Section 1: Internet Introduction

Introduction to the Internet

The Internet, or World Wide Web, is a computer-based worldwide information network. It has also been referred to as the information super highway. The Internet is composed of computers linked together on a worldwide basis to share information and is composed of a large number of smaller interconnected networks called Internet. These Internets may connect tens, hundreds, or thousands of computers, enabling them to share information with each other and to share various resources, such as powerful supercomputers and databases of information. The Internet has made it possible for people to effectively and inexpensively communicate with each other all over the world. Unlike traditional broadcasting media, such as radio and television, the Internet is a decentralized system. Each connected individual can communicate with anyone else on the Internet, can publish ideas, and can sell products with a minimum overhead cost. In the future, the Internet may have a dramatic impact on higher education and business as more universities offer courses and more companies offer goods and services online. Using a software such as America On Line allows you easily to "surf the Web", finding connections to millions of documents stored on these linked computers.

To access one document from another, you can click the mouse button on a "link" in a document that will access another document. As the mouse pointer moves over a link, which may be underlined text or a graphics image, the pointer will turn into a hand. To return to a previous document, you can click the "Back" button on the Toolbar.

To see a list of all the documents you have visited in your current session, you can click on the Window menu choice, then History. Click on the document you wish to revisit.

History of the Internet and the World Wide Web

ARPANET (Advanced Research Projects Agency NETwork) was launched in 1969 by the Department of Defense as a means for moving information over a distance between unlike computers. There was not a central authority or computer; rather messages were contained in "packets" that could travel independently by a variety of paths, through different computers, toward their destination.

ARPANET was disbanded in 1990, but by that time, it had become a research support infrastructure and global information infrastructure called the Internet. This network is an interconnected network with thousands of links to computer networks in academic, research, government, and commercial institutions, as well as public and private organizations and individuals.

Electronic mail is still responsible for much of the Internet traffic, but the main emphasis has come to be on the transmission of data files, known as hypermedia documents, which are displayed on the user's computer as though they were locally available. These documents contain text, documents, and hypertext links that are connected to other hypermedia documents on the Internet.

The World Wide Web

The World Wide Web (www) is a distributed browsing and search system introduced in 1993, developed by CERN, the European laboratory for Particle Physics.

This is a collection of multimedia documents created by organizations and users all over the world.

Documents on the Internet are linked in a hypertext Web that allows users to explore far and wide with simple mouse clicks. A web document is called a home page or a Web page. It is typically made up of text and images, like pages in a book.

A document may also include links to other documents on the web, which can be accessed by clicking on active text or graphical links. The new page might be on the same server, or it might be on another server thousands of miles away. "Surfing the Web" means moving from one web document to another, using the hypermedia links to explore pages on many different servers. The best way to learn more about the Internet is to begin surfing!

Using URL's

The Web is built around a naming scheme that allows an information resource to be located using the Uniform Resource Locator, or URL. A URL is the address of a file on the web. The anatomy is as follows:

http://server name/path name/file name

HTTP stands for Hyper Text Transfer Protocol, a protocol that permits various computers to talk to each other using a common language known as Hyper Text Markup Language (HTML). HTML is an easy to understand computer language that is simple to learn. Server name is the address of the computer which locates the host computer system where the information is stored, also called the domain. The path name shows which folders or subfolders contain the information, and the file name is the name of the actual HTML file which contains the information.

An example of a URL is:
http://www.aol.com

The domain is aol, or America On Line. If you are typing a URL into the location text box in Netscape or other internet browsing software, every part of the URL must be correct, or the browser will not find the file.

Internet Browsers

The Web is navigated using a browser, a program that allows you to read hypermedia documents and navigate the Web by clicking on "hot links". By clicking on an underlined, colored word or an icon at a web site, the user can quickly move to the information linked to a remote site or additional information at the current site. The special files that browsers read are HTML (Hyper Text Markup Language) files that come to your computer via the Internet.

Ethical and Etiquette Issues in Using the World Wide Web

The Internet is a virtual community in which people communicate, conduct business, meet new friends, and discuss a wide range of topics - all electronically. Communication can be asynchronous as well as distributed, between two people or a multitude of people. In this virtual community, there is no way of confirming the identity of a business or person.

Netiquette is the etiquette of the Net. It is a system of rules which has been devised to help members of this virtual community govern themselves, since there is no central governing body. These rules include being honest in your communications, remaining legal and ethical in your activities, and being polite when dealing with others.

In any society rules are broken occasionally. In this new virtual community, many individuals are careful with whom they communicate and which locations they visit. Caution is always suggested when traveling to new or unknown communities.

Using Search Engines to Find Information

The World Wide Web and its sites are dynamic and evolving, with new sites being added or edited every day, addresses changing, and links being out of date. To search through the more than 60 million documents on the Internet for a particular topic, you use a search engine.

A search engine is a program that finds matches between the word(s) you specify and keywords or sometimes all the words in a document. The information is compiled by spiders, programs that automatically and independently index documents on the Web for inclusion in a search engine's database.

Spiders "crawl" over the Web looking for information. This keyword list may include every word in the document, or specific words that have been selected as keywords. The search process will find every document that contains that word. When you click the Net may also select a search engine from the list.

When you are using a search engine, you enter your search string (sequence of letters or words) or keyword into the Search text box and click the Search button. Use the capitalization you expect to find in the target documents, Identify phrases by surrounding them with double quotation marks. Use a comma to separate proper names. Some popular search engines are listed below.

Lycos is the search engine served by Carnegie Mellon University.

It now accesses over 66,000,000 documents. The index searches document titles, headings, links, and keywords it locates in document. Lycos also lists a directory of keywords on its home page. Contact Lycos at http://lycos.cs.cmu.edu/

The University of Washington Computer Science and Engineering Department developed WebCrawler. WebCrawler number of words in the document by the number of times your calculates how relevant each document is by dividing the total query words appear in the document. You can access WebCrawler at
http://webcrawler.com/

Yahoo was originally developed at Stanford University. Yahoo is organized like the table of contents for the world's largest book. Yahoo organizes resources hierarchically into a series of menu selections, such as Art, Education, Government, and Reference. Selecting one of these directories leads to a further subset of directories. You can also use the Search window in Yahoo to further use the search engine. Yahoo can be reached at
http://www.yahoo.com

Section 2: Modems Introduction

As the World Wide Web is also known as the information super highway, you will need a vehicle to move you from site to site with the most convenience. The vehicle used to drive on the information super highway is the modem. A modem is a device that converts between analog and digital signals. Digital signals, which are used by computers, are made up of separate units, usually represented by a series of 1's and 0's. Analog signals vary continuously; an example of an analog signal is a sound wave. Modems are often used to enable computers to communicate with each other across telephone lines. A modem converts the digital signals of the sending computer to analog signals that can be transmitted through telephone lines. When the signal reaches its destination, another modem reconstructs the original digital other simultaneously, the modems are operating in full duplex mode; if only one modem can transmit signal, which is processed by the receiving computer. If both modems can transmit data to each at a time, the modems are operating in half duplex mode.

To convert a digital signal to an analog one, the modem generates a carrier wave and modulates it according to the digital signal. The kind of modulation used depends on the application and the speed of operation for which the modem is designed. For example, many high-speed modems use a combination of amplitude modulation, where the amplitude of the carrier wave is changed to encode the digital information, and phase modulation, where the phase of the carrier wave is changed to encode the digital information. The process of receiving the analog signal and converting it back to a digital signal is called demodulation. The word "modem" is a contraction of its two basic functions: modulation and demodulation.

The voice band telephone channel is a band pass channel, traditionally thought of as operating from about 300 Hz to 3,000 Hz. Modem modulations, therefore, had to operate within this band. Early modems used tones (e.g., FSK) which fell within this frequency band for communicating data but the information density was not very high (the number of bits per hertz was significantly less than one). Quadrature amplitude modulation (QAM) was a significant improvement, offering information densities of multiple bits per hertz.

QAM operates by modulating a carrier sine wave signal in both amplitude and phase. Each unique combination of amplitude and phase is known as a "symbol". In the general case, a symbol is defined as an information carrying token which is sent from the transmitter to the receiver.

In the early days of modems, these tokens were called "baud" in honor of the French inventor Emile Baudot who, in 1875, invented a 5 bit code for representing the alphabet. Each 5 bits were a token communicating a letter of the alphabet or a control code. Recently, however, the term baud has become corrupted in common usage, with people using baud to mean bits per second. This is a throwback to the early days of modems when a baud carried only one bit (so the baud rate and the bit rate were the same). Thus, 300 bit per second modems became 300 baud modems in techie-talk. Baud rate is now more correctly referred to as symbol rate. The problem is that after a baud started carrying multiple bits, people were still using baud to mean bits per second. Now, when you modulate a sine wave, the resulting signal is no longer a single frequency sine wave. The resulting signal will be a range of frequencies, related to the signal that is modulated onto the carrier. Assuming random bits, the band width of a modulated QAM signal is equal to the symbol rate. That is, if you send 2400 symbols per second, the bandwidth of the modem signal will be 2400 hz. The V.32 modulation, for example, uses a carrier of

1800 hz and a symbol rate of 2400 symbols per second. The bandwidth of the signal, therefore, is from 600 hz to 3000 hz.

Section 3: V.90 Introduction

Most recently, 33.6Kbps (Thousand Bits Per Second) speed modems have set a transmission speed limit over ordinary phone lines. These phone lines are considered analog lines. Traditional modem standards assume that both ends of a modem session have an analog connection to the public switched telephone network. Data signals are converted from digital to analog and back again, limiting transmission speeds to 33.6Kbps with current V.34 modems, and due to limitations of the public telephone network the theoretical maximum is 35Kbps.

However, most Internet Service Providers and corporations that use modems for remote access have a pure-digital connection to the phone network. With V.90 technology a different assumption is made: that one end of the modem session has a pure-digital connection to the phone network and takes advantage of that high speed digital connection.

X2 technology -- and now the V.90 56K ITU standard -- are capable of high speed downloads over analog phone lines and have brought their knowledge of the increasingly digital telephone system to make 56K technology possible. This technology takes advantage of the typical network configuration found when a modem dials into a digitally connected Internet service provider. Because it bypasses the analog-to-digital conversion in the downstream path, it can use nearly all of the available 64K network bandwidth. (Upstream data, typically less speed-sensitive, travels at up to 31.2K.)
What this means to you as the new owner of this V.90 56K modem is that you are driving the fastest modem possible on the information super highway.

By viewing the public switched telephone network as a digital network, V.90 technology is able to accelerate data downstream from the Internet to your computer at speeds of up to 56Kbps*. In this way V.90 technology is different than other standards of today, because it digitally encodes downstream data instead of modulating it as analog modems do. The data transfer is a symmetrical method, so upstream transmissions (mostly keystroke and mouse commands from your computer to the central site, which require less bandwidth) continue to flow at the conventional rates of up to 33.6Kbps. That is upstream data (Data sent from your modem) is sent as an analog transmission that mirrors the V.34 Standard. Only the down stream data transfer takes advantage of the high speed V.90 rates V.90 technology is ideal for Internet users, because you really need the 56Kbps* speed for downloading of Web pages with sound, video and other large files. All that is needed is for your V.90 modem to be connected to an ISP or corporate site using V.90 technology over their digital lines to the network.

Note:* Modems can receive data at speeds of up to 56Kbps however due to FCC (Federal Communications Commission) rulings on maximum permissible transmit power levels during down load transmissions, speeds of 54Kbps are the maximum. Actual data speeds received will vary depending on line conditions.

Because it bypasses the analog-to-digital conversion in the downstream path, it can use nearly all of the available 64K network bandwidth. (Upstream data, typically less speed-sensitive, travels at up to 31.2K.)

FAQ's (Frequently Asked Questions)

How fast is my new V.90 modem?

With a reasonably good phone line and if you live within 3 1/2 miles from your central office (local phone company building), you should get connect speeds between 40K and 53K. See our Speed charts. Some lines have impairments on them, like digital pads or robbed bit signaling (RBS), which decreases the highest achievable speeds. However if you are getting pretty good V34 connections, you should be able to significantly benefit from a V90 modem.

If these modems can't really connect at 56K, why are they called 56K?

It was an unfortunate misnomer. The FCC limits legal speed on the telephone network to 53Kbps. Actual speeds vary according to your phone line conditions.

Why do some new modems support both V.90 AND k56flex or X2?

This is to insure compatibility with your existing ISP. When your ISP upgrades their modems, your modem will be able to switch automatically into V.90 mode, but for now will continue to operate in K56flex or X2 mode. This is important for the near future. The new modem you buy should support TWO 56K protocols, V.90 plus another, because ISP's are running X2 or K56flex right now. If you have one pre-V.90 brand of modem, and your ISP has another pre-V.90 brand of equipment, you will still connect at the K56flx or X2 speeds.

To get the maximum speed from your new modem, make sure you are calling a phone number that has a compatible 56K modem at your Internet Service Provider or AOL. Some phone numbers only have V34 modems on them and you cannot get 56K speeds calling these. Also, make sure you are calling a compatible line. If your ISP has K56flex running,

you will not be able to get an X2 modem to connect at K56 speeds and visa versa.

Section 3.1 ITU standard - The Final Analog Modem Standard

The ITU set the V.90 modem as the standard for high speed modems. The V.90 modem standard will persevere as leader for analog modem speed, for a much longer reign than the very popular V.34 standard enjoyed. Very likely, V.90 is the final analog modem speed standard. This means you will not have to replace your modem every year, as has been the practice for speed seeking web surfers of the recent past. For tens of millions of people, using a V.90 modem will be how they connect to the internet for many years to come. Even given the progress, promotion and promise of other high bandwidth technologies like cable modems and DSL, many countries and rural USA will not have the infrastructure put in place to benefit from bi-directional cable or DSL. The V.90 modem is the high-speed conduit of choice to get on the Internet.

Section 3.2 56k V.90 comparison table with other modems

As you can clearly see from the table below, the 56k V.90 will surely save your time whether you are surfing the net, playing an interactive game or telecommuting.

Modem Speeds	Bits/s	Bytes/s	%ofv.90	Time used@ 9600	Kilobytes/ Minute	Megabytes/ Hour
9600	9600	1200	21%	20'00"hours	70	4
14400	14400	1800	31%	13'48"hours	106	6
28800	28800	3600	62%	7'36"hours	211	12
56kV.90	53000	5833	100%	4'12"hours	366	22

Section 3.3 Modem features and compatibility

Your new modem is compatible with the following standards.

.V.90 (56000bps down stream only)

.X2™ (56000bps down stream only)

.V.34 (33600 bps)

.V.32bis (14400 bps)

.V.32 (9600 bps)

.V.23 (1200/75 bps)

.V.22bis (2400 bps)

.V.22 (1200 bps)

.Bell 212A (1200 bps)

.Bell 103 (300 bps)

.V.17 (14400 bps FAX)

.V.29 (9600 bps FAX)

.V.27ter (4800 bps FAX)

.V.80 (Video Ready Mode)

.V.42bis (data compression)

.V.21 Channel-2 (300 bps FAX)

.MNP 5 (data compression)

.V.42 (error correction)

.EIA/TIA 602 AT Command set

.MNP 2-4 (error correction)

.TIA/EIA 578 Class 1 Fax Command set

.Plug and Play ISA spec V1.0a*

.Plug and Play ext COM spec V1.0

Note: * Voice, Speakerphone, PnP are optional features that may not be available on your modem.

Section 4　 Contents of Package

- **.** One modem
- **.** One telephone cable
- **.** One AC power adapter (external modem only)
- **.** Communication software & Modem Driver CD-ROM disk

Please contact the place of purchase if any of the above listed items are missing.

Section 5　 Comprehensive Modem Installation Instructions

Section 5.1　Modem Installation

This section will provide instructions for the installation of your modem. There are hardware installation and system setup two parts for the modem. The modem hardware must be installed into the computer correctly before you start the system setup.

Section 5.2　Hardware Installation

Section 5.2.1　　 Hardware Installation for Internal Modem

Before you install an internal modem, you must assign it a unique COM port address and IRQ setting. The COM port address tells your computer where to find your modem. The IRQ setting us used by your modem to get your computer 's attention. If your modem is set to use a COM port address that is being used by another device, you may experience COM port address or IRQ conflicts, and it will either not work properly or not work at all.

Your internal modem is factory configured to use the newer Plug-n-Play (PnP) technology, The COM port address and IRQ setting can be configured by computer's BIOS or Windows Operating System (Win 95, Win 98 and Win NT 4.0) automatically.

If your computer does not support PnP feature, the COM port address and IRQ can be selected via jumpers located on your modem (see Figure 5-1) manually. And the first step is to determine how many COM ports are on your computer without the modem installed. Most computers have 1 or 2 COM ports.

You can refer to the manual for your computer to give you an indication of which COM port addresses and IRQs are already being used by your computer.
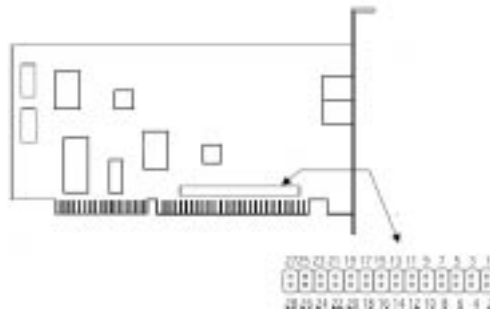
	COM Port (Address)	IRQ	Jumper Pin													
			1&2	3&4	5&6	7&8	9&10 (IRQ3)	11&12 (IRQ4)	13&14 (IRQ5)	15&16 (IRQ7)	17&18 (IRQ1O)	19&20 (IRQ11)	21&22 (IRQ12)	23&24	25&26	27&28
NoN-PnP Mode	1(3F8)	4**	open	open	short	short	open	short	open	open	open	open	open	open	open	open
	2(2F8)	3**	short	open	open	short	short	open	open	open	open	open	open	open	open	open
	3(3E8)	4**	open	short	short	open	open	short	open	open	open	open	open	open	open	open
	4(2E8)	3**	short	short	open	open	short	open	open	open	open	open	open	open	open	open
PnP	Mode*		open	open	open	open	short	short	short	short	shot	short	short	short	short	short

Note:*Factory default
    **For NoN-PnP mode, the IRQ setting can be changed to anyone of IRQ 3,4,5,7,10,11,12

FIGURE 5-1 Internal modem diagram and Jumper Table

After you have determined which COM port address and IRQ will be used for your modem. You can proceed to following steps for how to insert your modem into the computer.

1. Turn off and unplug your computer from the AC outlet.
2. Unplug any peripheral devices (keyboard, monitor, etc.) from your computer.
3. Take the cover off your computer, review computer's manual if youneed further instructions.
4. Find an empty ISA slot.
5. Unscrew the ISA slot bracket and save the screw, then remove the bracket.
6. Plug the modem into the ISA slot carefully until the modem is properly seated.
7. Fasten the modem bracket firmly with the screw saved in step 5.
8. Replace the computer cover.
9. Plug one end of telephone cord into the "**LINE**" jack at the modem's bracket. Plug the other end of the telephone cord into the telephone wall jack
10. Some model may include a phone jack for an optional telephone. If you wish to use a phone through the same telephone wall jack as the modem when the modem is not in use, plug the telephone cord of the phone into "**PHONE**" jack at the modem's bracket now . Lift the handset and listen for a dial tone to check for a properly connection.
11. Some model may also include a speaker and microphone jack. You can connect them to the "**SPK**"and "**MIC**" jack now.
12. Plug the power cords, and peripherals back into the computer and turn the computer on.
13. This finishes the hardware installation for internal modem. If you have not encountered any problems , you can go to **Section 5-3 Software Installation.** If you are having problems, see

Section 6 Troubleshooting.

NOTE : The telephone wall jack you use must be for an ANALOG phone line (the type found in most homes). Many offices are equipped with digital phone lines. Please be sure you know which type of line you have. The modem will be damaged if you use a digital phone line.

Section 5.2.2   Hardware Installation For External Modem

The following steps provide instructions for installing your external modem. You will also need a RS-232 serial cable (not included) to make the connection to your computer.

If you the serial connector of your computer looks like Figure 5-2, you need a shielded serial modem cable with a 25-pin female to 9-pin male connector.
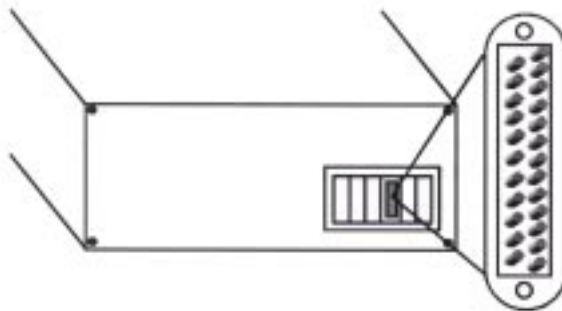
Figure 5-2

If the serial connector of your computer looks like Figure 5-3, you need a shielded serial modem cable with a 9-pin female to 9-pin male connector.
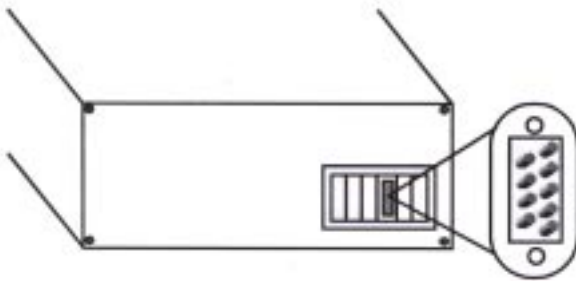
Figure 5-3

If you are Macintosh computer user, use only a high speed Macintosh serial cable with 8-pin mini-DIN to 9-pin male connector, which supports hardware flow control signals.

After you have determined which cable will be used for your modem. You can proceed to the following steps for how to connect your external modem to the computer.

Figure 5-4 External Modem rear panel

1. Turn off and unplug your computer from the AC outlet.
2. Unplug any peripheral devices (keyboard, monitor, etc.from your computer.
3. Connect the male end of the serial cable into the connector marked **RS-232** on the rear panel of the modem. (see **Figure 5-4**)
4. Connect the female end of serial cable to the available serial port marked **COMx**, **RS-232** or **SERIAL** on the back of your computer.
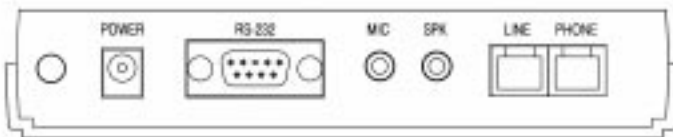5. Plug one end of telephone cord into the "**LINE**" jack at the modem's bracket. Plug the other end of the telephone cord into the tele phone wall jack
6. Some model may include a phone jack for an optional telephone. If you wish to use a phone through the same telephone wall jack as the modem when the modem is not in use, plug the telephone cord of the phone into "**PHONE**" jack at the modem's bracket now. Lift the handset and listen for a dial tone to check for a prop erly connection.
7. Some model may also include a speaker and microphone jack. You can connect them to the "**SPK**" and "**MIC**" jack now.
8. Plug the power adapter into a AC outlet, and insert its plug into the "POWER" jack on the rear panel of your modem after you verify the modem power switch is in the OFF position.
9. Plug the power cords, and peripherals back into the computer.
10. Turn on the modem power switch. Then turn the computer on.
11. This finishes the hardware installation for external modem. If you have not encountered any problems, you can go to **Section 5-3 Software Installation.** If you are having problems, see **Section 6 Troubleshooting.**

NOTE : The telephone wall jack you use must be for an ANALOG phone line (the type found in most homes). Many offices are equipped with digital phone lines. Please be sure you know which type of line you have. The modem will be damaged if you use a digital phone line.

Section 5.3 System setup

Section 5.3.1   Setup instructions for Windows 3.x

You must configure Windows to recognize the modem after hardware installation or when the modem COM port address and IRQ settings have been changed to avoid hardware conflicts with other devices in your system. This section will guide you through this setup procedure.

1.   Open **Program Manager** and double-click the **Main** icon. Then double-click the **Control Panel** icon
2.   Double-click the **Ports** icon.
3.   If it is not already selected, click the COM port for your modem. Then click **Settings**.
4.   Click **Advanced**. Then set the appropriate value in the Base I/O port address and **Interrupt Request Line (IRQ)** box to match your modem.
5.   Click OK. And you will see a series of screens after the preceding screen. Click **OK** on each screen until you see a screen with a **Close** button. Click **Close** to exit

Section 5.3.2   Setup instructions for Windows 95 and Windows 98

For Windows 95 and Windows 98 users, you may be able to simply plug your modem into your computer, power up, and be ready to work. The Windows system should do all the work of recognizing the modem for you. This section will guide you through this setup procedure.

1.   Check your version of Windows 95 by looking in **Start** and point to **Setting**. Then click on Control Panel. When the **Control Panel** window opens, double click the **System** icon and click on the

General tab. The **General** tab will tell whether you have "Windows 95 Version 4.00.950", "**Windows 95 Version 4.00. 950A**" or "**Win-dows 95 Version 4.00.950B**". Take note of the version and go to the next appropriate step.

A. If you have "**Windows 95 Version 4.00.950B**" or **Windows 98** skip this step and proceed to step 2 of this appendix. For "**Windows 95 Version 4.00.950**" and "**Windows 95 Version 4.00.950A**". After you complete the modem hardware installation and start Windows system. Windows system will automatically detect your new modem. Windows system will then prompt you with a new **New Hardware Found** screen with words describing your modem. On this screen it will ask you to **Select which driver you want to install your new hardware** You will select **Driver from disk provided by hardware manufacturer**.

B. Insert the **Modem Driver** disk included with your modem into appro priate drive A:\ or B:\ or into the CD-ROM driver if your **Modem Driver** is on a CD. Windows will help by giving you an option of drives. Most computers are configured with A:\ as a 3.5" floppy disk; C:\ as your hard drive; and D:\ as your CD-ROM. After inserting **Modem Driver** disk or CD click on **OK**.

C. If you have the voice option, the system will prompt with another "**New Hardware Found**" screen with the phrase "**Wave Device for Voice Modem**". On this screen it will ask you to **Select which driver you want to install your new hardware**. You will select "**Driver from disk provided by hardware manufacturer**".

D. Insert the **Modem Driver** disk included with your modem into appro priate drive A:\ or B:\ or into the CD-ROM if your **Modem Driver** is on a CD. Windows will help by giving you an option of drives. Most com puters are configured with A:\ as a 3.5" floppy disk; C:\ as your hard

drive; and D:\ as your CD-ROM. After inserting **Modem Driver** disk or CD click on **OK**.

E. You will be prompted to restart system. If there is no error message, your modem is set-up properly and is now functional.

2. For "**Windows 95 Version 4.00.95B**" and **Windows 98**. After you complete the modem hardware installation and start Windows system. Windows system will automatically detect your new modem. Windows system will then prompt you with a new **Update Device Driver Wizard** screen with words describing your modem. Click on **Next** when it correctly describes your new modem.

A. Insert the **Modem Driver** disk included with your modem into appro priate drive A:\ or B:\ or into the CD-ROM driver if your **Modem Driver** is on a CD. After inserting **Modem Driver** disk or CD, click on **Next**.
B. If you have the voice option, the system will prompt with another **Update Device Driver Wizard** screen with the phrase **Wave Device for Voice Modem**. You will insert the Modem Driver disk included with your modem into appropriate drive A:\ or B:\ or into the CD-ROM driver if your **Modem Driver** is on a CD. After inserting **Modem Driver** disk or CD, click on **Next**.

C. After Windows system further describes your wave device, click on **Finish**.
D. You will be prompted to restart system. If there is no error message, your modem is set-up properly and is now functional.

Section 5.3.3   Setup instructions for Windows NT 4.0

1.   Insert your Microsoft Windows NT 4.0 CD into CD-ROM drive.
2.   Open Windows NT Explorer and go onto NT 4.0 CD directory
         \Drvlib\Pnpisa\X86.
3.   Locate the file **PNPISA.INF** under the **Symbols** folder. Now
         using your mouse'sright click button, click on the **PNPISA.INF** file
         and click on Install from the pop-up menu.
4.   Windows NT will then prompt you to restart your system.
5.   When your computer restarts it will then prompt you with a **New
         Hard ware Found** screen with words describing your modem.
         On this screen it will ask you to **Select which driver you want
         to install your new hardware**. You will select **Driver from disk
         provided by hardware manufacturer.**
6.   Insert the **Modem Driver** disk included with your modem into
         appropriate drive A:\ or B:\ or into the CD-ROM if your **Modem
         Driver** is on a CD. Windows will help by giving you an option of
         drives.Most computers are configured with A:\ as a 3.5" floppy
         disk; C:\ as your hard drive; and D:\ as your CD-ROM. After insert
         ing **Modem Driver** disk or CD click on **OK**.
7.   Your computer will then prompt you with another **Install New
         Modem** screen. Select the correct model number of your modem
         from the list, and click on **OK**

8.   Your computer will then prompt you with a new **Advanced Port
         Settings** screen. On this screen you will click on the **Resources**
         tab. At the bottom of the **Resources** tab you will see a small win
         dow **Conflicting device list**. If the **Conflicting device list** reports
         No conflicts, click on **OK**. If on the other hand it reports **Conflicts**,
         click on **Set** Configuration Manually and select a different COM
         port under Basic Configurations until No conflicts is reported here.

9. You will be prompted to restart system. If there is no error message, your modem is set-up properly and is now functional.

Section 5.4 Testing Your Modem

Before you set up your software, start with a quick test to check that your modem is working. Once you have determined that your modem is setup properly, go on to **Section 5.5 Install Communication Software** to install your communications software. If you are having problems, see **Section 6 Troubleshooting**.

For Windows 3.x

Open Windows Terminal program. In terminal screen type **AT** and press **Enter**. An **OK** response means your modem is setup properly.

For Windows 95 and Windows 98

Click on **Start** and point to **Setting**. Then click on **Control Panel**. When the **Control Panel** window opens. Scroll down to the **Modem** icon and double clik on it. Click on the **Diagnostics** tab and highlight the COM port for your modem. Then click on **More Info**, your computer will automatically communicate with your new modem using AT commands and receiving responses from your modem. A list of responses means the modem is setup properly.

For Windows NT 4.0

Open Windows NT HyperTerminal program. In terminal screen type **AT** and press **Enter**. An **OK** response means your modem is setup properly.

Section 5.5 Install Communication Software

You can install the communications software from the CD-ROM disc included with your new modem. Please consult the software manual in the CD-ROM disc for the detail of software installation.

You do not have to use the communication software included with your new modem. The modem was designed for and tested using a wide range of communications software packages. Many communications software programs identify the modem automatically and configure themselves for the correct operating settings. Some of the communications software programs will ask you to select the type of modem you are using. Select a **Generic Fax class 1 modem** will let you use basic communications and fax functions.

You can also use the modem with DOS-based games and other applications. Most have feature for adding an unsupported modem to their supported-modem list. Others let you configure some parameters about the modem in order to use it. The parameters that such applications may need are as follows.

Initialization string   --for setting the modem to a known state, you can use AT&F.

Hang-up string   --for terminating a phone call, you can use ATH0.

Dialing string   --for instructing the modem to initiate a phone call, you can use ATDT.

Answer string   --for instructing the modem to answer a phone call, you can use ATA.

COM port rate   --for sending serialize data is sent to the modem, you can use 57600.

Section 6   Troubleshooting

Your modem is designed to provide reliable and trouble-free functionality, however, should you experience any difficulty, the information contained in this section will assist you in determining and resolving the source of the problem.

Problem : Modem does not respond to AT commands
Possible solutions :

1.   Make sure the modem is not configured with a conflicting COM port and IRQ setting (**see Section 5.2.1**). Your modem can not be con figured as COM4 (recommended) if another device in your sys tem is also configured as COM4. Similarly, IRQ settings may not overlap.

2.   Make sure the communication software is configured with the correct COM and IRQ settings (the same COM port and IRQ as the modem). Your communications software will not be able to send or receive any data if it is not configured to match the COM port and IRQ settings for the modem.

3.   Make sure the modem is properly initialized using the driver software. The software may improperly initialize your modem be cause you have selected an incorrect modem type. You may also be prompted to enter an initialization string by the software. Use AT&F as your initialization string.

4.   If you are running Microsoft Windows 3.1, make sure that the modem is properly configured in Windows (**see Section 5.3**)

Problem : Modem dials but does not connect

Possible solutions :

1.   Be sure the IRQ setting is identical on the modem AND the software.

2.   Make certain that the phone line is working properly. A noisy line will prevent proper modem operation.

Problem : Modem makes a connection but no data appears on screen

Possible solutions :

1.   Make sure all communication parameters (baud rate, data, stop, and parity bits) are properly configured and are identical on both sides. Be certain hardware flow control (RTS/CTS - default) is en abled in both the modem and the communication software.

2.   Press the ENTER key several times. The remote system may be waiting to receive your data before it begins.

3.   Make sure the correct terminal emulation mode is being used in the software (refer to software manual).

Problem : Modem displays errors while on-line with a remote modem

Possible solutions :

1.   Make sure Call Waiting is turned off by pressing *70 or #70 on your telephone.

2.   Make sure RTS/CTS hardware flow control is enabled (do not use XON/XOFF software flow control when transferring binary files).

3.   Make sure the data speed is not faster than your computer capability. Most IBM compatibles are capable of 19,200 bps under DOS and Windows3.x.Operating at higher speeds under Windows requires a faster CPU (386 or better).

Problem : Modem exhibits poor voice record or playback
Possible solutions :
1.   Make sure the correct modem type is selected in the Voice/FAX
        software.
2.   Make sure your computer is fast enough to handle voice opera
        tions (38.4 Kbps). Voice operations are CPU intensive and require
        a 386/33 or better CPU when running under MS Windows.

Problem : No dial tone
Possible solutions :
1.   Ensure that the telephone cord it securely connected at both mo
        dem and wall outlet.
2.   Unplug the telephone cord from the computer and connect it
        directly to a telephone from the wall outlet. Check for a dial tone. If
        there is none, the problem is in the telephone cord or system. Call
        your telephone service provider.

Problem : The modem does not answer incoming calls
Possible solutions :
1.   Ensure that the automatic answer parameter is set to one of the
        enabled options, using the ATS0 command (ATS0=1 to answer
        after one ring, and so on).
2.   Ensure that no other devices, such as fax or answering machines,
        are answering calls before the modem does.

If you can not resolve your situation after reading this section, contact
your dealer or vendor for assistance.

Appendix 1 Specifications

Modulation standard	: V.90, X2, V.34, V.32bis, V.32, V.29, V.27ter, V.22bis, V.23,V.22, V.21,V.17, Bell212/103
Compression	: V.42bis, MNP Class 5
Error Correction	: V.42, MNP Class 2-4
Host Interface	: ISA 16 bit bus
COM ports	: 1, 2, 3, 4
IRQ lines	: 3, 4, 5, 7, 10, 11, 12
FAX Group	: Group III
FAX Command	: EIA/TIA 578 class 1
VOICE Command	: IS - 101
Transmit level	: -10 dBm +/- 1 dB
Sensitivity	: -43 dBm
UART	: 16550 compatible
Power	: 0.75 W max
Temperature	: 0 to 55 degrees C, operating; -20 to 80 degrees C, non-operating

Appendix 2 AT command set

Executing commands

Your modem is in Command Mode upon power-on and is ready to receive and execute AT commands. The modem remains in Command Mode until it makes a connection with a remote modem. Commands may be sent to the modem from an attached terminal or a PC running a communication program. This modem is designed to operate at common DTE speeds ranging from 115.2 Kbps to 300 bps. All commands and data must be issued to the modem using one of the valid DTE speeds.

AT commands and format

All commands must begin with the AT prefix, followed by the command letter and ended with the ENTER key. All default settings are printed in bold text. Spaces are allowed in the command string to increase command line readability but are ignored by the modem during command execution. All commands may be typed in either upper or lower case, but not mixed. A command issued without any parameters is considered as specifying the same command with a parameter of "0".

   Example: ATL [ENTER]

This command causes your modem to lower its speaker volume.

AT Command Summary

All default settings are printed in bold and italic text.

AT	Command prefix
A/	Repeat last command
A	Answer
B0	Select V.22/V.21
B1	***Select B212A/B103***
B2	Select V.23 only; Dial modem transmit @ 75 BPS, receive @ 1200 BPS;Answer modem receive @ 75 BPS, transmit @ 1200 BPS
B3	Select V.23 only; Dial modem transmit @ 1200 BPS, receive @ 75 BPS;Answer modem receive @ 1200 BPS, transmit @ 75 BPS
D	Dial

	0 - 9	Dialing digits
	ABCD*#	Tone dial characters
	P	Pulse dial
	T	Tone dial
	R	The modem goes into answer mode directly after finish dialing
	S=n	Dial stored telephone number n

	W	Wait for dial tone
	,	Pause the time specified in S-register S8
	!	Flash hook
	@	Wait for quiet answer
	;	Return to command mode
E0		Disables echo
E		*Enables echo*
H0		Hangs up the telephone line
H1		Picks up the telephone line
I0		Reports product code
I1		Reports modem chip firmware version
I2		Verifies ROM checksum
I3		Report chipset name
L0		Low speaker volume
L1		Low speaker volume
L2		*Medium speaker volume*
L3		High speaker volume
M0		Speaker always off
M1		*Speaker on until carrier present*
M2		Speaker always on
M3		Speaker off during dialing; speaker on until carrier present
N0		Handshake only at DTE speed
N1		*Begin handshake at DTE speed and falls to highest compatible speed*
O0		Return to data mode
O1		Retrain and return to data mode
P		Select pulse dialing
Q0		*Enables result code*
Q1		Disables result code
Sn		Select S-register n; refer to **S-register summary** for the details

Sn=x	Write x to S-register n; refer to **S-register summary** for the details
Sn?	Read from S-register n; refer to **S-register summary** for the details
T	*Select tone dialing*
V0	Choose numeric form result code
V1	*Choose verbose form result code*
W0	*Reports DTE connect speed result code*
W1	Reports DTE connect speed result code
W2	Reports DCE connect speed result code
W3	Reports DTE connect speed result code with error correct and data compression Information
W4	Reports error correction, data compression and DCE speed
X0	Enables result code 0-4; disables dial tone and busy tone detection
X1	Enables result code 0-5,10 and above; disables dial tone and busy tone detection
X2	Enables result code 0-6, 10 and above; enables dial tone detection and disables busy tone detection
X3	Enables result code 0-5,7,10 and above; disables dial tone detection and enables busy tone detection
X4	**Enables result code 0-7, 10 and above; enables dial tone and busy tone detection**
Y0	**Disables long space disconnect**
Y1	Enables long space disconnect
Z0	Reset modem and recalls user profile 0
Z1	Reset modem and recalls user profile 1
&C0	Ignores carrier status; CD always ON
&C1	**CD set according to carrier status**
&D0	Ignores DTR

&D1	Modem switches from data mode to command mode when an ON-to-OFF transition of DTR occurs
&D2	When DTR switches OFF , the modem goes on-hook and disables auto-answer
&D3	Reset modem and recall user profile when DTR switches OFF
&F	Load factory defaults
&G0	*Disables guard tone*
&G1	Enables 550 Hz guard tone
&G2	Enables 1800 Hz guard tone
&J0	*Auxiliary relay never operated*
&J1	Activates auxiliary relay when modem is off-hook
&K0	Disable flow control
&K3	*Enables CTS/RTS hardware flow control*
&K4	Enables XON/XOFF software flow control
&M0	*Select asynchronous operation mode*
&P0	*Select 10 pps pulse dial with 39%/61% make/break* ratio
&P1	Select 10 pps pulse dial with 33%/67% make/break ratio
&Q0	*Select asynchronous operation mode*
&S0	**DSR always ON**
&S1	DSR ON only during handshaking and when carrier is lost
&T0	Terminates test in progress
&T1	Initiates local analog loop-back (LAL)
&T3	Initiates local digital loop-back
&T4	*Grants RDL request from remote modem*
&T5	Denies RDL requests from remote modem
&T6	Initiates remote digital loopback(RDL)
&T7	Initiates RDL with self-test
&T8	Initiates LAL with self-test

&U0	***Enables trellis coding***
&U1	Disables trellis coding
&V0	View active profile, stored user profile 0 and stored telephone number
&V1	View active profile, stored user profile 1 and stored telephone number
&W0	Stores active profile into user profile 0
&W1	Stores active profile into user profile 1
&Y0	***Recall user profile 0 on power-up***
&Y1	Recall user profile 1 on power-up
&Zn=x	Stores telephone number x(up to 30 digits) to location n(0-3)
%E0	Disables auto-retrain
%E1	***Enables auto-retrain***
%G0	Disables rate-renegotiation
%G1	***Enables rate-renegotiation***
-C0	***Disables calling tone***
-C1	Enables 1300 Hz calling tone
-C2	Enables V.8 calling tone for V.34 and 1300 Hz calling tone for others
+MS=<carrier>,<automode>,<min rate>,<max rate>	

> This command set the type of modulation used and the transmit and receive speeds. **The defaults is V90, 1,0,0**
>
> <carrier> the string parameter specifies the type of modulation used.
>
> > V21   V.21 300 bps
> > V22   V.22 1200 bps
> > V22B V.22bis 1200/2400 bps
> > V23C V.23 1200/75 bps
> > V32   V.32 4800/9600 bps
> > V32B V.32bis 7200-14400 bps

V34	V.34 asymmetrical 2400-33600 bps	
V34S	V.34 symmetrical 2400-33600 bps	
V34B	V.34 extended asymmetrical 2400-33600 bps	
V34BS	V.34 extended symmetrical 2400-33600 bps	
X2	X2 asymmetrical transmit 4800 - 31200 bps and receive 33333 - 53333 bps	
V90	V.90 asymmetrical transmit 4800-31200 bps and receive 33333-53333 bps	

<automode> control the modem to negotiate modulation automatically.

If <automode>=0	Disabled
If <automode>=1	Enabled

<min rate>

If <min rate> = 0	The lowest data rate = 300 when<automode>= 1.The lowest data rate = lowest modulation data rate when <automode> = 0
If <min rate>≒0	The parameter specifies the lowest data rate. Range = 0,300,1200,2400, 4800,7200,9600, 12000,14400,16800, 19200,21600,24000, 26400,28800,31200, 33600

<max rate>.

| | If <max rate> = 0 | The highest data rate = the highest modulation rate that less than or equal to DTE speed |
| | If <max rate>≠0 | The parameter specifies the highest Connection Speed Range =0,300,1200, 2400,4800, 7200,9600,12000,14400, 16800,19200,21600, 24000,26400,28800, 31200,33333,33600, 37333,41333,42666, 44000,45333,46666, 48000,49333,50666, 52000,53333,54666, 56000,57333 |

%An	Set auto-reliable fallback character (n=0-127, default is 13)
%C0	Disables data compression
%C1	*Enables MNP5 data compression*
%L	Report receive line signal level
\A0	Set maximum MNP block size to 64 characters
\A1	Set maximum MNP block size to 128 characters
\A2	Set maximum MNP block size to 192 characters
\A3	*Set maximum MNP block size to 256 characters*
\Bn	Transmit break in n*100ms (n = 0-9)
\C0	*Disables auto-reliable mode data buffering*
\C1	4 seconds buffer until 200 characters in the buffer or detec tion of a SYN character

\C2	No buffering, connect non-V.42 modem to V.42 modem
\G0	***Disables XON/XOFF flow control between local and remote modems***
\G1	Enables XON/XOFF flow control between local and remote modems
\J0	***Disables DTE speed adjust***
\J1	Enables DTE speed adjust
\Kn	Set break control (n=0-5, default is 5)
\N0	Select normal mode
\N1	Select normal mode
\N2	Select MNP reliable mode
\N3	***Select V.42 auto-reliable mode***
\N4	Select V.42 reliable mode
\Q0	Disables flow control
\Q1	Enables XON/XOFF software flow control
\Q2	Enables CTS hardware flow control
\Q3	***Enables CTS/RTS hardware flow control***
\Tn	Set inactivity timer (n=0-90, default is 0)
\X0	***Process XON/XOFF character as flow control character only***
\X1	Process XON/XOFF character as flow control character and pass through to local DTE or remote modem
-J0	Disables V.42 detect phase
-J1	***Enables V.42 detect phase***
"H0	Disables V.42bis data compression
"H1	Enables V.42bis data compression at transmit direction
"H2	Enables V.42bis data compression at receive direction

"H3   Enables V.42bis data compression at both trans
*   mit and receive direction*

"On   Set V.42bis string length (n=6-250,default is 32)

Appendix 3 S-Register Summary

Register	Function		Default	Range	Units
S0*	No. of rings to start auto-answer		0	0-255	ring
S1	Ring count		0	0-255	ring
S2*	Escape character		43	0-127	ASCII
S3	Carriage return character		13	0-127	ASCII
S4	Line feed character		10	0-127	ASCII
S5	Backspace character		8	0-32,127	ASCII
S6*	Wait before dialing		2	2-255	second
S7*	Wait for carrier		60	1-255	second
S8*	Pause time for dial modifier ,		2	0-255	second
S9*	Carrier recovery time		6	1-255	0.1 second
S10*	Lost carrier hang up delay	14	1-255	0.1	second
S11*	DTMF dialing speed		70	50-255	minisecond
S12*	Escape guard time		50	0-255	20minisecond
S14*	Bit-mapped register		-	0-255	-
	Bit 0			Reserved	
	Bit 1	=	0	E0 is selected	
		=	*1*	*E1 is selected*	
	Bit 2	=	*0*	*Q0 is selected*	
		=	1	Q1 is selected	
	Bit 3	=	0	V0 is selected	
		=	*1*	*V1 is selected*	
	Bit 4			Reserved	
	Bit 5	=	0	T(Tone dial) is selected	
		=	*1*	*P(Pulse dial) is selected*	
	Bit 6			Reserved	
	Bit 7	=	0	Answer	
		=	*1*	*Originate*	
S16	Bit-mapped register		-	0-255	-
	Bit 0	=	*0*	*LAL disabled*	
		=	1	LAL enabled (&T1)	
	Bit 1			Reserved	
	Bit 2	=	*0*	*LDL disabled*	
		=	1	LDL enabled (&T3)	
	Bit 3	=	*0*	*RDL OFF*	
		=	1	RDL in progress (&T6)	
	Bit 4	=	*0*	*RDL not active*	
		=	1	RDL request from remote modem is	
				in service	

	Bit 5	=	*0*	*RDL with self-test disabled*	
		=	1	RDL with self-test enabled (&T7)	
	Bit 6	=	*0*	*LAL with self-test disabled*	
		=	1	LAL with self-test enabled (&T8)	
	Bit 7			Reserved	
S18*	Modem test timer		0	0-255	second
S21*	Bit-mapped register		-	0-255	-
	Bit 0	=	*0*	*&J0 is selected*	
		=	1	&J1 is selected	
	Bit 1			Reserved	
	Bit 2			Reserved	
	Bit 4-3	=	00	&D0 is selected	
		=	01	&D1 is selected	
		=	*10*	*&D2 is selected*	
		=	11	&D3 is selected	
	Bit 5	=	0	&C0 is selected	
		=	*1*	*&C1 is selected*	
	Bit 6	=	*0*	*&S0 is selected*	
		=	1	&S1 is selected	
	Bit 7	=	*0*	*Y0 is selected*	
		=	1	Y1 is selected	
S22*	Bit-mapped register		-	0-255	-
	Bit 1-0	=	00	L0 is selected	
		=	01	L1 is selected	
		=	*10*	*L2 is selected*	
		=	11	L3 is selected	
	Bit 3-2	=	00	M0 is selected	
		=	*01*	*M1 is selected*	
		=	10	M2 is selected	
		=	11	M3 is selected	
	Bit 6-4	=	000	X0 is selected	
		=	001	Reserved	
		=	010	Reserved	
		=	011	Reserved	
		=	100	X1 is selected	
		=	101	X2 is selected	
		=	110	X3 is selected	
		=	*111*	*X4 is selected*	
	Bit 7	=	*0*	*&P0 is selected*	
		=	1	&P1 is selected	
S23*	Bit-mapped register		-	0-255	-
	Bit 0	=	0	&T5 is selected	
		=	*1*	*&T4 is selected*	

	Bit 3-1	=	000	0-300 BPS DTE rate	
		=	001	1200 BPS DTE rate	
		=	010	2400 BPS DTE rate	
		=	011	4800 BPS DTE rate	
		=	100	7200 BPS DTE rate	
		=	101	9600 BPS DTE rate	
		=	110	19200 BPS DTE rate	
		=	111	>= 38400 BPS DTE rate	
	Bit 5-4	=	*00*	*Even parity*	
		=	01	Space parity/No parity	
		=	10	Odd parity	
		=	11	Mark parity	
	Bit 7-6	=	*00*	*&G0 is selected*	
		=	01	&G1 is selected	
		=	10	&G2 is selected	
		=	11	Reserved	
S25*	DTR transition timer		5	0-255	10 minisecond
S27*	Bit-mapped register		-	0-255	-
	Bit 3,1,0	=	*000*	*&Q0 is selected*	
		=	001	Reserved	
		=	010	Reserved	
		=	011	Reserved	
		=	100	Reserved	
		=	101	Reserved	
		=	110	Reserved	
		=	111	Reserved	
	Bit 2,4,5			Reserved	
	Bit 7,6	=	00	B0 is selected	
		=	*01*	*B1 is selected*	
		=	10	B2 is selected	
		=	11	B3 is selected	
S30*	Inactivity timer		0	0-255	minute
S33*	Sleep mode timer		10	0-90	second
S37*	Max line speed attempted		0	0-35	-
		=	*0*	*According to DTE rate*	
		=	1-2	Reserved	
		=	3	300 BPS	
		=	4	Reserved	
		=	5	1200 BPS	
		=	6	2400 BPS	
		=	7	4800 BPS	
		=	8	7200 BPS	
		=	9	9600 BPS	
		=	10	12000 BPS	
		=	11	14400 BPS	
		=	12	16800 BPS	

	=	13	19200 BPS	
	=	14	21600 BPS	
	=	15	24000 BPS	
	=	16	26400 BPS	
	=	17	28800 BPS	
	=	18	31200 BPS	
	=	19	33600 BPS	
	=	20	36000 BPS	
	=	21	33333 BPS	
	=	22	37333 BPS	
	=	23	41333 BPS	
	=	24	42666 BPS	
	=	25	44000 BPS	
	=	26	45333 BPS	
	=	27	46666 BPS	
	=	28	48000 BPS	
	=	29	49333 BPS	
	=	30	50666 BPS	
	=	31	52000 BPS	
	=	32	53333 BPS	
	=	33	54666 BPS	
	=	34	56000 BPS	
	=	35	57333 BPS	
S91*	Data mode transmit level	10	0-15	dBm
S92*	Fax mode transmit level	10	0-15	dBm

Notes : The value of the S-registers marked with (*) were saved in NVRAM

Appendix4 Result Codes Summary

Verbose Code	Numeric Code
OK	0
CONNECT	1
RING	2
NO CARRIER	3
ERROR	4
CONNECT 1200	5
NO DIAL TONE	6
BUSY	7
NO ANSWER	8
RINGBACK	45
CONNECT 1200/75	22
CONNECT 75/1200	23
CONNECT 2400	10
CONNECT 4800	11
CONNECT 7200	24
CONNECT 9600	12
CONNECT 12000	25

CONNECT 14400	13
CONNECT 16800	59
CONNECT 19200	14
CONNECT 21600	61
CONNECT 24000	62
CONNECT 26400	63
CONNECT 28800	64
CONNECT 31200	65
CONNECT 33333	33
CONNECT 33600	66
CONNECT 37333	34
CONNECT 38400	28
CONNECT 41333	35
CONNECT 42666	36
CONNECT 44000	37
CONNECT 45333	38
CONNECT 46666	39
CONNECT 48000	42
CONNECT 49333	43
CONNECT 50666	53
CONNECT 52000	54
CONNECT 53333	55
CONNECT 54666	56
CONNECT 56000	57
CONNECT 57333	58
CONNECT 57600	18
CONNECT 115200	31

CONNECT (DTE data rate)/(modulation)/error correction)/(data compression)/

TX:(DCE transmit data rate)/RX:(DCE receive data rate)

Appendix 5 Indicator Lights (for External Modem)

Your external modem features LED indicators on the front panel that report modem status :

MR	Modem Ready	Lights when the modem is turned on.

TR	Terminal Ready	Lights when the computer is ready to send or receive data. Indicates the status of the DTR signal from the terminal or computer.
SD	Transmit Data	Flashes whenever data or commands are transmitted from the serial port of your computer or other device to the modem.
RD	Receive Data	Light flashes when data is sent from the modem to your computer or other serial device. At high speeds light may appear continuously on.
OH	Off Hook	Lights when the modem is off hook.
CD	Carrier Detect	Lights when the Data Carrier Detect (DCD) signal from the modem to the computer is on.
RS	Request to Send	Lights when the computer can accept data from the modem. The light will turn off when the modem is set for hardware flow control and the computer is not ready, preventing data flow from the modem

CS   Clear to Send   Lights when the modem can
                             accept data from the computer.
                             The light will turn off when the
                             modem is set for hardware flow
                             control and the modem data
                             buffer is full, pre-venting data flow
                             from the computer.

Appendix 6 Government compliance notices

FCC compliance

This equipment complies with Part 68 of the FCC Rules. On this equip-
ment is a label that contains, among other information, the FCC registra-
tion 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 isn't 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, discon-
nect 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.

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 might 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.