PCTEL
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V.90/K56Flex Series AT Command Guide

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AT Command Guide

Introduction

This manual describes the AT commands for PCTEL modems.

AT Command Format

A command line is a string of characters sent from a DTE to the modem (DCE) while the modem is in a command state. A command line has a prefix, a body, and a terminator. Each command line (with the exception of the A/ command) must begin with the character sequence AT and must be terminated by a carriage return. Commands entered in upper case or lower case are accepted, but both the A and T must be of the same case, i.e., "AT or "at. The default terminator is the ENTER key <CR> character. Characters that precede the AT prefix are ignored. The command line interpretation begins upon receipt of the ENTER key character.

Characters within the command line are parsed as commands with associated parameter values. The basic commands consist of single ASCII characters, or single characters proceeded by a prefix character (e.g., "&" or "+"), followed by a decimal parameter. Missing decimal parameters are evaluated as 0.

Escape Code Sequence

When the modem has established a connection and has entered on-line data mode, it is possible to break into the data transmission in order to issue further commands to the modem in an on-line command mode. This is achieved by the DTE sending to the modem a sequence of +++AT<ENTER>. To issue a disconnect sequence type +++ATH<ENTER>. This format complies with the Time Independent Escape Sequence (TIES).

Basic AT Commands

Command	Function
AT	Attention - this precedes all commands except A/
A/	Execute previous command - does not require a <CR> *
A	Causes the modem to go off hook. If a call is coming in, the modem will try to answer it. The procedure for answering a call is a short silence and then an answer tone. Sending a character to the modem during this procedure will abort the answer procedure. The amount of time the modem will wait for a carrier is programmable by modifying the S7 register.
B0 **B1** B2	Select CCITT V.22 (1200 bps) Select Bell 212A (1200 bps) Select CCITT V23 Originate mode will transmit data at 75 bps and receive data at 1200 bps. Answer mode will transmit data at 1200bps and receive data at 75bps. The command N0 (Disable auto mode) must be selected.
D	D alone will take the modem off-hook and wait for a dial tone. (See X command for exceptions) The length of time to wait for a dial tone before dialing is programmable in register S6.
Dmn L W T P , ; @ ! ^ S=(0-9)	ATDmn will dial a phone number where m is a modifier: L, W, ,, ;, @, !, or S. It will dial the telephone number n. Dial last number Wait for dial tone. If you have selected X0 or X1 (disable dial tone detection), then you can use this modifier to override that setting. Tone dialing Pulse and Tone dialing cannot be mixed on the same command line. Pulse dialing allows the modem to work on telephone networks where tone dialing is not supported. Pulse and Tone dialing cannot be mixed on the same command line. Pause during dial. The amount of time to pause is determined in register S8. Return to command mode after dialing. It doesn't wait for carrier or hang up. Wait for 5 seconds of silence. This is used to access systems that do not provide a dial tone. Hook flash. Causes the modem to go on-hook for 0.5 seconds. This is used in PBX systems and for voice features like call waiting. Send 1300Hz calling tone Dials a stored number. Up to ten numbers can be stored, and the addresses are from 0 to 9. To store a number into one of these addresses, use the & Z command.
E0 **E1**	Commands issued to the modem are not echoed to the local terminal. This only matters in the command mode. It does not affect the modem's ability to send response codes. Commands are echoed to the local terminal.
H0 H1	Force modem on-hook (hang-up). Force modem off-hook (to answer or dial).
I0 I1 I2 I3 I4 I5	Return numeric product code Return hardware variation code Report internal code Report software revision number Report product feature listing Highest Speed Modulation

L0	Speaker volume zero
L1	Speaker volume low
L2	Speaker volume low
L3	Speaker volume low (Hardware currently limits volume adjustment to on/off)

M0	Speaker always off
M1	Speaker on until carrier detected
M2	Speaker always on
M3	Speaker on during answering only
N0	Disable auto-mode. This forces the modem to connect at the speed specified in register S37.
N1	Enable auto-mode. The modem will connect at the highest available line speed and ignore any ATBn command.
O0	Return to data mode. If you have entered the command mode using the time independent escape sequence, this will put you back in data mode without going on-hook.
O1	Retrain the modem. If the line condition has changed since the original connection, retraining the modem will cause it to reconnect at the most efficient speed for the current line condition.
Q0	Enable response to DTE.
Q1	Disable response to DTE. The modem does not send responses to the terminal. Issuing a command will not produce a response (unless the command is something like ATZ, which will restore this setting to default.)
Sn	Set default S-register. Any subsequent = or ? commands will modify the default S register.
Sn=m	Set register n to value m
Sn?	Return the value of register n
V0	Result codes will be sent in numeric form. (See the result code table)
V1	Result codes will be sent in word form. (See the result code table.
W0	Report DTE speed only. After connection, there will be no message about what Error Correction or Data Compression protocol is in use.
W1	Report DCE speed, Error Correction/Data Compression protocol, and DTE speed.
W2	Report DCE speed only
X0	Send OK, CONNECT, RING, NO CARRIER, ERROR and NO ANSWER. Busy and Dial Tone Detection is disabled.
X1	Send X0 messages and CONNECT speed
X2	Send X1 message and NO DIALTONE
X3	Send X2 messages and BUSY and RING BACK. Dial Tone Detection is disabled.
X4	Send all responses
Y0	Disable long space disconnect
Y1	Enable long space disconnect; with error correction, hang up after sending 1.6 second long space; without error correction, hang up after 4 second long space.
Z0	Uses profile in & W0 Reset to configuration stored in profile 0
Z1	Uses profile in & W1 Reset to configuration stored in profile 1
=n	Sets the value of the default S register
?	Reports the value stored in the default S register.

AT "&" Commands

&	Ampersand Commands
&C0	Force DCD on
&C1	DCD follows remote carrier
&D0	DTR is assumed on
&D1	DTR drop causes modem to enter command mode without disconnecting
&D2	DTR drop causes modem to hang up
&D3	DTR drop causes modem to hang up and be reinitialized; &Y determines which profile is loaded.
&F	Load factory profile
&G0	Disable guard tone
&G1	Enable 550Hz guard tone
&G2	Enable 1800Hz guard tone on answering modem
&K0	Disable flow control
&K3	Enable RTS/CTS flow control
&K4	Enable XON/XOFF flow control
&K5	Enable transparent software flow control
&K6	Enable both RTS/CTS and XON/XOFF flow control
&P0	Selects 33%-67% make/break ratio at 10 pulses per second
&P1	Selects 33%-67% make/break ratio at 20 pulses per second
&P2	Selects 39%-61% make/break ratio at 10 pulses per second
&P3	Selects 39%-61% make/break ratio at 20 pulses per second
&S0	Force DSR on
&S1	DSR on at the start of handshaking and off after carrier loss
&T0	Terminate test
&T1	Start ALB test (not supported in MicroModem series)
&U0	Enable trellis coding
&U1	Disable trellis coding
&V0	Display active profile
&V1	Display stored profiles
&V2	Display stored telephone numbers
&W0	Save active profile to profile 0
&W1	Save active profile to profile 1
&Y0	Use profile 0 on powerup
&Y1	Use profile 1 on powerup
&Zn=m	Save telephone number (up to 100 digits) into memory location n (0-9)

AT "%" Commands

%	Percent Commands
%A0 %A1	Mu law encoding: Automatically selected based on country code selection A law encoding
%C0 %C1 %C2 **%C3**	Disable data compression Enable MNP5 compression Enable V.42bis compression Enable both V.42bis and MNP5
%E0 %E1 **%E2** %E3	Disable auto-retrain Enable auto-retrain Enable auto-retrain and fallback Enable auto-retrain and fast hang up
%L	Report received signal level in -dBm
%N0 %N1 %N2 %N3 %N4 %N5 %N6 %N7 %N8 %N9	Dynamic CPU loading disabled Dynamic CPU loading not to exceed 10% Dynamic CPU loading not to exceed 20% Dynamic CPU loading not to exceed 30% Dynamic CPU loading not to exceed 40% Dynamic CPU loading not to exceed 50% Dynamic CPU loading not to exceed 60% Dynamic CPU loading not to exceed 70% Dynamic CPU loading not to exceed 80% Dynamic CPU loading not to exceed 90%
%Q	Report line signal quality

AT " \ " Commands

\	Backslash Commands
\A0 **\A1** \A2 \A3	64-character max. MNP block size 128-character max. MNP block size 192-character max. MNP block size 256-character max. MNP block size
\Bn	In non-error correction mode, transmit break in 100 ms units (1-9 with **default 3**)
\G0 \G1	Disable XON/XOFF flow control (modem to modem) Enable XON/XOFF flow control (modem to modem)
\Kn	Define break type (refer to the AT "\Kn Description)
\L0 \L1	Use stream mode for MNP Use interactive block mode for MNP
\N0 \N1 \N2 **\N3** \N4 \N5	Normal mode; speed control without error correction Plain mode; no speed control and no error correction Reliable mode Auto-reliable mode LAPM error correction only MNP error correction only

AT "\Kn" Description

\Kn	Local DTE sends break during normal or reliable mode	Local modem sends break during plain mode	Remote modem sends break during normal mode
\K0	Enter command state; no break to remote	Break to remote; and enter command state	Empty data buffers; and send break to DTE
\K1	Empty data buffers; break to remote	Same as\K0	Same as\K0
\K2	Same as\K0	Send break to remote	Immediately send break to DTE
\K3	Immediately send break to remote	Same as\K0	Same as\K2
\K4	Same as\K0	Same as\K2	Send break to DTE with buffered RXD data
\K5	Send break to remote with TXD data	Same as\K2	Same as\K4

AT "*" Commands

*	Asterisk commands
*Q0	Send the "CONNECT xxxx" result codes to the DTE when an invalid TIES escape sequence is detected after the "OK" response has already been sent
*Q1	Does NOT send the "CONNECT xxxx" result codes to the DTE when an invalid TIES escape sequence is detected after the "OK" response has already been sent

AT "+" Commands Summary

+	+ Commands
+DR	Data Compression Reporting
+DS	Data Compression
+ER	Error Control Reporting
+EB	Break Handling in Error Control Operation
+ES	Error Control Selection
+ETBM	Call Termination Buffer Management
+ICF	Character Format
+IFC	PC to Modem Local Flow Control
+ILRR	PC (DTE) – Modem (DCE) local Rate Reporting
+GMI	Request Manufacturer Identification
+GMM	Request Model Identification
+GMR	Request Revision Identification
+MA	Modulation Automode Control
+MR	Modulation Reporting Control
+MS	Modulation Selection

AT+ Command Descriptions

+DR – Data Compression Reporting

+DR = <value>
This parameter controls whether or not the extended-format "+DR" intermediate result code is transmitted from the modem to the local PC.

+DR: NONE	Data Compression is not used
+DR: V42B	V.42bis is in use in both directions

+DR?

The modem shall send text to the local PC, consisting of:
+DS: <current value>
e.g. +DR: 0

+DR=?

+DR: (list of supported values)
Modem responds with list(s) of supported values
e.g. +DS: (0,1)

+DS – Data Compression

+DS = [<direction>[,<compression_negotiation>[,<max_dict>[,<max_string>]]]]

This parameter controls the manner of operation of the V.42 operation in the modem. It accepts 3 numeric sub-parameters:

<direction>: Specifies the desired direction(s) of operation of the data compression function from the local PC point of view.

<compression_negotiation>: Specifies whether or not the local PC should continue to operate if the desired result is not obtained

<max_dict>: Specifies the maximum number of dictionary entries, which should be negotiated

<max_string>: Specifies the maximum string length to be negotiated (V.42bis P2)

<direction>	Description
0	Negotiated – no compression (V.42bis P0=0)
1	Transmit only
2	Receive only
3	Both directions, accept any direction (V.42bis P0=0)
< compression_ negotiation >	Description
0	Do not disconnect if V.42bis is not negotiated by the remote modem as specified in <direction>
1	Disconnect if V.42bis is not negotiated by the remote modem as specified in <direction>
< max_dict>	2048
< max_string>	32

+DS?

The modem shall send text to the local PC, consisting of:
+DS: <direction>, <compression_negotiation>, <max_dict><max_string>
e.g. +DS: 3,0,2048,32

+DS=?

+DS: (list of supported < direction > values, (list of supported < compression_negotiation > values), (list of supported <max_dict > values), (list of supported <max_string > values)
Modem responds with list(s) of supported values
e.g. +DS: (0-3), (0-2), (2048), (32)

+ER –Error Control Reporting

+ER = <value >

This parameter controls whether or not the extended-format "+ER" intermediate result code is transmitted from the modem to the local PC:

The +ER intermediate result code, if enabled, is issued after the modulation report (+MCR and +MRR) and before the Data Compression Report (+DR)

+ER: NONE	Error control is not in use
+ER: LAPM	V.42 LAPM protocol is in use
+ER: ALT	V.42 Alternative (MNP) protocol is in use

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ER?

The modem shall send text to the local PC, consisting of:
+ER: <current setting>
e.g. +ER: 0

+ER=?

+ER: (list of supported values)
e.g. +ER: (0,1)

Value	Description
0	Error control reporting disabled (No + ER immediate result code trasmitted)
1	Error control reporting enabled (No + ER immediate result code trasmitted)

+EB – Break Handling in Error Control Operation

+EB = [<break_selection>[, <timed>[, <default_length>]]]
This parameter is used to control the manner of operation of the V.42 operation in the modem. It accepts 3 numeric sub-parameters:

<break_selection>: Specifies the type of break to be signaled to the remote modem upon detecting a break from the local PC (see Recommendation V.42 for different break types).

<timed>: Specifies if the break signal to the remote modem is timed or not.

<default_length>: Specifies the amount of time in tens of milliseconds that a break should be signaled to the local PC when a break indication is received from the remote modem without a break length explicitly indicated.

< break_selection >	Description
0	Ignore break (do not signal to remote modem)
1	Non-expedited, non-destructive
2	Expedited, non-destructive
3	Expedited and destructive
<timed>	Description
0	Any transmitted V.42 L-SIGNAL shall NOT indicate break signal length
1	Any transmitted V.42 L-SIGNAL shall indicate break signal length
< default_length>	Description
0	Do not deliver break to local PC
1 to 200	Default break length of 0.01 to 2 seconds
Other	Higher values may be supported

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+EB?

The modem shall send text to the local PC, consisting of:
+EB: <break_selection>, <timed>, <default_length><CR>
e.g. +EB: 1,0,30<CR>

+EB=?

+EB: (list of supported < break_selection > values, (list of supported <timed> values), (list of supported <default_length > values)
Modem responds with list(s) of supported values

+ES – Error Control Selection

+ES = [<orig_rqst>[, <orig_fbk>[,<ans_fbk>]]]
This parameter is used to control the manner of operation of the V.42 protocol in the modem. It accepts 3 numeric sub-parameters:

<**orig_rqst**>: Specifies the initial request mode of operation when originating a call

<**orig_fbk**>: Specifies the acceptable fallback mode of operation when originating a call

<**ans_fbk**>: Specifies the acceptable fallback mode of operation when answering a call

<orig_rqst>	Description
0	Direct Mode
1	Initiate call with Buffer mode only
2	Initiate V.42 without Detection phase. If V.8 is in use, this is a request to disable V.42 Detection Phase
3	Initiate V.42 with Detection Phase
4	Initiate Alternative Protocol
<orig_fbk>	Description
0	Error Control Optional; if error control can not be established, use Buffered mode with flow control
1	Errol Control Optional; if error control can not be established, change data rate to match line <carrier> rate and use Direct mode.
2	Error Control Required; if error control can not be established, disconnect.
3	Error Control (LAPM) Required if LAPM can not be established, disconnect.
4	Error Control (Alternate (MNP)) Required if MNP can not be established, disconnect.
<ans_fbk>	Description
0	Direct Mode
1	Error Control Disabled, use Buffered mode
2	Error Control Optional; if error control can not be established, use Buffered mode with flow control
3	Errol Control Optional; if error control can not be established, change data rate to match line <carrier> rate and use Direct mode.
4	Error Control Required; if error control can not be

	established, disconnect.
5	Error Control (LAPM) Required if LAPM can not be established, disconnect.
6	Error Control (Alternate (MNP)) Required if MNP can not be established, disconnect.

+ES?

+ES=?

+ETBM – Call Termination Buffer Management

+ETBM = [<pending_TD>[,<pending_RD>[,<timer>]]]

This parameter controls the handling of data remaining in the modems buffers upon call termination. It accepts 3 numeric sub-parameters:

<pending_TD>: Controls how previously-transmitted data remaining in the modems buffers should be handled when the local PC requests disconnection of the call

<pending_RD>: Controls how previously received data remaining in the modems buffers should be handled when the remote modem disconnects the call

<timer>: Sets the maximum time limit on how long the modem will attempt to deliver the buffered data before abandoning the attempt and disregarding remaining data.

Circuit 109 (Carrier Detect) is held in the ON condition until all pending data is delivered or discarded.

<pending_TD>	Description
0	Discard all buffered data immediately and disconnect
1	Attempt until all data is delivered and acknowledged (ignore timer); if remote modem disconnects, disregard remainder
2	Attempt until all data is delivered and acknowledged; if timer expires or remote modem disconnects, disregard remainder
<pending_RD>	Description
0	Discard all buffered data immediately and disconnect
1	Attempt until all data is delivered (ignore timer); if local PC requests disconnect, disregard remainder
2	Attempt until all data is delivered ; if timer expires or local PC requests disconnect, disregard remainder
<timer>	Description
0 to 30	Delivery timer value in seconds
Other	Higher values may be supported (reserved for future use)

+ETBM?

+ETBM: <pending_TD>,<pending_RD>,<timer>

Modem responds with current settings

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+ETBM=?

+ETBM: (list of supported <pending_TD> values, (list of supported <pending_RD> values), (list of supported <timer> values)
Modem responds with list(s) of supported values

+ICF – Character Format

+ICF =   [<format>[, <parity>]]
Sets the character framing between the PC and the PCTEL modem for use while the modem is receiving commands and while sending information text and result codes. +IPR=0 forces +ICF=0

<format>	Valid Numeric Values
0	Auto detect
1	8 Data 2 Stop
2	8 Data 1 Parity 1 Stop
3	8 Data 1 Stop
4	7 Data 2 Stop
5	7 Data 1 Parity 1 Stop
6	7 Data
<parity>	Define Numeric Values
0	Odd
1	Even
2	Mark
3	Space

+ICF?

+ICF: <format>, <parity>
Modem responds with current settings

+ICF=?

+ICF: (list of supported <format> values, (list of supported <parity> values)
Modem responds with list(s) of supported values

IFC – PC to Modem Local Flow Control

+IFC =   [<modem_by_PC>[, <PC_by_modem>]]
This parameter is used to control the operation of local flow control between the PC and Modem during the data state when V.42 error control is being used, or when fallback to non-error control mode is specified to include buffering and flow control. It accepts 2 numeric sub-parameters

<**modem_by_PC**>: Specifies the method used by the PC to control the flow of data it receives from the modem.

<**PC_by_modem**>: Specifies the method to be used by the modem to control the flow of transmitted data from the PC

< modem_by_PC >	Description

0	None
1	DC1/DC3 (in band- X-On/X-Off) on circuit 103 (TD); do not pass DC1/DC3 characters to the remote modem
2	Circuit 133 (Ready for Receiving)
4 to 127	Reserved
Other	Reserved
<PC_by_modem>	Description
0	None
1	DC1/DC3 (in band- X-On/X-Off) on circuit 104 (RD)
2	Circuit 106 (Clear to Send/Ready for Sending)
3 to 127	Reserved
Other	Reserved

+IFC?

+IFC: <modem_by_PC>, <PC_by_modem>
Modem responds with current settings

+IFC=?

+IFC: (list of supported <modem_by_PC> values, (list of supported <PC_by_modem> values)
Modem responds with list(s) of supported values

+ILRR – PC (DTE) – Modem (DCE) Local Rate Reporting

+ILRR=<value>

<value>	Description
0	Disables reporting of local port rate (+ILRR: is not transmitting)
1	Enables reporting of local port rate (+ILRR: is transmitting)

+ILRR?

+ILRR: <current setting >
Modem responds with current settings

+ILRR=?

+ILRR: (list of supported values)
Modem responds with list of supported values

+GMI – Request Manufacturer Identification

Responds with: PCTEL, Inc.

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+GMM – Request Model Identification

Reports the model HSP Data/Fax Modem

+GMR – Request Revision Identification

Reports the driver revision

+MA – Modulation Automode Control

+MA= [<carrier>, [<carrier>[, <carrier>[,…]]]]
This parameter is a list of modulations that the modem may use to connect with the remote modem in Automode operation.

+MR – Modulation Reporting Control

+MR= <value>
The <carrier> reported shall be the current (negotiated or renegotiated) modulation <carrier>. If enabled, the intermediate result codes are transmitted at the point during connect negotiation (handshaking) at witch the modem has determined which modulation and rate will be used, before any Error Control or Data Compression reports are transmitted, and before any final result code (e.g. CONNECT) is transmitted.
The format of this information text is:

+MCR: <carrier>   e.g. +MCR: V32B
+MRR: <rate>[, <rx_rate>]   e.g. +MRR: 14400

<value>	Description
0	Disables reporting modulation connection (+MCR and +MRR: are **not** transmitted)
1	Enables reporting modulation connection (+MCR and +MRR: are transmitted)

+MR?

The DCE shall transmit a line of information test to the DTE, consisting of:
+MR:<current setting>

For example, with the current recommended default setting the DTE could report:
+MR:0

Test syntax

+MR=?

The DCE shall transmit a string of information test to the DTE, consisting of:
+MR:(list of supported values)

For example, a DCE that supported all defined settings would report:

+MR:(0,1)

+MS - Modulation Selection

This extended format command selects the modulation, optionally enables or disables automode, and optionally specifies the lower and highest connection rate using up to four sub-parameters.

+MS= <carrier>[, [<automode>][,[<min_rate>][,[<max_rate>]]]]

<carrier>	Modulation
V21	V.21
V22	V.22
V22B	V.22bis
V23	V.23, with Switched carrier
V32	V.32
V32B	V.32bis
V34	V.34
V.90	V.90
K56FLEX	K56FLEX

<automode>	Option Selected
0	Disabled
1	enabled, with V.8 or Annex A – V.32bis where applicable

+MS?

+MS: <carrier>, <automode>, <min_rate>, <max_rate>, <min_rx_rate>, <max_rx_rate>
Modem responds with current values

+MS=?

+MS:

(list of supported <carrier> values, (list of supported <automode> values), (list of supported <min_rate> values), (list of supported <max_rate> values), (list of supported <min_rx_rate> values), (list of supported <max_rx_rate> values)
Modem responds with list(s) of supported values

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AT "#" Command (Non Voice)

#UD
This command reports calls received from the diagnostics information at the end of a PSTN data call. The output format of the report consists of number of lines; each contains a series of numeric report codes. For details of the report format refer to Microsoft's Unimodem Diagnostics Command Reference Specifications.

#UG
This command is similar to #UD except the report is more legible.

AT – Command

-V90	Enable or disable V.90
-V90 = 1	Enables V.90
-V90 = 0	Disables V.90

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Result Codes

Long Form	Short Form	Description
OK	0	Modem successfully executed a AT command
CONNECT	1	A connection established
RING	2	Modem detected an incoming call
NO CARRIER	3	Modem lost or could not detect a remote carrier signal within the register S7 time
ERROR	4	Modem detected an error in an AT command
CONNECT 1200	5	Connection at 1200 bps
NO DIALTONE	6	Modem did not detect a dial tone within 5 seconds after off-hook
BUSY	7	Modem detected a busy tone
NO ANSWER	8	Modem did not detect 5 seconds of silence when using the @ dial modifier in the dial command
CONNECT 0600	9	Connection at 600 bps
CONNECT 2400	10	Connection at 2400 bps
CONNECT 4800	11	Connection at 4800 bps
CONNECT 9600	12	Connection at 9600 bps
CONNECT 7200	13	Connection at 7200 bps
CONNECT 12000	14	Connection at 12000 bps
CONNECT 14400	15	Connection at 14400 bps
CONNECT 19200	16	Connection at 19200 bps
CONNECT 38400	17	Connection at 38400 bps
CONNECT 57600	18	Connection at 57600 bps
CONNECT 115200	19	Connection at 115200 bps
CONNECT 28800	20	Connection at 28800 bps
CONNECT 300	21	Connection at 300 bps
CONNECT 1200TX/75RX	22	Connection at transmit 1200/receive 75 bps
CONNECT 75TX/1200RX	23	Connection at transmit 75/receive 1200 bps
CONNECT 110	24	Connection at 110 bps
RING BACK	25	Ring Back signal detected
+FCERROR	+F4	Error occurred in Class 1 fax operation
FAX	33	Fax modem connection established
DATA	35	Data modem connection established
CARRIER 300	40	Carrier rate of 300 bps
CARRIER 1200/75	44	Carrier rate of transmit 1200/receive 75 bps
CARRIER 75/1200	45	Carrier rate of transmit 75/receive 1200 bps
CARRIER 1200	46	Carrier rate of 1200 bps
CARRIER 2400	47	Carrier rate of 2400 bps
CARRIER 4800	48	Carrier rate of 4800 bps
CARRIER 7200	49	Carrier rate of 7200 bps
CARRIER 9600	50	Carrier rate of 9600 bps
CARRIER 12000	51	Carrier rate of 12000 bps
CARRIER 14400	52	Carrier rate of 14400 bps
CARRIER 16800	53	Carrier rate of 16800 bps

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Long Form	Short Form	Description
CARRIER 19200	54	Carrier rate of 19200 bps
CARRIER 21600	55	Carrier rate of 21600 bps
CARRIER 24000	56	Carrier rate of 24000 bps
CARRIER 26400	57	Carrier rate of 26400 bps
CARRIER 28800	58	Carrier rate of 28800 bps
CONNECT 16800	59	Connection at 16800 bps
CONNECT 21600	61	Connection at 21600 bps
CONNECT 24000	62	Connection at 24000 bps
CONNECT 26400	63	Connection at 26400 bps
COMPRESSION: CLASS 5	66	MNP Class 5 data compression connection established
COMPRESSION: V.42bis	67	V.42bis data compression connection established
COMPRESSION: NONE	69	Connection established without data compression
PROTOCOL: NONE	76	Connection established without error correction
PROTOCOL: LAPM	77	V.42/LAPM error correction connection established
PROTOCOL: ALT	80	MNP 3-4 error correction connection established
CARRIER 31200	90	Carrier rate of 31200 bps
CARRIER 33600	91	Carrier rate of 33600 bps
CONNECT 31200	95	Connection at 31200 bps
CONNECT 33600	96	Connection at 33600 bps
CARRIER 32000	97	Connection at 32000 bps
CARRIER 34000	98	Connection at 34000 bps
CARRIER 36000	99	Connection at 36000 bps
CARRIER 38000	100	Connection at 38000 bps
CARRIER 40000	101	Connection at 40000 bps
CARRIER 42000	102	Connection at 42000 bps
CARRIER 44000	103	Connection at 44000 bps
CARRIER 46000	104	Connection at 46000 bps
CARRIER 48000	105	Connection at 48000 bps
CARRIER 50000	106	Connection at 50000 bps
CARRIER 52000	107	Connection at 52000 bps
CARRIER 54000	108	Connection at 54000 bps
CARRIER 56000	109	Connection at 56000 bps
CARRIER 58000	110	Connection at 58000 bps
CARRIER 60000	111	Connection 60000 bps
CARRIER 28000	112	Connection 28000 bps
CARRIER 29333	113	Connection 29333 bps
CARRIER 30666	114	Connection 30666 bps
CARRIER 33333	115	Connection 33333 bps
CARRIER 34666	116	Connection 34666 bps
CARRIER 37333	117	Connection 37333 bps
CARRIER 38666	118	Connection 38666 bps
CARRIER 41333	119	Connection 41333 bps
CARRIER 42666	120	Connection 42666 bps
CARRIER 45333	121	Connection 45333 bps
CARRIER 46666	122	Connection 46666 bps
CARRIER 49333	123	Connection 49333 bps

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Long Form	Short Form	Description
CARRIER 50666	124	Connection 50666 bps
CARRIER 53333	125	Connection 53333 bps
CARRIER 54666	126	Connection 54666 bps

S Registers

REG.	Function
0	**Rings to auto-answer** Set the number of rings required before the modem answers. 0 setting disables auto-answer. Range: 0 - 255 rings Default: **0** (auto-answer disabled)
1	**Ring counter** Counts the number of incoming rings before the modem answers. Resets to 0 after five seconds of silence Range: 0 - 255 rings Default: **0**
2	**Escape character** Define the character used for the three-character escape code sequence. 0 setting disables the escape code character. Range: 0 - 127 Default: **43** (+)
3	**Carriage return character** Define the character for carriage return Range: 0 - 127 Default: **13** (carriage return)
4	**Line feed character** Define the character for line feed Range: 0 - 127 Default: **10** (line feed)
5	**Backspace character** Define the character for backspace Range: 0 - 127 Default: **8** (backspace)
6	**Wait before dialing** Set the length of time to pause after off hook before dial. Range: 2 - 255 seconds Default: **2** seconds
7	**Wait for carrier after dial** Set the length of time that the modem waits for a carrier from the remote modem before hanging up. Range: 1 - 255 seconds Default: **65** seconds
8	**Pause time for dial delay** Set the length of time to pause for the pause dial modifier ",". Range: 0 - 255 seconds Default: **2** seconds
9	**Carrier detect response time** Define the length of time a signal is detected and qualified as a carrier. Range: 1 - 255 tenths of a second Default: **6** (0.6 second)

REG.	Function
10	**Lost carrier hang up delay** Set the length of time the modem waits before hanging up after a carrier loss. Range: 1 - 255 tenths of a second Default: **14** (1.4 seconds)
11	**DTMF speed control** Set the length of tone and the time between tones for the tone dialing. Range: 50 - 255 milliseconds Default: **95** milliseconds
12	**Escape Prompt Delay (EPD) timer** Set the time from detection of the last character of the three character escape sequence until the "OK" is returned to the DTE Range: 0 - 255 fiftieths of a second Default: **50** (1 second)
13	Reserved
14	Reserved
15	Reserved
16	Reserved
17	Reserved
18	**Test timer** Set the length of loopback test. Range: 0 - 255 seconds (not supported in MicroModem series) Default: **0** (disable timer)
19	Reserved
20	Reserved
21	Reserved
22	Reserved
23	Reserved
24	Reserved
25	**Delay to DTR** Set the length of time the modem ignores DTR before hanging up Range: 0 - 255 hundredths of a second Default: **5** (0.05 second)
26	Reserved
27	Reserved
28	Reserved
30	**Disconnect inactivity timer** set the length of time allowed for inactivity before the connection is hung up. Range: 0-255 in minutes Default: **0** (disabled)
32	**XON character** Set the value of XON character Range: 0-255 Default: **17**
33	**XOFF character** Set the value of XOFF character Range: 0-255 Default: **19**
REG.	Function

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34	**V.90 data rate (bit-rate)** Set the maximum bit rate for V.90 Range: 0-21 bit rate = 28000 + S34 * 1333bps **K56Flex data rate (bit-rate)** Set the maximum bit rate for 56K Range: 0-12 bit rate = 32000bps + S34 * 2000bps **V.34 data rate (bit-rate)** Set the maximum bit rate for V.34 Range : 0-8 (2400 baud) bit rate = ((S34)+1) * 2400bps Default: **21** (33600 bps)
35	**V.34 symbol rate (baud-rate)** Set the maximum baud rate for V.34 Range: 0-5 0 - 2400 baud 1 - 2743 baud (N/A) 2 - 2800 baud (N/A) 3 - 3000 baud 4 - 3200 baud 5 - 3429 baud (N/A until V.34bis) Default: **0** (2400 baud)
36	Reserved
37	**Line connection speed** 0 - Attempt to connect at the highest speed 3 - Attempt to connect at 300 bps 4 - Attempt to connect at 1200 bps 6 - Attempt to connect at 2400 bps 7 - Attempt to connect at 4800 bps 8 - Attempt to connect at 7200 bps 9 - Attempt to connect at 9600 bps 10 - Attempt to connect at 12000 bps 11 - Attempt to connect at 14400 bps 12 - Attempt to connect at V.34 13 - Attempt to connect at 56K 14 – Attempt to connect at V.90 Default: **0**
38	**Delay before forced hang up** Set the delay to hang up after the disconnecting command is received. Range: 0 - 255 Milliseconds Default: **20** Milliseconds
39	Reserved

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REG.	Function
40	Reserved
41	Reserved
42	Reserved
43	Reserved
44	Reserved
45	Reserved
46	Reserved
47	Reserved
48	Reserved
82	Reserved
86	**Call failure reason code** 0 - Normal disconnect; no error 4 - Loss of carrier 5 - V.42 negotiation failed to detect an error correction modem at remote end 6 - No response to complete negotiation 9 - No common protocol 12 - Remote initiated a normal disconnect 13 - Remote modem did not respond after 10 message retransmissions 14 - Protocol violation 15 - Compression Failure 20 - Hang up by inactivity time out
91	**Transmit level** Set the transmit level in -dBm Range: 0 - 15 (-dBm) Default: **11** (-11 dBm)

FAX Class 1 Command Set

Command	Function
+FCLASS=0	**Select data mode**
+FCLASS=1	Select facsimile Class 1 mode
+FAE?	Report active adaptive answer setting: 0 for disabled, 1 for enabled
+FAE=?	Report adaptive answer capability
+FAE=0	**Disable adaptive answer**
+FAE=1	Enable adaptive answer
+FCLASS=?	Report service classes supported
+FTS=n	Stop transmission and pause, 0-255 in 10 ms
+FRS=n	Wait for silence, 0-255 in 10 ms
+FTM=?	Report Class 1 transmit capabilities (= 3, 24, 48, 72, 73, 74, 96, 97, 98, 121, 122, 145, 146)
+FRM=?	Report Class 1 receive capabilities (= 3, 24, 48, 72, 73, 74, 96, 97, 98, 121, 122, 145, 146)
+FTH=n	Transmit data with carrier n, n = 3
+FRH=n	Receive data with carrier n, n = 3

AT Voice Commands Summary

Command	Function
ATA	Answering in Voice Mode
ATD	Dial command in Voice Mode
ATH	Hang up in Voice Mode
ATZ	Reset from Voice Mode
AT+FCLASS= 8	Enter Voice Mode: This command must be issued prior to entering any other voice commands.
AT#BDR	Select baud rate (turn off autobaud)
AT#CID	Enable Caller ID detection and select reporting format
AT#CLS	Select data, fax, or voice
AT#MDL?	Identify model
AT#MFR?	Identify manufacturer
AT#TL	Transmit level control
AT#REV?	Identify revision level
AT#RG	Record gain control
AT#SPK	Change the setting of Speakerphone
AT#VBS	Bits per sample (ADPCM)
AT#VBT	Beep tone timer
AT#VLS	Voice line select (ADPCM)
AT#VRA	Ringback goes away timer (originate)
AT#VRX	Voice Receive Mode (ADPCM)
AT#VSD	Silence deletion tuner (voice receive, ADPCM)

Command	Function
AT#VSP	Silence detection period (voice receive, ADPCM)
AT#VSS	Silence sensitivity tuner (voice receive)
AT#VTX	Voice Transmit Mode (ADPCM)
AT#VBQ?	Query buffer size
AT#VCI?	Identify compression method (ADPCM)
AT#VRN	Ringback never came timer (originate)
AT#VSK	Buffer skid setting
AT#VSR	Sampling rate selection (ADPCM)
AT#VTD	DTMF/tone reporting capability
AT#VTS	Play tone string (online voice command)

AT Voice Command Descriptions

AT FCLASS = 8 must be issued prior to entering any other voice command.
ATA - Answering in Voice
This command works similarly to the way it works in Data and Fax Modes.
Result Code:
    VCON

ATD - Dial Command in Voice
This command will perform the dial action in Voice Mode.
Result Codes:
VCON Issued in Voice Mode when the modem determines that the remote modem or handset has
    gone off-hook.
NO ANSWER   Issues in Voice Mode when the modem determines that the remote has not picked
    up the line before the S7 timer expires.

ATH - Hang Up in Voice
This command works the same as in Data and Fax modes by hanging up the phone line.
1. This command forces the #CLS=0, but does not destroy any of the voice parameter setting such as
    #VBS, #VSP, etc.
2. The #BDR setting is forced back to 0.

ATZ - Reset from Voice Mode
This command works the same as in Data and Fax modes. In addition, it will also resets all voice
related parameters to default states, forces the #BDR=0 condition, and forces the telephone line to be
selected with the handset on-hook.

+FCLASS=8 – Enter Voice Mode
This command puts the modem into the voice mode.

#BDR - Select Baud Rate (Turn off Autobaud)
These commands select a specific DTE/modem baud rate.
Parameters: n = 0 - 48 (Baud Rate = n * 2400 bps)
Default: 0
Result Codes:
    OK   if n is between 0 and 48
    ERROR   Otherwise
Command options:
    #BDR?   Return the current setting
    #BDR=?   Return a message indicating the speeds that are supported
    #BDR=0   Enable autobaud detection on the DTE interface
    #BDR=n   Select the baud rate

#CID - Enable Caller ID Detection and Select Reporting Format
This command enables or disables Caller ID recognition and reporting in any mode.
Parameters: n = 0, 1, or 2
Default: 0
Result Codes:
  OK   n = 0, 1, or 2
  ERROR Otherwise
Command Options:
  #CID? Return the current setting (0, 1, or 2)
  #CID=? Return the message, "0-2"
  #CID=0 Disables Caller ID
  #CID=1 Enable formatted Caller ID reporting of SDM (Single Data Message) and MDM
      (Multiple Data Message) packets.
  #CID=2 Enable unformatted Caller ID reporting.

#CLS - Select Data, Fax, or Voice
This command select Data, Fax, or Voice Mode
Parameters: n=0, 1, or 8
Default: 0
Result Codes:
  OK   if n = 0, 1, 2, or 8
  ERROR Otherwise
Command options:
  #CLS? Return the current setting (0, 1, or 8)
  #CLS=? Return the message, "0, 1, 8"
  #CLS=0 Select Data Mode.
  #CLS=1 Select Class 1 Fax Mode.
  #CLS=8 Select Voice Mode.

#MDL - Identify Model
This command identifies the model number of the modem.
Command option:
  #MDL? "PCT288DFV"

#MFR? - Identify Manufacturer
This command identifies the modem manufacturer.
Command option:
  #MFR? "PCtel"

#REV? - Request Revision Level
This command requests the revision number of PCTEL Driver.
  #REV? "PCtel 2.00"

#RG - Record Gain Control
This command sets the record gain.
Parameters: n = 0000 - 7FFF
Default: 7FFF
Result Codes:
     OK   if n = 0000 - 7FFF
     ERROR   Otherwise
Command options:
     #RG?   Return the current setting
     #RG=?   Return the message, "0000-7FFF"
     #RG=n   Set the record gain to n

#SPK - Change the setting of Speakerphone
This command set the parameters for speakerphone.
Parameters: #SPK=<mute>, <spk>, <mic>

<mute>	Microphone state
0	microphone mute
1	microphone on (default)
2	Room Monitor mode (mic on max. AGC, speaker off)

<spk>   Speaker Output Level
     Range: 0 to 15 (speaker attenuation in 2 dB steps)
     Default: 5 (10 dB attenuation)
     Speaker mute is achieve by a value of 16

<mic>	Microphone Gain Parameter
0	0 dB
1	6 dB gain (default)
2	9.5 dB gain
3	12 dB gain

Command options:
     It is not necessary to enter all three parameters,
     #SPK=,<spk>,<mic>
     #SPK=,,<mic>

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#TL - Transmit Level Control
This command sets the transmit level.
Parameters: n = 0000 - 7FFF
Default: 3FFF
Result Codes:
     OK   if n = 0000 - 7FFF
     ERROR   Otherwise
Command options:
     #TL?   Return the current setting
     #TL=?   Return the message, "0000-7FFF"
     #TL=n   Set the record gain to n

#VBQ? - Query Buffer Size
This command query the modem's voice transmit and voice receive buffers size.
Parameters: None
Command option:
     #VBQ?   Return the size of buffers.

#VBS - Bits Per Sample (Compression Factor)
This command selects the degree of ADPCM voice compression to be used.
Parameters: n = 4   (Only 4 bits per sample compression ratio is supported)
Default: 4
Result Codes:
     OK   if n = 4
     ERROR   Otherwise
Command options:
     #VBS?   Return the current setting
     #VBS=?   Return "4"
     #VBS=4   Selects 4 bits per samples.

#VBT - Beep Tone Timer
This command sets the duration for DTMF tone generation
Parameters: n = 0 - 40 (duration = n /10 seconds)
Default: 10
Result Codes:
     OK   if n = 0 - 40
     ERROR   Otherwise
Command options:
     #VBT?   Return the current setting
     #VBT=?   Returns the message, "0-40"
     #VBT=0   Disables the tone generation capability.
     #VBT=n   Sets tone duration

#VCI? - Identify Compression Method
This command identifies the compression method used by the modem.
Parameter: None
Command option:
        #VCI?   Returns the message, "PCTEL; ADPCM; 32"

#VLS - Voice Device Selection
This command select which devices is routed through the modem.
Parameter: n = 0, 1, 2, 3, 4, or 6
Default: 0
Result Codes:
        OK   if n = 0, 1, 2, 3, 4, or 6
        ERROR   Otherwise
Command options:
        #VLS?   Return current setting
        #VLS=?   Return the device types supported by the modem.
        #VLS=n   Select Device Type (see table below)

Device Type	Device Description
0	Phone Line with Telephone handset
1	Handset
2	On-Board Speaker
3	Microphone
4	Telephone line with on-board speaker ON and handset
6	Speaker Phone

#VRA - Ringback Goes Away Timer (Originate)
When originate a voice call, this command can set the "Ringback Goes Away" timer value, an amount of time measures from when the Ringback cadence stops once detected. If Ringback is not detected within this period, the modem assumes that the remotes has picked up the line and switches to Online Voice Command Mode. Every time a Ringback cadence is detected, this timer is reset.
Parameters: n = 0 - 255 (0 - 25.5 seconds)
Default: 70
Result Codes:
        OK   if n = 0 - 255
        ERROR   Otherwise
Command options:
        #VRA?   Return the current setting
        #VRA=?   Return the message, "0-255"
        #VRA=0   Turn off the timer. The dialing modem sends VCON and enters Online Voice
                Command Mode after one Ringback.
        #VRA=n   Set the timer (timer = n * 0.1 seconds)

#VRN - Ringback Never Came Timer (Originate)
When originating a voice call, this command set the "Ringback Never Came" timer value, an amount of time measured from completion of dialing. If Ringback is not detected within this period, the modem assumes the remote has picked up the line and switches to Online Voice Command Mode.
Parameters: n = 0 - 255 (0 - 25.5 seconds)
Result Codes:
          OK   if n = 0 - 255
          ERROR   Otherwise
Command option:
          #VRN? Return the current setting
          #VRN=?   Return the message, "0-255"
          #VRN=0   Turn off the "Ringback Never Came timer". After dialing, the modem sends VCON and enters Online Voice Command Mode immediately.
          #VRN=n   Set the timer (duration = n * 0.1 second)

#VRX - Voice Receive
This command set the modem in Voice Receive Mode.
Parameters: None
Result Codes:
          CONNECT   when voice transfer from modem to DTE can begin
          ERROR   if #VLS=0 and not connected to any input device

#VSD - Silence Deletion Tuner (Voice Receive)
This command can enable/disable Voice Receive Mode silence detection. Silence Deletion is not supported in PCtel HSP Modem.
Parameters: n = 0
Default: 0
Result Codes:
          OK   if n = 0
          ERROR   Otherwise
Command options:
          #VSD?   Return current setting
          #VSD=?   Return the message, "0"
          #VSD=0   Disable Silence Deletion

#VSK - Buffer Skid Setting
This command queries and sets the number of bytes of spare space, after the XOFF threshold is reached, in the modem's buffer during Voice Transmit Mode. This equates to the "skid" spare buffer space, or the amount of data the DTE can continue to send after being told to stop sending data by the modem, before the modem voice transmit buffer overflows.

Parameters:	n = 0 - 255
Default:	255
Result Code:	
OK	if n = 0 - 255
ERROR	Otherwise
Command options:	
#VSK?	Return the current setting
#VSK=?	Return the message, "0-255"
#VSK=n	Set the skid buffer size to n bytes

#VSP - Silence Detection Period (Voice Receive)
This command sets the Voice Receive Mode silence detection period value. If the modem does not receive any ADPCM data after the timer expired, it will cause the modem to send <DLE>s or <DLE>q codes.

Parameters:	n = 0 - 255 (0 - 25.5 seconds)
Default:	55
Result Code:	
OK	if n = 0 - 255
ERROR	Otherwise
Command options:	
#VSP?	Return current setting
#VSP=?	Return the message, "0-255"
#VSP=0	Disable the silence period detection timer
#VSP=n	timer = n * 0.1 second

#VSR - Sampling Rate Selection
This command sets the audio codec-sampling rate.

Parameters:	n = 8000 (8000 Hz sampling rate)
Default:	8000
Result Codes:	
OK	if n = 8000
ERROR	Otherwise
Command options:	
#VSR?	Return the current setting
#VSR=?	Return the message, "8000"
#VSR=8000	Set the sample rate to 8000

#VSS - Silence Sensitivity Tuner (Voice Receive)
This command set the sensitivity in Voice Receive Mode silence detection.
Parameters: n = 0 - 3
Default: 2
Result Codes:
        OK   if n = 0 -3
        ERROR   Otherwise
Command options:
        #VSS?   Return current setting
        #VSS=?   Return the message, "0-3"
        #VSS=0   Disable silence detection by the modem in Voice Receive Mode
        #VSS=1   Least sensitive setting
        #VSS=2   Medium sensitive setting
        #VSS=3   Most sensitive setting

#VTD - Tone Reporting Capability
This command sets which types of tones can be detected and reported to the DTE via shielded codes in Voice Transmit, Voice Receive, and Online Voice Command Modes.
Parameters: i, j, k
Default: 3F, 3F, 3F
Result Codes:
        OK   if setting is supported by the modem.
        ERROR   Otherwise
Command options:
        #VTD? Return current setting
        #VTD=?   Returns the tone reporting capabilities of the modem.
        #VTD=i,j,k   Where i, j, k corresponds to the desired capabilities (see table below), i for
Voice Transmit, j for Voice Receive, and k for Online Voice Command Modes.

Bit	Description
0	0 / 1 = Disable / Enable DTMF tone capability
1	0 / 1 = Disable / Enable V.25 1300 Hz Calling tone capability
2	0 / 1 = Disable / Enable V.30 1100 Hz Facsimile Calling tone capability
3	0 / 1 = Disable / Enable V.25/T.30 2100 Hz Answer tone capability
4	0 / 1 = Disable / Enable Bell 2225 Hz Answer tone capability
5	0 / 1 = Disable / Enable call progress tone and cadence tone capability

#VTS - Play Tone String (Online Voice Command Mode)
This command can play one or more DTMF or other tones. No key abort is allowed.
Dual or Single Tones: These are represented by a substring enclosed in square brackets ("[ ]")
within the parameter. Each such substring consists of three sub-elements corresponding to 2
frequencies in Hertz (0, or 2000-3000) and a duration (ASCII decimal in units of 100ms).
Varying DTMF Digits: This is represented by a substring enclosed in curly braces ("{ }") within the
parameter. Each such substring consists of two sub-elements corresponding to a DTMF digits (0-9,
A-D, *, #), and alternate duration in units of 100ms.
Parameters: The tone generation consists of elements in a list with each element separated by
commas.   Result Codes:

OK	Command to play tones on currently selected device is accepted.
ERROR	Command was not issued in Online Voice Command Mode or string is grammatically incorrect.

#VTX - Voice Transmit
This command set the modem in Voice Transmit Mode. The #VLS command should have been
previously issued correctly.
Parameters: None
Result Codes:

CONNECT	when voice transmission by DTE can begin.
ERROR	If #VLS=0 and output device is not connected.

Shielded Codes

Code Sent to DTE	Meaning
<DLE>0 - <DLE>9, <DLE>*, <DLE>#, <DLE>A - <DLE>D	**DTMF** Digits 0 through 9, *, #, or A through D detected by the modem.
<DLE>a	**Answer Tone(CCITT)** Sent to the DTE when the V.25/T.30 2100 Hz Answer Tone (Data or Fax) is detected. If the DTE fails to react to the code, and the modem continues to detect Answer tone, the code is repeated as often as once every 0.5 second.
<DLE>b	**Busy** Sent to DTE when the busy cadence is detected. The modem sends the busy <DLE>b code every 4 seconds if busy continues to be detected and the DTE does not react. This allows the DTE the flexibility of ignoring what could be a false busy detection.
<DLE>c	**Calling Tone** Sent when the T.30 1100 Hz Calling Tone (Fax Modem) is detected. The modem assumes the calling tone is valid and sends this code only after 4 seconds of proper cadence has been detected. If the DTE does not react to this code, the code is repeated as often as once every 4 seconds.
<DLE>d	**Dial Tone** Sent in Voice Receive Mode when dial tone is detected after any remaining data in the voice receive buffer. The modem sends this code every 3 seconds if dial tone continues to be detected and the DTE does not react. This allows the DTE the flexibility of ignoring what could be false dial tone detection.
<DLE>e	**European Data Modem Calling Tone** Sent when the V.25 1300 Hz Calling Tone (Data Modem) is detected. The modem assumes that the calling tone is valid, and sends this code only after 4 seconds of proper cadence has been detected. If the DTE does not react to this code and calling tone continues, the code is sent again as often as once every 4 seconds.
<DLE>f	**Bell Answer Tone** Sent when Bell 2225 Hz Answer Tone (Data) is detected. If the DTE fails to react to the code and the modem continues to detect Answer tone, the code is repeated as often as every 0.5 second.
<DLE>h	**Hung Up Handset** Sent immediately when the modem detects that the local handset has hung-up.
<DLE>q	**Quiet** Sent in Voice Receive Mode after any remaining data in the receive voice buffer when the silence detection timer (#VSP) expires and the voice data has been passed to the DTE.

<DLE>s	**Silence** Sent in Voice Receive Mode after the silence detection timer (#VSP) expires and if valid voice has not been detected (#VSS).
<DLE>t	**Handset Off-Hook** Sent one time when the local handset transition goes off-hook.
<DLE><ETX>	**End of Stream** This code is sent to denote the end of a voice data stream.

Shielded Codes (Continued)

Code Sent to Modem	Meaning
<DLE><ETX>	**Terminate** Sent during Voice Transmit Mode to indicate that the DTE has finished transmitting a voice message. The Modem completes transmission of any remaining data in the voice transmit buffer before responding with the VCON message and entering Online Voice Command Mode.
<DLE><CAN>	**Cancel** Sent during Voice Transmit Mode to indicate that the DTE has finished transmitting a voice message and wants the modem to discard any remaining data in the voice transmit buffer. The modem immediately purges its buffer and then responds with VCON message entering Online Voice Command Mode.
<DLE>p	**Pause** Sent during Voice Transmit Mode to force the modem to suspend sending voice data to the selected output device. Any data currently in the voice transmit buffer is saved until either a resume (<DLE>r), or cancel (<DLE><CAN>), is received, in which case the data is lost. If a <DLE><ETX> is received during the paused state, the modem processes it normally, and also automatically resumes transmission of the data left in the buffer (appended with <DLE><ETX>). Any other data received from the DTE while in this paused state is placed in the transmit buffer according to available space, with flow control active.
<DLE>r	**Resume** Sent during Voice Transmit Mode to force the modem to resume sending voice data to the selected output device. Any data currently in the voice transmit buffer is now played.

PTT Testing

This facilitates testing of signal levels and provides a continuous signal when the modem is in IDLE mode. This allows the user to initiate a series of signal that are necessary for PTT approval. These signals are answer tone, carriers, modulation, and other pertinent signals. A selected test will be terminated when any keyboard character is entered. The followings are command descriptions.

Note: For DTMF, the transmit level is -10dBm for low band and -8dBm for high band, inter digit delay is fixed at 70ms. All other transmit levels are adjustable according to the setting of register S91 (from -10 to -15dBm).

%P00 - %P09	DTMF tone digits from 0 to 9.
%P10	DTMF digit A.
%P11	DTMF digit B.
%P12	DTMF digit C.
%P13	DTMF digit D.
%P14	DTMF digit *.
%P15	DTMF digit #.
%P16	V.21 Channel 1 mark 980 Hz.
%P17	V.21, Channel 2 mark 1650 Hz.
%P18	V.23, Reversed channel mark 390 Hz.
%P19	V.23, Forward channel mark 1300 Hz.
%P20	V.22 Originate.
%P21	V.22bis, originateOriginate.
%P22	V.22, Answer.
%P23	V.22bis, Answer.
%P24	V.21, Channel 1 space 1180 Hz.
%P25	V.21, Channel 2 space 1850 Hz.
%P26	V.23, Reversed channel space 450 Hz.
%P27	V.23, Forward channel space 2100 Hz.
%P28	V.32, at 9600 bps.
%P29	V.32bis, 14400 bps.
%P30	Silence, off-hook.
%P31	V.25 Answer tone, 2100 Hz.
%P32	Guard tone, 1800 Hz.
%P33	V.25 Calling tone, 1300 Hz.
%P34	Fax calling tone, 1100 Hz.
%P35	V.21 Channel 2, 1650 Hz.
%P36	V.27ter, 2400 bps.
%P37	V.27ter, 4800 bps.
%P38	V.29, 7200 bps.
%P39	V.29, 9600 bps.
%P40	V.17, 7200 bps long train.
%P41	V.17, 7200 bps short train.
%P42	V.17, 9600 bps long train.

%P43	V.17, 9600 bps short train.
%P44	V.17, 12000 bps long train.
%P45	V.17, 12000 bps short train.
%P46	V.17, 14400 bps long train.
%P47	V.17, 14400 bps short train.
%P48	V.34, 2400 bps modulation.
%P49	V.34, 4800 bps modulation.
%P50	V.34, 7200 bps modulation.
%P51	V.34, 9600 bps modulation.
%P52	V.34, 12000 bps modulation.
%P53	V.34, 14400 bps modulation.
%P54	V.34, 16800 bps modulation.
%P55	V.34, 19200 bps modulation.
%P56	V.34, 21600 bps modulation.
%P57	V.34, 24000 bps modulation.
%P58	V.34, 26400 bps modulation.
%P59	V.34, 28800 bps modulation.
%P60	V.32bis, 9600 bps modulation.
%P61	V.32bis, 12000 bps modulation.
%P62	Bell 212A, originate 1200 bps
%P63	Bell 212A, answer 1200 bps
%P64	Bell 103, originate mark 1270 Hz
%P65	Bell 103, originate space 1070 Hz
%P66	Bell 103,-answer mark 2225 Hz
%P67	Bell 103,-answer space 2025 Hz
%P68	V.34, 31200 bps modulation.
%P69	V.34, 33600 bps modulation.
%P70	V.32, 4800bps
%P71	V.32bis, 4800bps
%P72	V.32bis, 7200bps
%P73	V.21 Channel 1, "10101010 ..." pattern generation
%P74	V.21 Channel 2, "10101010 ..." pattern generation
%P75	Bell 103 originate, 1270Hz 1070Hz "10101010 ..." pattern generation,
%P76	Bell 103 answer mark, 2225Hz answer space 2025Hz "10101010 ..." pattern

%P99, n   where 0<= n <=23

$f(Hz) = n * (150Hz)$

n	f(Hz)	
0	0	modem goes off hook and reports power level of incoming signal if present
1	150	
2	300	
3	450	
4	600	
5	750	
6	900	
7	1050	

8	1200
9	1350
10	1500
11	1650
12	1800
13	1950
14	2100
15	2250
16	2400
17	2550
18	2700
19	2850
20	3000
21	3150
22	3300
23	3450

V90K56DOCATC11A

Default Country Specific Profiles

JAPAN

B0 E1 L1 M1 N1 P Q0 V1 W1 X4 Y0 &C1 &D2 &G0 &K3 &P0 &S0 &U0 &Y0 %C3

%E2 %N0 \A1 \B3 \G0 \K5 \L0 \N3 *Q0 -V90=1

S00=000 S01=000 S02=043 S03=013 S04=010 S05=008 S06=004 S07=055
S08=004 S09=006 S10=014 S11=075 S12=050 S13=000 S14=000 S15=000
S16=000 S17=000 S18=000 S19=000 S20=000 S21=000 S22=000 S23=000
S24=000 S25=005 S26=000 S27=000 S28=000 S29=000 S30=000 S31=000
S32=017 S33=019 S34=021 S35=000 S36=000 S37=000 S38=020 S39=000
S40=000 S41=000 S42=000 S43=000 S44=000 S45=010 S46=000 S47=000
S48=000 S82=000 S86=099 S91=015

USA

B1 E1 L1 M1 N1 T Q0 V1 W0 X4 Y0 &C0 &D0 &G0 &K3 &P2 &S0 &U0 &Y0 %C3

%E2 %N0 \A1 \B3 \G0 \K5 \L0 \N3 *Q0 -V90=1

S00=000 S01=000 S02=043 S03=013 S04=010 S05=008 S06=002 S07=065
S08=002 S09=006 S10=014 S11=095 S12=050 S13=000 S14=000 S15=000
S16=000 S17=000 S18=000 S19=000 S20=000 S21=000 S22=000 S23=000
S24=000 S25=005 S26=000 S27=000 S28=000 S29=000 S30=000 S31=000
S32=017 S33=019 S34=021 S35=000 S36=000 S37=000 S38=020 S39=000
S40=000 S41=000 S42=000 S43=000 S44=000 S45=010 S46=000 S47=000
S48=000 S82=000 S86=099 S91=011

KOREA

B1 E1 L1 M1 N1 T Q0 V1 W0 X4 Y0 &C1 &D0 &G0 &K3 &P2 &S0 &U0 &Y0 %C3

%E2 %N0 \A1 \B3 \G0 \K5 \L0 \N3 *Q0 -V90=1

S00=000 S01=000 S02=043 S03=013 S04=010 S05=008 S06=002 S07=050
S08=002 S09=006 S10=014 S11=095 S12=050 S13=000 S14=000 S15=000
S16=000 S17=000 S18=000 S19=000 S20=000 S21=000 S22=000 S23=000
S24=000 S25=005 S26=000 S27=000 S28=000 S29=000 S30=000 S31=000
S32=017 S33=019 S34=021 S35=000 S36=000 S37=000 S38=020 S39=000
S40=000 S41=000 S42=000 S43=000 S44=000 S45=010 S46=000 S47=000
S48=000 S82=000 S86=099 S91=015

CHINA

B1 E1 L1 M1 N1 T Q0 V1 W0 X4 Y0 &C0 &D0 &G0 &K3 &P2 &S0 &U0 &Y0 %C3

%E2 %N0 \A1 \B3 \G0 \K5 \L0 \N3 *Q0 -V90=1

S00=000 S01=000 S02=043 S03=013 S04=010 S05=008 S06=002 S07=050
S08=002 S09=006 S10=014 S11=095 S12=050 S13=000 S14=000 S15=000
S16=000 S17=000 S18=000 S19=000 S20=000 S21=000 S22=000 S23=000
S24=000 S25=005 S26=000 S27=000 S28=000 S29=000 S30=000 S31=000
S32=017 S33=019 S34=021 S35=000 S36=000 S37=000 S38=020 S39=000
S40=000 S41=000 S42=000 S43=000 S44=000 S45=010 S46=000 S47=000
S48=000 S82=000 S86=099 S91=011

CTR21 (Europe)

B1 E1 L1 M1 N1 T Q0 V1 W0 X4 Y0 &C0 &D0 &G0 &K3 &P0 &S0 &U0 &Y0 %C3

%E2 %N0 \A1 \B3 \G0 \K5 \L0 \N3 *Q0 -V90=1

S00=000 S01=000 S02=043 S03=013 S04=010 S05=008 S06=004 S07=050
S08=002 S09=006 S10=014 S11=095 S12=050 S13=000 S14=000 S15=000
S16=000 S17=000 S18=000 S19=000 S20=000 S21=000 S22=000 S23=000
S24=000 S25=005 S26=000 S27=000 S28=000 S29=000 S30=000 S31=000
S32=017 S33=019 S34=021 S35=000 S36=000 S37=000 S38=020 S39=000
S40=000 S41=000 S42=000 S43=000 S44=000 S45=010 S46=000 S47=000
S48=000 S82=000 S86=099 S91=011