EtherFast 10/100 + 56K Modem PC Card

User Guide

LINKSYS

Contents

Introduction

The **EtherFast 10/100 + 56K Modem PC Card** will connect your notebook computer with any 10/100 Local Area Network and the Internet. It's two cards in one -- the card's unique integrated coupler is equipped with an auto-sensing 10/100 RJ-45 port and a standard RJ-11 telephone port built right in. Just one integrated unit means that there's no cables or dongles to lose!

The EtherFast 10/100 + 56K Modem PC Card comes with everything you need to get up and running fast. Although it's small enough to fit in your shirt pocket, the card includes both a 56Kbps data modem and a 14.4Kbps send/receive fax built-in. Fully Plug-and-Play compatible for a rapid installation, the EtherFast 10/100 + 56K Modem PC Card is optimized for 32-bit operating systems like Windows 98, WIndows 95 and NT 4.0. A complete software suite is included, with support for most notebook computers, Internet Service Providers, communication software packages, faxing applications, and dial-up programs.

Hotswapping technology lets you insert or remove the EtherFast 10/100 + 56K Modem PC Card while your computer is on, and a convenient low power consumption rate helps to preserve your notebook PC's battery life.

With its professional-grade features, coupler-free design, free software upgrades, and free, technical support, the EtherFast 10/100 + 56K Modem PC Card is guaranteed to help you stay connected for years to come.

Some of the EtherFast 10/100 + 56K Modem PC Card's features include:

• Type II PCMCIA 56Kbps Data Modem with 14.4Kbps Send/Receive Fax
• Compatible with V.90 and K56Flex Standards.
• Versatile Modem Runs with Regular Telephone Lines
• Internet-Ready – Runs with Most Internet, ISP, and BBS Dial-Up Protocols
• Surf the Web while you Send or Receive Email, and Network Data Simultaneously
• Backward Compatible with Older V.x Standards, Slower Dialups, ISPs, and Modems
• Compatible with Windows 95, 98, and NT 4.0
• Fully Hotswappable--Insert or Remove Card while Power is On
• Built to PCMCIA 2.1 Specifications
• Low 80mW Auto-Sleep Mode Helps Preserve Notebook Battery Life
• Digital Line and Lightning Protection Protect Your PC from Surges
• Free Technical Support and Software Upgrades
• 5-Year Limited Warranty

Package Contents

Before starting the installation, make sure you received all of the following items. If any items are missing or damaged, see your nearest Linksys dealer for replacement parts.

• EtherFast 10/100 + 56K Modem PC Card
• Program Disk
• User Guide and Registration Card
• RJ-45 Network Cable
• RJ-11 Standard Telephone Cable

Hardware Setup

The one-piece **EtherFast 10/100 + 56K Modem PC Card** consists of both a PCMCIA-style PC Card and an integrated cable coupler. It is different from most PC cards that have a snap-on pigtail coupler, or "dongle". The integrated design means that you can take your PC Card anywhere and you never have to worry about losing or breaking your coupler.

The PC Card has two cable ports -- one for RJ-45 10/100 network connections, and one RJ-11 port for connecting the LANmodem to a telephone line for dial-up Internet access.

Installing the Hardware

Follow the directions below to install the 10/100 + 56K Modem PC Card unit.

1. Turn off your PC and any devices attached to it. Your computer may support **hot swapping**, which allows PCMCIA cards to be inserted or removed while the PC's power is on. If this is the case, you don't need to turn your PC off when inserting the 10/100 + 56K Modem PC Card. If you aren't sure whether your PC supports this function, always turn the computer off before inserting or removing cards.

2. Plug a standard RJ-11 telephone cable into the 10/100 + 56K Modem PC Card's telephone plug. Next, connect the telephone cable into a standard telephone wall jack.

3. Connect a RJ-45 UTP cable into the PC Card's RJ-45 port (the larger of the two ports on the coupler). The port will automatically sense between 10Mbps and

4

100Mbps connections and it will adjust the card to operate at the correct speed. Plug the other end of the RJ-45 cable into a hub or switch.

Remember that 100Mbps Fast Ethernet always uses Category 5 Twisted Pair RJ-45 cabling or better. Cables of lesser quatity and category will not work. Be sure that your cables are free of defects and that they do not exceed 100 meters (328 feet) in length.

4. Locate your PC's PCMCIA slot. The slot is usually located on the side of the PC. Slide the 10/100 + 56K Modem PC Card into the slot with the triangle on the face of the card facing up. Make sure that the card is seated snugly in place. If your computer has more than one slot, insert the 10/100 + 56K Modem PC Card into the first slot (slots are usually numbered in sequential order starting with 0 or 1).

After verifying that the 10/100 + 56K Modem PC Card hardware and software are working correctly, you can always move the card to a different slot later if needed.

The hardware setup is complete.

About the Software

The 10/100 + 56K Modem PC Card, in addition to its drivers, requires two different kinds of software in order to work:

• PCMCIA card and socket services, and
• communication software

PCMCIA card and socket services are special software drivers that allow a PCMCIA card to communicate with your computer's PCMCIA slot. Hopefully your computer came with services pre-installed by the PC's manufacturer that will allow your computer to run with a wide range of PCMCIA cards. The 10/100 + 56K Modem PC Card was designed as a "generic" LAN and modem card that should run right out of the box with most services. Popular services include SystemSoft's CardSoft and CardWizard, Phoenix's PCM+, and CardWare.

If your computer doesn't have PCMCIA services, or if you're not sure how to get yours working, the 10/100 + 56K Modem PC Card comes with generic services you can use to get the card up and running in your computer's PCMCIA slot. In order to use the services you'll need to edit your computer's startup files. You'll find additional instructions on using PCMCIA services in the next chapter.

Communication software allows the 10/100 + 56K Modem PC Card to dial out from your computer over telephone lines, connect to on-line services, tap into the Internet, surf the web, download files, send and receive faxes, and much more.

There are many different ways you can obtain communication software for the 10/100 +56K Modem PC Card.

6

• Use virtually any Internet, modem, and/or fax software that may have been pre-installed on your computer. Most Windows 98, 95 and NT 4.0 computers have a built-in Internet dialer program, a modem program called **Hyperterminal**, and built-in fax software, all of which are compatible with the 10/100 + 56K Modem PC Card. Especially if you're going to be getting on the Internet, we highly recommend using the software that was pre-installed on your PC for getting connected. For more details, consult the user guide(s) that came with your computer and Windows.

• Buy an off-the-shelf package from the computer store. There are plenty of Internet/modem/fax packages available at affordable prices.

• Obtain a shareware or freeware communications package from the Internet. If you already have Internet access, you might be able to locate good communcations packages at shareware sites like http://www.shareware.com.

If you decide to buy or obtain a third-party communications software package, make sure that it is Hayes-compatible, which will ensure its ability to control the 10/100 + 56K Modem PC Card with AT commands. For more information about Hayes and AT, see page 50.

About COM Ports, IRQs, and I/O Values

Like many peripheral devices, the 10/100 + 56K Modem PC Card uses a COM port, I/O address, and an IRQ in your computer when it is in use.

A COM port is a serial communications port that allows data to be exchanged with the outside world. Most PCs have four COM ports available for you to use.

7

Also known as an interrupt, an IRQ is a particular slice of your computer processor's time. Most computers have 13 possible interrupts for you to use, numbered 3 through 15 in sequential order. You must choose an interrupt not already in use by another device.

An I/O base address is the input/output area of your computer's Input/Output range that the 10/100 + 56K Modem PC Card will use for transferring data between the modem and the PC. The I/O value you assign to the card must not be in use by any other devices.

In most cases, a computer's COM Ports, IRQ numbers, and I/O addresses are paired together to make determining the values to use easier.

Plug-and-play operating systems like Windows 95 and 98 will usually assign available COM, I/O, and IRQ values to the 10/100 + 56K Modem PC Card automatically, making the card's installation quick and easy.

If you aren't using Windows 95 or 98, you will need to choose COM, IRQ, and I/O values for the 10/100 + 56K Modem PC Card to use. This can usually be accomplished by checking your Windows Control Panel, or if you are using MS-DOS, by running DOS's MSD program. If you're not sure which COM, IRQ, or I/O values to use, start by trying COM2. If it doesn't work, try COM3.

In Windows NT, you can use WINMSD to find out what settings are assigned to the modem portion of the card. Your COM port settings may have to be manually configured.

Please note that if you are using any specialized dial-up communications software, such as software from America Online (AOL), you must set the EtherFast

10/100 + 56K Modem PC Card's COM value to COM 1, 2, 3, or 4. Some communications software will not recognize any COM value higher than 4.

If you can't seem to find a COM, I/O, or IRQ value to use, contact your PC's manufacturer to determine which values are currently available for use with the EtherFast 10/100 + 56K Modem PC Card.

Card and Socket Services

PCMCIA card and socket services allow your computer to recognize a PCMCIA card when it is inserted into your PC's PCMCIA slot. Your PC will need some kind of services installed in order to use the EtherFast 10/100 + 56K Modem PC Card.

PCMCIA services are normally required on DOS and Windows 3.x computers, and are usually loaded into memory by your computer's CONFIG.SYS and/or AUTOEXEC.BAT file each time your computer is started up.

Windows 95 and 98 have their own card and socket services. Windows NT 4.0 has limited services. If you are using Windows 95, 98, or NT 4.0, proceed to the appropriate section in the user guide to set up the EtherFast 10/100 + 56K Modem PC Card.

Almost all PCMCIA-equipped PCs have card and socket services pre-installed by the computer's manufacturer. Some popular packages include Phoenix's PCM+ Services and Systemsoft's Cardsoft or CardWizard Services for DOS and Windows

If you have any of these packages, follow the directions that came with them to set up a new 10/100 + 56K Modem PC Card. In most cases, packages like these

9

will recognize a PC Card as soon as it is plugged in, and may even assign COM and IRQ values to it automatically. If a card is successfully initialized, most packages will provide you with an icon, a pop-up message, a positive audible tone, or some other indication that the card is ready for use.

If your computer has PCMCIA services that are not listed above, you can try to get them to work with the 10/100 + 56K Modem PC Card. Consult your services' documentation to find out how to get your computer to recognize a new PCMCIA card. You will need to tell the services which IRQ and I/O settings the 10/100 + 56K Modem PC Card should use. See page 7 for more information on IRQ and I/O settings.

If your computer doesn't have services (or you don't know what kind are installed), you may be able to use the 10/100 + 56K Modem PC Card's generic services, which are included on the 10/100 + 56K Modem PC Card's disk. The generic services must be run each time your computer is booted in order to prepare the PC Card for use, and always before your PC's network drivers are loaded into memory. If you want to use the generic services, turn to page 11.

If your computer doesn't have services, and the generic services contained on the 10/100 + 56K Modem PC Card's disk don't seem to work with your PC, contact your computer's manufacturer to find out (1) what kind of services your computer uses, or (2) how to get compatible services if your computer doesn't have them.

How to Use the 10/100 + 56K Modem PC Card's Generic Services

The software disk provided with the 10/100 + 56K Modem PC Card includes generic card and socket services that can be used to enable the EtherFast 10/100 + 56K Modem PC Card each time your computer is started up. Also known as a hardware-specific client enabler, the services will be loaded by your computer's startup files each time your system is started. The PC Card's hardware-specific client enabler will only enable the EtherFast PC Card. If you want to use other PCMCIA cards in the future, you will need to obtain specific services for those card(s) from their manufacturers before you'll be able to use them. This service is mainly used by DOS or Windows 3.x computers. Plug-and-Play operating systems like Window 95 and 98 do not require the generic services.

The generic services can be found on the disk that came with the 10/100 + 56K Modem PC Card, and are contained in a program called **carden.exe**. Each time your computer is started up, enabler will run and establish communication with the PC Card.

In order to use enabler, you will need to obtain the COM and IRQ values in advance that you want to use for the 10/100 + 56K Modem PC Card. Be sure to choose values that are not already in use by other devices in your computer. See page 7 for information on good values to use. We recommend trying COM1 or COM2.

It's a good idea to write down the COM and IRQ values that you plan to use. When you run your communications software to get on-line with the 10/100 + 56K Modem PC Card, it may ask you to supply the values.

Follow the instructions below to install the 10/100 + 56K Modem PC Card's enabler program if your computer doesn't already have services. You should have some experience with copying and editing files before continuing.

1. Boot up your computer.

2. Insert the 10/100 + 56K Modem PC Card's Program Disk into drive A.

3. Copy the enabler.exe program from the disk's root directory (a:\) to your computer's root directory. You can use the Windows File Manager to accomplish this, or if you are using DOS, simply type the following at the MS-DOS prompt:

```
copy a:\enabler\carden.exe c:\
```

4. Load your system's CONFIG.SYS file into your favorite text editor or word processor for editing. If you are using DOS, for example, you might type:

```
edit c:\config.sys
```

5. Scroll through the CONFIG.SYS file. Find the line that reads DEVICE=EMM386.EXE. The line will probably be located near the beginning of the CONFIG.SYS, and it may vary slightly in appearance.

6. Once you find the EMM386 line, you will need to add a command to the end of it in order to reserve an area of memory for the PC Card's enabler to use. Add the following command to the end of the EMM386 line:

```
NOEMS X=D000-D7FF
```

The new EMM386 line now looks something like this (it may vary slightly, depending upon how the line looked when you first found it in the file):

DEVICE=EMM386.EXE NOEMS X=D000-D7FF

If there are already commands on the EMM386 line, try not to disturb them when you add the new command.

7. When you're finished, save your new CONFIG.SYS. (If you are using the DOS Editor, for example, you can click on Alt-F for File, then press S for Save).

8. Next, load your AUTOEXEC.BAT file for editing in the same way you loaded the CONFIG.SYS.

Add the following command line to the beginning of the file:

> c:\carden.exe /IOP=i /IRQ=9 /COM=c
> /MIR=mi /slt=5

where   i equals the I/O address of the network portion
         c equals the COM port to use
         q is the IRQ value of the network portion
         mi equals the I/O address of the modem
         slt equals the slot

This command will run the client enabler program each time your computer is started up. Note: If you do not include any of the switches after **carden**, the program will automatically choose them for you.

For example, to use IRQ 10, I/O 320, COM 2 with a modem IRQ value of 3 in slot O you'd use:

```
c:\carden /IRQ=10 /IOP=320 /COM=2
/MIR=3 /slt=0
```

9. Save your new AUTOEXEC.BAT file. The card and socket services setup is complete.

Power down your computer and insert the EtherFast 10/100 + 56K Modem PC Card into one of your PC's PCMCIA slots.

Restart your PC. When the enabler command in the AUTOEXEC.BAT file is executed, you should see a message that looks similar to this scroll by (it may vary):

PCMCIA Ethernet Client Driver v3.00
IO Base = 0X030, IRQ=10, COM=02, MIR=3, slot = 0

You may also hear an audible tone indicating that the card was successfully initialized.

If you received an error message, or a message stating that the 10/100 + 56K Modem PC Card was not installed successfully, you might need to change the card's IRQ, I/O, COM, modem IRQ, or slot settings. Try different values until you find a combination that works. Remember that each time you try a different value with enabler, you should also change the value in your communication software. For more general information about I/O and IRQ settings, see page 7.

To check to settings assigned to the card, run the following command from a DOS prompt:

c:\carden /chk

Driver Setup

This user guide contains the instructions for setting up the EtherFast 10/100 + 56K Modem PC Card under Windows 95, 98 and NT 4.0. Check the diskette for instructions on configuring the PC Card under all of the other operating systems that the card supports.

Linksys does not write, maintain, or provide technical support for the Linux operating system. Drivers for Linux may be obtained from the World Wide Web. You can also check the Linux page on the Linksys web site.

Linksys does not provide technical support for beta or freeware operating systems.

Windows 98 Setup

Follow the instructions below to install your EtherFast 10/100 + 56K Modem PC Card on Microsoft Windows 98.

After installing the EtherFast 10/100 + 56K Modem PC Card hardware in your computer, follow the instructions below to install the EtherFast 10/100 + 56K Modem PC Card's Windows 98 network driver from the card's program disk.

The following setup instructions are for setting up your EtherFast 10/100 + 56K Modem PC Card on the Final Release of Microsoft Windows 98 Only. The drivers included on the program disk are not compatible with any beta version of Microsoft Windows 98.

Please keep in mind that the installation procedure for the driver will vary slightly depending on the version of Windows 98 you are using and your current system configuration.

Installing The Driver

To install the network driver for the card, Start up your computer and Windows 98.

1. Windows 98 will automatically detect the presence of the EtherFast 10/100 + 56K Modem PC Card in your computer.

If Windows 98 goes directly to the windows desktop and does not display the New Hardware Found window, refer to problem 1 of the Troubleshooting section of this guide.

2. While the Update Device Driver Wizard window is visible, put the EtherFast 10/100 + 56K Modem PC Card program disk 1 into drive A and click on **Next**.

A window will appear and ask you *What would you like Windows to do?*

3. Select *Search for the best driver for your device (Recommended)*. Click on **Next**.

4. A window will appear asking where you would like Windows 98 to search for the driver. Make sure that Floppy disk drives is selected and/or that **A:** is specified in the location window, and click **Next** to continue.
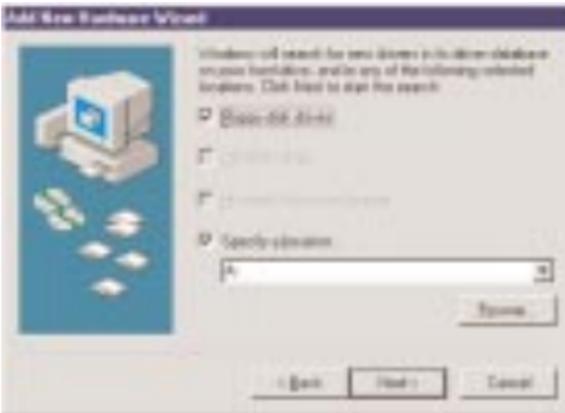
5. Windows will begin searching your drives for the correct device drivers.

A message will notify you that Windows has found the Linksys EtherFast 10/100 + 56K PC Card (PCMLM56) driver. Click on **Next**.

If Windows cannot find the driver for the card, skip to problem 2 of the Troubleshooting section on page 63.

6. Windows 98 will begin copying a number of files onto your computer. If Windows asks you to supply your original Windows 98 installation or setup files, insert the CD-ROM or disks as needed, and direct Windows 98 to the proper location, (eg: D:\win98). If Windows asks you to supply a driver that contains the letters LM, type a:\ in the box that pops up.

17

During the installation, windows may ask you for a computer and workgroup name. If so, refer to instructions 12-14 on page 20. Otherwise, continue with the installation.
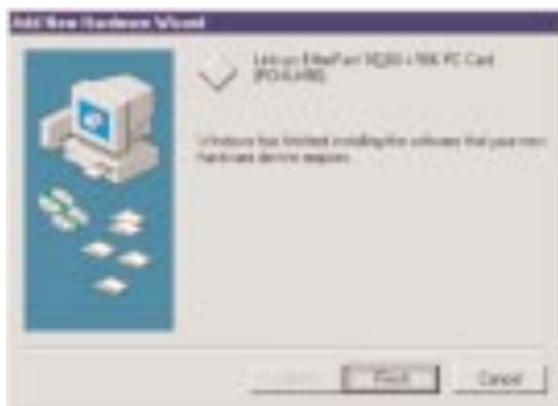
7.Windows will finish copying all of the necessary files to your system. A window will appear when the Windows 98 is finished copying files. Click **Finish**.

You will see Windows 98 detect a multi-function adapter. It will first detect the modem, then the LAN adapter.

If you are asked if you want to restart your computer, click **No**. Over the next few steps, you will check your network settings. The modem will become active after the next reboot. See page 49 after you have configured the networking settings for your EtherFast PC Card.

8. Once you are back at the Windows 98 desktop, click on the **Start** button. Click on **Settings**, then **Control Panel**.

9. Double-click on the **Network** icon. The Network window will appear. Click on the **Configuration** tab.

10. Make sure that the following network components are installed:

Client for Microsoft Networks
Client for NetWare Network
Linksys EtherFast 10/100 + 56K PC Card (PCMLM56)
IPX/SPX-compatible Protocol
NetBEUI

There may be other components listed in addition to the ones shown above. This is fine. However, if any components listed above are missing, you'll need to install them manually. Refer to page 76 in the Troubleshooting section of this user guide.

For setup of the TCP/IP protocol, contact your system administrator or consult Microsoft's documentation. Linksys does not supply technical support for setup or troubleshooting of the TCP/IP protocol.

11. In the Primary Network Logon box, select **Client for Microsoft Networks**.

12. Click on the **Identification** tab.

Type the name of your computer in the Computer name box. Make up a name that is unique from all the other computers' names on the network. Call it whatever you'd like, (ex: Tardis, TimsComputer, etc.).

13. Type the name of your workgroup in the Workgroup box. The name you type should be the same workgroup name in use by all of the other PCs on the network. The Workgroup box is case sensitive. Use the same case that is in use on your other computers.

14. Enter a description of your computer in the Computer Description box. This box is optional.

15. Click on the **Access Control** tab.

Make sure that **Shared-level access control** is selected. If the setting is on User-Level access control and you can't change it, skip to problem 5 of the Troubleshooting section on page 64.

16. Click on the **OK** button. Your system may or may not ask you for your Windows 98 CD-ROM or the location of the 98 installation files. Direct Windows to the appropriate location, (D:\win98, C:\windows\options\cabs, etc.).

17. Once Windows is done copying the necessary files, the System Settings Change window appears. Remove all disks from your computer and click on **Yes** to restart your PC. If you don't see this window, simply close down Windows 98 and restart your computer.

21

The installation is complete. Remember to remove the installation disk from the floppy drive.

Look at the EtherFast PC Card's cable housing. If your cabling is properly attached and the network is detected, the Link light will be on, and the Activity (ACT) light will be flickering or solid. If you are connected to a 100Mbps hub, the 10/100 light will be lit.

18. Once the computer has restarted and Windows is up, a Logon window will appear requiring you to enter a username and password. Make up a username and password, enter them, and click **OK**.

DO NOT click the **Cancel** button, or you won't be able to log onto the network. If the a logon does not appear or if it does not allow you to log on, refer to problem 3 in the Troubleshooting section in the back of this guide.

19. Once you are at the Windows 98 desktop, double-click on the **Network Neighborhood** icon. You should see the name of the network, and/or the names of the other PCs on the network. In order to see your computer in Network Neighborhood, you need to enable file and printer sharing, which is covered on pages 24-26.

If you don't see anything at all, press the **F5** key on your keyboard a few times to refresh the screen.

If you only see your computer in Network Neighborhood, skip to problem 6 on page 64 of the Troubleshooting section.

If you see all computers on the network except yours, and the other PCs can't see your computer, see problem 7 in the Troubleshooting section.

Client Setup

Before enabling File and Printer Sharing, you should prepare your computer to be used with any file servers that may be on the network.

If you are not using Windows 98 with an NT or NetWare file server, skip the next two paragraphs. Otherwise:

• Using the Card to Connect to a NetWare 3.x File Server

Click on **My Computer**, **Control Panel**, and **Network**. Change the Network Logon to *Client for NetWare Network*. Next, double-click on the *Client for NetWare networks*. Put your server's name in the Preferred Server box. Click in the *Enable Logon Script Processing* box. Click on **OK** and restart your PC.

Note: This method is effective for NetWare 3.11 and 3.12 servers. for NetWare 4.x or higher, you should obtain and use Client32 instead.

• Using the Card to Connect to a Windows NT Domain

Click on **My Computer**, **Control Panel**, and **Network**. Change the Primary Logon to *Client for Microsoft Network*. Double-click on the *Client for Microsoft networks*. Check the L*og into Windows NT domain* box. Put your NT domain name in the Windows NT domain area. Click on **OK** and restart your PC.

Continue with the installation instructions that appear on your screen, if any. When you're finished, restart your computer.

Preparing to Use File and Printer Sharing

The instructions below explain how to turn on file and printer sharing in Windows 98 so that your computer can be accessed by others and vice-versa.

Start up Windows 98. If you are asked to log in, be sure to give your correct username and password. To set up sharing for the first time on a computer, click on **Start**, **Settings**, **Control Panel**, then double-click on **Network**. Click on the **Configuration** tab, followed by the **File and Printer Sharing** button. The File and Printer Sharing window will appear.

If you'd like others to be able to access the files on your PC's hard drive, select *I want to be able to give others access to my files*. If you'd like to share your printer with other users on the network, select *I want to be able to allow others to print to my printer*. Click on the **OK** button. File and Printer Sharing for Microsoft Networks should now appear in the list of installed components. Click **OK**. When asked to restart your PC, choose to do so.

Enabling File Sharing

After following the preparation instructions, double-click on your **My Computer** icon. A window of available disk drives will appear. Using your right mouse button, click once on the drive or folder that you want to make available to other users. Click on **Sharing**, followed by the **Sharing** tab. Click on **Share As**. In the Share Name box, enter a name for the drive or folder you are sharing, (eg: C-Drive, CD-ROM, Leela, etc.).

Next, decide on the type of access that you want to give other users.

- **Read-Only access** lets other users view the files on your PC.
- **Full access** lets users create, change, or delete files on your PC.
- **Depends on Password** lets users have Read-Only and/or Full access, depending on the pass word that you decide to give them.

Use your mouse to select the type of file sharing access that you want other users to have. If you want to assign access password(s), type them into the Password box(es). When you're done, click on the **Apply** button, followed by **OK**.

Your drive(s) can now be accessed from other users whenever they click on their Windows Network Neighborhood icons. If a user tries to access one of your drives or folders that's password-protected, he or she will be asked for the appropriate Read-Only or Full access password.

How To Share Printers

After following the steps on pages 24-26, double-click on your **My Computer** icon. Click on the **Printers** folder. A window of available printers will appear. Using your right mouse button, click once on the printer that you want to share with other users. Click on **Sharing**, followed by the **Sharing** tab. Click on **Share As**. In the Share Name box, give a name to the printer you're about to share (Jack's HP4, for example).

If you want to assign a password to the printer so only certain users can access it, type a password in the **Password** box. When you're done, click on the **Apply** button, followed by **OK**. Your printer(s) are now shared.

When you're finished, restart your PC, log into your net-work, and double-click on **Network Neighborhood**. You should be able to se the other computers on your network. The installation is complete.

Note: Not all printers may be shared on the network or you may require special instructions. Refer to your printer's user guide or contact your printer manufactur-er.

Windows 95 Setup

Follow the instructions below to install your EtherFast 10/100 + 56K Modem PC Card on Microsoft Windows 95. After installing the EtherFast 10/100 + 56K Modem PC Card hardware in your computer, follow the instructions below to install the EtherFast 10/100 + 56K Modem PC Card's Windows 95 network driver from the card's program disk.

There are currently two versions of Windows 95:

· Windows 95 **version A** (the first release)
· Windows 95 **version B**, also called OSR2

Please keep in mind that the installation procedure for the network driver will vary slightly depending on the edition of Windows 95 you are using and your current system configuration.

To install the network driver, Start up your computer and Windows 95.

1. Windows 95 will automatically detect the presence of the EtherFast 10/100 + 56K Modem PC Card in your computer.

27

If Windows 95 goes directly to the windows desktop and does not display the New Hardware Found window, refer to problem 1 of the Troubleshooting section of this guide.

2. While the Update Device Driver Wizard window is visible, put the EtherFast 10/100 + 56K Modem PC Card program disk 1 into drive A and click on **Next**.

3. Windows will begin searching your floppy drive for the correct device drivers.

A message will appear that reads Windows found the Linksys + 56K Modem Fast Ethernet Adapter driver. Click on **Finish**.

If Windows cannot find the driver for the card, skip to problem 2 of the Troubleshooting section on page 63.

4. Windows 95 will begin copying a number of files onto your computer.

Insert Disk

Please insert the disk labeled 'Drivers Disk for Linksys PCMLM56', and then click OK.

OK

If Windows asks you to supply your original Windows 95 installation or setup files, insert the CD-ROM or disks as needed, and direct Windows 95 to the proper location, (eg: D:\win95, C:\windows\options\cabs, etc.). If Windows asks you to supply a driver containing the letters LM type **a:** in the box that pops up.

During the installation, windows may ask you for a computer and workgroup name. If so, refer to instructions 8-10 on page 31. Otherwise, continue with the installation.

You will see a window pop up and alert you that Windows 95 has recognized a modem device. Then, another window will show that Windows 95 has recognized the LAN device. Windows will continue to copy files.

Windows will finish copying all of the necessary files to your system. When asked if you want to restart your computer, click **No**. Over the next few steps, you will check your network settings. The modem will become active after the next reboot. See page 49 after you have configured the networking settings for your EtherFast PC Card.

Once you are back at the Windows 95 desktop, click on the **Start** button. Click on **Settings**, then **Control Panel**.

5. Double-click on the **Network** icon. The Network window will appear. Click on the **Configuration** tab.

29

6. Make sure that the following network components are installed:
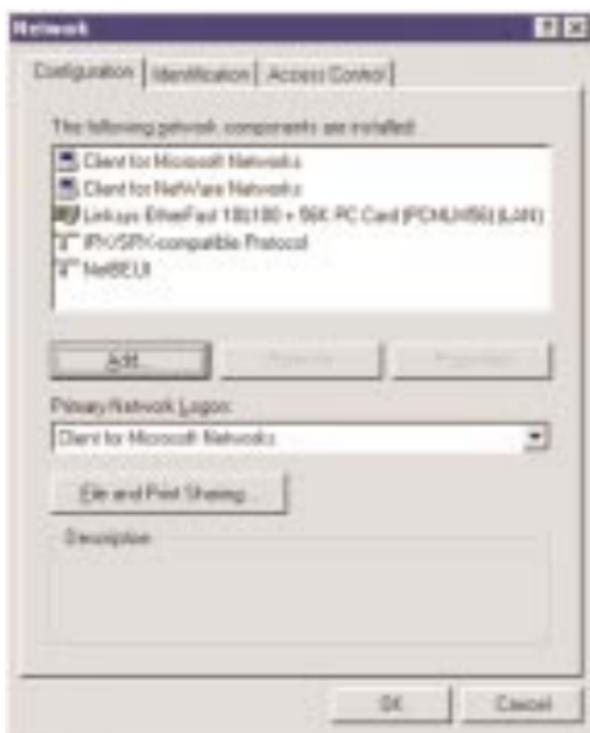
Client for Microsoft Networks
Client for Netware Network
Linksys EtherFast 10/100 + 56K PC Card (PCMLM56)
IPX/SPX-compatible Protocol
NetBEUI

There may be other components listed in addition to the ones shown above. This is fine. However, if any components listed above are missing, you'll need to install them manually. Refer to page 76 in the Troubleshooting section of this user guide.

For setup of the TCP/IP protocol, contact your system administrator or consult Microsoft's documentation. Linksys does not supply technical support for setup or troubleshooting of the TCP/IP protocol.

7. In the Primary Network Logon box, select **Client for Microsoft Networks**.

8. Click on the **Identification** tab.

Type the name of your computer in the **Computer name** box. Make up a name that is unique from all the other computers' names on the network. Call it whatever you'd like, (ex:Tardis, Joe, etc.).

9. Type the name of your workgroup in the **Workgroup** box. The name you type should be the same workgroup name in use by all of the other PCs on the network. The Workgroup box is case sensitive. Use the same case that is in use on your other computers.

10. Enter a description of your computer in the **Computer Description** box. This box is optional.

11. Click on the **Access Control** tab.

Make sure that *Shared-level access control* is selected. If the setting is on *User-Level access control* and you can't change it, skip to problem 5 in the Troubleshooting section on page 64.

12. Click on the **OK** button. Your system may or may not ask you for your Windows 95 CD-ROM or the location of the Windows 95 installation files. Direct Windows to the appropriate location, (D:\win95, C:\windows\options\cabs, etc.).

13. Once Windows is done copying the necessary files, the System Settings Change window appears. Remove all disks from your computer and click on **Yes** to restart your PC. If you don't see this window, simply close down Windows 95 and restart your computer. The installation is complete.

Look at the EtherFast PC Card's cable housing. If your cabling is properly attached and the network is detected, the Link light will be on, and the Activity (ACT) light will be flickering or solid. If you are connected to a 100Mbps hub, the 10/100 light will be lit.

14. Once the computer has restarted and Windows is up, a Logon window will appear requiring you to enter a username and password. Make up a username and password, enter them, and click **OK**.

DO NOT click the **Cancel** button, or you won't be able to log onto the network. If the a logon does not appear or if it does not allow you to log on, refer to problem 3 in the Troubleshooting section in the back of this guide.

15. Once you are at the Windows 95 desktop, double-click on the **Network Neighborhood** icon. You should see the name of the network, and/or the names of the other PCs on the network. In order to see your computer in Network Neighborhood, you need to enable file and printer sharing, which is covered on pages 35-37.

If you don't see anything at all, press the **F5** key on your keyboard a few times to refresh the screen.

If you only see your computer in Network Neighborhood, skip to problem 6 on page 64 of the Troubleshooting section.

If you see all computers on the network except yours, and the other PCs can't see your computer, see problem 7 in the Troubleshooting section.

Client Setup

Before enabling File and Printer Sharing, you should prepare your computer to be used with any file servers that may be on the network.

If you are not using Windows 95 with an NT or NetWare file server, skip the next two paragraphs. Otherwise:

• Using the Card to Connect to a NetWare File Server

Click on **My Computer**, **Control Panel**, and **Network**. Change the Network Logon to *Client for NetWare Network*. Next, double-click on the *Client for NetWare networks*. Put your server's name in the Preferred Server box. Click in the *Enable Logon Script Processing* box. Click on **OK** and restart your PC.

Note: This method is effective for NetWare 3.11 and 3.12 servers. for NetWare 4.x or higher, you should obtain and use Client32 instead.

• Using the Card to Connect to a Windows NT Domain

Click on **My Computer**, **Control Panel**, and **Network**. Change the Primary Logon to *Client for Microsoft Network*. Double-click on the *Client for Microsoft networks*. Check the *Log into Windows NT domain* box. Put your NT domain name in the Windows NT domain area. Click on **OK** and restart your PC.

Continue with the installation instructions that appear on your screen, if any. When you're finished, restart your computer.

Preparing to Use File and Printer Sharing

The instructions below explain how to turn on file and printer sharing in Windows 95 so that your computer can be accessed by others and vice-versa.

To set up sharing for the first time on a computer, click on **Start**, **Settings**, **Control Panel**, then double-click on **Network**. Click on the **Configuration** tab, followed by the **File and Printer Sharing** button. The File and Printer Sharing window will appear.

If you'd like others to be able to access the files on your PC's hard drive, select *I want to be able to give others access to my files*. If you'd like to share your printer with other users on the network, select *I want to be able to allow others to print to my printer*. Click on the **OK** button.

File and Printer Sharing for Microsoft Networks should now appear in the list of installed components. Click **OK**. When asked to restart your PC, choose to do so.

Enabling File Sharing

After following the preparation instructions on the previous page, double-click on your **My Computer** icon. A window of available disk drives will appear. Using your right mouse button, click once on the drive or folder that you want to make available to other users. Click on **Sharing**, followed by the **Sharing** tab. Click on **Share As**.

In the Share Name box, enter a name for the drive or folder you are sharing, (eg: C-Drive, CD-ROM, Leela, etc.).

Next, decide on the type of access that you want to give other users.

- **Read-Only access** lets other users view the files on your PC.
- **Full access** lets users create, change, or delete files on your PC.
- **Depends on Password** lets users have Read-Only and/or Full access, depending on the password that you decide to give them.

Use your mouse to select the type of file sharing access that you want other users to have. If you want to assign access password(s), type them into the Password box(es). When you're done, click on the **Apply** button, followed by **OK**.

Your drive(s) can now be accessed from other users whenever they click on their Windows Network Neighborhood icons. If a user tries to access one of your drives or folders that's password-protected, he or she will be asked for the appropriate Read-Only or Full access password.

How To Share Printers

After following the steps on the 2 previous pages, double-click on your **My Computer** icon. Click on the **Printers** folder. A window of available printers will appear.

Using your right mouse button, click once on the printer that you want to share with other users. Click on **Sharing**, followed by the **Sharing** tab. Click on **Share As**. In the Share Name box, give a name to the printer you're about to share (Jack's HP4, for example). If you want to assign a password to the printer so only certain users can access it, type a password in the Password box. When you're done, click on the **Apply** button, followed by **OK**. Your printer(s) are now shared.

When you're finished, restart your PC, log into your network, and double-click on **Network Neighborhood**. You should be able to se the other computers on your network. The installation is complete.

Note: Not all printers may be shared on the network or you may require special instructions. Refer to your printer's user guide or contact your printer manufacturer.

Windows NT 4.0 Setup

Before you begin the installation, you should have your original Windows NT CD-ROM handy. NT may ask for it in order to install special files onto your computer during the network driver setup. PCMCIA Services in Windows NT 4.0 have to be enabled prior to installing the card (see appendix page ??). Windows NT 4.0 has limited support for standard PCMCIA controllers (PCIC or compatable). If you have a CardBus controller in your laptop, check with the manufacturer of the laptop to see if you can set your slots to emulate PCIC or compatable or if you require a 3rd party software. Windows NT 4.0 doesn't have any support for CardBus PCMCIA controllers and can not operate the card properly. Also, PCMCIA services in NT do not allow for hot swapping. The card has to be in the laptop before powering the laptop on. To remove the card, the PC has to be powered off.

To install the card in an NT 4.0 workstation

Shut down your computer. Insert the EtherFast 10/100 + 56K Modem PC Card into either of your computer's card slot if you haven't already. Start up your computer. If asked to log in, do so.

Click on **Start**, **Settings**, **Control Panel**. Double-click on the **Network** icon. If you have not already installed the networking components for NT, you will see a message that looks like this:
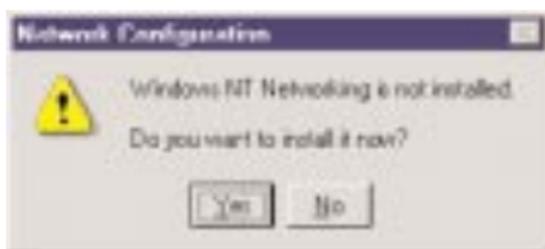
To install NT networking while setting up the 10/100 +
56K Modem PC Card, click on Yes and continue with
step 1 below. If you have already installed networking
and only wish to set up the card, skip to step 1 on page
46.

**Install NT Networking and the EtherFast 10/100
+ 56K Modem PC Card Together**

1. Choose Wired to the Network and click **Next**.

Next you will be asked to choose an network adapter.
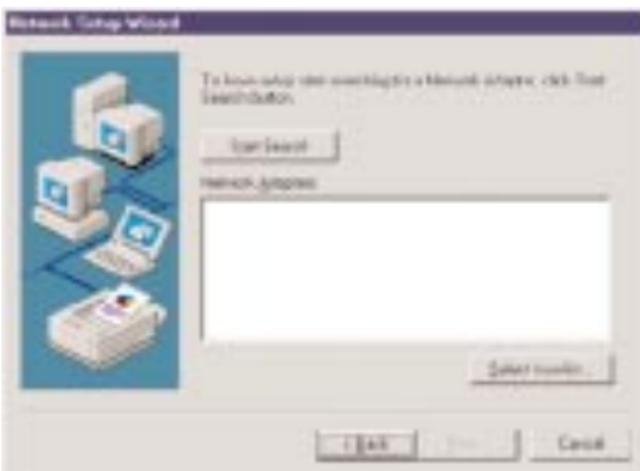
Choose to **select from a list** of available adapters.

39

2. When the list appears, click on the **Have Disk** button.
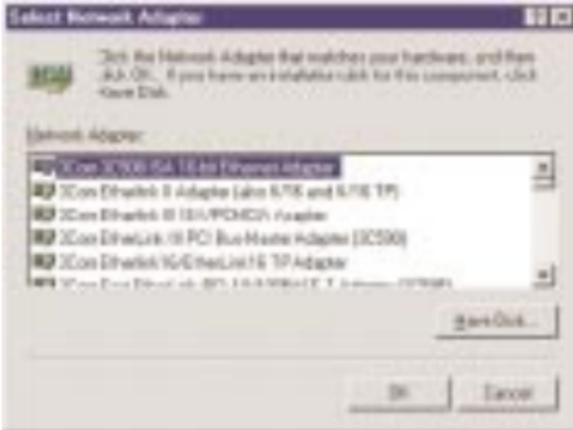
Put the Linksys disk into drive A and type **a:** and then
Click **OK**.
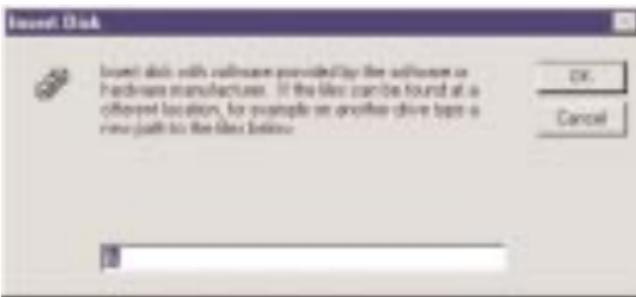
When Linksys EtherFast 10/100 + 56K PC Card
(PCMLM56) appears, click **OK**.
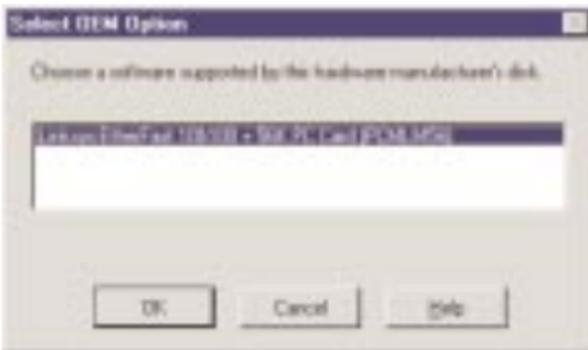
3. You will see the Linksys adapter in the Network Adapters box with a check next to it. Click **Next**.
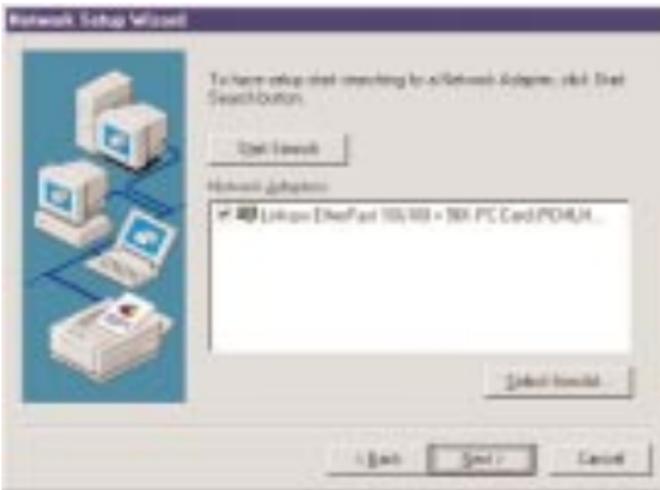
When the Network Setup wizard reappears, choose your desired Network Protocols, then click on **Next**.
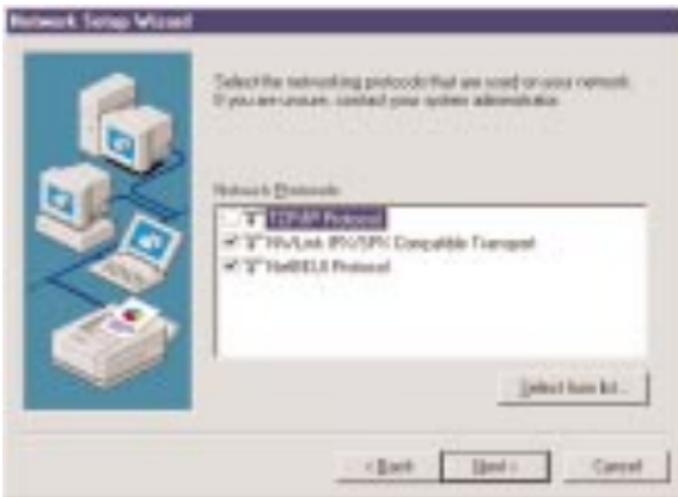
For setup of the TCP/IP protocol, contact your system administrator or consult Microsoft's documentation. Linksys does not supply technical support for setup of the TCP/IP protocol.

4. When asked to choose the network services to install, do so. Click **Next** when you are finished.
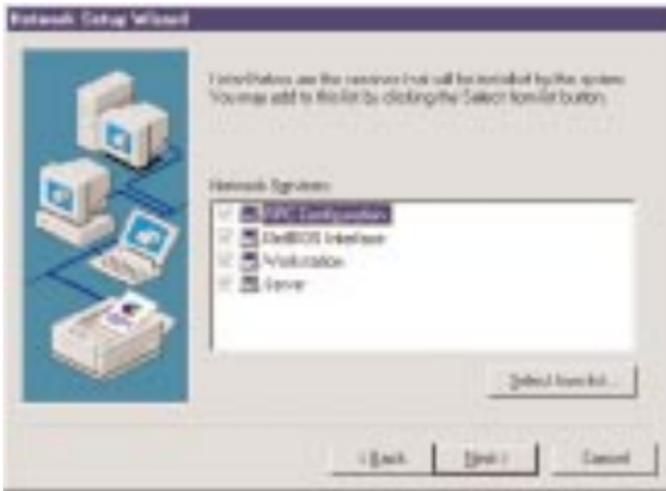
Click **Next** to install the components you have selected.
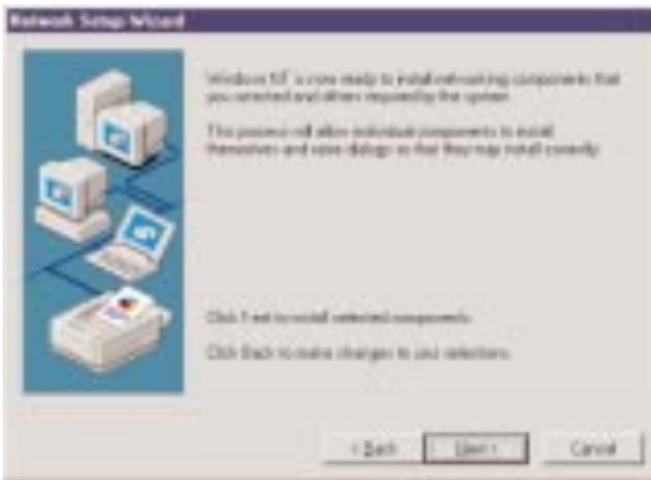
Click **Next**.

5. Setup may need to copy some Windows NT files from your original Windows NT CD-ROM.
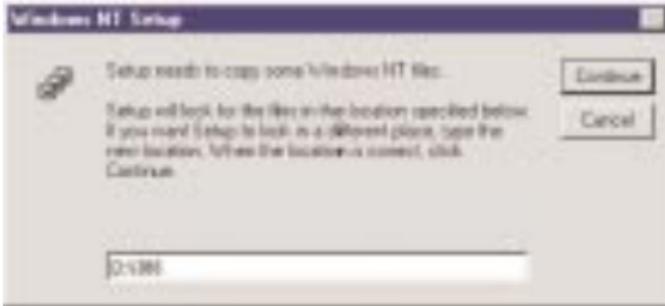
If this window appears type in the location of your Windows NT CD-ROM. For example, if your CD-ROM is designated as D:, then type **d:\i386**.

6. Setup may also need drivers from the Linksys diskette. NT will display the same windows as step 5 above. Type **a:** or the location of the floppy disk if this window appears.

7. NT will ask you to supply the **I/O Port**, **Interrupt**, and **Connection Type** values for the card.

43
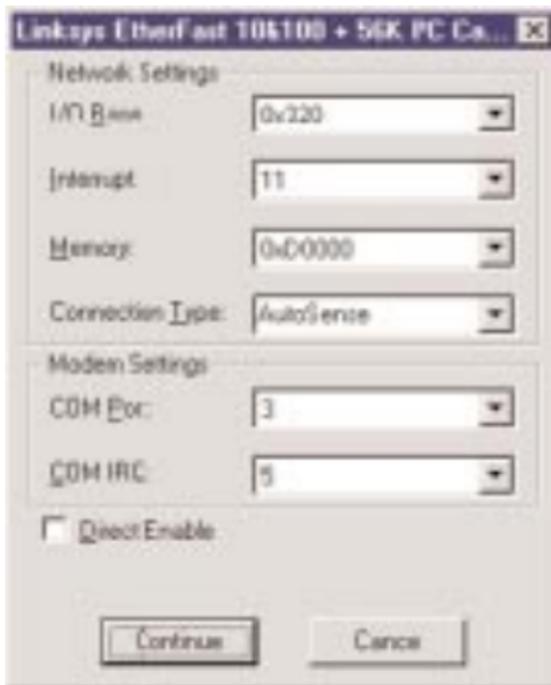
Choose **AutoSense** for the Connection Type. Good values to start with for the other settings are **0x300** and **0x320** (for the I/O Port) and **Auto** (for the IRQ). For more information, see page 7. Also choose the COM Port and IRQ that the modem will use. Do not enter settings that are being used by another device.

If you're not sure of the interrupt and other resource values that are available for use on your PC, click on **Start**, then **Run**. Type **WINMSD** and press **Enter**. Click on the **Resources** tab. Look at the IRQs that are already in use and choose one that is unused. To check the I/O values, click on the **I/O Port** button.

8. When you're finished entering your I/O and Interrupt values, click on **Continue**. NT will copy necessary workstation files to your computer.

9. If you have installed the TCP/IP protocol, the Setup will ask you if you will be obtaining IP addresses from a DHCP server. If you click **Yes**, continue on to step number 10. If you click **No**, you will need to obtain the necessary TCP/IP information from your Network Administrator to complete the TCP/IP properties requirements.

When the Network Setup Wizard reappears, configure your bindings. See your Windows NT User Guide for more information on bindings.

10. When the bindings are configured, click **Next**, followed by **Next** again to start the network.

11. When the Network Wizard window reappears, enter a name for your computer. You can name it whatever you would like, (Mary's Computer, Tardis, etc.).

44

12. Next, choose either **Workgroup** or **Domain**, then enter the workgroup or domain name that you want your PC to connect to. If you're not sure of the name, see your Windows NT user guide(s) or contact your network administrator for the proper settings.

When you're finished, click on **Next**, followed by **Finish**. Choose to restart your computer. If a service pack was installed previously, you must reapply the service pack.

After NT restarts, log in. Look at the EtherFast 10/100 + 56K Modem PC Card's cable coupler. If your cabling is properly attached and the network is detected, the green Link light will be on, and the Activity (ACT) light will be flickering or solid. The installation is complete. You can now access the network at large through the **Network Neighborhood** icon on the Windows NT desktop.

Note: If you receive errors about event log storage or if there is not enough storage space to restart the server, you need to reapply the NT service packs.

For instructions on how to use the modem, see page 49.

**Installing the EtherFast 10/100 + 56K Modem
PC Card (NT Networking is Already Installed)**

1. When the Network window appears, click on the
Adapters tab.

Click on the **Add** button, followed by **Have Disk**. Put
the PC Card disk into drive A. When asked to supply
the path to the disk, type **a:** and click **OK**.

NT will ask you to supply the I/O Port, Interrupt,
Memory value, and Connection Type for the card. Good
values to start with are **0x300** and **0x320** (for the I/O
Port) and **Auto** (for the IRQ). Choose **AutoSense** for
the connection type.

2. When you're finished, click **Close**. NT will copy nec-
essary files to your computer.

3. When the Network window reappears, click on the
Bindings tab. Choose your bindings.

Click on the **Protocols** tab and select your settings.

For setup of the TCP/IP protocol, contact your system administrator or consult Microsoft's documentation. Linksys does not supply technical support for setup or troubleshooting of the TCP/IP protocol.

Do the same for the **Services** tab. After your bindings, settings, and services are set, click on the **Close** button. Choose to restart your computer. If a service pack was previously installed, you must reapply the service pack.

After NT restarts, be sure to log in. Look at the EtherFast card's cable coupler. If your cabling is properly attached and the network is detected, the green Link light will be on, and the Activity (ACT) light will be flickering or solid.

The installation is complete. You can now access the network at large through the **Network Neighborhood** icon on the Windows NT desktop.

If You Have Problems

If the EtherFast 10/100 + 56K PC Card's coupler doesn't light up after you restart your computer, you may need to change your slot's boot setting in NT.

Follow these instructions:

Click on **Start**, **Settings**, **Control Panel**. Double-click on the **Devices** icon. Scroll down in the Devices list to *EtherFast 10/100 + 56K PC Card*. Click on **Startup**.

Verify that the Startup Type is set to **Boot**. If it isn't, use your mouse to select it. Click **OK**, then **Close**. Choose to restart your computer.

Note: If you receive errors about event log storage or if there is not enough storage space to restart the server, you need to reapply the NT service packs.

Using the EtherFast 10/100 + 56K Modem PC Card

The instructions below will tell you how to get the 10/100 + 56K Modem PC Card up and running with your communications software. Before you begin, make sure you've already followed the directions for Services, and that you've installed the driver for your particular operating system (Windows 98, NT 4.0, etc.).

About the EtherFast 10/100 + 56K Modem PC Card's Features

The 10/100 + 56K Modem PC Card's built-in fax allows you to send and receive faxes, access the Internet, dial up on-line Internet Service Providers or Bulletin Board Systems, download files, and much more. Some of its features include:

• 56Kbps Hayes Enhanced-compatible data modem
• V.90 and K56Flex compatibility
• 14.4Kbps send/receive fax
• V.42bis, MNP5 data compression
• V.42, MNP4 error checking
• Backward compatibility with earlier modem standards
• 32KB buffer for faster file transfers

There are different technologies available for achieving 56Kbps data speeds. The most popular, which is what the 10/100 + 56K Modem PC Card uses, is known as **V.90**.

Sleep Mode

The 10/100 + 56K Modem PC Card normally requires a very low 5V/640mW of power to operate. When the PC Card hasn't been used for ten minutes, it automatically puts itself into a super low 80mW sleep mode to help preserve your computer's battery life.

Hayes Compatibility

The PC Card is ready to run with all software and hardware that supports the Hayes Extended AT command set. Hayes commands are a common, industry-wide set of commands that allow the faxmodem to be controlled by any software that is also Hayes-compatible. Since most modem software makes use of Hayes commands, the PC Card should work with virtually any communications software for Windows, Windows for Workgroups, Windows 95, 98 or NT 4.0.

Hayes commands are based around **AT**, or attention, commands. AT commands always start with the letters AT, followed by the desired number, letter, or symbol that makes up the command.

You probably won't need to use AT commands very often, except when setting up the 10/100 + 56K Modem PC Card's init string (more on this later). Your communications software will use AT commands automatically for you in most instances. When you want to dial a number, for example, you'll probably click on a button in your software that says "dial." The software will prompt you for the number, then issue the AT commands necessary to initialize the modem, pick up the phone line, and dial.

If you want to enter AT commands in order to control the 10/100 + 56K Modem PC Card manually, most

communication software packages include a terminal window where you can type them in. See your software's documentation for details.

There are hundreds of different AT commands available for the modem and faxing. Multiple commands can be strung together on the same line. To hang up, then dial 1234 using touch tones, for example, you could use:

ATH
ATDT1234

or, more simply

ATHDT1234

Again, you'll probably never need to use AT commands; your software will use them automatically each time you tell it to dial, send email, etc.

Setting Up Your Communications Software

Before you begin using the 10/100 + 56K Modem PC Card, you should configure your communications software. Depending on the software you're using, you may need to:

• Pick the type of modem you're using from the software's list of available modem types
• Enter the 56K LANmodem's Hayes AT init string
• Set your software's IRQ and COM values
• Select your bit, parity, and stop bit values
• Choose a download protocol

All of these topics are described in detail on the pages that follow.

Before continuing, start up your data or fax communications software now. There should be some kind of Options, Preferences, or Setup area in the software where you can configure how the software will operate.

If you're not sure where this area is, see the software's Help file or take a look at the user guide that came with it.

If you don't have communications software yet, but you are using Windows, Windows for Workgroups, Windows 95, 98 or NT, you can use the Microsoft Windows communications software that came with your operating system. If you want to use Microsoft's built-in software, skip to page 59, "Testing the 10/100 + 56K Modem PC Card," then return to this section.

52

Pick the Modem Type

Tell your communications software what kind of modem you're using. Scroll through the list of available faxmodem types. If you don't see the Linksys 10/100 + 56K Modem PC Card listed, you can choose any generic 56K modem that supports the V.90 standard and Hayes AT commands.

Entering the Init String

An initialization string is a string of Hayes AT commands that sets up the 10/100 + 56K Modem PC Card for communications. After telling your communications software which init string to use, the software will automatically send the string to the modem when it is ready to dial.

Find the area in your communications software where you can set up the init string. The recommended init string is as follows:

AT&FE1&C1&D2V1\V0

You can change the init string if you want.

Setting the Speed

The 10/100 + 56K Modem PC Card is designed to automatically adjust to the fastest possible speed when making a dial-up connection. Unless your software requests you to supply the fastest speed your modem supports, you normally don't need to specify how fast the 10/100 + 56K Modem PC Card should go -- it will adjust automatically when a host connects to it.

If you want to set the speed, you can do so when you enter the Init string. Simply choose AT commands that

put the 10/100 + 56K Modem PC Card at the speed you want. Setting the PC Card's speed manually will override its ability to automatically sense a host's speed during your computing session. If you manually tell the 10/100 + 56K Modem PC Card to run at a speed of 33.6Kbps via Hayes AT commands, for example, the PC Card will not shift into any other speeds unless you tell it otherwise.

Set the IRQ and COM Values

Your communications software should have an area where you can enter the IRQ and COM values that are in use by the 10/100 + 56K Modem PC Card. Enter them now.

If your software is running under Windows 95, 98 or NT 4.0, you might be able to skip this step; because Windows 95 and NT 4.0 automatically choose the IRQ and COM values for the PC Card, they may also inform your communications software about which values are in use.

Set the Data Bit, Parity, and Stop Bit Values

Modems are serial devices that communicate in zeroes (0) and ones (1). Each zero or one is called a bit. The 10/100 + 56K Modem PC Card can be made to communicate with either 7 or 8 data bits at a time. 8 data bits is the most popular standard.

Parity

An error-detection method that checks the validity of a transmitted character. The same type of parity must be used by two communicating computers, or both may omit parity. When parity is used, a parity bit is added to each transmitted character. The bit's value is 0 or 1, to

54

make the total number of 1's in the character even or odd, depending on which type of parity is used. Most computers use no parity.

Stop bits are separator bits that are inserted between every set of 7 or 8 communication bits. Most stop bit sequences are only 1 bit long. Tell your communications software to use a stop bit of 1 bit.

When users refer to the bit, parity, and stop bit settings of a modem, they usually run the values together. 8-N-1 means "use 8 bits, no parity, and 1 stop bit." 7-Odd-0 means "use 7 bits, an odd parity, and no stop bits."

Downloading

The process of getting a file from another computer by modem is called **downloading**. In order to successfully download a file, you need to make sure that your communications software is using the same download protocol as the computer you're communicating with. A protocol is nothing more than an agreed-upon standard of download rules and procedures.

For downloading data from one modem to another, such as through a BBS, (Bulliten Board System), the most popular download protocols are **Xmodem-CRC** and **Zmodem**. Zmodem is the easiest to use. If possible, configure your communications software so that it uses Zmodem.

When you download a file from another computer or a BBS, the procedure will normally go something like this:

1. You tell your communications software to initalize the modem and dial the number of the computer you want to access.

2. The remote computer answers, asks your for your password (if any), then shows you a menu of options.

3. You choose the option that lets you download a file. The remote computer asks you for the name of the file that you want to download, followed by the download protocol that you want to use.You'll choose Xmodem, Zmodem, or some other protocol.

That protocol that you choose must be the same protocol that you told your communications software to use before dialing.

4. The remote computer begins sending the file. Your computer will ask you where you want to save the incoming file (which drive, directory, etc.). The file is then sent.

Downloading from the Internet with FTP and HTTP

For downloading large files over the Internet, the most common protocol that you will be using is FTP, or **File Transfer Protocol**.

If you go to a web site and download a file or program, you are most likely opening an FTP session. In other words, your computer requests the file from the server, and the server begins sending the file. You then have the option of saving it to your hard drive under any name that you would like.

A common saying that you have probably heard is "FTP it!" which is basically what you do when you grab a file off of the Internet.

FTP is simple in that you can browse files using an FTP client. An FTP client is a software application that allows you to connect with an FTP server and either

upload or download a file over the Internet. FTP client software operates independently of your web browser.

Many times, however, you may not even need an FTP client to download files over the Internet. Web browsers such as Microsoft Internet Explorer and Netscape Communicator/Navigator allow you to download files and even navigate FTP server directories using the browser itself.

Most web sites offer direct links right on the page for file downloads. When you click on the file name on the web page, the transfer begins. When you click on the file you want to download, watch the browser's address window. You see the URL change from an HTTP address to an FTP address. This integration of transfer protocols in today's software is one of the many features that help to streamline and simplify the Internet experience.

Uploading on the Internet

If you are uploading a file on the Internet, you are transmitting the file from your computer to a server somewhere on the Web. If you are going to be running your own web site or if you are going to be trading shareware files with other users, you will need to learn how to upload.

Uploading on the Internet is always done with an FTP client. Many FTP clients make uploading and downloading as easy as dragging a file from one location to another with your mouse. Even the most basic FTP clients have all of the features you will need to access an FTP server. FTP client software is usually free or inexpensive, depending on the application's features.

Using an FTP Client

Initiating the client side of an FTP session is relatively easy. Once connected to the Internet through your ISP, you simply enter all of your important information into the login box. Your client software will ask you for a URL (beginning with ftp://), your user name, password, and the path on the server that you would like to access, such as d:/shareware/docs.

While all private FTP servers will require a password, most publicly accessible FTP servers allow anonymous logins. To log in on an FTP server as an anonymous user, type "anonymous" or "anon" as your user name, and type your email address or email login name (everything before the @ symbol) as your password.

Different FTP server have different login rules, and many servers only allow a limited number of logins.

Testing the EtherFast 10/100 + 56K Modem PC Card

The instructions below will tell you how to test the 56K LANmodem if you are using Windows, Windows for Workgroups, Windows 95, 98 or NT. The directions explain how to use the communications software from Microsoft that is included with each of these operating systems.

If you are using communications software other than Microsoft's, read the directions below to get a feel for how testing works, then consult your software's user guide(s) for further instructions.

Testing with Windows 95, 98 and NT 4.0

1. Start up Windows. Click on **Start**, followed by
Programs, **Accessories**, and finally, **Hyperterminal**.
Double-click on the **HyperTrm** icon.

2. Enter a name for the new connection you're about to
establish (you normally give each connection its own
name, like "test"), choose an icon for it, and click **OK**.

3. Enter the phone number that you want to dial. To test
your 56K LANmodem, try dialing the Linksys Bulletin
Board System at (949) 261-2888.

4. Pick the **56K LANmodem** from in the *Connect
using:* box. When you're done, click **OK**, followed by
the **Dial** button.

Hyperterminal will pick up the phone line, dial Linksys,
and attach to the BBS. Follow the instructions that
appear on your computer screen to navigate through the
BBS. When you're ready to hang up, click on Call, fol-
lowed by Disconnect.

If receive TAPI errors in Hyperterminal, your 56K
LANmodem is not properly connected to your PC.
Verify that all of your cabling is working and the evey-
thing is connected properly.

Twisted Pair Cabling

There are different grades, or categories, of twisted-pair cabling. **Category 5** is the most reliable and widely compatible, and is **required** for Fast Ethernet.

You can buy Category 5 cabling that is pre-made, or you can cut and crimp your own. Category 5 cables can be purchased or crimped as either straight-through or crossed. A Category 5 cable has 8 thin, color-coded wires inside that run from one end of the cable to the other. Only wires 1, 2, 3, and 6 are used by Ethernet networks. In a straight-through cable, wires 1, 2, 3, and 6 at one end of the cable are also wires 1, 2, 3, and 6 at the other end. In a crossed cable, the order of the wires change from one end to the other: wire 1 be-comes 3, and 2 becomes 6.

straight-through cable		crossed cable	
Wire	Becomes	Wire	Becomes
1	1	1	3
2	2	2	6
3	3	3	1
6	6	6	2

The color code for the 4 wires should be as follows: **Wire 1**, white with an orange stripe; **Wire 2**, orange; **Wire 3**, white with a green stripe; **Wire 6**, green. The other four wires have to be connected as follows: **Wire 4**, blue; **Wire 5**, white with a blue stripe; **Wire7**, white with a brown stripe, **Wire 8**, brown.

To figure out which wire is wire number 1, hold the cable so that the end of the plastic RJ-45 tip (the part that goes into a wall jack first) is facing away from you. Flip the clip so that the copper side faces up (the springy clip will now be parallel to the floor).When looking down on the coppers, wire 1 will be on the far left.

60
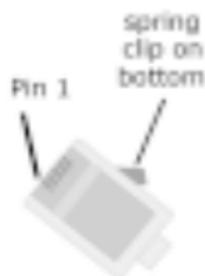
LEDs

Your EtherFast 10/100 + 56K Modem PC Card has six
diagnostic performance LED indicators on the coupler
housing. Each cable port has its own set of 3 LEDs.

EtherFast 10BaseT/100BaseTX RJ-45	
LINK	**ON** when a link is detected on the RJ-45 port.
10/100	**ON** when the EtherFast PC Card is communicating with the LAN at 100Mbps.
ACT	Flickers when activity is detected on the RJ-45 port (either receiving or transmitting data).

56K Modem RJ-11 Telephone Cable Port	
CD	**ON** when a carrier is detected and the modem has established a link.
RX	Flickers when the modem is receiving data.
TX	Flickers when the modem is transmitting data.

Troubleshooting

General Troubleshooting Tips

1. If there is not a link light on the card and the hub, verify that your network cable is category 5 grade doesn't exceed **100 meters** (328 feet) in length, and that it is properly connected to a 10BaseT or Fast Ethernet 100BaseTX hub.

2. If you are using Windows NT 4.0 and the EtherFast 10/100 + 56K Modem PC Card doesn't seem to respond, make sure your system's services have been started by clicking on **Control Panel**, **Services**, then **PCMCIA**. To enable the PCMCIA services in NT, go to page 78.

3. Windows NT is not a true Plug-and-Play operating system. You should turn your computer off before inserting or removing the EtherFast 10/100 + 56K Modem PC Card.

4. When trying different IRQ and I/O values for the EtherFast 10/100 + 56K Modem PC Card to use, remember to use the same values for both the network software driver as well as the socket and card services.

5. If the modem fails to initialize, change the COM and IRQ settings for the modem. If you have the modem set for COM3 and IRQ5 and you have a sound card in your PC, you may experience conflicts.

NT users can run WINMSD from a DOS prompt to find an open setting. Also, in most cases, NT users will have to add the modem manually. See page 78 for detailed instructions.

Troubleshooting Hints for Windows 95 and 98

Problem 1: Windows doesn't detect new hardware with the EtherFast Card hardware installed, or detects new hardware every time your start up your PC.

Solutions
You might not have inserted the PC card correctly or securely into the appropriate slot of your computer. Check that the card is securely inserted into the appropriate slot.

You may have previously aborted a new hardware setup. Follow the directions on page 74.

Problem 2: Windows can't locate the driver for the EtherFast Card device.

Solutions
You may have inserted the wrong diskette into your PC's drive. The diskette may be defective or files may be missing. Make sure the disk has files called NETLM.INF, MFLM.INF, and MDMLM.INF in the root of the floppy or in the Win95 or Win98 sub-directory.

Problem 3: The Windows Logon screen doesn't appear after you restart your computer.

Solutions
Click on **Start**, **Shut Down**, then **Close All Programs and Logon as a Different User**. If this solves the problem, your PC's manufacturer may have disabled Window's networking. Contact your computer's manufacturer for help.

Problem 4: After entering a username and password, a window appears that reads, "No Domain Server could be found to validate your Username and Password."

Solution
Click on **Start**, **Settings**, **Control Panel**. Double-click on **Network**. Click on the **Configuration** tab. Under *The Following Network Components are Installed* box, highlight *Client for Microsoft Networks* and click on the **Properties** button. Once you are in the *Client For Microsoft Networks Properties* window, make sure that *Log on to Windows NT Domain* is Unchecked. Once you have made sure that it is Unchecked click on the **OK** button.

Problem 5: On the Access Control Tab, *Shared Level Access* is grayed out and not accessible.

Solutions
You previously had your primary network logon set to *Client for NetWare Networks*. On the Configuration Tab of the Network Properties window, make sure that your primary network logon is set to *Client for Microsoft Networks*.

Problem 6: In Network Neighborhood you can only see yourself and no other computers on the network.

Solutions
Make sure that the cables are connected correctly. Make sure you are getting Link or Activity lights on both the EtherFast PC Card and your hub. Try changing to a cable that you know is working.

Your workgroup name may be different from other computers on your network. Make sure each PC on the network is using the same workgroup name.

Problem 7: In Network Neighborhood, you can see all other computers on the network but not yourself, and all other computers can see each other and not your computer.

Solutions
You may have not have enabled File and Printer Sharing. To do so, go to page 24 for Windows 98 and page 35 for Windows 95.

The network card might not be setup properly. Try reinstalling the card. Skip to page 74.

Problem 8: Network Neighborhood is Empty.

Solutions
Verify that your Microsoft Client is installed. Make sure you logged in properly when Windows started up. See the Windows setup instructions in this guide for directions.

Problem 9: You receive DHCP Errors in 95 or 98.

Solutions
Remove the TCP/IP component from Window's networking. To do this, click on **Start**, **Settings**, **Control Panel**, then double-click on **Network**. Click once on the component entry with the word TCP/IP in it, then click on the **Remove** button. Click **OK** when finished.

Setup, Control, and Operation Problems

Read the tips and hints below to troubleshoot the EtherFast 10/100 + 56K Modem PC Card's setup, control, and operation.

• Setup Problems

Check cabling and phone connections. Make sure that the 10/100 + 56K Modem PC Card card is properly inserted into your computer's PCMCIA slot, that its coupler is plugged in, and that the telephone cable is live and working.

In Windows 95, 98 or NT 4.0, make sure the modem is installed properly. To do this, click on **Start**, **Settings**, **Control Panel**. Open the **Modems** icon and click on the **Diagnostics** tab (not available in NT 4.0). Highlight the COM port that the 10/100 + 56K Modem PC Card is using. Windows will poll the modem. If Windows returns with information about the modem's settings and capabilities, the modem is properly installed; if it doesn't, keep reading for more troubleshooting hints.

• The generic enabler.exe program doesn't seem to find the EtherFast 10/100 + 56K Modem PC Card.

If you are using the enabler program in DOS, Windows 3.x, or WFW, the program will automatically scan all of your computer's PCMCIA slots in search of the PC Card. If it is unable to locate the card, you might want to tell enabler which slot the card is in. Most notebook computers come with two PCMCIA slots, and they are usually numbered 0 and 1 or 1 and 2. Your computer's manual should be able to tell you which slot is which. Decide on the slot you want to use, and remember its number. If you're not sure which slot is which, just pick a slot number and try it -- if it doesn't work, try another. To specify a slot number, use this syntax in your AUTOEXEC.BAT file. See page 13 for details:

c:\carden.exe /SLT=s

where   s is the computer's PCMCIA slot to use

For example, to use the card in slot 1 of your PC (if the slots are numbered 0 and 1), you'd use:

c:\carden /SLT=1

If enabler still can't find the card, you may need to try a different slot, different settings, or combinations.

The interrupt that the modem is using may be the same interrupt that another card is using. Change the MIR settings to a different, unused, interrupt value. Even if you are not using a serial port which is set to the same interrupt as the modem, it can still interfere with the modem.

Control, Dialing, and Answering Problems

• **Modem doesn't connect at 56Kbps.**

The attainment of 56Kbps speeds relies upon optimum line integrity and a host that supports 56Kbps connections. Line noise and other factors may result in slower data transfer speeds. Your phone line may be too noisy to obtain 56K, the host you're dialing may not support 56K, or your host may not support the V.90 56Kbps standard.

• **The computer doesn't seem to recognize the 10/100 + 56K Modem PC Card, and/or it doesn't respond to AT commands**

Make sure that you are using a card and socket service, or that you have some way of initializing the card. If your PC has resume mode, try turning it off. If you don't get a response after an AT command, be sure that command echo and messaging are both turned on. Make sure that you're using the correct interrupt and COM port settings, and that your communications software is using the correct driver for the PC Card. Check the 10/100 + 56K Modem PC Card for damage. If you're using Windows 3.0, try changing the COMnbase= line in your SYSTEM.INI to COMnbase=-1 (where n is the COM port of the modem). If using Wordperfect for Windows, try disabling the FAXMAN line in the AUTOEXEC.BAT file.

• **The modem does not execute the command line**

Make sure you are typing 'AT' at the beginning of command line. Make sure the modem is not in Data Mode. type '+++' if necessary. Make sure your software is set to the same COMx: port as the modem is.

• **Modem doesn't initialize, or after communicating, fails to drop the line.**

Try re-initializing the modem. If that doesn't work, use AT&F to reset it to its factory defaults. Also, make sure that you aren't using any type of digital phone system (digital PBX, etc.).

• **The modem does not give a response after an AT command was executed.**

Try the ATE1Q0 command to turn Echoing on.

• **The modem gives an 'ERROR' response after an AT command was executed.**

Make sure you did not type an invalid command. Make sure your command line is 40 characters or less in length.

• **The modem goes off-hook and disables the tele phone line.**

The modem may be set to auto-answer the phone when it rings. Disable auto-answer by typing ATS0=0 then Enter at the command line. If that doesn't work, try AT&C1.

• **The modem does not dial a phone number after you execute the AT dial command.**

If you are using touch tone dialing on a phone line that requires pulses, then it may not work. Use ATDT in place of ATDP.

• The modem does not auto-answer the phone.

If necessary, make sure the software is configured to auto-answer the phone. To set auto-answer mode on from the AT commands, type ATS0=n and press Enter. The n stands for which number of rings the modem will answer on. Example: ATS0=3 takes the modem answer on the third ring. The software does not control the modem properly or can not detect the modem. Make sure the software has been set up correctly. Check the initialization and dial strings.

Some TSRs (programs that stay in memory after they are loaded) may conflict with the communications software. Try starting your computer without loading any TSRs.

• The modem doesn't dial when you tell it to.

Make sure the software dialing prefix is ATDT. Make sure the software and modem are set to the same COMx: port. The modem may not have hung up the phone line since the last call. Change to command mode and type ATH and press Enter.

• The modem can connect to some modems, but not others.

The remote modem may not support data compression or error correction, which might cause it to take too long to negotiate a link.
You might try changing the way the modem negotiates by using the AT&Qn, ATNn, and ATS37=n commands. Start with AT&Q0N1.

69

- **When dialing another modem, you receive a CONNECT response, but nothing else**.

The remote modem may be waiting for you to type a command.

- **The modem speaker does not make any sound when you're connecting to another modem**

The software may have the speaker disabled. Use the ATM1 to turn it on.

- **The modem disconnects (looses the connection) in the middle of use**

The remote modem may have locked up. The telephone line may have disconnected your call. Your software may have turned off the DTR signal to the modem.

- **The modem does not connect with another modem**

There may be a problem with the remote modem if you do not hear the high pitched tone from the remote modem. Try redialing. If it still doesn't work, try a slower speed.

- **When the modem is connecting to another modem, it reports a higher connect baud rate that it is really using**

Go into Command Mode with your software and type **ATW2** then **Enter**. This tells the modem to report the modem-to-modem baud rate instead.

Transmission Problems

• **Data is garbled during or after transmission**

You may be using a noisy line; try the transmission again. Try turning on RTS/CTS flow control—this may give your PC more time to react to incoming/outgoing data. Make sure that all PCs and modems are communicating with the same protocols and speeds. If you have call waiting, disable it.

• **The characters on the screen are doubled**

Both the modem and the software have the echo feature turned on. Since only one echo is needed, turn the software echo feature off.

• **The remote modem is echoing your typed characters**

Type **ATE1** then **Enter** at the command line. Then turn off the software echo feature.

• **No text appears on the screen when in data mode**

The remote modem is not echoing your typed characters. Type **ATE0** and press **Enter** at the command line. Then turn the software echo feature on.

Your software may not be set to use Full Duplex or the remote modem may not be set to use Full Duplex either.

• **No text appears on the screen when in command mode**

If you can't see the characters you are typing, then type **ATE1** and press **Enter**.

• **The modem occasionally transmits an error burst**

The telephone line may be noisy or bad. Hang up the call and try calling again for a better telephone line.

If there other telephones on the same line that your modem is using, then someone may have picked up a telephone on that extension.

Your telephone line may have the call waiting feature enabled.

• **The modem gets errors in transmitted data randomly**

Try to use V.42 or MNP1-4 when possible. Also, try connecting at a slower baud rate.

• **After you download a file, it was not stored on your disk drive**

If both modems are using MNP or V.42 protocol, then the flow control may not be setup. Configure your software to use RTS/CTS flow control. That will cause your computer to pause long enough for the file to be stored to disk.

• **The text on the screen is not legible**

Your software settings may not match the settings on the remote modem's software. Make sure your data bits, stop bits, and parity settings match the settings that the other computer is using. The two most common settings are: 8 data bits, NO parity, and 1 stop bit (8,N,1) or 7 data bits, EVEN parity, and 1 stop bit (7,E,1).

Also, if the telephone line is very noisy, then you may be seeing corrupted data on your screen.

- **When using V.42bis or MNP5, some features are disabled**

You may be using a non-streaming protocol, like Xmodem or Ymodem to transfer files with. Those are fine unless you are using V.42bis or MNP5

Starting Over in Windows

Installing Windows 95 and 98 Network Components from Scratch

If you experience installation difficulties, you may need to re-install all of Window's networking components from scratch. The instructions below explain how to give your PC a clean sweep so that you can start the EtherFast + 56K Modem PC Card's software installation over.

1. At the desktop click on the **Start** button, highlight **Settings**, click on **Control Panel**.

2. Double-click on the **Network** Icon.

3. Look at the box with the text that reads *The following network components are installed*.

4. If the box has a component called *Dial-Up Adapter*, skip forward to step 6. If it doesn't, go to step 5.

5. Remove any instance on the name Linksys in the box. This includes *IPX/SPX…Linksys*, *NetBEUI…Linksys*, and *TCP/IP…Linksys*. Also remove *Client for Microsoft Networks*, *Client for NetWare Networks*, and *File and Printer Sharing for Microsoft Networks*. In some cases, removing one of these components may in turn automatically remove other components as well.

6. For PCs with Dial-Up Networking and/or an AOL adapter, remove any instance of the name *Linksys*, all *IPX/SPX* protocols, all *NetBEUI*, all *Clients*, and *File and Printer Sharing for Microsoft Networks*.

Do not remove Dial-Up Adapter, AOL Adapter, TCP/IP-Compatible Protocol-AOL Adapter or TCP/IP-Compatible Protocol-Dial-Up Adapter.

7. When you are done removing all the unnecessary components, click **OK**. When asked to restart, click **No**.

8. Return to the Windows Control Panel. Double-click on the **System** icon. The System Properties window will appear. Click on the **Device Manager** tab.

9. Scroll down to the items Multi-function Adapter, Modem, Network Adapters and expand it by clicking on the **plus** [+] or **minus** [-] sign next to it.

10. Starting with Multi-function adapter, remove all devices with the name *Linksys* in it's description. (If at any point you are asked to restart the computer, click **No**). After you do this, the Network Adapter and Modem headings may disappear.

11. Scroll down to the Other Devices section. Remove all items with the word *Linksys* in them. (If Other Devices is not listed, proceed to the next step.)

12. When you're finished, click on the **Close** button. Use the Windows Explorer to go to the C:\windows\inf directory.

13. Delete the following files only, and do not use wild-cards:

NETLM.INF
MDMLM.INF
MFLM.INF

14. Next, go to the c:\windows\inf\other directory. If you don't have this directory, just go to the next step.

Otherwise, delete any file with Linksys or MFLM in its name or description.

15. Shut down Windows, and restart your computer. After your computer has restarted, go back and follow the Windows 95 or 98 setup instructions.

Manually Installing the Network Components in Windows 98 and 95

There may be times when you might need to manually install missing Windows 95 or 98 networking components.

1. Click on **Start**, **Settings**, then **Control Panel**.

2. Double-click the **Network** icon. The Network window appears.

3. Click on the **Configuration** tab. Make sure that the following network components are installed:

Client for Microsoft Networks
Client for NetWare Network
Linksys EtherFast 10/100 + 56K Modem PC Card
IPX/SPX-compatible Protocol
NetBEUI

There may be other components listed in addition to the ones shown above. If any of the above components are missing, add them as follows:

Client for Microsoft Networks
If you plan on connecting to an NT file server or peer-to-peer network, click on the **Add** button. Highlight *Client* and click on **Add**. In the Network Client box, highlight *Client for Microsoft Networks* and click **OK**.

Client for Netware Networks
If you plan on connecting to a Novell NetWare workstation, click on the **Add** button. Highlight *Client* and click on **Add**. In the Network Client window, select *Manufacturer* and choose **Microsoft**. Highlight *Client for NetWare Networks* on the right, then click **OK**.

IPX/SPX-compatible Protocol
Click on the **Add** button. Choose *Protocol* and click on the **Add** button. Select *Manufacturer* and choose **Microsoft**. Under the Network Protocol box, highlight *IPX/SPX-compatible protocol*. Click **OK**. If you have a Dial-Up or AOL adapter installed, remove the *IPX-SPX-Compatible protocol* for Dial-Up or AOL

NetBEUI
Click on the **Add** button. Select *Protocol*, then click on **Add**. Under *Manufacturer*, choose **Microsoft**. Under Network Protocol, highlight *NetBEUI*. Click **OK**. If you have a Dial-Up adapter installed, remove the *NetBEUI for Dial-Up Adpater* protocol.

4. If you were referred to this section by the Windows setup instructions, please return to step 16 of the setup now and continue following the instructions.

Note: For the setup and troubleshooting of the TCP/IP protocol, contact your system administrator or refer to the Windows documentation. Linksys does not provide technical support for the setup or troubleshooting of the TCP/IP protocol.

Enabling PCMCIA Services in NT

To enable card and socket services in NT, click on
Start, **Settings**, **Control Panel**. Double click on
Devices. Scroll down the list until you find **PCMCIA**.
Highlight it and click **Startup** and choose **Boot** from
the options.
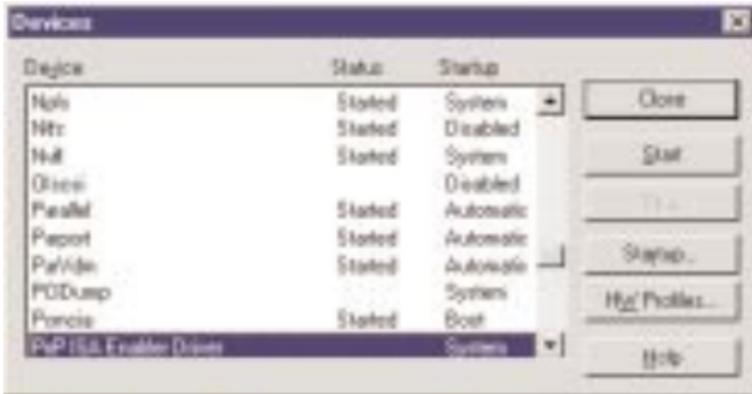
After you are done click on **Close** and restart your com-
puter. After the PC is restarted go to the same window
and make sure the service is Started. If the service can
not be started, see your laptop's documentation or con-
tact the manufacturer of the laptop.

Detecting the Modem under NT

1. After the driver for the card is installed, in order for
NT to be able to use the Modem, it has to be added to
the system. Click on **Start**, **Setting**, **Control Panel**.
Double click on **Modems**. Click on **Add**. The following
window will appear.

78

2. You can simply click **Next** and have NT try to detect the card. If NT fails to detect the Modem, you can manually add the Modem in by manually installing the Modem. Choose *Don't detect my modem; I will select it form a list*. Follow the instructions that appear. When you get to the following window, find Linksys in the list and highlight it.
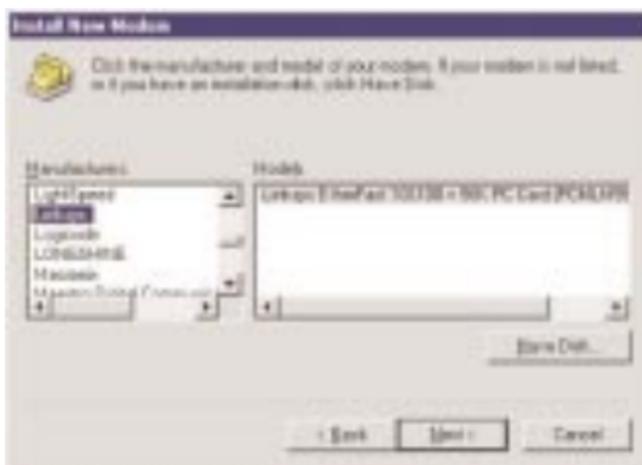
3. Next, choose the port the card is set to.
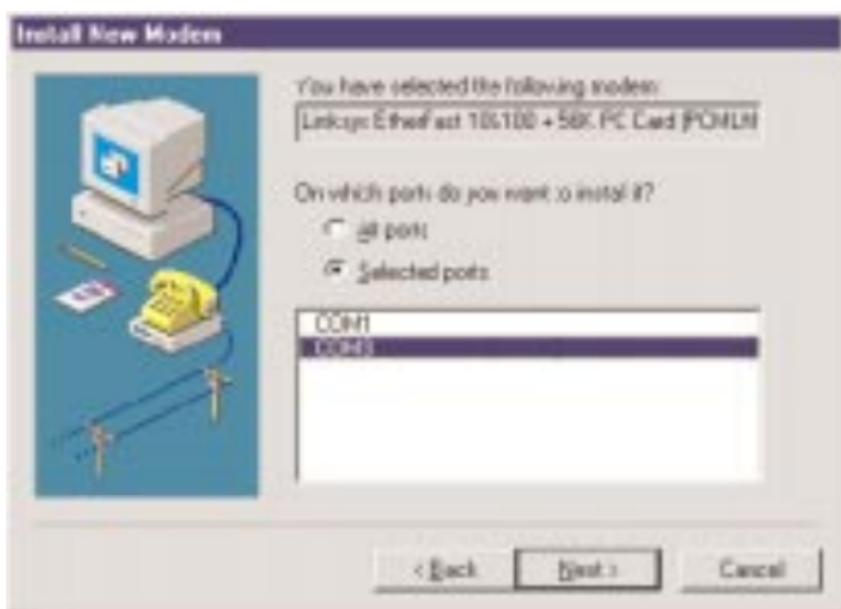
If you don't remember the settings, check the properties of the card by going to the Control Panel and clicking on the **Network** icon.

79

4. Follow the rest of the instructions until you are asked to click on **Finish**. NT may ask you to reboot the system.

The next time you open **Modems** in the **Control Panel**, you will see the Linksys card listed in the list of modems. If you have problems communicating with the modem, you can try and remove the modem, reconfigure the modem settings (IRQ and COM) of the card in the properties of the card by clicking on the **Network** icon in the **Control Panel** and adding the modem portion of the card by going through the above steps.

Specifications

Standards	IEEE 802.3, IEEE 802.3u V.90, K56flex V.34bis, V.34, V.32bis, V.32, V.22bis, V.23, V.22/Bell 212A, V.21/Bell 103
Topology	Star
Protocol	CSMA/CD
Speed	**LAN** 10Mbps and 100Mbps **Modem** 56Kbps Downstream, 33.6Kbps Upstream Max. 14.4Kbps Tx/Rx Fax
Ports	1 Dual-Speed 10BaseT/ 100BaseTX RJ-45 1 Standard RJ-11
Card Type	16-Bit PCMCIA Type II
LEDs	Link, Activity, 10/100Mbps (lit if 100), Modem Carrier Detect, Modem Transmit, Modem Receive
Certification	FCC Class A & CE
Cabling	RJ-45 Category 5 UTP & STP, RJ-11 Standard Telephone Cable
Dimensions	4.4" x 2.3" x 0.65"
Weight	2.0 oz.

Environmental Specifications

- Operating Temperature   32ºF - 120ºF

- Storage Temperature   -4ºF - 158ºF

- Operating Humidity   10% - 85% N.C.

- Storage Humidity   5% - 90% N.C.

- Power Consumption   5v/260mA, 60mA Sleep

Customer Support

For help with the installation or operation of your
EtherFast 10/100 + 56K Modem PC Card, contact
Linksys Customer Support at one of the phone numbers
or Internet addresses below.

Customer Support	949-261-1288
Fax	949-261-8868
Bulletin Board	949-261-2888
	(33.6, 8-N-1)
Email	support@linksys.com
Web	http://www.linksys.com
FTP Site	ftp.linksys.com

LINKSYS