Model: FM-HCF56i

Zoltrix
56,000
V.90/K56 Flex
PCI PnP Spirit
with
Voice Mail & Speaker Phone
Installation Manual

Check out the Zoltrix WWW Site at
http://www.zoltrix.com
or call the Zoltrix BBS to download details on
AT Commands, S-Registers, additional drivers,
and much more! 510-657-7413

Manual V 1.1
August 1998

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Hardware Manual Summary

This manual offers you information on the setting up and installing of the ***Zoltrix Spirit.*** It is written for both first-time users as well as users who may already have a familiarity with fax/modems or other computer peripherals.

If you are not familiar with the terminology, please refer to the Glossary in Appendix G.

Chapter 1, "***Internal Fax/Modem Installation***", provides step by step instructions on the set up of your fax/modem. Topics include electro-static discharge (ESD), inserting the modem, and connecting telephone lines.

Chapter 2, "***Windows 95 Driver Installation***", provides step by step instructions on the set up of the modem software drivers. Topics include Windows 95 setup and the testing of port settings for conflicts and the testing of the modem driver.

Chapter 3, "***Using the Fax/Modem***", discusses the option of controlling of the fax/modem by customizing the INITialization string and includes general information on setting up both Fax and Modem software.

Appendix A, "***Quick Reference***", lists AT command and S-Register summaries.

Appendix B, "***Regulatory Information***", lists important FCC information.

Appendix G, "***Glossary***", lists common data communication terms used in this manual.

Appendix S, "***Specifications***", lists technical specifications of the ***Zoltrix Spirit.***

Appendix T, "***Troubleshooting***", discusses possible configuration problems and solutions with the modem.

Chapter 1

INTERNAL FAX/MODEM INSTALLATION

1 Introduction

Congratulations on your purchase. The ***Zoltrix Spirit*** uses Rockwell's state-of-the-art HCF chipset. Host-controlled modem software performs processing of general modem control, command sets, fax Class 1, speakerphone, voice/audio/TAM, error correction, data compression, and operating system interface functions. Unlike the HSP approach of other chipset manufactures, the HCF has a **D**igital **S**ignal **P**rocessor on the chip and does not reqiure that the CPU perform the signal processing like the HSP approach.

1.1 Before You Start

If you've never installed an add-in board in your computer before, please follow the instructions in this section carefully. Read the entire section before beginning.

1.1.1 Electro-static Discharge (ESD)

Some of the components on your board are sensitive to static electricity (Electro-Static Discharge), so before you handle the fax/modem, you need to discharge any static electricity that you may have generated. This can be done by touching any unpainted metal surfaces of your computer's chassis or by grasping a cold water pipe. This is called "grounding". Ground yourself before you take the board out of the static-shielded bag and everytime you intend to handle the board.

The board should be kept in the static-shielded bag anytime it is not installed in your computer. Never bring the board close to anything plastic where high levels of ESD (Electro-Static Discharge) may exist. Because ESD can even reside on the outside of the static-shielded bag, you should never place the board on top of the bag.

Also, please read through the User's Manual for your computer for any precautions that should be followed for your particular computer.

1.1.2 Safety Precautions

Some general safety precautions you should follow are:

1. **Turn OFF the computer before you begin. Also, turn OFF any external devices that are connected to your computer, such as printers.**
2. Handle the board **gently** by the edges. Some of the component leads under the board have very sharp edges and may cause serious injury.

1.2 Necessary Equipment

Make sure that you have the following equipment at hand before you begin.

- The ***Zoltrix Spirit***
- A Pentium or faster compatible computer with an available PCI expansion slot
- A modular telephone outlet and cable
- A small, flat-blade screwdriver and a small pair of pliers or tweezers
- A telephone set (Optional)
- Shielded PC speakers or headset and Microphone (required for speaker phone)

1.3 Installation Steps

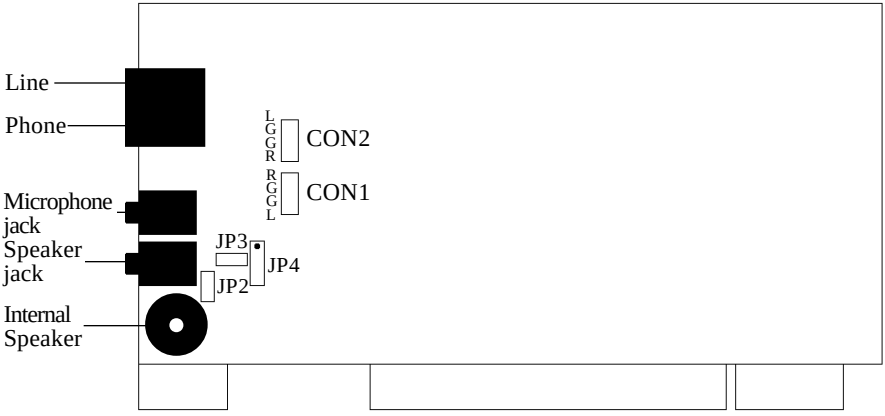
The steps to install your modem are shown in order in this section. For some steps, you may need to refer to your computer's User's Manual.

1.3.1 Selecting the COM Port

The ***Zoltrix Spirit*** is PnP and can use COM ports 1 to 4 and IRQ's 2,3,4,5,10,11,12 & 15. This is selected automatically. There are no hardware jumpers or dip switches to set. Refer to Chapter 2 for the Windows software installation instructions. You may want to read the section (T.2 Determining What Serials Ports Are Installed in Your Computer) to determine if you have any available com port addresses left on your computer.

1.3.2 Jumper settings

Before inserting the modem into the slot in the computer, you should go over the following options to properly configure the modems jumper settings.



CON1 **Audio Out: Connect to the Sound cards CD-ROM audio input**

CON2 **Audio In: Connect to the CD-ROM audio output**

JP2 **Short to enable the internal speaker (Default)**
Open to disable the internal speaker

JP3 **Short if connecting speakers to the speaker jack (Default)**
Open if connecting a headset to the speaker jack

JP4 Short pins 1-2 for line out level to be sent to the speaker jack
Short pins 2-3 for speaker out level to be sent to the speaker jack (Default)

• **Denotes JP4's pin 1 location**

Note: Short = Jumper shorting the designated pins together
Open = No jumper across the designated pins

1.3.3 Recommended Jumper settings

Following are the recommended settings for various uses:

1.	Passive speakers (non amplified)	Use the factory default settings.
2.	Active speakers (amplified)	JP2=short, JP3=short, JP4=1&2
3.	Sound card connection	JP2=open, JP3=short, JP4=1&2
4.	Headset	JP2=short, JP3=open, JP4=2&3

1.3.4 Connecting to a sound card (optional)

If you want the modem to share the sound cards speakers, you can use one of two different methods. The first method needs to be done before installing the modem, while the second method is performed when the modem is installed.

1.3.5 Connecting to a sound card (via CD-ROM audio-in)

To control the volume of the modem use your sound cards software audio mixer or the Win95 volume control and use the CD selection. A drawback to using this method is that an audio CD will also be affected by the volume change intended for the modem.

1. Connect CON1 to the sound cards CD-Audio-in.
2. Connect the CD-ROM audio-out to CON2 with a 4 pin audio cable.

Note: Make sure that the left, right and ground channels from the CD-ROM connects to the proper pins on CON1 and CON2.

1.3.6 Connecting to a sound card (via Sound cards line-in)

To control the volume of the modem use your sound cards software audio mixer or the Win95 volume control and use the Line selection.

1. Connect an audio cable, with a 1/8 inch stereo plug at both ends, into the modems speaker jack.
2. Connect ther other end of the audio cable into the sound cards line-in jack.

1.3.7 Inserting the Fax/Modem

1. Turn off the power to the computer. Also, turn off any external devices that are attached, such as a printer and monitor.
2. Take out the mounting screws on the back of you computer. Refer to your computer manual if you cannot locate them.
3. Remove the computer cover. Refer to your computer manual if you cannot determine how to remove the cover.
4. Select an empty PCI slot. You may need to remove the metal slot cover first, using a small screwdriver.
5. Discharge any static electricity in your body by touching any bare metal surface on the chassis of the computer and remove the modem from the static-shielded bag.

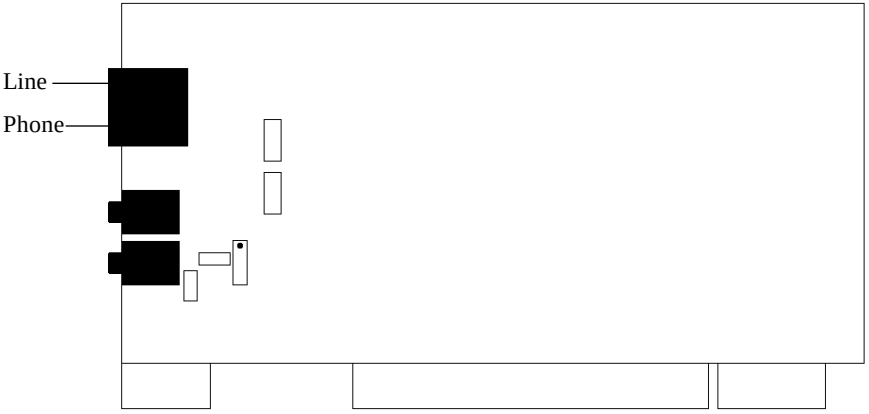
6. Press the board firmly into the slot ensuring that the gold tabs on the fax/modem are aligned with the connectors in the slot.
7. Insert the screw and tighten slightly. Check to ensure that the telephone jacks in the back of the modem are unobstructed. If so, then tighten the screw securely.
8. Replace the computer cover.

1.3.8 Installing Telephone Lines

The Fax/Modem has two modular telephone jacks on the back of the modem. You will need to connect your Fax/Modem to the wall outlet via a modular telephone cord.

If your wall outlet is not a modular type, you can purchase an inexpensive converter at most electronics or phone stores. It is suggested that you connect your modem to a "*dedicated line*". A dedicated line is a regular phone line that does not go through a switchboard, PBX, etc...

You can also connect a telephone set to your modem, enabling you to use the phone when the modem is not in use. The modem can also be used as an autodialer with your telephone set. It is recommended that you use a single line phone outlet (RJ11). However, you can use a two-line (RJ14) phone line, but the modem will only work on the first line using the center pair of wires.



To connect the telephone line to the modem follow these steps:

1. Insert one end of the phone line into the jack on the modem labeled **Line** or **Wall**.
2. Insert the other end of the phone line into the phone jack, (usually located on the wall).

If you wish to use a phone in conjunction with your modem, please follow these steps:

1. Insert the line from the phone into the modem jack labeled **Phone**.
2. Make sure that the other end of the phone line is connected to the telephone.

Chapter 2

Windows 95 DRIVER INSTALLATION

2 Introduction

The ***Zoltrix Spirit*** is designed to operate in Windows 95 only. In addition, the ***Zoltrix Spirit*** complete solution allows the modem to be upgraded with enhancements and features through software upgrades rather than a chip change or a board swap. The ***Zoltrix Spirit*** may be upgraded with features and protocols as they become available from Rockwell, the chipset manufacturer. At the time of this writing, it supports both V.90 and K56Flex to provide maximum compatibility.

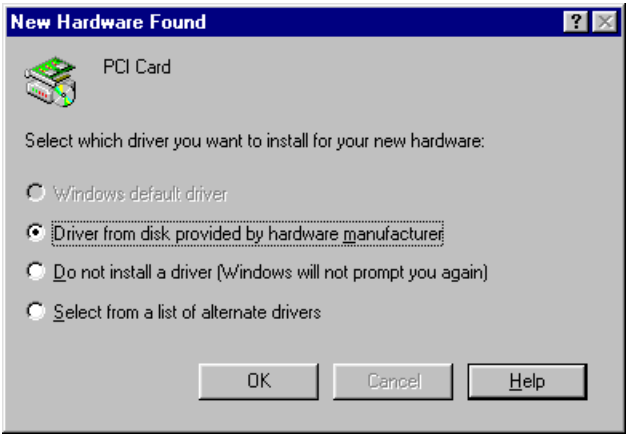
2.1 Windows 95 Software Setup

To setup the ***Zoltrix Spirit***, you must complete the following installation procedure:

2.1.1 Installing the Windows 95 Drivers

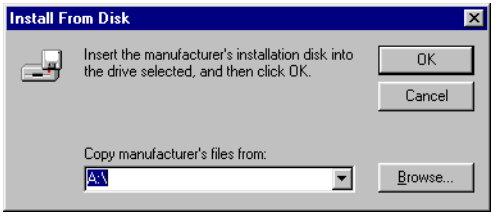
1. Start Windows 95. As soon as Windows 95 starts you will see a screen similar to the following:

Note: If you do not see the following screen, you may have the OSR2 version of Win95. Refer to the instructions following in section 2.1.2 for Windows 95 (OSR2) installion instructions.



2. Click the OK button

This will bring up a screen similar to the following:



3. Insert the ***Zoltrix Spirit*** setup diskette into drive A:

   If you have the Zoltrix COMMUNICATIONS CD-ROM, insert the CD-ROM into your CD-ROM drive and select D:\

Note: Replace D: with the drive letter of your CD-ROM drive if necessary

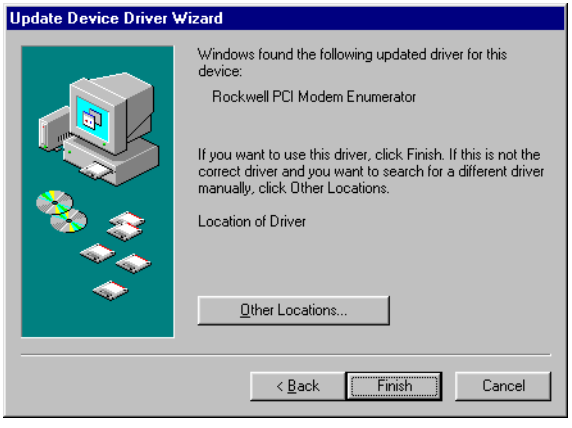
4. Click the OK button to start copying the files.

5. You will then see the modem device and wave device found and the drivers will be automatically installed.

6. After all the files are copied the installation of the Driver is complete. Follow any onscreen instructions such as the following:

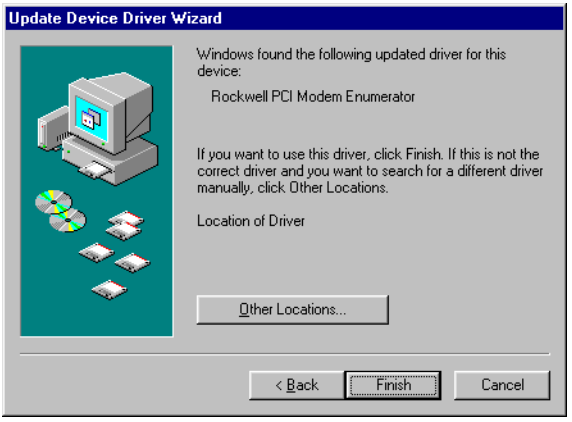
2.1.2 Windows 95 (OSR2) Modem Driver Setup

1. Start Windows 95. As soon as Windows 95 starts you will see a screen similar to the following:



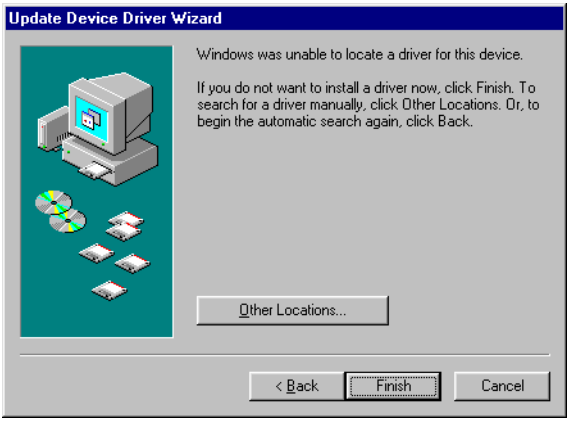
2. Click on the Next > button.

If you did have the driver disk in the drive, you will see a screen similar to the following:



3. Click on the  button to complete the modem driver installation.

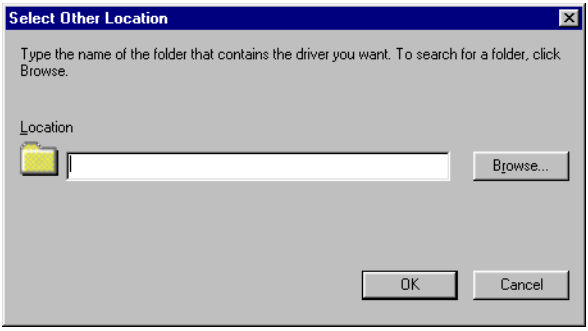
If you did not have the driver disk in the drive, you will see a screen similar to the following:



4. Either insert the driver disk now and click on the back button to go back to step 2

   or

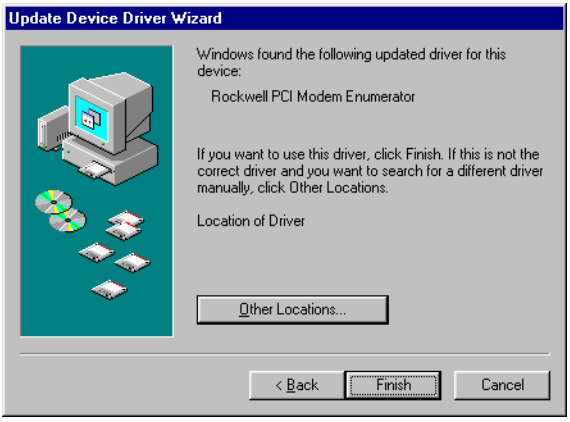
   Click on the Other Locations button to bring up a screen similar to the following:



5. Click on the Browse button and then select the correct drive and directory containing the Win95 driver and then click on the OK button.

Note: The OK **button will be grayed out until you find a directory that actually contains a modem driver.**

After Clicking on OK if you do not see a screen similar to the following, the location does not contain the correct driver:



6. Click on the Finish button to complete the modem driver installation.

If the following screen is displayed, Click on OK and once again select the correct drive and directory that contains the modem driver to complete the driver installation.

2.1.3 Testing the modem driver for the *Zoltrix Spirit*

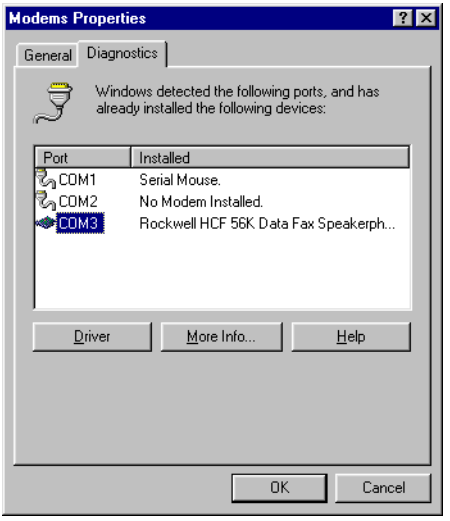
After installing the software drivers and restarting Windows 95, use the following procedure to verify that the ***Zoltrix Spirit*** is working.

1. Double click on the 

ICON in the Control Panel.

2. Click on the Diagnostics tab.

   This will bring up a screen similar to the following:



3. Click on the port the Rockwell HCF 56K Data Fax Modem is assigned to **(as indicated in the previous picture).**
4. Click on the More Info... button to allow Windows 95 to query the modem.

Windows 95 will give you a short report on the status. If Windows 95 reports:

You need to verify that the port settings of the HCF Modem is not conflicting with any other devices.

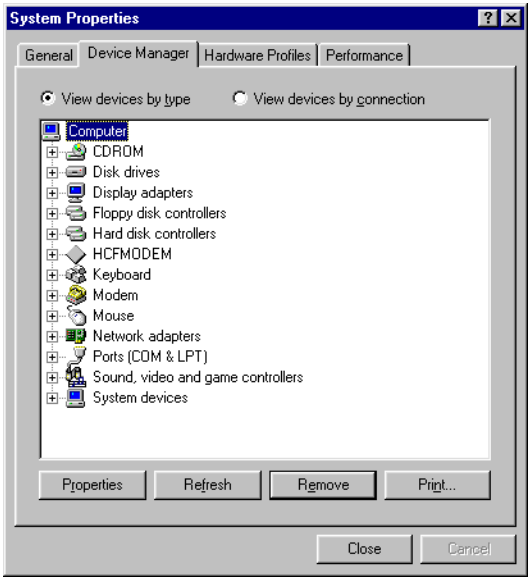
2.1.4 Checking the Spirit port settings for conflicts

1. Double click on the 

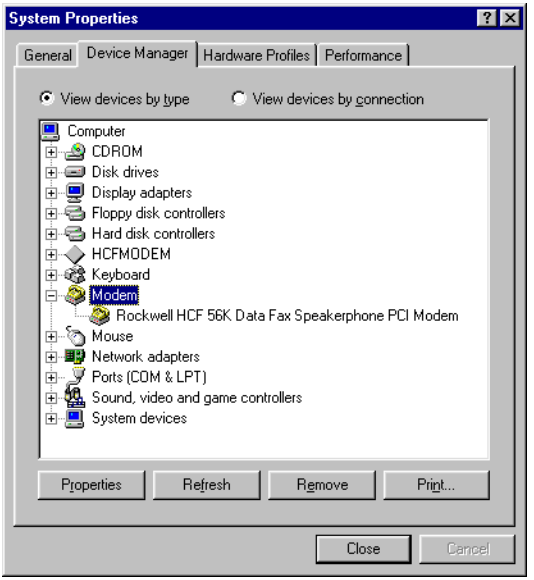
ICON in the Control Panel.

2. Click on the Device Manager tab.

   This will bring up the following screen:



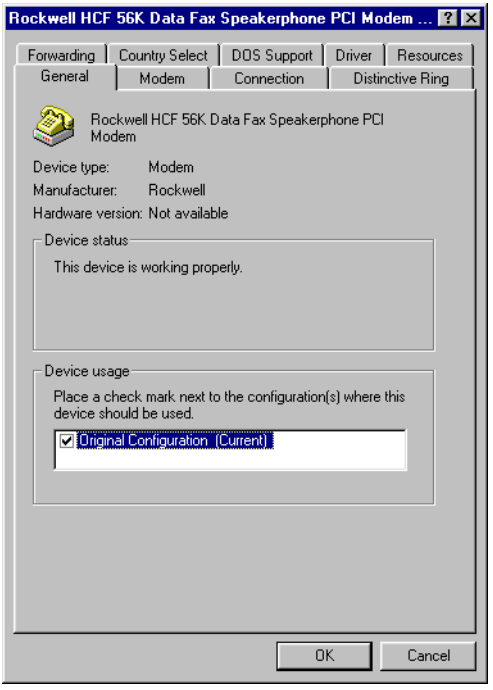
3. Double Click on Modem **(as indicated on the next picture)**



4. Click on **Rockwell HCF 56K Data Fax Speakerphone PCI Modem**

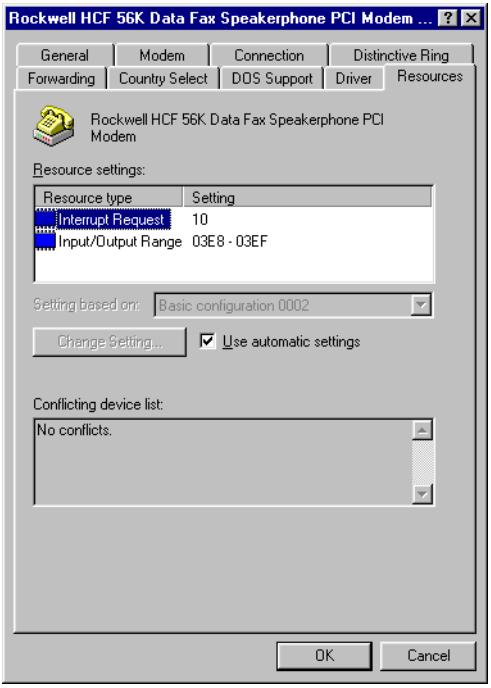
5. Click on the Properties button.

This will bring up the screen similar to the following:

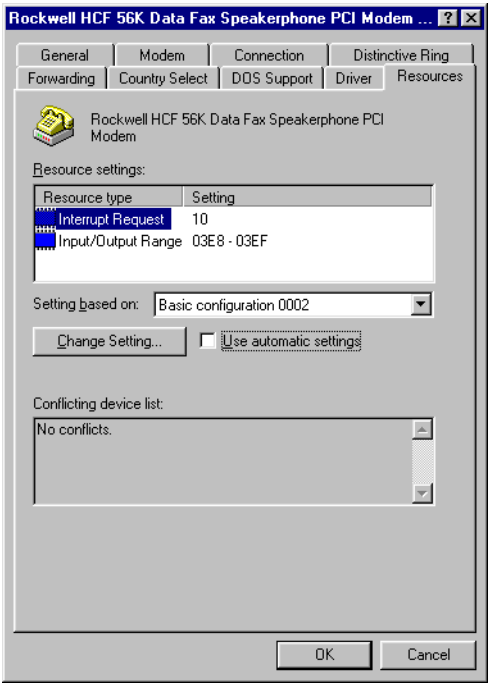


6. Click on the Resources tab.

This will bring up the following screen:



7. Click on the box next to ***Use automatic settings*** to deselect the check mark **(as indicated on the next picture).**



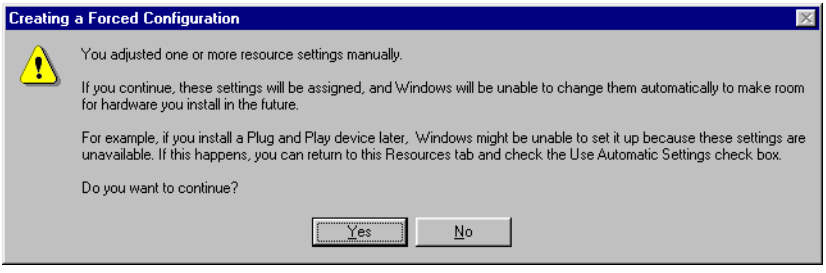
8. If you wish to change the port address that the modem is using, Click on the arrow to the right of ***Basic configuration 0*** and select the configuration that matches the port address you wish to use.

9. You cannot change the Interrupt the modem is using as this is selected by the motherboard BIOS. If you need to change the setting, refer to your motherboard BIOS manual for information on changing the IRQ used by the PCI device.

Note: Make sure that the information displayed in the Conflict Information window says "No devices are conflicting".

11. Click the OK button to exit the ***Resources*** Window.

    This will bring up the following screen:



12. Click on Yes if you are sure you want to make the change

13. Click on Close to exit the ***System Properties*** Window.

Chapter 3

Using the Modem

3.1 Introduction

The ***Zoltrix Spirit*** can be used to transfer or receive data files, send and receive faxes to and from any ITU-T Group III fax machine or fax card, as an automated voice answering machine and a full duplex speaker phone. All of these functions require different types of commands to be sent to the modem to perform either function. This is done automatically by your software or manually through commands issued via your keyboard.

Some advanced features may require that you issue the commands manually. This process is explained in the remainder of this chapter.

3.1.1 How to Obtain the Complete AT Commands

The complete detailed descriptions of all the AT commands are not provided in this manual. You may obtain a complete listing of the commands from the World Wide Web at:

http://www.zoltrix.com/modem.htm

3.1.2 Default Initialization Strings

Your modem has been preset at the factory to optimize its performance. These factory programmed defaults allow the modem to achieve the best possible connection under the worst of telephone line conditions. This is done by programming the modem with a set of instructions called the "INIT (short for initialization) String".

The INIT string instructs the modem how to execute each communication session including implementing or not implementing error correction and data compression during the session. The factory default INIT string stored in the modem is as follows:

AT&F&C1&D2

If the program that you are using allows the entry or editing of an INIT string, consider entering AT&F&C1&D2. However, you should note the original INIT string in case you need to set it back to the programs default settings.

3.1.3 Customizing Your Modem Settings

If you want to custom configure your stored profiles, we suggest that you always use AT&F&C1&D2 as the first part of your customized INIT string and add other settings to the end. For example, if you wish to change the duration of the dial tone to 55ms by adding an S11 option to your string, the resulting string would be as follows:

AT&F&C1&D2S11=55

Notice that **AT&F&C1&D2** is the first part of the string and the new option **S11=55** has been appended to the end of the string.

Note: If the modem's performance suffers after the settings have been modified, issue AT&F&C1&D2&W to the modem. This will instruct the modem to restore the default init string and store it in the modems N.V. Ram (Permanent memory). If your model does not support the N.V. Ram , change the INIT string to the default string.

3.1.4 Fax Software Compatibility

The ***Zoltrix Spirit*** supports Class 1 fax software. If there is a listing of fax/modems to select from and this modem is not listed , select a ***generic class 1***. If a initialization string is required you can use the Default Initialization String found in section 3.1.2.

3.1.5 Using the Voice Features

The ***Zoltrix Spirit*** can also be used as a voice answering machine and a full duplex speaker phone, when used with the supplied Fax/Data/Voice software.

For more information on how to use the answering machine feature and the speaker phone feature of the modem, refer to the software manual and/or on-line help.

3.1.6 DOS Window Support

The ***Zoltrix Spirit*** is designed specifically for use with Windows 95 and will not operate in other operating systems such as DOS, but will operate in a DOS window using communication programs or online games that can be run in a Windows 95 DOS window. The Com Port and IRQ will be mapped for use in the DOS window. The IRQ will be different than the actual IRQ used by the card.

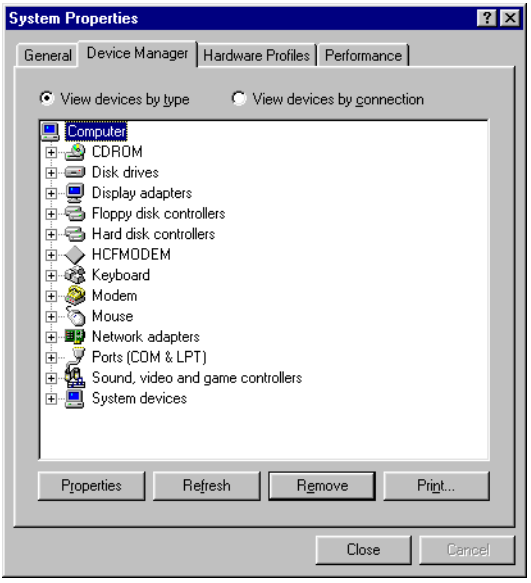
To view the settings used for the modem in a DOS Window, use the following instructions:

1. Double click on the 

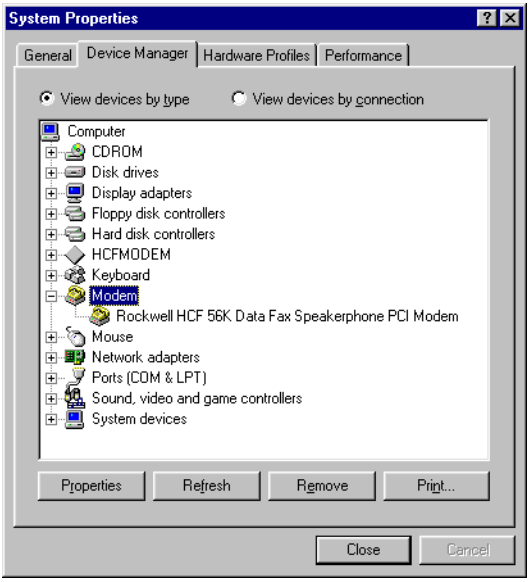
ICON in the Control Panel.

2. Click on the Device Manager tab.

This will bring up the following screen:



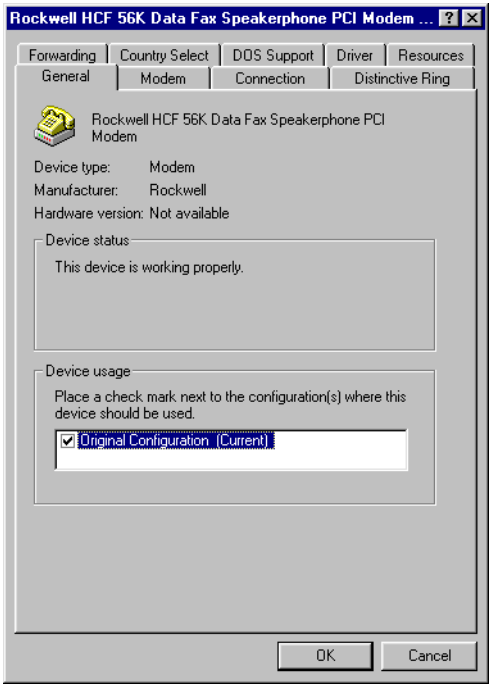
3. Double Click on  Modem **(as indicated on the next picture)**



4. Click on **Rockwell HCF 56K Data Fax Speakerphone PCI Modem**

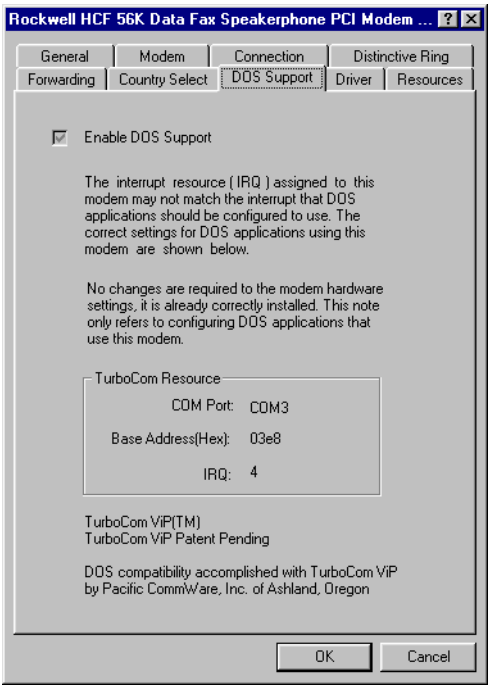
5. Click on the Properties button.

   This will bring up the screen similar to the following:



6. Click on the DOS Support tab.

This will bring up the following screen:



As you can see from the example above, the modem is set to use COM3 with a base address of 03e8 using IRQ4. These values are selected automatically by the TurboCom driver and cannot be modified. Use the settings displayed on this screen for your DOS based communication or online game. If you also need to modify the INIT string used by the program try one of the following:

AT&F&C1&D2W2
or
AT&F&C1&D2

3.2. Issuing AT Commands

If you would like to learn more about how to control your modem directly with the use of AT commands, refer to the following web page:

http://www.zoltrix.com/usemodem.htm

Table A-1. AT Command Summary

	Command	Title	Default
	A/	Re-execute Command	none
	ATA	Answer	none
	ATDn	Dial	T
*	ATE	Command Echo	1
	ATHn	Switch-Hook Control	none
	ATIn	Identification	none
*	ATLn	Speaker Volume	1
*	ATMn	Speaker Control	1
	ATOn	Return To The On-line State	none
*	ATP	Set Pulse Dial as Default	none
*	ATQn	Result Code Display	0
	ATSn?	Reading S Registers	none
	ATSn=x	Writing To S Registers	none
*	ATT	Set Tone Dial as Default	none
*	ATVn	Result Code Form (Message Control)	1
*	ATWn	Negotiation Progress Reporting	0
*	ATXn	Extended Result Codes	4
	ATZn	Reset	none
*	AT&Cn	DCD Option	0
*	AT&Dn	DTR Option	0
	AT&F	Restore Factory Configuration	none
*	AT&Gn	Set Guard Tone	0
*	AT&Pn	Dial Pulse Ratio	0 (US)
	AT&V	View Active Profile	none
	AT&W0	Store User Profile	none
*	AT%En	Enable/Disable Auto Retrain	1

*** Command setting may be stored in one user profiles with the AT&W command.**

Table A-2 S-Register Summary

	Register	Title	Default
*	S0	Number of Rings till Auto-Answer	0
	S1	Ring Counter	0
*	S2	Escape Character	43
	S3	Carriage Return Character	13
	S4	Line Feed Character	10
	S5	Back Space Character	8
*	S6	Wait For Blind Dialing	2
*	S7	Wait For Carrier After Dial	50
*	S8	Pause Time For Dial Delay	2
*	S10	Lost Carrier To Hang Up Delay	14
*	S11	DTMF Tone Duration	95
*	S12	Escape Prompt Delay	50
	S29	Flash Dial Modifier Time	0

*** Register value may be stored in one of two user profiles with the AT&W command.**

Important F.C.C. Information

This product will be connected to the public telephone network. This network is regulated by the Federal Communications Commission (F.C.C.).
All F.C.C rules must be followed in the use of this product.

F.C.C. Notice to the User

1. Upon request only, you must provide the following data to your telephone utility company (telco):

   (a) Notice of the intention to install or permanently remove an FCC Part 68-registered device or system, and the *F.C.C. registration number.

* (b) The Ringer Equivalence Number (R.E.N., see device label). Note that if several devices are connected on the same line, the sum of the R.E.N. values must not add up to more than 5.0 (A or B). This R.E.N. figure is important to your Telco.

* (c) The USOC jack type to be provided by the telco. Typically these may be RJ11C for single lines, or RJ21X for multi-lines.

* Note: These items are noted on the equipments FCC compliance label.

2. This device may not be used on telco-operated coin phone lines. Party lines and privately owned coin-phones are subject to local State regulatory policies, and possible additional special State requirements.

3. The telco has the right to make changes to their network which may affect the operation of your equipment, provided you are given adequate advance written notice to permit correct operation.

4. In case of operational problems, disconnect your unit by removing the modular or multiconnector plug from the telco's jack. If your regular phone still works properly, your modem has problems and must remain disconnected and serviced at an authorized service center. If upon the above disconnection your regular phone still has problems, notify your telco that there may be a problem with your phone lines. If there is a problem with the phone lines, you may or may not be required to pay for any repair service to the phone lines. However, if the problem is with lines that are not telco installed, you will be charged for the service.

5. Unless otherwise noted in the User's Manual (e.g. fuses, etc.), user may not, under any circumstances, in or out of warranty, attempt any service, adjustments, or repairs on this unit. It must be returned to the factory or authorized U.S. Service center for all such work. Locations can be obtained from the original place of purchase.

6. Special FCC rules apply to equipment connected behind a PBX or KTS.

FCC Radio Frequency Interference Statement

This modem has certified to comply with the limits for a Class B device, pursuant to Subpart J of Part 15 of the F.C.C. rules. This Equipment generates and uses radio frequency energy. If not installed and used properly, in strict accordance with the manufacturer's instructions, it may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of the F.C.C. rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation.

To determine if the equipment is causing interference to radio and television reception, the user should turn off the computer that the modem has been installed in. If the interference goes away, it is assumed that the modem is causing the interference. The user is encouraged to try to correct the problem by one or more of the following measures:

- Reorient the receiving antennae
- Relocate the computer with respect to the receiver.
- Move the computer away from the receiver.
- Plug the computer into a different outlet so that the computer and the receiver are on different branch circuits.
- If necessary, consult the dealer or an experience radio/television technician for additional suggestions.

The Federal Communications Commission has a booklet available that may be of help to the user. The name of the booklet is,"Interference Handbook." It is available from the U.S. Government Printing Office, Washington, D.C., 20402, Stock Number 004-000-00450-7. The manufacturer is not responsible for any radio interference caused by unauthorized modification or improper use of this equipment. It is the responsibility of the user to correct such interference.

Disclaimer

The Manufacturer makes no representations or warranties, expressed, statutory or implied, regarding the fitness or merchantability of this product for any particular purpose. Further, the Manufacturer is not liable for any damages, including but not limited to, lost profits, lost savings, or other incidental or consequential damages arising out of the use of this product. The Manufacturer also reserves the right to make any improvements or modifications to the product described in this manual at any time, without notice of these changes.

Copyright

Appendix G

GLOSSARY of COMMUNICATION TERMS

Active Profile

The current modem settings of the modem. The active profile of the modem is the current values of all S-Registers and AT commands. The active profile is changed by modem software and can also be changed manually by sending AT commands to the modem directly. Once the active profile is configured to meet your special needs you may then store it permanently in the Non-Volatile Ram.

ASCII (American Standard Code for Information Inter-exchange)

A standard character set and coding scheme used to represent letters, numbers, symbols, and control characters. The IBM PC and most micro-computers use ASCII.

Analog

A continuous sound wave or signal, such as a voice, that conventional telephone lines were developed for.

ARQ (Automatic Repeat reQuest)

A term used to describe the automatic retransmission of defective data blocks for the purpose of error detection in MNP and V.42 protocols.

Asynchronous

A way of transmitting data where start and stop bits are used to frame each character. Data is sent and received at irregular periods of time.

Auto Answer

A function of the modem where it is set up to answer an incoming call.

Auto Dial

A function of the modem where it will dial a telephone number for you.

Baud

The unit of signaling speed, specifying the number of signal elements per second. Since a signal element can represent more than one bit, baud rate is not necessarily the same as bits per second.

BPS (BITS PER SECOND)

The number of bits that are transmitted in one second. This is the basic unit of measure for serial data transmission.

Carrier

A continuous frequency capable of being modulated or impressed with a second data-carrying signal.

Command Mode

This is the mode in which the operator, or communications software, can issue commands to the modem.

Cyclic Redundancy Checking (CRC)

A technique used to detect errors in the transmission of data by the affirmation of error codes by bot the sending and receiving modem..

Data Compression

A technique used to reduce the amount of data being sent without reducing the information represented. In effect, modems with data compression transmit data faster than non-compression types. Data compression can be implemented in the Hardware or Software.

DCE (Data Communication Equipment)

A term used to describe any equipment that has the capacity to establish and control the data link via the telephone network.

Data Mode

This is the mode in which data is either being sent or received from a remote device once a connection has been established.

DIGITAL

A non-continuous signal, voltages representing either a on or off condition used to represent 1 data bit.

DIRECT MODE

A direct connection is equivalent to any standard 2400 bps modem connection. The maximum throughput is equal to the connection rate, and the DTE rate must match the connection rate.

DTE (DATA TERMINAL EQUIPMENT)

Any communications equipment which acts as one of the final destinations of a communications network.

DTMF (DUAL TONE MULTI FREQUENCY)

The method of dialing uses tones to represent the numbers to dial.

EIA (Electronics Industries Association)

The U.S. governing party which determines the industry standards for electronic industries.

Full Duplex

A transmission method in which data is sent and received simultaneously over the same line.

Frequency

The number of times that a sound wave repeats itself in a second. It is usually expressed in Hertz (Hz).

Half-Duplex

A method of data transmission in which data flow occurs in both directions, but in only one direction at a time.

Handshaking

An exchange of signals between two communication devices that establishes a connection and allows the transmission of data.

HDLC (HIGH-LEVEL DATA LINK CONTROL)

A common bit-oriented data link protocol issued by the ISO (International Standards Organization).

HERTZ (HZ)

A unit of measure of frequency. Measures the number of cycles (sound waves) that pass through a reference point per second.

HCF

This is Rockwell's terminalogy that refers to using the Host computers processor (Pentium chip) in place of a dedicated controller chip on the modem.

IRQ (Interrupt ReQuest)

A signal within the computer's processing architecture which allows any peripheral device (such as data being receive at a serial port) to interrupt the hardware and software when the attention of the computer's microprocessor is required.

ITU-T (International Telecommunications Union-Telecommunication)

Formerly called the **CCITT**, the **ITU,** which is part of the International Telecommunications Union based in Geneva, has developed a series of modem standards that have been adapted primarily by the post, telephone, and telegraph (PTT) organizations that operate telephone networks of many countries outside the United States. Because of the popularity, certain **ITU** recommendations have also been followed in designing modems for operation on communications facilities in the United States.

LAPM (Linked Access Procedure for Modems)

A error control protocol similiar to MNP protocols. Defined in the CCITT V.42 recommendation, it uses CRC and ARQ to assure data reliability.

MANUAL DIAL

The use of a telephone to dial a call.

MNP (MICROCOM NETWORK PROTOCOL)

An error correction protocol developed by **MICROCOM, INC.**

MODEM

A contraction of the words **MO**dulator and **DEM**odulator. It is used to transform digital data into analog signals (modulate), at the transmitter, and transform the analog signals into digital data (demodulate), at the receiver.

MODULATION

The process or technique of impressing a data-carrying signal onto a carrier.

NON-VOLATILE MEMORY

A memory location on the modem that allows the user to change the modem default's and then store them permanently. The contents of the memory are not lost when power is removed.

NORMAL MODE

In normal mode, error correction and compression are turned off ant the modem provides data buffers. This allows the terminal rate to be different from the connection rate. However, the maximum modem-to-modem throughput continues to be equal to the connection rate.

OFF HOOK

Indicates that the modem has picked up the phone line.

ON LINE

Indicates that a communications session is in progress.

PULSE DIAL

The type of dialing used by rotary-type telephones. Each digit is represented by a series of pulses.

SYNCHRONOUS

A method of communication where a group of characters are sent as a continuous stream of data at regular intervals of time.

VOLUME CONTROL

The volume of the Fax Modem can be changed in the software via the **L** (Loudness) command.

Technical Specifications

- **Data Modulation Protocol Standards**

V.90	56,000/54,667/53,333/50,667/49,333/46,667/45,333/42,667/ 41,333/38,667/37,333/34,667/33,333/30,667/29,333
K56Flex	56,000/54,000/52,000/50,000/48,000/46,000/44,000/ 42,000/40,000/38,000/36,000/34,000/32,000 bps
ITU-T V.34bis	33,600/31,200 bps
ITU-T V.34	28,800/26,400/24,000/21,600/19,200/16,800 bps
ITU-T V.32bis	14,400/12,000/7,200 bps
ITU-T V.32	9,600/4,800 bps
ITU-T V.23	1,200/75 bps (FSK)
ITU-T V.22bis	2,400 bps (QAM)
ITU-T V.22	1,200 bps (DPSK)
Bell 212A	1,200 bps (DPSK)
ITU-T V.21	300 bps (FSK)
Bell 103	300 bps (FSK)

- **Fax Modulation or Protocol Standards**

ITU-T V.17	14,400/ 12,000/ 9,600/ 7,200 bps (TCM)
ITU-T V.29	9,600/ 7,200 bps (QAM)
ITU-T V.27ter	4,800/ 2,400 bps (DSPK)
ITU-T V.21 Channel 2	300 bps (FSK)

Fax Send and Receive rates up to 14,400 bps
Group III Compatible
Supports TIA 578 Class 1 and Class 1.0 (T.31)

- **Error Correction**

V.42 LAPM
MNP 2-4

- **Data Compression**

V.42bis (up to 4-1 compression)
MNP 5 (up to 2-1 compression)

- Supports both K56Flex and V.90 (Dual Mode)
- Software Upgradable
- High Throughput Virtual UART for High Speed Operation up to 115,200 bps
- PnP Auto Selection of Com Port and IRQ settings
- Enhanced AT Command set { V.25ter(Annex A) and TIA-602 }
- TIA-695 compatible Voice and Speaker Phone AT Command set
- NVRAM directory stored profile
- Flow Control (XON/XOFF, RTS/CTS)
- Speed Buffering
- Automode
- Data/Fax/Voice Auto Detection
- Automatic Format/Speed Sensing
- Low Power Consumption with Auto Power Management
- Supports Both Tone and Pulse Dialing
- Signal Quality Monitoring and Auto Retrain
- Ties Escape Command

Appendix T

Trouble-Shooting

T.1 How to Use this Section

The modem has been designed and manufactured to make telecommunications as easy and painless as possible. However, success with communications depends upon a number of things working together correctly: your computer, your modem, your software, and your telephone line. And, these individual pieces must be working correctly on the other side of the connection as well.

While correcting problems is usually quite simple, the difficulty lies in knowing where to look. This section of the manual is designed to assist you in determining the cause of problems that may occur so they can be fixed , you might also look to similar sections in your communications software manual.

Additionally, Zoltrix web site locations that may help in solving the modem problem, are listed.

T.2 Determining What Serials Ports Are Installed in Your Computer

Whether you are installing an Internal or an External modem in your system, it is a good idea to determine what serial ports are installed in your computer...if any. You may assume that you only have COM1 on your computer, when you actually have both COM1 and COM2. You also might have many other combinations of COM ports.

To determine what COM port is being used, match the information from the Port Address to the following chart:

COM1	**03F8-03FF**
COM2	**02F8-02FF**
COM3	**03E8-03EF**
COM4	**02E8-02EF**

T.2.1 Determining What Serials Ports Windows 95 Recognizes

Before you physically install a the PnP internal modem and after you physically install a internal modem, you should verify if the Com port is recognized by Windows 95.

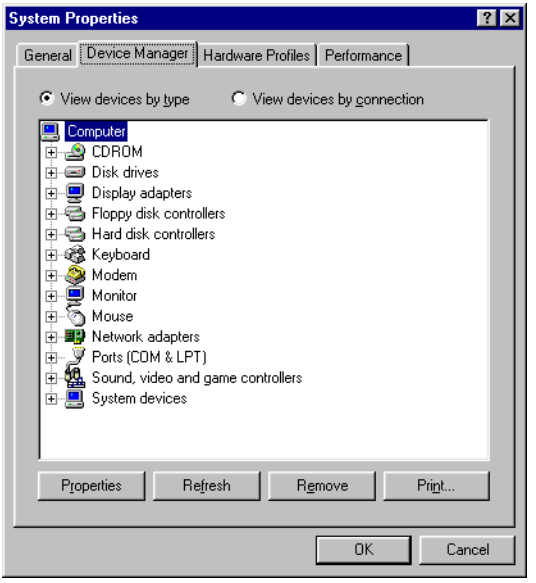
Use the following instructions to determine what Com ports are recognized by Windows 95.

1. Double click the 

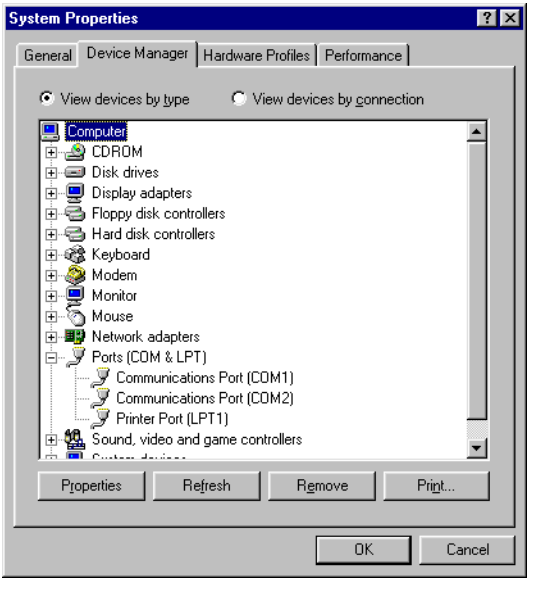
ICON in the Control Panel.

2. Click on the Device Manager tab.

This will bring up the following screen:



3. Double Click on Ports (COM & LPT) **(as indicated on the picture below)**



From the picture above, we can see that Windows 95 recognizes Com 1 and Com2.

T.3 Online Technical Support

If you have access to the World Wide Web be sure to visit the Zoltrix home page at:

http://www.zoltrix.com

For Technical Support phone numbers and e-mail addresses and information of K56 technology, including FAQ's, refer to the Zoltrix Support Services web page at:

http://www.zoltrix.com/techsupp.htm

For AT command manuals and drivers, refer to the following web page:

http://www.zoltrix.com/modem.htm