
**High Performance
V.90/K56Flex/V.34+/V.42bis
56K BPS
Plug & Play External
Voice/FAX/Data Modem**

*With Advanced
Speakerphone functions*

User's Manual

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Section One - Introduction

This 56 Kbps* Plug and Play FAX/Voice/Data Speakerphone Modem connects your computer to all popular high speed modems available today. The modem incorporates "V.90/K56Flex"(56Kbps) technology to provide increased download speeds using regular telephone lines. The modem incorporates Plug and Play for ease of installation. It features speakerphone capabilities for hands-free communication.

This manual describes the hardware installation procedures for your new modem. Additional information on AT commands and S-registers is provided so that your system can be customized for a particular operating environment.

**Note: V.90/K56Flex is capable of downloading at 56Kbps. However, current FCC regulations limit its speeds to 53Kbps.*

Section Two - Installation

This section will provide step by step instructions on how to install your new 56 Kbps Voice/FAX/Data modem. Installation of this modem product is a two-step process consisting of: 1) hardware installation and, 2) communication software installation and configuration.

2.1 Unpacking Your Modem

Be certain that you have all the items listed below. This package contains:

- ¡EA modem
- ¡EA telephone cable
- ¡ESoftware for the modem
- ¡ESoftware user's manual
- ¡EA modem power supply
- ¡EA User's manual

2.2 Hardware Installation

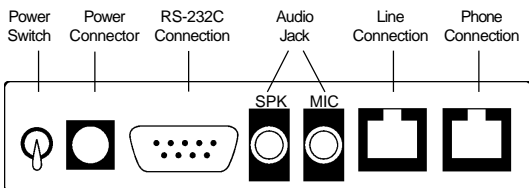
Installation of this modem requires an available serial port on your computer. This is either a 25-pin or 9-pin male connector on the back of your computer. Consult the computer's manual on this topic. You will also need a properly configured serial cable. The recommended cable for IBM Compatible PCs with a 25-pin serial port is an RS-232 cable with all 25 pins configured Straight-through.

For computers with a 9-pin serial port, use an IBM AT type (9-pin to 25-pin) RS-232 serial cable. For Macintosh Plus or newer computers, use *only* a high speed RS-232 serial cable that supports hardware flow control signals.

Note: Exercise caution when working with any AC-powered device. Always turn the power off when connecting or disconnecting cables to or from the device.

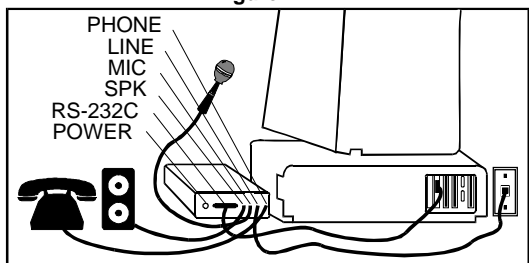
1. Turn your computer off.
2. Plug the male end of the RS-232 modem cable into the connector marked **RS-232C** on the back of the modem (refer to Figure 2-1).

Figure 2-1



3. Plug the other end of the cable into the serial port on your computer (refer to Figure 2-2).

Figure 2-2



4. Turn the modem's power switch off. Plug the round end of the power cord into the connector marked **POWER** on the back of the modem.
5. Plug the transformer end of the power adapter into an AC wall outlet.
6. Connect the telephone cable from the modem's **LINE** "c" connector to the telephone wall jack.

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7. Optionally, connect a telephone to the modem's **PHONE** connector.
 8. Turn the modem on.
 9. Turn your computer on. Your modem is now installed.

If you are running Windows 95, continue to **Section 2.3** for configuration information. Otherwise, proceed to **Section 2.4** for communication software installation.

2.3 Configuring in Windows 95

2.3.1 Windows 95 Release 4.00.950

When Windows 95 starts for the first time after card installation, it detects the modem and displays the **New Hardware Found** dialog box.

Under **New Hardware Found**, when asked to "Select which driver you want to install for your new hardware," click on "Driver from disk provided by hardware manufacturer." Click **OK**.

The **Install From Disk** dialog box now instructs you to "insert the manufacturer's installation disk into the drive selected, and then click **OK**." Insert the modem's driver diskette into the disk drive and type **A:**(or **B:** if inserted in drive B) in the "Copy manufacturer's files from:" box. Click **OK**.

Windows 95 may request its own installation disks or CD-ROM for some files. Insert the Windows 95 disks or CD-ROM as required. When all necessary files are copied, the modem is configured. **Proceed to Section 2.4.**

2.3.2 Windows 95 Release 4.00.950 B

When Windows 95 starts for the first time after card installation, it detects the modem and displays the **Update Device Driver Wizard**.

Insert the driver disk into the disk drive and click **Next**. Windows will find the driver on the driver disk. Click **Finish**. Windows 95 may request its own installa-

tion disks or CD for some files. Insert the Windows 95 disks or CD as required.

Windows will now find a second device on the modem. Make sure that the driver disk is still in the disk drive and click "Next." Windows will find the second driver. Click "Finish" to complete the installation.

When all necessary files are copied, the modem is configured. **Proceed to Section 2.4.**

2.4 Software Installation and Configuration

You are now ready to install and configure the communication software. Refer to your software manual for installation procedures.

We suggest the following communication parameters when you first use your data communication software. Consult the software manual for information on using these and other parameters/features.

115,200 bps; 8 data bits; no parity; 1 stop bit; RTS/CTS flow control set to on;” initialization string:AT&F.

We suggest that a "**Generic Class 1**" modem type should be selected in your fax software, and a "**Generic Rockwell**" modem type should be selected in your Voice software.

Note that the COM port setting in your communication software must be the COM port that connects the modem to the computer.

2.5 Using the Fax, Voice, and Speakerphone Capabilities of the Modem

Your modem has built-in advanced FAX, Voice, and Full Duplex Speakerphone functions. Please consult your FAX/Voice/Speakerphone software manual about procedures on using these features.

Voice functions include recording and playback of voice prompts (files). You may record or playback voice with your modem by attaching a telephone to the RJ-11 jack marked "PHONE" or by attaching a microphone to the MIC jack and a speaker to the SPK jack located on the back of the modem bracket. Follow instructions in the FAX/

Voice/Speakerphone software on recording and playback of voice prompts.

2.6 Testing Your Modem After Installation

In order to test your modem you should be familiar with your communication software. Load and set up your communication software and enter into "Terminal mode." Make sure that the COM Port and IRQ settings of the software match the modem. Type **AT** on your terminal screen and press **ENTER**. You may see AT,AATT or nothing on the screen. In any case, the modem should respond with an **OK** or **0**. If it does not, please refer to Section 6 for troubleshooting information.

2.7 Using Your Modem

The communication software included with your modem product provides a user friendly interface to access the voice and fax and data functions of your modem. ***This software should be sufficient for all of your communication needs.*** There may be times when you need to access the modem manually via modem commands. Read Section 3 for a summary description of the modem command set before manually accessing the modem. You may want to read the software manual first, however, as the software may already provide a user friendly method of accessing the functions you need (i.e. dialing or answering calls).

2.8 Front Panel LEDs

The modem provides LED indicators on the front panel to allow call progress monitoring. When the LEDs are lit they indicate the following:

TST	<i>Flashing</i> when the modem is in the test mode or if an error is detected.
HS	<i>High speed</i> -on when communicating at 2400 bps or above.
AA	<i>Auto-Answer</i> On when auto answer is enabled. Flash when ring is detected.
CD	<i>Carrier Detect</i> The modem has detected a carrier signal from the remote modem
OH	<i>Off Hook</i> The modem has gone off hook in preparation to dialing or answering a call
RD	<i>Receive Data</i> Data is being sent to the

	computer from the modem
SD	<i>Send Data</i> Data is being received by the modem from the computer
TR	<i>Terminal Ready</i> The modem is able to receive commands.
MR	<i>Modem Ready</i> The modem is turned on.

2.9 Where To Go From Here

You should familiarize yourself with the functions available from the included software by reading its manual. You will be accessing most, if not all, of the modem's functions from this software. You may also use any other commercially available communication software with the modem. Read Section 3 ONLY if you are interested in accessing the modem manually, and not through the included software. Section 4 and 5 contain reference material, and can be skipped. If you have difficulties getting your modem to work, read Section 6, Troubleshooting to find answers to commonly asked questions and problems.

Section Three - AT Command Set

3.1 Executing Commands

Commands are accepted by the modem while it is in Command Mode. Your modem is automatically in Command Mode until you dial a number and establish a connection. Commands may be sent to your modem from a PC running communication software or any other terminal devices.

Your modem is capable of data communication at rates of: **300, 1200, 2400, 4800, 9600, 14400, 19200, 28800, 38400, 57600,** and **115200** bps. Make sure your COM port baud rate settings in your communications software is set to one of the above speeds.

3.2 Command Structure

All commands sent to the modem must begin with **AT** and end with **ENTER**. All commands may be typed in either upper or lower case, but not mixed. To make the command line more readable, spaces may be inserted between commands. If you omit a parameter from a

command that requires one, it is just like specifying a parameter of **0**. Example:

ATH[ENTER]

This command causes your modem to hang up.

3.3 Basic AT Commands

In the following listings, all default settings are printed in **bold text**.

Command	Function
A	Manually answer incoming call.
A/	Repeat last command executed. Do not precede A/ with AT or follow with ENTER .
B_	B0 CCITT mode B1 Bell mode
D_	0 - 9, A-D, # and * L last number redial P pulse dialing T touch-tone dialing W wait for second dial tone , pause @ wait for five seconds of silence ! flash ; return to Command Mode after dialing
DS=n	Dial one of the four telephone numbers (n=0-3) stored in the modem's non-volatile memory.
E_	E0 Commands are not echoed E1 Commands are echoed
+++	Escape Characters - Switch from Data Mode to Command Mode
H_	H0 Force modem on-hook (hang up) H1 Force modem off-hook (make busy)
I_	I0 Display product-identification code I1 Factory ROM checksum test I2 Internal memory test I3 Firmware ID I4 Reserved ID
L_	L0 Low speaker volume L1 Low speaker volume L2 Medium speaker volume L3 High speaker volume

M_	M0	Internal speaker off
	M1	Internal speaker on until carrier detected
	M2	Internal speaker always on
	M3	Internal speaker on until carrier detected and off while dialing
N_	N0	Disable Autoscan mode
	N1	Enable Autoscan mode
O_	O0	Return to Data Mode
	O1	Return to Data Mode and initiate an equalizer retrain
P		Set Pulse dial as default
Q_	Q0	Modem sends responses
	Q1	Modem does not send responses
Sr?		Read and display value in register r.
Sr=n		Set register r to value n (n = 0-255).
T		Set Tone Dial as default
V_	V0	Numeric responses
	V1	Word responses
W_	W0	Report DTE speed only
	W1	Report line speed, error correction protocol, and DTE speed.
	W2	Report DCE speed only
X_	X0	Hayes Smartmodem 300 compatible responses/blind dialing.
	X1	Same as X0 plus all CONNECT responses/blind dialing
	X2	Same as X1 plus dial tone detection
	X3	Same as X1 plus busy detection/blind dialing
	X4	All responses and dial tone and busy signal detection
Y_	Y0	Modem does not send or respond to break signals
	Y1	Modem sends break signal for four seconds before disconnecting
Z_	Z0	Reset and retrieve active profile 0
	Z1	Reset and retrieve active profile 1

3.4 Extended AT Commands

&C_	&C0	Force Carrier Detect Signal High (ON)
	&C1	Turn on CD when remote carrier is

		present
&D_	&D0	Modem ignores the DTR signal
	&D1	Modem returns to Command Mode after DTR toggle
	&D2	Modem hangs up, returns to the Command Mode after DTR toggle
	&D3	Resets modem after DTR toggle
&F_	&F	Recall factory default configuration
&G_	&G0	Guard tone disabled
	&G1	Guard tone disabled
	&G2	1800 Hz guard tone
&K_	&K0	Disable flow control
	&K3	Enable RTS/CTS hardware flow control
	&K4	Enable XON/XOFF software flow control
	&K5	Enable transparent XON/XOFF flow control
	&K6	Enable both RTS/CTS and XON/XOFF flow control
&L_	&L0	Modem is set up for dial-up operation
&M_	&M0	Asynchronous operation
&P_	&P0	US setting for off-hook-to-on-hook ratio
	&P1	UK and Hong Kong off-hook-to-on-hook ratio
	&P2	Same as &P0 setting but at 20 pulses per minute
	&P3	Same as &P1 setting but at 20 pulses per minute
&R_	&R0	Reserved
	&R1	CTS operates per flow control requirements
&S_	&S0	Force DSR Signal High (ON)
	&S1	DSR off in command mode, on in on-line mode
&T_	&T0	Ends test in progress
	&T1	Perform Local Analog Loopback Test
	&T3	Perform Local Digital Loopback Test
	&T4	Grant Remote Digital Loopback Test request by remote modem
	&T5	Deny Remote Digital Loopback Test request

	&T6	Perform a Remote Digital Loopback Test
	&T7	Perform a Remote Digital Loopback Test and Self-Test
	&T8	Perform Local Analog Loopback Test and Self-Test
&V	&V0	Displays Active and Stored Profiles
	&V1	Display Last Connection Statistics
&W_	&W0	Stores the active profile as Profile 0
	&W1	Stores the active profile as Profile 1
&Y_	&Y0	Configuration Profile 0 active upon Power on or reset
	&Y1	Configuration Profile 1 active upon Power on or reset
&Zn=x	<i>n=0-3</i>	Store phone number x into non-volatile RAM
%E_	%E0	Disable auto-retrain
	%E1	Enable auto-retrain
+MS?		Displays the current Select Modulation settings
+MS=?		Displays a list of supported Select Modulation options
+MS=a,b,c,d,e,f		Select modulation where: a =0, 1, 2, 3, 9, 10, 11, 12, 56, 64, 69; b =0-1; c =300-56000; d =300-56000; e =0-1; and f =0-1. A, b, c, d, e, f default= 12, 1, 300, 56000, 0, 0 . Parameter " a " specifies the modulation protocol desired where: 0=V.21, 1=V.22, 2=V.22bis, 3=V.23, 9=V.32, 10=V.32bis, 11=V.34, 12=V.90, K56Flex, V.34....., 56=K56Flex, V.90,V.34....., 64=Bell 103, and 69=Bell 212. Parameter " b " specifies automode operations where: 0=automode disabled, 1= automode enabled with V.8/V.32 Annex A. Parameter " c " specifies the minimum connection data rate (300-56000). Parameter " d " specifies the maximum connection rate (300-56000); Parameter " e " specifies the codec type (0=£g-Law, and 1=A-Law). Parameter " f " specifies "robbed bit" signaling detection (0=detection disabled

		1=detection enabled)
#CID=n	n=0	Disable Caller ID
	n=1	Enables Caller ID with formatting (date, time, number, name)
	n=2	Enables Caller ID without formatting
#CID?		Displays current Caller ID mode
#CID=?		Returns Caller ID capabilities of modem.

3.5 MNP/V.42/V.42bis Commands

%C_	%C0	Disable MNP Class 5 and V.42bis data compression
	%C1	Enable MNP Class 5 data compression only
	%C2	Enable V.42bis data compression only
	%C3	Enable MNP Class 5 and V.42bis data compression
&Q_	&Q0	Direct data link only (same as \N1)
	&Q5	V.42 data link with fallback options
	&Q6	Normal data link only (same as \N0)
\A_	\A0	64-character maximum MNP block size
	\A1	128-character maximum MNP block size
	\A2	192-character maximum MNP block size
	\A3	256-character maximum MNP block size
\Bn		Send a 1/10 second line break to the modem, where n = 1 to 9. At normal connect, the default is 3
\Kn		Set break control, where n= 0 to 2. The effect of this command depends on the modem operating condition. Default is 1.
\N_	\N0	Normal data-link only
	\N1	Direct data-link only
	\N2	V.42 or MNP data link only
	\N3	V.42/MNP/Normal data link
	\N4	V.42 data link only
	\N5	MNP data link only

3.6 Fax Class 1 Commands

+FAE=n	Data/Fax Auto Answer
+FCLASS=n	Service Class
+FRH=n	Receive data with HDLC framing
+FRM=n	Receive data

+FRS=n	Receive silence
+FTH=n	Transmit data with HDLC framing
+FTM=n	Transmit data
+FTS=n	Stop transmission and wait

3.7 Fax Class 2 Commands

+FCLASS=n	Services class.
+FAA=n	Adaptive answer.
+FAXERR	Fax error value.
+FBOR	Phase C data bit order.
+FBUF?	Buffer size(reade only).
+FCFR	Indicate confirmation to receive.
+FCLASS=	Service class.
+FCON	Facsimile connection response.
+FCIG	Set the polled station identification.
+FCIG:	Report the polled station identification.
+FCR	Capability to receive.
+FCR=	Capability to receive.
+FCSI:	Report the called station ID.
+FDCC=	DCE capabilities parameters.
+FDCS:	Report current session.
+FDCS=	Current session results.
+FDIS:	Report remote capabilities.
+FDIS=	Current sessions parameters.
+FDR	Begin or continue phase C receive data.
+FDT=	Data transmission.
+FDTC:	Report the polled station capabilities.
+FET:	Post page message response.
+FET=N	Transmit page punctuation.
+FHNG	Call termination with status.
+FK	Session termination.
+FLID=	Local ID string.
+FLPL	Document for polling.
+FMDL?	Identify model.
+FMFR?	Identify manufacturer.
+FPHCTO	Phase C time out.
+FPOLL	Indicates polling request.
+FPTS:	Page transfer status.
+FPTS=	Page transfer status.
+FREV?	Identify revision.
+FSPT	Enable polling.
+FTSI:	Report the transmit station ID.

3.8 Voice Commands

#BDR	Select Baud Rate
#CID	Enable Caller ID detection and reporting

	format
#CLS	Select Data, Fax or Voice/Audio
#MDL?	Identify Model
#MFR?	Identify Manufacturer
#REV?	Identify Revision Level
#TL	Audio output transmit level
#VBQ?	Query Buffer Size
#VBS	Bits per sample (ADPCM or PCM)
#VBT	Beep Tone Timer
#VCI?	Identify Compression Method
#VLS	Voice line select
#VRA	Ringback goes away timer
#VRN	Ringback never came timer
#VRX	Voice Receive Mode
#VSDB	Silence deletion tuner
#VSK	Buffer skid setting
#VSP	Silence detection period
#VSR	Sampling rate selection
#VSS	Silence deletion tuner
#VTD	DTMF tone reporting capability
#VTM	Enable timing mark placement
#VTS	Generate tone signals
#VTX	Voice transmit mode

Section Four - S Registers

Your modem has 41 registers, designated S0 through S95. Table 4-1 shows the registers, their functions, and their default values. Some registers can have their values changed by commands. If you use a command to change a register value, the command remains in effect until you turn off or reset your modem. Your modem then reverts to the operating characteristics specified in its non-volatile memory. Refer to Section 3 for information on how to use the AT commands to manipulate the S registers.

Table 4-1 S - Registers

Register	Function	Range/units	Default
S0	Auto-answer Ring	0-255 /rings	0
S1	Ring counter	0-255 /rings	0
S2	Escape code character	0-255 /ASCII	43
S3	Carriage return character	0-127 /ASCII	13
S4	Line feed character	0-127 /ASCII	10
S5	Backspace character	0-255 /ASCII	8
S6	Dial tone wait time	2-255 /seconds	2
S7	Remote carrier wait time	1-255 /seconds	50

S8	Comma pause time	0-255 /seconds	2
S9	Carrier detect response time	1-255 /0.1 second	6
S10	Carrier loss time	1-255 /0.1 second	14
S11	Touch-tone dialing speed	50-255 /milliseconds	95
S12	Escape character guard time	0-255 /0.02 second	50
S13	Reserved		
S14	Echo, response, dialing, originate/answer	Bit-mapped register	
S15	Reserved		
S16	Modem tests	Bit-mapped register	0
S17	Reserved		
S18	Length of modem tests	0-255 /seconds	0
S19-20	Reserved		
S21	CTS, DTR, DCD, DSR and long space disconnect	Bit-mapped register	
S22	Speaker and response	Bit-mapped register	
S23	Remote digital loopback request, data rate, parity	Bit-mapped register	
S24	Sleep mode timer	0-255 seconds	0
S25	Data terminal ready delay	0-255 /0.01 second	5
S26	RTS to CTS delay interval	0-255 /0.01 second	1
S27	Asynchronous/Bell/CCITT modes	Bit-mapped register	
S28	Pulse dial, make/break ratio	Bit-mapped register	
S29	Flash time	0-255 /0.01second	70
S30	Disconnect timer	0-255 /10 seconds	0
S31	Autoscan, EC result code	Bit-mapped register	
S32	XON character	0-255 /ASCII	17
S33	XOFF character	0-255 /ASCII	19
S34-35	Reserved		
S36	LAPM failure options	Bit-mapped register	7
S37	Reserved		
S38	Hang-up delay	0-255 /seconds	20
S39	Flow control options	Bit-mapped register	3
S40	MNP options, break types block modes	Bit-mapped register	104
S41	Compression, retrain	Bit-mapped register	195
S42-45	Reserved		
S46	Data compression control	136 or 138	138
S47	Reserved		
S48	V.42 negotiation options	0, 7, or 128	7
S49-81	Reserved		
S82	Break options	3, 7, or 128	128
S83-85	Reserved		
S86	Connection failure code	0-225	
S87-S90	Reserved		
S91	Transmit attenuation	0-15/dBm	10
S92	Fax attenuation	0-15/dBm	10
S95	Extended result code options	Bit-mapped register	0

Section Five - Result Codes

OK	0	CONNECT	1
RING	2	NO CARRIER	3
ERROR	4	CONNECT 1200	5
NO DIALTONE	6	BUSY	7
NO ANSWER	8	CONNECT 600	9
CONNECT 2400	10	CONNECT 4800	11
CONNECT 9600	12	CONNECT 7200	13
CONNECT 12000	14	CONNECT 14400	15
CONNECT 16800	59	CONNECT 21600	61
CONNECT 24000	62	CONNECT 26400	63
CONNECT 28800	64	CONNECT 19200	16
CONNECT 32000	165	CONNECT 34000	166
CONNECT 36000	167	CONNECT 38000	168
CONNECT 38400	17	CONNECT 40000	169
CONNECT 42000	170	CONNECT 44000	171
CONNECT 46000	172	CONNECT 48000	173
CONNECT 50000	174	CONNECT 52000	175
CONNECT 54000	176	CONNECT 56000	177
CONNECT 57600	18	CONNECT 31200	91
CONNECT 33600	84	CONNECT 115200	19
CONNECT 1200TX/75RX FAX	22	CONNECT 75TX/1200RX	23
	33	DATA	35
CARRIER 300	40	CARRIER 1200/75	44
CARRIER 75/1200	45	CARRIER 1200	46
CARRIER 2400	47	CARRIER 4800	48
CARRIER 7200	49	CARRIER 9600	50
CARRIER 12000	51	CARRIER 14400	52
CARRIER 16800	53	CARRIER 19200	54
CARRIER 21600	55	CARRIER 24000	56
CARRIER 26400	57	CARRIER 28800	58
CARRIER 32000	150	CARRIER 34000	151
CARRIER 36000	152	CARRIER 38000	153
CARRIER 40000	154	CARRIER 42000	155
CARRIER 44000	156	CARRIER 46000	157
CARRIER 48000	158	CARRIER 50000	159
CARRIER 52000	160	CARRIER 54000	161
CARRIER 56000	162	CARRIER 31200	78
CARRIER 33600	79	COMPRESSION: CLASS 5	66
COMPRESSION: V.42BIS	67	COMPRESSION: NONE	69
PROTOCOL: NONE	70	PROTOCOL: LAPM	77
PROTOCOL: ALT	80	+FCERROR	+F4

Section Six - Troubleshooting

This section describes some of the common problems you may encounter while using your modem. If you can not resolve your difficulty after reading this chapter, contact your dealer or vendor for assistance.

Modem does not respond to commands.

1. Make sure the communication software is configured to "talk" to the modem on the correct COM port and IRQ setting (same COM port and IRQ setting as the modem). Your communication software must know which address your modem is using in the system in order to pass data to it. Similarly, IRQ settings must be set correctly to receive data from the modem.
2. Make sure that your modem is initialized correctly. Your modem may have been initialized to not display responses. You may factory-reset the modem by issuing **AT&F** and press **ENTER**. The factory default allows the modem to display responses after a command has been executed.

Modem does not dial.

1. Make sure the modem is connected to a working phone line. Replace the modem with a working phone to ensure that the phone line is working.
2. Make sure the phone line is connected to the jack marked "LINE" Incorrect connection prevents the modem from operating properly. Refer to Section 2.3 for modem connection instructions.

Modem dials but does not connect.

1. Make sure the IRQ setting is identical on both the modem and the software. Modem and software must be configured identically.
2. Make sure the phone line is working properly. Replace the modem with a regular phone and dial the number. If the line sounds noisy, you may have difficulty connecting to the remote device.

Modem makes a connection but no data appears on your screen.

1. Make sure the correct data format (data bits, stop bits, and parity bits) and flow control (RTS/CTS) are being used.
2. Make sure the correct terminal emulation mode is being used (see communication software manual).

High pitch tone is heard whenever you answer the phone.

1. Make sure Auto-Answer is turned off. Your modem is factory configured to NOT auto-answer. Issue **AT&F** to factory reset your modem.

Modem experiences errors while communicating with a remote modem.

1. Make sure the DTE speed is the same as the modem connection speed when in Direct Mode.
2. Make sure the remote system and your modem use the same communication parameters (speed, parity, etc.).
3. Make sure RTS/CTS hardware flow control is enabled and XON/XOFF software flow control is disabled in the communication software.
4. Make sure the data speed is not faster than your computer's capability. Most IBM compatibles are capable of 19,200 bps under DOS and Windows 3.X. Operating at higher speeds under Windows requires a 486 or faster CPU or Windows 95.

Modem experiences bursts of errors or suddenly disconnects while communicating with a remote modem.

1. Make sure Call Waiting is turned off.
2. Make sure the phone line does not exhibit excess noise.

Modem exhibits poor voice record or playback.

1. Make sure the correct modem type is selected in the Voice/FAX software. Use "**Generic Rockwell**" or similar selection.

Section Seven - Support and Service

In the unlikely event you experience difficulty in the use of this product, we suggest you: (1) consult the Troubleshooting section of this guide and (2) consult with your dealer. To obtain service for this product, follow the Return Merchandise Authorization Procedure as outlined in the Warranty card.

Appendix A - Specifications

Communication Std. V.90, K56Flex, V.34+, V.34,
V.32bis, V.32, V.29, V.27ter,
V.22bis, V.23, V.22, V.21, V.17,
Bell212/103

Data Compression: V.42bis/MNP5

Error Correction: V.42/MNP2-4

Host Interface:	RS232C
FAX Group:	Group III Send/Receive Standard
FAX Command set:	EIA/TIA-578 Service Class 1, Class 2
Transmit level:	-11 dBm +/- 1 dB
Receiver Sensitivity:	-39 dBm (V.34); -43 dBm (all other protocols)
UART:	16550 compatible
Data format:	300-115200 bps
Power:	0.75 W
Temperature:	0 to 55 degrees C (Operating)
CallerID:	Yes
PnP:	Revision 1.0a
Speakerphone:	Full-duplex with DSP echo cancellation

Appendix B - Notices

FCC Compliance

This equipment complies with Part 68 of the FCC Rules. On this equipment is a label that contains, among other information, the FCC registration number and Ringer Equivalence Number (REN) for this equipment. You must, upon request, provide this information to your telephone company.

If your telephone equipment causes harm to the telephone network, the Telephone Company may discontinue your service temporarily. If possible, they will notify in advance. But, if advance notice is not practical, you will be notified as soon as possible. You will be informed of your right to file a complaint with the FCC.

Your telephone company may make changes in its facilities, equipment, operations, or procedures that could affect proper operation of your equipment. If they do, you will be notified in advance to give you an opportunity to maintain uninterrupted telephone service.

The FCC prohibits this equipment to be connected to party lines or coin-telephone service.

In the event that this equipment should fail to operate properly, disconnect the equipment from the phone line to determine if it is causing the problem. If the problem is with the equipment, discontinue use and contact your dealer or vendor.

The FCC also requires the transmitter of a FAX transmission

be properly identified (per FCC Rules Part 68, Sec. 68.381 (c) (3)).

FCC Class B Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy, and if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and the receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio / TV technician for help

Notice: 1) Shielded cables, if any, must be used in order to comply with the emission limits. 2) Any change or modification not expressly approved by the Grantee of the equipment authorization could void the user's authority to operate the equipment.

DOC Compliance Information

NOTICE: The Canadian Department of Communications label identifies certified equipment. This certification means that the equipment meets certain telecommunications network protective, operational and safety requirements. The Department does not guarantee the equipment will operate to the user's satisfaction.

Before installing this equipment, users ensure that it is permissible to be connected to the facilities of the local telecommunications company. The equipment must also be installed using an acceptable method of connection. The customer should be aware that compliance with the above conditions may not prevent degradation of service in some situations.

Repairs to certified equipment should be made by an

authorized Canadian maintenance facility designated by the supplier. Any repairs or alterations made by the user to this equipment, or equipment malfunctions, may give the telecommunications company cause to request the user to disconnect the equipment.

Users should ensure for their own protection that the electrical ground connections of the power utility, telephone lines and internal metallic water pipe system, if present, are connected together. This precaution may be particularly important in rural areas.

Caution: Users should not attempt to make such connections themselves, but should contact the appropriate electric inspection authority, or electrician, as appropriate.

NOTICE: The Load Number (LN) assigned to each terminal device denotes the percentage of the total load to be connected to a telephone loop which is used by the device, to prevent overloading. The termination on a loop may consist of any combination of devices subject only to the requirement that the sum of the Load Numbers of all the devices does not exceed 100.

UL Notice

Caution: This internal modem adapter is to be installed in UL Listed computers only, Always disconnect the modem adapter from the telephone system during installation or when the cover is removed from the computer.