the process by which data is reduced in size when it is sent from your computer to your modem, and then expanded to its original size by the receiving modem. Since the transmitted data has been compressed, it takes less time to send.

DCE (Data Communication Equipment)

Data Communication Equipment (DCE) is the modem connected to your computer.

The DCE speed is the speed of data transfer between the modem and the telephone line. The DCE speed is also called the line speed.

DTE (Data Terminal Equipment)

Data Terminal Equipment (DTE) is the computer to which your modem is connected.

The DTE speed is the speed of data transfer between your computer and your modem.

DTR (Data Terminal Ready)

A Data Terminal Ready (DTR) signal is sent by the computer to the modem to indicate that the computer (the "data terminal") is ready to communicate with the modem.

DTR can also be used for other purposes, such as signaling the modem to hang up the phone (called "hardware hangup").

echoing

When the modem is in command mode, it can transmit characters it receives back to the computer. This is called echoing. For example, if you enter a modem command in a telecommunications application, your keystrokes appear in the application window if echoing is turned on.

You use the En command to turn echoing on and off.

error correction

Error correction is the process by which errors that occur during data transfer are detected and, if possible, corrected.

Modems use error-correction protocols to correct errors. These protocols monitor the received data and request the retransmission of faulty data.

fallback/fallforward

Fallback/fallforward is a process by which two connected modems can increase (fall forward) or decrease (fall back) the speed they are using, without reconnecting.

This process takes place when the line conditions change: for example, if the amount of static on the line increases, the modems can fall back to a speed that is reliable even with the increased noise level. The process is almost instantaneous.

You use the %En, -Kn, and -Qn commands to control fallback/fallforward.

guard tone

A guard tone is a tone emitted by the modem when it detects a carrier.

Different countries use guard tones of different frequencies. For instance, the default guard tone for the United Kingdom is 1800 Hz.

handshaking

Handshaking is a method of controlling the speed of data transfer by signaling when each side of the connection is ready to receive data. This ensures that both sides can keep up and no data is lost.

In hardware handshaking, the modem and computer exchange RTS and CTS signals over the connecting cable. In software handshaking, the modem and computer exchange XON and XOFF characters to start and stop data transfer.

ITU

The ITU (International Telecommunications Union), formerly known as CCITT, is an international organization which studies telecommunications technology and recommends international telecommunications standards. These standards enable different devices from different manufacturers to communicate with each other.

k56flex

K56flex is a communications protocol that provides a standard way of transferring data at speeds of 32,000 bps to 56,000 bps.

make/break ratio

The make/break ratio is used in pulse dialing. It specifies the ratio of off-hook (make) time to on-hook (break) time for each pulse. You use the &Pn command to set the make/break ratio.

Phone systems in different countries require different make/break ratios.

MNP 4 protocol

MNP 4 is an error-correction protocol, providing a standard way of correcting errors that can occur as data is transmitted or received.

MNP 4 provides less efficient error correction than V.42.

MNP 5 protocol

MNP 5 is a data-compression protocol, providing a standard way of compressing data for transmission in order to save transfer time.

MNP 5 provides less efficient data compression than V.42bis.

MNP 10 protocol

MNP 10 is an error-correction protocol designed to overcome the problems associated with poor telephone line conditions. This protocol is often used for cellular telephone connections.

MNP 10 provides less efficient error correction than MNP 10EC.

MNP 10 EC protocol

MNP 10EC is an error-correction protocol that is designed for correcting errors that can occur as data is transmitted or received over cellular telephone lines.

MNP 10EC provides more efficient error correction than MNP 10.

off-hook

When a modem goes off-hook, it claims the telephone line to which it is connected. Taking a modem off-hook is equivalent to picking up a telephone to make or answer a call.

on-hook

When a modem goes on-hook, it releases the telephone line to which it is connected, freeing the telephone line for other uses. This action, which is equivalent to hanging up a telephone, terminates the current data connection.

on-line mode

In on-line mode, data sent from the computer to the modem is transmitted to the remote modem, instead of being interpreted as AT commands.

When you establish a connection with another modem, the modem is automatically placed in on-line mode.

parameter

A parameter is an additional value that you must provide along with a command.

For example, in the Hn command, the letter ***n*** stands for a parameter whose value can be either 0 or 1. You type the actual command as either “H0” or “H1”.

Most AT commands require at least one parameter, denoted in command descriptions by the letter ***n***. When you enter an AT command, you must substitute a valid parameter value for ***n***. (A few commands require a second parameter, denoted by ***x***.)

pulse dialing

Pulse dialing is a method of dialing in which the modem sends a set of pulses for each number (one pulse for the number 1, two pulses for 2, and so on).

result codes

A result code is a message the modem sends to the computer, indicating the result of an AT command or the status of a connection. If a telecommunications application is active on your computer, the result code appears on your screen.

Result codes are reported either as numbers (numeric) or as words (verbose). You use the Vn command to switch between these modes.

retraining

Retraining is a process by which two connected modems can renegotiate the protocol and speed they are using, without having to reconnect. Retraining takes place when the line conditions change: for example, if the amount of static on the line increases. The process normally takes several seconds.

You use the %En command to control retraining.

RTS (Request to Send) & CTS (Clear to Send)

Request to Send (RTS) and Clear to Send (CTS) are hardware-handshaking signals.

When the computer is ready to send data, it sends a Request to Send (RTS) signal to the modem. When the modem is ready to receive data, it sends a Clear to Send (CTS) signal to the computer.

space

A space is a long period of silence encountered during a modem connection.

S-registers

S-registers are memory locations in the modem where modem settings are stored.

You use the Sn=x command to change the setting in an S-register.

touch-tone dialing

Touch-tone dialing is a method of dialing in which each character (0–9, *, #, A, B, C, D) is represented by a different tone.

V.21 protocol

V.21 is a communications protocol that provides a standard way of transferring data at 300 bps.

V.22 protocol

V.22 is a communications protocol that provides a standard way of transferring data at 1200 bps.

V.22bis protocol

V.22bis is a communications protocol that provides a standard way of transferring data at 1200 bps or 2400 bps.

V.32 protocol

V.32 is a communications protocol that provides a standard way of transferring data at 4800 bps or 9600 bps.

V.32bis protocol

V.32bis is a communications protocol that provides a standard way of transferring data at speeds of 4800 bps to 14,400 bps.

V.34 protocol

V.34 is an error-correction and data-compression protocol that provides a standard way of transferring data at speeds of 2400 bps to 28,800 bps.

As an error-correction protocol, V.34 provides a standard way of correcting errors that can occur as data is transmitted or received. As a data-compression protocol, V.34 provides a standard way of compressing data before it is transmitted and decompressing data before it is received.

V.34 annex 12 protocol

V.34 annex 12 is a communications protocol that provides a standard way of transferring data at speeds of 2400 bps to 33,600 bps.

V.42 protocol

V.42 is an error-correction protocol that provides a standard way of correcting errors that can occur as data is transmitted or received. V.42 provides more efficient error correction than MNP 4.

V.42bis protocol

V.42bis is a data-compression protocol, providing a standard way of compressing data before it is transmitted and decompressing data after it is received.

V.42bis provides more efficient data compression than MNP 5.

XON & XOFF

XON and XOFF are characters used in software handshaking.

When the computer is ready to receive data, it sends an XON character. To request a pause in the data flow, it sends XOFF.