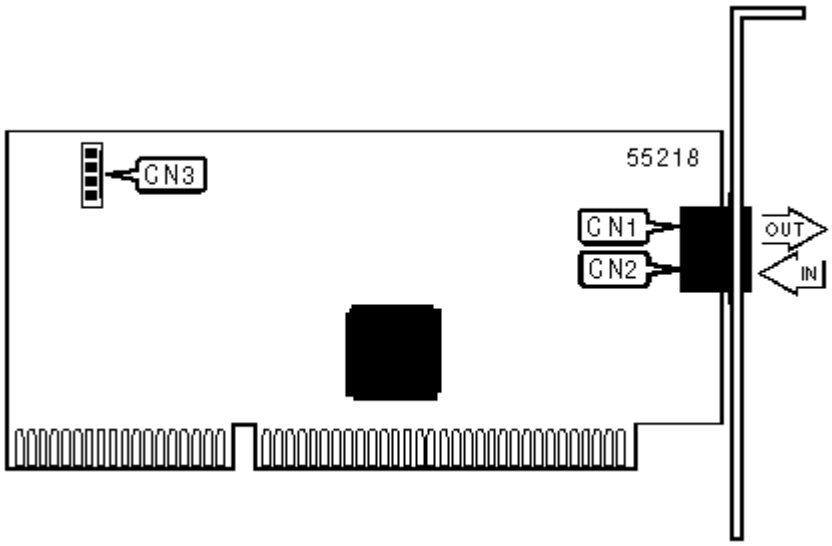
MULTIWAVE INNOVATION, INC

CW56ES

Card Type	Modem (synchronous/asynchronous), Voice
Chipset	Unidentified
Maximum Modem Rate	56.0Kbps
Maximum Fax Rate	14.4Kbps
Fax Class	Class I & II
Modem Modulation Protocol	Bell 103A/212A
Fax Modulation Protocol	ITU-T V.21, V.22, V.22bis,V.32, V.32bis, V.34bis ITU-T V.17, V.21 CH2, V.27ter, V.29
Error Correction/Compression	MNP5, V.42, V.42bis
Data Bus	16-bit ISA



CONNECTIONS

Function	Label	Function	Label
Line out	CN1	Speaker connector	CN3
Line in	CN2		

SUPPORTED COMMAND SET

Basic AT Commands

AT, A/

A, B, E, H, L, M, P, Q, T, V, W, X, Z

&C, &V, &W

Extended AT Commands

\A, \G, \L, \N

%C

S Registers

S0, S1, S2, S3, S4, S5, S6, S7, S8, S9, S10, S11, S12, S22, S29, S32, S33, S95

Special Commands

#CID

Voice Commands

#MDL?, #MFR?, #REV?, #VRX, #VTS, #VTX

Note: See MHI Help File for full command documentation.

Proprietary AT Command Set

AUTO-MODE DETECTION

Type: Configuration

Format: AT [cmds] N*n* [cmds]

Description: Selects various options for the automatic detection and negotiation of protocols during the handshake process if the modem is communicating with a remote modem of dissimilar speed.

Command	Function
N0	Auto-mode detection disabled. Handshake begins at line speed designated by the S37 register or if S37=0, at last DTE speed
N1	Auto-mode detection enabled. Handshake conducted according to the automode algorithm supported by the modem

COMMUNICATIONS MODE

Type: Configuration

Format: AT [cmds] &M*n* [cmds]

Description: Selects communications mode

Note: Command non-functional; for compatibility purposes only. Returns OK.

COMMUNICATIONS MODE

Type: Configuration

Format: AT [cmds] &Q*n* [cmds]

Description: Selects communications mode options

Note: Command non-functional; for compatibility purposes only. Returns OK.

DATA SET READY (DSR)

Type: Configuration

Format: AT [cmds] &S*n* [cmds]

Description: Selects DSR options

Note: Command non-functional; for compatibility purposes only. Returns OK.

DATA TERMINAL READY (DTR)

Type: Configuration

Format: AT [cmds] &D*n* [cmds]

Description: Selects modem response to DTR

Command	Function
■ &D0	DTR forced high
&D1	DTR toggle causes online command mode
&D2	Normal DTR operations

DIAL

Type: Immediate

Format: AT [cmds] D<#> [cmds]

Description: Dials telephone number according to any modifiers included in the string

Note: Any combination of modifiers can be used to produce the desired dial functions in sequence.

Command	Function
DL	Re-dial last number
DP	Pulse dialing enabled
DSn	Dial stored telephone number *n*
DT	Tone dialing enabled/Pulse dialing disabled
DW	Dialing resumed following dial tone detection

D,	Dialing paused for amount of time specified in S8 register
D!	Flash function initiated. Modem commanded to go off-hook for specified time before returning on-hook.
D;	Modem returned to idle state after dialing. The semicolon can only be placed at the end of the dial command.

FACTORY DEFAULT PROFILE

Type: Configuration

Format: AT [cmds] &F [cmds]

Description: Sets values in active profile to values found in the default profile

Command	Function
&F0	Restore factory configuration 0
&F1	Restore factory configuration 0

FLOW CONTROL

Type: Configuration

Format: AT [cmds] &K*n* [cmds]

Description: Enables flow control options

Command	Function
&K0	Flow control disabled
&K3	RTS/CTS flow control enabled
&K4	XON/XOFF flow control enabled
&K5	Transparent XON/XOFF flow control enabled
&K6	Both RTS/CTS & XON/XOFF flow control enabled

JACK TYPE

Type: Configuration

Format: AT [cmds] &J*n* [cmds]

Description: Selects jack type

Note: Command non-functional; for compatibility purposes only. Returns OK.

LINE TYPE

Type: Configuration

Format: AT [cmds] &L*n* [cmds]

Description: Selects line type

Note: Command non-functional; for compatibility purposes only. Returns OK.

LONG SPACE DISCONNECT

Type: Configuration

Format: AT [cmds] Y*n* [cmds]

Description: Commands the modem to disconnect after a 1.6 second break is detected

Note: Command non-functional; for compatibility purposes only. Returns result code.

ON-LINE

Type: Immediate

Format: AT [cmds] O*n* [cmds]

Description: Controls on-line command (data transmission) state options.

Note: The O command must be placed at the end of the command string.

Command	Function
O0	On-line command mode with no retraining enabled
O1	On-line command mode with long retrain enabled
O2	On-line command mode with short retrain enabled

PULSE DIALING RATIO

Type: Configuration

Format: AT [cmds] &P*n* [cmds]

Description: Selects pulse dial make/break ratio

Command	Function

■ &P0	39/61ms at 10pps (North America)
&P1	33/67ms at 10pps (Europe)

REPORT INFORMATION

Type: Immediate

Format: AT [cmds] I*n* [cmds]

Description: Displays information requested

Command	Function
I0	Reports product code
I1	Reports hardware variation
I2	Reports DSP firmware revision model code
I3	Reports controller firmware revision model code
I4	Reports manufacturer and model information

RESTORE PROFILE ON POWER-UP

Type: Configuration

Format: AT [cmds] &Y*n* [cmds]

Description: Restores a selected profile into the active profile on power-up (hard reset)

Note: Command non-functional; for compatibility purposes only. Returns OK.

TEST MODES

Type: Immediate

Format: AT [cmds] &T*n*

Description: Selects test options

Command	Function
&T0	End current test
&T1	Begin local analog loopback test

TRANSMIT CARRIER

Type: Configuration

Format: AT [cmds] C*n* [cmds]

Description: Controls the transmit carrier switching

Note: Command non-functional; for compatibility purposes only. Returns result code.

EXTENDED AT COMMAND SET

AUTO-RETRAIN - AUTO-FALLBACK/FALL-FORWARD

Type: Configuration

Format: AT [cmds] %E*n* [cmds]

Description: Controls auto-retrain mode and fallback/fall-forward

Command	Function
%E0	Auto-retrain disabled
■ %E1	Auto-retrain enabled

SPECIAL COMMANDS

BLACKLISTED NUMBERS

Type: Configuration

Format: AT [cmds] *B*n* [cmds]

Description: Displays numbers which failed the last call attempt within two hours. In countries that do not require blacklisting, command returns ERROR

CALLING TONE

Type: Configuration

Format: AT [cmds] *C*n* [cmds]

Description: Controls whether the DTE will allow the modem to send a 1300Hz calling tone when originating

Command	Function
*C0	Disable calling tone
*C1	Enable calling tone

COUNTRY SELECT

Type: Configuration

Format: AT [cmds] *NC*n* [cmds]

Description: Selects up to 7 country parameters

Command	Function
*NC0	United States
*NC1	Japan
*NC2	Germany
*NC3	United Kingdom
*NC4	France
*NC5	Netherlands
*NC6	Italy

DELAYED NUMBERS

Type: Configuration

Format: AT [cmds] *D*n* [cmds]

Description: Displays delayed numbers with lag associated with each number

SINGLE/DUAL TONE

Type: Configuration

Format: AT [cmds] *S*n* [cmds]

Description: Selects single or dual tone

Command	Function
*S0	Regular dual tone transmitted to line
*S1	Low band tone transmitted to line
*S2	High band tone transmitted to line

MODULATION SELECTION

Type: Configuration

Format: AT [cmds] +MS=*x,y,z,a* [cmds]

Description: Sets options for active protocol; the transfer rates specified by *z* and *a* must be valid for the protocol selected.

Command	Function
x=0	V.21
x=1	V.22
x=2	V.22bis
x=3	V.23
x=9	V.32
x=10	V.32bis
x=11	V.34
x=64	Bell 103
x=69	Bell 212A

S(status) REGISTERS

BIT-MAPPED REGISTER S14

Format: AT [cmds] S14=*n* [cmds]

Range: 0-174

Unit: Bit-mapped

Description: Controls echo, result codes and display, dial mode, and answer/originate mode.

Bit	Value	Function
0	0	Not used
1	0	Command echo disabled
	1	Command echo enabled
2	0	Result codes enabled
	1	Result codes disabled
3	0	Display result codes in numeric format
	1	Display result codes in verbose format

4	0	Not used
5	0	Tone dial enabled
	1	Pulse dial enabled
6	0	Not used

BIT-MAPPED REGISTER S21

Format AT [cmds] S21=*n* [cmds]

Range: 0-253

Unit: Bit-mapped

Description: Selects jack type, CTS/DCD/DSR signals, and low DTR action

Bit	Value	Function
0	0	Selects RJ-11, RJ-41S, or RJ45S jack
	1	Selects RJ-12 or RJ-13 jack
1	0	Not used
2	0	Not used
4, 3	00	DTR forced high
	01	DTR toggle causes online command mode
	10	Normal DTR operations
5	0	Not used
6	0	DSR bahavior (not used)
7	0	Not used

BIT-MAPPED REGISTER S27

Format AT [cmds] S27=*n* [cmds]

Range: 0-111

Unit: Bit-mapped

Description: Selects synchronous/asynchronous mode, line type, clock source, and ITU-T/Bell modes.

Bit	Value	Function

3, 1, 0	00	Asynchronous mode, serial port speed follows connect speed
	01	Error corrected mode
	10	Buffered asyncronous mode
2, 4-7	0	Not Used

BIT-MAPPED REGISTER S28

Format AT [cmds] S28=*n* [cmds]

Range: 0-31

Unit: Bit-mapped

Description: Controls transmit/receive speed, MNP link negotiation speed

Bit	Value	Function
0-2	0	Not Used
4, 3	00	39ms make/61ms break at 10pps
	01	33ms make/67ms break at 10pps
	10	39ms make/61ms break at 20pps
	11	33ms make/67ms break at 20pps
7, 6	00	MNP link negotiation at highest possible speed
	01	MNP link negotiation at 1200bps
	10	MNP link negotiation at 4800bps

BIT-MAPPED REGISTER S31

Format: AT [cmds] S31=*n* [cmds]

Range: 0-10

Description: Select line speed detection

Bit	Value	Function
0	0	Not used
1	0	Line speed auto-detection disabled
	1	Line speed auto-detection enabled
2-7	0	Not used

BIT-MAPPED REGISTER S40

Format AT [cmds] S40=*n* [cmds]

Range: 0-255

Unit: Bit-mapped

Description: Controls power level and break handling; selects MNP extended services, link negotiation, and block size.

Bit	Value	Function
0-1	0	Not Used
2	0	Not Used
5, 4, 3	0	Not Used
7, 6	■ 00	MNP block size is 64 characters
	01	MNP block size is 128 characters
	10	MNP block size is 192 characters
	11	MNP block size is 256 characters

BIT-MAPPED REGISTER S41

Format AT [cmds] S41=*n* [cmds]

Range: 0-31

Unit: Bit-mapped

Description: Selects compression, auto-retrain, flow control, and MNP mode.

Bit	Value	Function
1 - 0	00	Data compression disabled
	01	MNP5 enabled
	10	V.42bis enabled
	11	MNP5 and V.42bis enabled
2	0	Not Used
3	0	Flow control disabled
	1	Flow control enabled
4	0	Stream mode for MNP
	1	Block mode for MNP
5-7	0	Not Used

CONNECTION FAILURE CODES

Type: Register

Format AT [cmds] S86? [cmds]

Description: Reports codes which correspond to the possible causes of a connection failure

Value	Meaning
0	Normal hang up
4	Carrier signal lost
9	No common protocol found
12	No failure - remote modem disconnected normally
13	Remote modem failed to respond after 10 re-transmissions same message
14	Violation of negotiated protocol caused failure

DCE LINE SPEED

Type: Register

Format AT [cmds] S37=*n* [cmds]

Description: Sets the maximum allowable data exchange rate attempted during handshake process.

Command	Function
■ S37=0	Attempt an automode connection
S37=1	300bps
S37=2	300bps
S37=3	300bps
S37=4	Reserved
S37=5	V.22 at 1200bps
S37=6	V.22 at 2400bps
S37=8	V.32bis at 4800bps
S37=7	Reserved

S37=9	V.32bis at 9600bps
S37=10	V.32bis at 12.0Kbps
S37=11	V.32bis at 14.4Kbps
S37=12	V.32bis at 7200bps
S37=13	Reserved
S37=14	Reserved
S37=15	V.34 at 14.4Kbps
S37=16	V.34 at 16.8Kbps
S37=17	V.34 at 19.2Kbps
S37=18	V.34 at 21.6Kbps
S37=19	V.34 at 24.0Kbps
S37=20	V.34 at 26.4Kbps
S37=21	V.34 at 28.8Kbps
S37=22	V.34 at 33.6Kbps

ERROR CORRECTION/COMPRESSION

Type: Register

Format: AT [cmds] S46=*n* [cmds]

Description: Selects active error correction and compression protocols

S46=136	LAP-M only, no compression
S46=138	LAP-M with V.42bis data compression

FLOW CONTROL

Type: Register

Format AT [cmds] S39? [cmds]

Description: Displays the current flow control

Value	**Meaning**
0	Flow control disabled

1	RTS/CTS flow control enabled
2	XON/XOFF flow control enabled
3	Transparent XON/XOFF flow control enabled
4	Both RTS/CTS & XON/XOFF flow control enabled

TEST MODES

Type: Register

Format: AT [cmds] S16=*n* [cmds]

Range: 0-125

Unit: Bit-mapped

Description: Controls loopback tests, analog, digital, remote digital, and self tests.

Bit	Value	Function
0	0	Local analog loopback disabled
	1	Local analog loopback enabled
1	0	Not used
2	0	Local digital loopback disabled
	1	Local digital loopback enabled
3-7	0	Not used

TIES/HAYES

Type: Register

Format: AT [cmds] S68=*n* [cmds]

Description: Selects TIES/Hayes

Command	Function
S68=0	TIES enabled
S68=1	Hayes escape sequence enabled

TRANSMISSION LEVEL - DATA

Type Register or Configuration

Format AT [cmds] S91=*n* [cmds]

Range 6-15

Unit -1dBm

Default 10

Description Sets the signal level for data transmission

TRANSMISSION LEVEL - FAX

Type Register or Configuration

Format AT [cmds] S92=*n* [cmds]

Range 6-15

Unit -1dBm

Default 10

Description Sets the signal level for fax transmission

VOICE COMMANDS

AEC/SPEAKERPHONE

Type: Configuration

Format: AT [cmds] +VSP=*n* [cmds]

Description: Controls AEC/speaker phone. +VSP=? queries setting

Command	Function
+VSP=0	Unidentified
+VSP=1	Unidentified

AUTOMATIC HANG-UP CONTROL

Type: Configuration

Format: AT [cmds] +VNH=*n* [cmds]

Description: Controls hang-ups in non-voice mode. +VNH=? queries setting

Command	Function
+VNH=0	Normal hang-up
+VNH=1	DCE initiated hang-ups are disabled in non-voice modes
+VNH=2	Logical hang-up. Automatic hang-up is disabled but OK result will be issued to hang-up command in non-voice modes

EVENT REPORTING AND MASKING

Type: Immediate

Format: AT [cmds] +VEM=*n* [cmds]

Default: FFFFFFFF8

Range: Unidentified

Unit: Hexadecimal

Description: Selects value of event mask to DTE. +VEM=? queries four lines of information, corresponding to the service level, voice transmit state, voice receive state, and voice command state

RECEIVE DATA SOURCE

Type: Configuration

Format: AT [cmds] +VRX=*n* [cmds]

Description: Enables voice reception process on DCE.

Command	Function
VRX=0	Voice reception enabled
VRX=1	Voice reception with DCE periodic tone enabled

TONE GENERATOR (PHONE KEYS)

Type: Immediate

Format: AT [cmds] +VTS=*a*

Unit: ASCII [0-9, A-D, #, *]

Description: Generates the DTMF tone for the characters in the string for the duration set with +VTD. +VTS=? queries values

TONE GENERATOR LENGTH

Format: AT [cmds] +VTD=*n* [cmds]

Default: 100

Range: 0 - 500

Unit: .01sec

Description: Sets the length of DTMF tones that are generated. +VTD=? queries values

VOICE DEVICE

Type: Configuration

Format: AT [cmds] +VLS=*n* [cmds]

Description: Selects the I/O device for the DSP chip. +VLS=? queries setting

VOICE GAIN - PLAYBACK

Type: Configuration

Format: AT [cmds] +VGT=*n* [cmds]

Range: 0, 128

Description: Sets the gain for voice playback.

VOICE GAIN - RECORD

Type: Configuration

Format: AT [cmds] +VGR=*n* [cmds]

Range: 0-128

Description: Sets the gain for received voice signals. A value of 0 sets automatic gain level.

VOICE PARAMETERS

Type: Configuration

Format: AT [cmds] +VIP=*n* [cmds]

Description: Resets voice parameters to factory default settings. +VIP=? Will display acceptable profiles

VOICE SILENCE DETECTION

Type:	Configuration
Format:	AT [cmds] +VSD=*m*,*n* [cmds]
Default:	*m* = 128, *n* =50
Range:	*m* 0-255, *n* 0-600
Unit:	*m* 1 dB, *n* .1 second
Description:	Sets the threshold of silence detection (*m*) and the minimum period of silence required to be detected (*n*). +VSD=? queries values