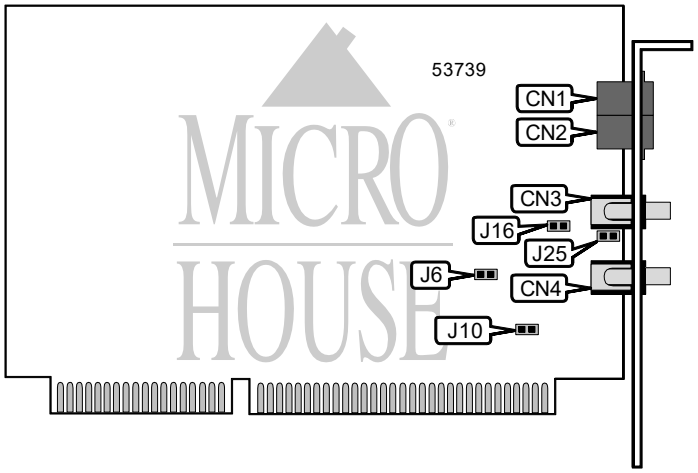
ZOOM TELEPHONICS, INC.
COMSTAR 33600 SVD

Card Type	Modem (asynchronous)
Chip Set	Rockwell
I/O Options	Voice, speakerphone, SVD, speaker out, microphone in
Maximum Data Rate	33.6Kbps
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
Fax Modulation Protocol	ITU-T V.17, V.21CH2, V.27ter, V.29, V.33
Fax Class	Class I
Error Correction/Compression	MNP5, MNP10EC, V.42, V.42bis
Data Bus	16-bit ISA



CONNECTIONS			
Function	**Label**	**Function**	**Label**
Telephone line out	CN1	Speaker out	CN3
Telephone line in	CN2	Microphone in	CN4

USER CONFIGURABLE SETTINGS		
Setting	**Label**	**Position**
í Speaker jack is monaural	J16	Open
Speaker jack is stereo	J16	Closed
í Microphone is electret	J25	Closed
Microphone is dynamic	J25	Open

AUDIO OUTPUT LEVEL CONFIGURATION		
Setting	**J6**	**J10**
Lowest	Open	Closed
Low	Open	Open
Medium	Closed	Closed
High	Closed	Open

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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, &Q, &S, &T, &V, &W, &Y, &Z
Extended AT Commands
\A, \B, \G, \N, \V
%C, %E, %L, %Q
Special AT Commands
#CID, :E, -K, +MS, -Q
S-Registers
S0, S1, S2, S3, S4, S5, S6, S7, S8, S9, S10, S12, S18, S24, S25, S26, S29, S30, S32, S33, S36
S38, S39, S46, S48, S82, S86, S95
Note: See MHI documentation for complete information.

UNIDENTIFIED COMMANDS	
Command	**Default**
\K	Unidentified
S14	Unidentified
S16	Unidentified
S21	Unidentified
S22	Unidentified
S23	Unidentified
S27	Unidentified
S28	Unidentified
S31	Unidentified
S40	Unidentified
S41	Unidentified

Proprietary AT Command Set

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.

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DIAL (CON'T)	
Command	**Function**
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^	Calling tone enabled for this call.
D&	Wait for prompt tone detection function enabled. Waits for prompt tone for amount of time specified by the S7 command.
D;	Modem returned to idle state after dialing. The semicolon can only be placed at the end of the dial command.

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 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.
I4	Displays modem identifier.
I5	Displays country code.
I6	Displays data pump modem and revision.

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DISTINCTIVE RING	
Type:	Configuration
Format:	AT [cmds] $$R*n* [cmds]
Description:	Selects whether the modem will use the Distinctive Ring function.

Command	Function
í $$R0	Distinctive Ring disabled.
$$R2	Distinctive Ring enabled.

DISTINCTIVE RING TYPES	
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.

LINE SPEED	
Type:	Register
Format:	AT [cmds] S37=*n* [cmds]
Description:	Sets the maximum allowable data exchange rate attempted during the handshaking process.

Command	Function
í S37=0	Attempt to connect at fastest common speed.
S37=1	Set speed to 300bps.
S37=2	Set speed to 300bps.
S37=3	Set speed to 300bps.
S37=5	Set speed to 1200bps.
S37=6	Set speed to 2400bps.
S37=7	Attempt to connect with V.23.
S37=8	Set speed to 4800bps.
S37=9	Set speed to 9600bps.
S37=10	Set speed to 12Kbps.
S37=11	Set speed to 14.4Kbps.
S37=12	Set speed to 7200bps.

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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.

MNP10EC MODE	
Type:	Configuration
Format:	AT [cmds] -SEC=*n* [cmds]
Description:	Selects whether the modem will attempt to use MNP10EC mode during the handshaking sequence.
Command	**Function**
-SEC=0	MNP10EC handshaking disabled unless a V.34 connection is attempted via a cellular line.
í -SEC=1	MNP10EC handshaking enabled.

SPEAKERPHONE OPTIONS		
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.	

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SVD OPTIONS	
Type:	Configuration
Format:	AT [cmds] $$AS*n* =*xx* [cmds]
Description:	Selects whether the modem will use SVD mode and selects the line source for it.

Command	**Function**
$$AS*n* =OFF	SVD enabled
$$AS*n* =ON	SVD disabled.
n=1	Telephone handset used for voice I/O with high data throughput.
n=2	Telephone handset used for voice I/O with high voice throughput.
n=3	Telephone line used for voice I/O with high data throughput.
n=4	Telephone line used for voice I/O with high voice throughput.
í *n*=5	Speakerphone used for voice I/O with high data throughput.
n=6	Speakerphone used for voice I/O with high voice throughput.

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*.

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TONE GENERATOR - TIMED PHONE KEYS	
Type:	Immediate
Format:	AT [cmds] #VTS={*a*, *n*}
Range:	*a* 0-9, A-D, #, *; *n* 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 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.

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

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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:	70
Range:	0 - 255
Unit:	.1 second
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.

VOICE SAMPLE QUALITY	
Type:	Configuration
Format:	AT [cmds] #VBS=*n* [cmds]
Description:	Selects the number of bits per sample that the modem records.
Command	**Function**
#VBS=2	Modem records 2 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.

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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=11025	Selects a sampling rate of 11.025KHz in PCM encoding only.

VOICE SILENCE DETECTION	
Type:	Configuration
Format:	AT [cmds] #VSD=*n* [cmds]
Description:	Selects whether the modem will use silence detection to pause recording during periods of silence.
Command	**Function**
í #VSD=0	Silence detection disabled.
#VSD=1	Silence detection enabled.

VOICE SILENCE DETECTION TIME	
Type:	Configuration
Format:	AT [cmds] #VSP=*n* [cmds]
Default:	55
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.

VOICE TIMING MARK	
Type:	Configuration
Format:	AT [cmds] #VTM=*n* [cmds]
Description:	Configures timing mark placement.
Command	**Function**
í #VTM=0	Timing marks disabled.
#VTM=10	Timing marks enabled.

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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]
Default:	153
Range:	128 - 228
Unit:	Unidentified
Description:	Sets the volume level when playing back audio signals. Lower numbers indicate a lower volume level.