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

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TOPIC -------------------------------------------------------------


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


DISCUSSION --------------------------------------------------------


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

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


Verbalize result codes

  0    OK  Command is correct and has been completed
  1    CONNECT  Connection established
  2    RING  Incoming ring detected
  3    NO CARRIER  No connection or lost the carrier
  4    ERROR  Bad command
  5    CONNECT 1200  Connection established at 1200 bps
  6    NO DIALTONE  Dial tone not detected in S7 seconds
  7    BUSY  Busy tone detected
  8    NO ANSWER  See ATD…@…
 10    CONNECT 2400  Connection established at 2400 bps
 11    CONNECT 4800  Connection established at 4800 bps
 12    CONNECT 9600  Connection established at 9600 bps
 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

Xn   Active result code

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

```
   0    Selects result codes 0 through 4 and 8.
```

```
1    Selects result codes 0 through 5, 8, and 10 through 28.
2    Selects result codes 0 through 6, 8, and 10 through 28.
3    Selects result codes 0 through 5, 7, 8, and 10 through 28.
4    Selects all result codes.
```

Yn   Remote break handling

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

- Greater than 1.6 seconds for an asynchronous connection.
- An attention frame for MNP or V.42.
- 0   The modem ignores any long breaks received from the remote modem.
- 1   On receiving a long break from the remote modem, the modem
  goes on-hook (hangs up) and returns to command state.
- 2   On receiving a long break from the remote modem, the modem
  returns to command state but remains connected to the
  remote modem (does not hang up).

Zn   Reset

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

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

&Cn DCD options

Since bus modems have no DTE-DCE serial interface, this command has no effect
and remains for scripting compatibility.
0-2 Return OK.

&Dn 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.

&Gn Guard tones

This command specifies whether guard tones should be transmitted. Guard tones
are used in some telephone systems to allow proper data transfer over the
network. They are not used in the United States.

```
0    Disables guard tone.
1    Same as 2.
2    Sends 1800 Hz guard tone.
```

```
&Kn  Local flow control
     ----------------------
This command specifies which kind of local flow control is used. Since 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.


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

  0    Selects switched (dial-up) line.
  1    Selects conditioned leased line.

&Pn  Pulse mode make/break ratio
     -------------------------------
  0    Sets the dial pulse make/break ratio at 39%/61%.
  1    Sets the dial pulse make/break ratio at 33%/67%.

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

  0    Asynchronous mode (no error control, disables V.42 and MNP).
  5    Error control mode Instructs the modem to make a connection
       using V.42/MNP and fallback as necessary (see S36 and S48 registers).
  6    Same as 0.

&Rn  CTS/RTS
     -----------
Since integrated modems have no DTE-DCE serial interface, this command has no
effect and remains for scripting compatibility.
0-1  Return OK.

&Sn  DSR
     --------
Since integrated modems have no DTE-DCE serial interface, this command has no
effect and remains for scripting compatibility.
0-2  Return OK.

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

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

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

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

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

&Un Trellis coding

Enables/disables Trellis code modulation in V.32.
   0   Enable Trellis coding.
   1   Disable Trellis coding.

&Vn Display profiles

Displays the following information

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

&Wn Profile saving

This command saves the current active profile.

   0   Saves the active profile into profile 0.

```
   1    Saves the active profile into profile 1.


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


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

   0    Specifies saved profile 0 as start-up configuration.
   1    Specifies saved profile 1 as start-up configuration.


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


MNP-specific AT commands

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


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

   0    Disables MNP 5data compression.
   1    Enables MNP 5 data compression.


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

   0    Disables modem-to-modem flow control.
   1    Enables modem-to-modem flow control.


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

   0-1  Normal mode MNP disabled.
   2    Reliable mode The modem will interrogate the remote modem
         for MNP capabilities. If the remote modem does not support MNP,
         the local modem hangs up.
   3    Auto-reliable mode The modem interrogates the remote modem for
         MNP capabilities. If the remote modem supports MNP, a reliable
```

connection is established. If the remote modem does not support
MNP, a normal connection is established.

\O   MNP link negotiation

Treated as ATO0 command. Modem returns to online state. MNP Link is not
negotiated.

\Tn Inactivity timer

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

\U   MNP link negotiation

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

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

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

\Y   MNP link signaling

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

\Z   MNP termination

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

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