MOTOROLA, INC.
VOICESURFR 56K (INTERNAL)

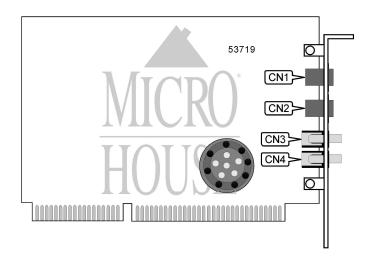|	
Card Type	Modem (asynchronous)
Chip Set	Rockwell
I/O Options	Voice, speakerphone, microphone in, speaker out
Maximum Modem Rate	56Kbps
Maximum Fax Rate	14.4Kbps
Data Modulation Protocol	Bell 103A/212A
	ITU-T V.21, V.22, V.22bis, V.23, V.32, V.32bis, V.34
	Rockwell V.FC, K56+
Fax Modulation Protocol	ITU-T V.17, V.21CH2, V.27ter, V.29
Error Correction/Compression	MNP5, V.42, V.42bis
Fax Class	Class I
Data Bus	16-bit ISA
Card Size	Three-quarter length, full-height

CONNECTIONS			
Function	**Label**	**Function**	**Label**
Telephone line	CN1	Microphone in or speaker out	CN3
Telephone line	CN2	Microphone in or speaker out	CN4
Note: It is not known which of CN1 and CN2 is the microphone in jack and which is the speaker out jack.			

SUPPORTED STANDARD COMMANDS
Basic AT Commands
+++, 'comma', A/
A, B, E, H, L, M, N, O, P, Q, T, V, W, X, Y, Z
&C, &D, &F, &G, &K, &P, &R, &S, &T, &V, &W, &Y, &Z
Extended AT Commands
\A, \B, \K, \N, \V
%C, %E, %L, %Q
Special AT Commands
#CID, +MS
S-Registers
S0, S1, S2, S3, S4, S5, S6, S7, S8, S9, S10, S11, S12, S14, S16, S18, S21, S22, S23, S24, S25
S26, S27, S28, S29, S30, S32, S33, S36, S38, S39, S40, S46, S48, S82, S86, S91, S92, S95
Note: See MHI help file for complete information.

UNIDENTIFIED COMMANDS	
Command	**Default**
+ES=*nnn*	3,0,2
+ESA=*nnnnnnnn*	0,0,0,0,0,0,0,0
+ITF=*nn*	255,64

Proprietary AT Command Set

BIT-MAPPED REGISTER S31		
Format:	AT [cmds] S31=*n* [cmds]	
Default:	2	
Range:	0 - 43	
Description:	Select automode, extended result code format, and caller ID format.	
Bit	**Value**	**Function**
0	í 0	Extended result codes controlled by S95.
	1	Extended result codes set for single-line format.
1	0	Auto-mode detection disabled
	í 1	In originate mode, handshake begins at line speed designated by the S37 register. Modem can shift to a slower speed if necessary. In answer mode, handshake attempted with the following protocols in order - V.FC, V.32bis, V.32, V.22bis, V.22 or Bell 212, V.21, and Bell 103
3, 2	í 00	Enables CONNECT result codes to report DTE speed
	01	Full reporting of CONNECT result codes
	10	Enables CONNECT result codes to report DCE speed
5, 4	í 00	Caller ID disabled.
	01	Caller ID displays formatted data.
	10	Caller ID displays raw hexadecimal data.

BIT-MAPPED REGISTER S41		
Format	AT [cmds] S41=*n* [cmds]	
Default:	71	
Range:	0 - 71	
Description:	Selects compression and auto-retrain.	
Bit	**Value**	**Function**
1, 0	00	Data compression disabled.
	01	MNP5 enabled.
	10	V.42bis enabled.
	í 11	MNP5 and V.42bis enabled.
6, 2	00	Auto-retrain disabled.
	01	Auto-retrain enabled.
	í 11	Auto-fallback/fall-forward enabled.
5 - 3	000	Not used.

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DIAL	
Type:	Immediate
Format:	AT [cmds] D<#>;[cmds]
Description:	Dials the telephone number indicated according to any modifiers included in the string.

Command	Function
DL	Re-dial last number.
DP	Pulse dialing enabled.
DS=*n*	Dial stored telephone number *n*.
DT	Tone dialing enabled.
DW	Dialing resumed following dial tone detection.
D,	Dialing paused for amount of time specified in S8 register.
D>	Transmit grounding pulse.
D!	Flash function initiated. Modem commanded to go off-hook for specified time before returning on-hook.
D@	Wait for Quiet Answer function enabled. Modem waits until a "quiet answer," a ring-back signal followed by silence up to the time specified in S7, is received prior to executing the rest of the dial string.
D&	Wait for prompt tone detection function enabled. Waits for prompt tone for amount of time specified by the S7 command.
D*	Toggles calling tone on or off for this call.
D;	Modem returned to idle state after dialing. The semicolon can only be placed at the end of the dial command.

DISPLAY BLACKLIST NUMBERS	
Type:	Immediate
Format:	AT [cmds] *B [cmds]
Description:	Displays the list of all the numbers on the blacklist and their statuses.

DISPLAY CHIPSET MANUFACTURER	
Type:	Immediate
Format:	AT [cmds] #MFR? [cmds]
Description:	Displays the voice chipset manufacturer's name.

DISPLAY CHIPSET MODEL NAME	
Type:	Immediate
Format:	AT [cmds] #MDL? [cmds]
Description:	Displays the model name of the modem's voice chipset.

DISPLAY CHIPSET REVISION	
Type:	Immediate
Format:	AT [cmds] #REV? [cmds]
Description:	Displays the revision level of the modem's voice chipset.

DISPLAY DELAYED NUMBERS	
Type:	Immediate
Format:	AT [cmds] *D [cmds]
Description:	Displays the list of all delayed numbers and their statuses.

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DISPLAY INFORMATION	
Type:	Immediate
Format:	AT [cmds] I*n* [cmds]
Description:	Displays information requested about the modem.
Command	**Function**
I0	Displays product identification code.
I1	Displays ROM checksum.
I2	Tests and displays ROM checksum result.
I3	Displays firmware revision, model, and interface.
I4	Displays product name.
I5	Displays country code.
I6	Displays data pump model and revision.

DISTINCTIVE RING		
Format:	AT [cmds] -SDR=*n* [cmds]	
Default:	Unidentified	
Range:	0 - 7	
Description:	Selects which distinctive ring signals the modem will respond to.	
Bit	**Value**	**Function**
0	0	Do not respond to distinctive ring type 1.
	1	Respond to distinctive ring type 1.
1	0	Do not respond to distinctive ring type 2.
	1	Respond to distinctive ring type 2.
2	0	Do not respond to distinctive ring type 3.
	1	Respond to distinctive ring type 3.

MODE SELECTION	
Type:	Immediate
Format:	AT [cmds] #CLS=*n* [cmds]
Description:	Selects which mode the modem will operate in.
Command	**Function**
#CLS=0	Modem will operate in data mode.
#CLS=1	Modem will operate in fax class 1 mode.
#CLS=8	Modem will operate in voice mode.

RPI CONFIGURATION	
Type:	Configuration
Format:	AT [cmds] +H*n* [cmds]
Description:	Configures the Rockwell Protocol Interface.
Command	**Function**
+H0	RPI disabled.
+H1	RPI enabled and local serial port speed set to 19.2Kbps.
+H2	RPI enabled and local serial port speed set to 38.4Kbps.
+H3	RPI enabled and local serial port speed set to 57.6Kbps.
+H11	RPI+ enabled.

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SPEAKERPHONE OPTIONS

Command	Function	
Type:	Configuration	
Format:	AT [cmds] #SPK=*x,y,z* [cmds]	
Description:	Sets various options for speakerphone functions.	
Command	**Function**	
x=0	Microphone enabled.	
x=1	Microphone disabled.	
x=2	Microphone enabled with maximum gain, speaker disabled.	
y	**Default:**	5
	Range:	0 - 16
	Unit:	-2 dBm
	Description:	Sets the attenuation level for speaker output in voice mode. A value of 16 will mute the speaker.
z=0	Microphone gain set to 0 dBM.	
z=1	Microphone gain set to 6 dBM.	
z=2	Microphone gain set to 9.5 dBM.	
z=3	Microphone gain set to 12 dBM.	

TONE DETECTION

AT [cmds] #VTD=*x,y,z* [cmds]

x,y,z 63

0 - 63

Sets which tones the tone detection will report.

The value of *x* sets the tone detection modes in voice transmit mode, *y* sets the
voice command mode.

Value		Function
0	DTMF tones are not detected.	
í 1	DTMF tones are detected.	
	0	V.25 1300Hz calling tone is not dete
	í 1	V.25 1300Hz calling tone is detected
	0	T.30 1100Hz fax tone is not detecte
	í 1	T.30 1100Hz fax tone is detected.
	0	V.25/T.30 2100Hz answer tone is no
	í 1	V.25/T.30 2100Hz answer tone is de
	0	Bell 2225Hz answer tone is not dete
	í 1	Bell 2225Hz answer tone is detected
	0	Call progress tones are not detected
	í 1	Call progress tones are detected.

TONE GENERATOR - DIRECT ENTRY

Type:	Immediate
Format:	AT [cmds] #VTS=[*m, n, x*]
Range:	*m* 200-3000, *n* 200-3000, *x* 0-255
Unit:	*m* 1 Hz, *n* 1 Hz, *x* .1 second
Description:	Generates a dual-frequency tone for duration *x* at frequencies *m* and *n*.

Continued on next page. . .

TONE GENERATOR - TIMED PHONE KEYS	
Type:	Immediate
Format:	AT [cmds] #VTS={*a, n*}
Range:	*a* 0-9, A-D, #, *; *x* 0-255
Unit:	*x* .1 second
Description:	Generates the DTMF tone for duration *x* for the character *a*.

TONE GENERATOR - PHONE KEYS	
Type:	Immediate
Format:	AT [cmds] #VTS=*a*
Range:	0-9, A-D, #, *
Description:	Generates the DTMF tones for the characters in the string for the duration set with +VBT.

TONE GENERATOR LENGTH	
Format	AT [cmds] #VBT=*n* [cmds]
Default:	10
Range:	0 - 40
Unit:	0.1 second
Description:	Sets the length of DTMF tones that are generated.

VOICE BUFFER SPACE	
Type:	Configuration
Format:	AT [cmds] #VSK=*n* [cmds]
Default:	255
Range:	0 - 255
Unit:	1 byte
Description:	Sets the amount of data the modem can send into the buffer after the XOFF signal is sent.

VOICE DEVICE	
Type:	Configuration
Format:	AT [cmds] #VLS=*n* [cmds]
Description:	Selects the I/O device for the DSP chip.
Note:	This modem may not support all options listed below. The #VLS? command will display the available options.

Command	Function
í #VLS=0	Telephone line and handset used for voice I/O.
#VLS=1	Telephone handset used for voice I/O.
#VLS=2	Internal speaker only used for voice I/O.
#VLS=3	External microphone only used for voice I/O.
#VLS=4	Telephone line and handset used for voice I/O; internal speaker enabled.
#VLS=5	Headset used for voice I/O.
#VLS=6	Speakerphone used for voice I/O.
#VLS=7	Handset muted by disconnecting handset or speakerphone from telephone line.
#VLS=8	Connects caller ID relay for recording of conversation over handset.
#VLS=9	Connects handset (or speakerphone) to DSP chip for recording or playback.

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VOICE - DISPLAY BUFFER SIZE	
Type:	Immediate
Format:	AT [cmds] #VBQ? [cmds]
Description:	Displays the size of the voice buffer.

VOICE - DISPLAY COMPRESSION TYPE	
Type:	Immediate
Format:	AT [cmds] #VCI? [cmds]
Description:	Displays the type of compression currently in use.

VOICE - LOCAL SERIAL PORT SPEED	
Type:	Configuration
Format:	AT [cmds] #BDR=n [cmds]
Default:	0
Range:	0 - 48
Unit:	2400bps
Description:	Sets the speed of the local serial port when in voice mode. A value of 0 indicates that the modem should auto-detect the correct serial port speed.

VOICE RE-RING DETECT TIME	
Type:	Configuration
Format:	AT [cmds] #VRA=n [cmds]
Default:	70
Range:	0-255
Unit:	10 mS
Description:	Sets the maximum time the modem will wait for the remote station to ring again before it assumes that it has gone off-hook.

VOICE RECEIVE	
Type:	Immediate
Format:	AT [cmds] #VRX
Description:	Commands the modem to begin receiving voice data.

VOICE RING DETECT TIME	
Type:	Configuration
Format:	AT [cmds] #VRN=n [cmds]
Default:	Unidentified
Range:	Unidentified
Unit:	Unidentified
Description:	Sets the maximum time the modem will wait for the remote station to ring before it assumes that it went off-hook before it rang.

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VOICE SAMPLE QUALITY	
Type:	Configuration
Format:	AT [cmds] #VBS=n [cmds]
Description:	Selects the number of bits per sample that the modem records.
Note:	This modem may not support all options listed below. The #VBS? command will display the available options.

Command	Function
#VBS=2	Modem records 2 bits per sample in ADPCM encoding.
#VBS=3	Modem records 3 bits per sample in ADPCM encoding.
í #VBS=4	Modem records 4 bits per sample in ADPCM encoding.
#VBS=8	Modem records 8 bits per sample in PCM encoding.
#VBS=16	Modem records 16 bits per sample in PCM encoding.

VOICE SAMPLING RATE	
Type:	Configuration
Format:	AT [cmds] #VSR=n [cmds]
Description:	Sets the sampling rate used when recording voice signals.

Command	Function
í #VSR=7200	Selects a sampling rate of 7.2KHz.
#VSR=8000	Selects a sampling rate of 8KHz.
#VSR=11025	Selects a sampling rate of 11.025KHz in PCM encoding only.

VOICE SILENCE DETECTION TIME	
Type:	Configuration
Format:	AT [cmds] #VSP=n [cmds]
Default:	Unidentified
Range:	0 - 255
Unit:	.1 second
Description:	Sets the minimum amount of silence that the modem will detect.

VOICE SILENCE DETECTION THRESHOLD	
Type:	Configuration
Format:	AT [cmds] #VSS=n [cmds]
Description:	Sets the threshold of sensitivity that the modem uses to determine silence detection.

Command	Function
#VSS=0	Silence detection disabled.
#VSS=1	Minimum silence detection sensitivity.
#VSS=2	Standard silence detection sensitivity.
#VSS=3	Maximum silence detection sensitivity.

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VOICE TIMING MARK	
Type:	Configuration
Format:	AT [cmds] #VTM=*n* [cmds]
Description:	Configures timing mark placement.

Command	Function
#VTM=0	Timing marks disabled.
#VTM=1	Timing marks enabled.

VOICE TRANSMISSION LEVEL	
Type:	Configuration
Format:	AT [cmds] #TL=*hhhh* [cmds]
Default:	3FFF
Range:	0000 - 7FFF
Unit:	Unidentified (hexadecimal)
Description:	Sets the transmission level for sending audio in voice mode.

VOICE TRANSMIT	
Type:	Immediate
Format:	AT [cmds] #VTX
Description:	Commands the modem to begin transmitting voice data.

VOICE VOLUME LEVEL	
Type:	Configuration
Format:	AT [cmds] #VGT=*n* [cmds]
Description:	Sets the volume level when playing back audio signals.

Command	Function
#VGT=128	Low volume setting.
í #VGT=129	Medium volume setting.
#VGT=130	High volume setting.
#VGT=131	Highest volume setting.