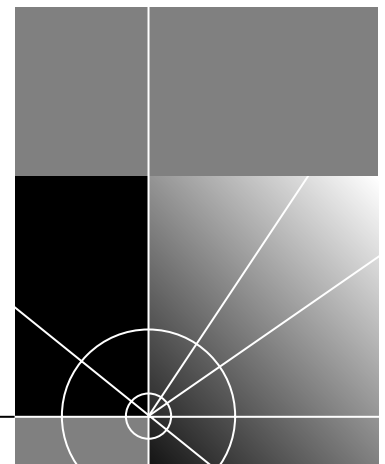**3Com** ®

EtherLink® 10/100 PCI Network Interface Card with 3XP processor User Guide

3CR990 Family of EtherLink NICs

You can print this user guide using Adobe Acrobat Reader, which is provided on the *EtherCD* that shipped with this product. Acrobat Reader is located in the language subdirectory.

CONTENTS

1

BEFORE YOU BEGIN

Product Registration

The United States government places registration requirements on using data encryption products. To obtain customer support for 3CR990 NICs, you are required to register your NIC product with 3Com. You can register this product electronically or by U.S. mail.

In addition to enabling customer support for your NIC, registration also entitles you to receive upgrade information and advance feature information.

NOTE: The original version of Windows 95 (Build 950) does not automatically allow you to change your default browser, even if Microsoft Internet Explorer is not present. If you are running this version of Windows 95 on your PC, access the following site to register your 3CR990 NIC product: http://www.3com.com/productreg.

NOTE: To be able to register electronically, a web browser must be installed on your system. You must also have an active Internet service provider (ISP) connection.

To register electronically:

1 Insert the *EtherCD* (that shipped with this product) in your CD-ROM drive.

The *EtherCD* Welcome screen appears.

If the Welcome screen does not appear

Go to: **EtherCD Navigation**.

2 Click **Register Product**, and then **Register Online**.

3 Follow the prompts as they appear.

To register by U.S. mail:

1 Find and remove the registration card included in the *EtherLink 10/100 PCI Network Interface Card Quick Guide* that shipped with this product.

2 Fill out the registration card and drop it in the mail. (No postage is required.)

EtherCD **Navigation**

This section provides information about *EtherCD* content and navigation.

If auto insert is enabled for your CD-ROM drive, the 3Com Welcome screen is displayed when you insert the *EtherCD* in your CD-ROM drive.

If the Welcome screen is not displayed when you insert the *EtherCD* in your CD-ROM drive, you can either enable the auto insert feature for your CD-ROM drive or navigate to the root subdirectories.

Go to: **Auto Insert**.

Go to: **Root Subdirectories**.

The following table describes the navigation links available on the Welcome screen:

Links	Description
User Guide	■ Print a PDF version of the user guide ■ Copy the online version of the user guide to your desktop ■ View the user guide online with a web browser
NIC Software	■ Install and configure the NIC in supported Windows operating systems ■ Perform the Preinstallation procedure (Windows 2000 only) ■ Install DynamicAccess technology ■ Create installation diskettes to install the NIC software in a PC that does not have a CD-ROM drive installed
Other Software	■ Install Adobe Acrobat Reader (version 4.0 for English or version 3.0 for international)
Register Product	■ Register your NIC product online
Release Notes	■ Describes the features of 3CR990 NICs, includes frequently asked questions and known problems information

Root Subdirectories

The following table lists and describes the root subdirectories included on the *EtherCD* that shipped with this product.

Subdirectory	Description
English	Each language subdirectory contains files specific to that language. This subdirectory contains copies of Adobe Acrobat Reader (4.0 or 3.0), CMI Client installation files, the Disk Copy utility, PDF and HTML versions of the user guide, and a user guide for diskette installation only in PDF format.
Help	Installation and configuration files, basic troubleshooting, support information, and system resource information.
Installs	Contains images for Dynamic*Access*, MBA, and 3Com EtherDisks.
Ndis2	Contains the DOS NDIS 2.x driver.
NWClient	Contains a DOS NetWare client driver file and runtime image file, a sample NET.CFG file, and an installer for the DOS ODI client driver.
NWServer	Contains a server driver, LDI import file, and appropriate NLMs for loading into a NetWare 4.1x or 5.0 server.

Auto Insert   If auto insert is not enabled for your CD-ROM drive, the *EtherCD* Welcome screen is not displayed when you insert the *EtherCD* in your CD-ROM drive. To enable auto insert on your CD-ROM drive:

1 Right-click the **My Computer** icon, and then select **Properties**.

2 Select the **Device Manager** tab.

3 Click the **+** symbol next to CD ROM in the list.

4 Select the name of your CD-ROM drive.

5 Click **Properties**, and then select the **Settings** tab.

6 Select the check box for **Auto insert notification**.

To view the Welcome screen on the CD navigator with auto insert enabled, reinsert the CD in the CD-ROM drive.

Text Files   The following table lists the text files that are included in the Help directory on the *EtherCD* that shipped with this product.

Text File Name	Text File Description
win2000.txt	Explains how to install the NIC, verify a successful installation, uninstall the NIC software, and update the driver.
win98.txt	Explains how to install the NIC, verify a successful installation, uninstall the NIC software, and update the driver.
unt_w98.txt	Explains how to perform an automated installation of Windows 98 over the network (unattended install).
w95ndis.txt	Provides instructions specific to Windows 95 for first-time installations, updating drivers, removing the NIC driver and *EtherCD* software, troubleshooting installation problems, and a peer-to-peer networking overview.
w95netwr.txt	Explains how to install the Windows 95 driver to support the Microsoft client for NetWare networks.
winnt.txt	Provides installation instructions and troubleshooting tips for installing drivers in Windows NT 4.0 and Windows NT 3.51.
unt_nt4.txt	Explains how to perform an automated installation of Windows NT 4.0 over the network (unattended install).
netware.txt	Explains how to install the ODI driver for the NetWare 4.1x and 5.0 server.
client32.txt	Contains NetWare 4.11 on Windows 95/98 client driver installation notes.
nwdosodi.txt	Explains how to install the driver for a 16-bit NetWare client running DOS.
support.txt	Contains information about technical assistance services available from 3Com.
trouble.txt	Contains troubleshooting tips.
wakefaq.txt	Contains common questions and answers about Remote Wake-Up.
license.txt	Includes the wording from the 3CR990 NIC software license agreement.
register.txt	Explains why and how to register your NIC.

Installation Overview

This section provides basic information that you need before you start the installation.

Check List

Before you start the installation, verify that you have all of the components that shipped with this product. If any of these items are damaged or missing, contact your shipper or network supplier.

- 3CR990 NIC
- Remote Wake-Up cable (Used only for 2.1 PCI specification-compliant PCs.)
- *EtherCD* Version 1.0 for the 3CR990 Family

You also need to know the network protocol (for example, IPX, NetBEUI, or TCP/IP).

Windows 2000

If you are running Windows 2000 on your PC, the first step is to run the Preinstallation program on the *EtherCD* before you install the NIC in your PC.

To run the Preinstallation program, from the *EtherCD* Welcome screen click **NIC Software**, **Drivers and Diagnostics**, **NIC Preinstallation**, **NIC Installation with Windows 2000**, and then **Done**.

Windows 98/95

If you are running Windows 98 or Windows 95 on your PC, the first step is to install the NIC.

Go to: **NIC Installation**.

Windows NT 4.0

If you are running Windows NT 4.0 on your PC, the first step is to install the NIC.

Go to: **NIC Installation**.

Windows NT 3.51

If you are running Windows NT 3.51 on your PC, the first step is to install the NIC.

Go to: **NIC Installation**.

Netware Server

If you are running Netware on a server, the first step is to install the NIC.

Go to: **NIC Installation**.

Minimum System Requirements

Your PC or server must meet the following requirements before you can successfully install the 3CR990 NIC:

- 80486 or Pentium processor
- Available bus-mastering PCI slot
- Minimum of 640 K of memory

Making a DOS-Bootable Diskette

For installation and configuration procedures that require you to boot from DOS, you cannot successfully use the MS-DOS prompt from within Windows. Perform a "clean" boot from DOS or use a DOS boot disk.

i> *NOTE: To use the CD-ROM drive on a PC or server in a DOS environment, the DOS drivers for the CD-ROM drive must be installed. Consult the documentation that accompanied your CD-ROM drive or your motherboard for information about how to install these drivers.*

i> *NOTE: If the PC or server is only running DOS and a CD-ROM drive is not installed, you must install the NIC software using installation diskettes. For more information about installation diskettes*

Go to: **Diskette Installation**.

To make a DOS-bootable diskette:

1 Insert a blank, formatted diskette in drive A.

2 At the DOS prompt, enter:

```
sys a:
```

System files are copied to the diskette.

3 Remove the diskette from drive A and attach a label for future reference.

Diskette Installation

Installation diskettes are not included with this product. If you do not have a CD-ROM drive installed in your PC, you need to locate a system with a CD-ROM drive and create installation diskettes from the *EtherCD* that accompanied this product.

Go to: **Making NIC Installation Diskettes**.

If you have Internet access, you can also download installation disk images from the 3Com World Wide Web site.

Go to: **http://support.3com.com/software**.

Making NIC Installation Diskettes

You will need three blank, formatted diskettes with labels for this operation. Label the diskettes 1, 2, and 3.

To make installation diskettes:

i> *NOTE: Text on the installation diskettes is in English only.*

1 Insert the *EtherCD* in the CD-ROM drive.

2 From the main menu, select **Installation**, and then click **Create Installation Diskettes**.

3 Click **Create**, and then follow the prompts.

Go to: **Installing from Diskettes**.

Installing from Diskettes   To install NIC software, you will need the NIC, your Windows operating system source diskettes, and the NIC installation diskettes.

- To install NIC software using installation diskettes, see the file DISKETTE.PDF on the *EtherCD.* The path for this file is:

  Installations \ Diskette.pdf

- To make installation diskettes

  Go to: **Making NIC Installation Diskettes**.

2

3CR990 NICs

NIC Overview

The 3CR990 network interface cards (NICs) represent a new generation of secure, intelligent client NICs with an on-board RISC processor (3XP processor). The RISC processor is designed to optimize system and network performance. Optimization occurs by offloading key networking and security tasks even when running bandwidth-intensive applications such as voice, video, imaging, and Internet and intranet applications. These NICs connect your PCI-compliant PC to a 10 Mbps or 100 Mbps Ethernet network and provide advanced features for high performance and secure transactions.

The 3CR990 NICs provide up to 3DES (Data Encryption Standard 168-bit) encryption. Encryption processing is handled entirely by the RISC processor and the encryption chip that reside on the 3CR990 NICs.

The onboard encryption chip enables true end-to-end network security (IPSec) at the data capacity of the connected network cable (wire speed), without sacrificing performance.

The following figure shows the 3CR990 NIC and the location of its major components.

Encryption chip

Remote Wake-Up (RWU) connector

3Com

TX DATA

ACT
10   L
       N
100   K

3XP processor

3CR990 NICs support up to 168-bit (3DES) encryption
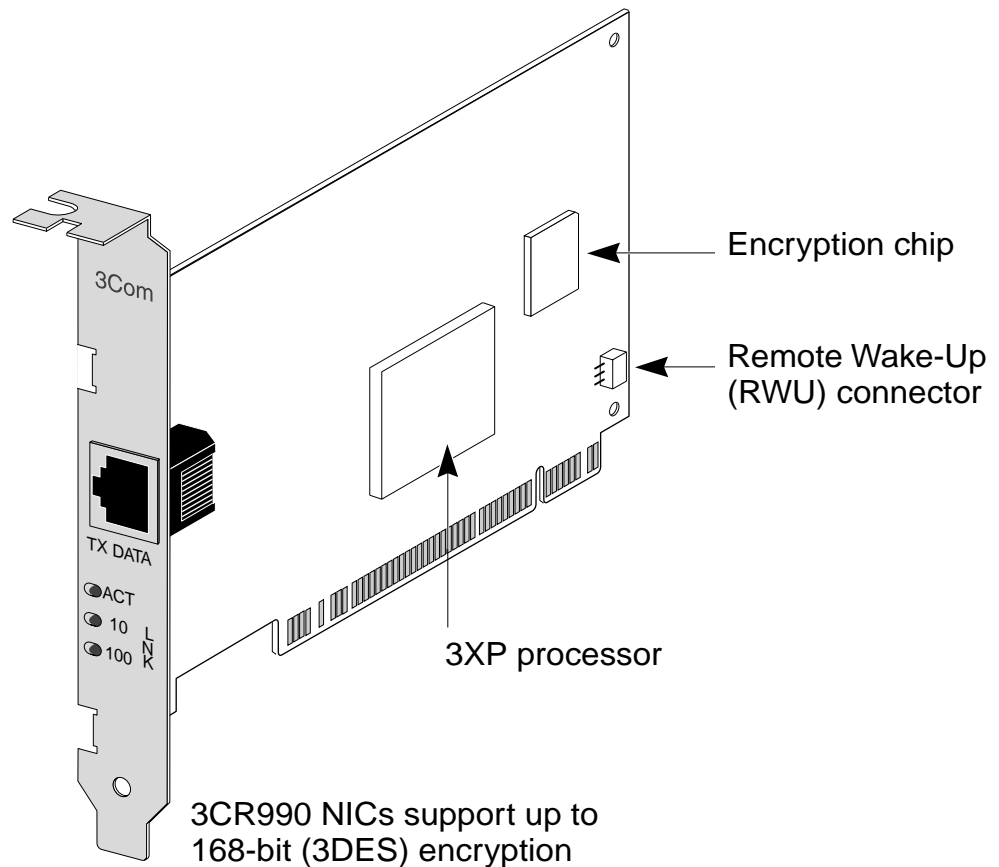
NIC Features   The 3CR990 NICs provide these features for supported IP and IPX environments:

- Integrated Boot ROM

- Remote Wake-Up

- Desktop Management Interface (DMI)

    - DHCP server prevention

    - Broadcast storm limitation

- Offline diagnostics

Integrated Boot ROM Managed PC Boot Agent (MBA) software provides the multiprotocol preboot firmware and tools. MBA adds management capabilities to the NIC by enabling the PC to boot from a network server, rather than from its local drive. 3CR990 NICs have an integrated boot ROM already installed on the NIC.

For information on configuring and using the MBA, see the *Managed PC Boot Agent (MBA) User Guide* located on the *EtherCD.* Navigate the following path: CD ROM drive letter \ Installs \ Mba \ Manual, and then double-click **3ComGuide.exe** to unzip the compressed user guide file.

MBA preboot support allows you to use management applications to perform tasks such as:

- Installing and configuring a new PC that has never been connected to the network.

- Upgrading software.

- Scanning for viruses.

- Performing disaster recovery tasks.

In addition to firmware, MBA has a complete set of tools, utilities, and pre-OS software that enables network administrators to perform tasks such as:

- Reconfiguring multiple systems at once.

- Backing up hard drives automatically.

For more information on the management features supported by 3C990 NICs, access the 3Com World Wide Web site

Go to: **http://www.3com.com/managedpc**.

Remote Wake-Up   Remote Wake-Up provides the ability to remotely power-up a network PC. When the PC is in sleep mode and receives a wake-up packet (Magic Packet frame) through the LAN, the NIC turns on the power to the PC. To use the Remote Wake-Up feature, a desktop management application is also required that is able to generate a Magic Packet Remote Wake-Up signal.

NOTE: *The 3CR990 NICs provide a network connection with or without the Remote Wake-Up cable installed.*

Your PC or server must be either 2.1 or 2.2 PCI specification-compliant to use Remote Wake-Up. A PC that meets the PCI 2.1 specification uses the 3-pin Remote Wake-Up connector on the PC motherboard. A PC that meets the PCI 2.2 specification uses the PCI bus on the motherboard to handle Remote Wake-Up. (A 3-pin connector is not provided on the motherboard.)

Additionally, to support Remote Wake-Up, a PC must have a:

- BIOS that supports Remote Wake-Up (power management capability)

- 5-volt standby power supply unit rated at a minimum of 375 mA

If you are unsure whether your PC meets the requirements listed above, refer to your PC documentation or contact your PC manufacturer. For more information on Remote Wake-Up, including a list of PCs that currently support this feature, access the 3Com World Wide Web site

Go to: **http://www.3com.com/partners/acpi**.

Desktop Management Interface

Desktop Management Interface (DMI) is a network management standard that is widely accepted for managing Intel-based computers. The 3Com DMI Agent allows any DMI management application to access information such as the NIC driver location, version, and size; packets sent statistics; crc receive errors; and much more.

The 3Com DMI Agent consists of a DMI browser with the following components:

- DMI service layer
- DMI agent
- GUI installer
- NDIS drivers

DHCP Server Prevention

This feature prevents the PC from acting like a DHCP server. All receive packets are passed through a DHCP filter and are discarded if they are deemed to be destined for the DHCP process.

Broadcast Storm Limitation

Broadcast throttling is implemented on both the transmit and receive data streams. The user can specify a transmit broadcast threshold as a percentage of the transmit bandwidth. The adapter monitors each data stream and discards any broadcast or multicast packets that exceed this limit.

To install DMI, on the *EtherCD* Welcome screen, click **NIC Software**, **DynamicAccess Technology**, and **Install 3Com DMI Agent now**.

Offline Diagnostics

This product provides offline diagnostics programs for configuring, testing, and troubleshooting 3CR990 NICs. The configuration program within the DOS diagnostics program is used for a PC running Windows 2000, Windows NT 3.51, or DOS. The 3Com NIC diagnostics program (3Com NIC Doctor) is a windows-based program used for a PC running Windows 98, Windows 95, or Windows NT 4.0.

Windows 2000 Offload Features

Additionally, the 3CR990 NICs support windows 2000 offload features in an IP environment. The 3CR990 NIC Windows 2000 offload features are designed to enhance the Windows 2000 operating system capabilities by offloading key TCP/IP networking and security tasks from the Windows 2000 operating system:

- IPSec Offload—reduces CPU utilization by allowing the 3XP processor and a crypto chip on the NIC to perform data encryption operations.
- TCP Segmentation Offload—reduces CPU utilization by allowing the 3XP processor on the NIC to perform segmentation of TCP packets
- IP and TCP checksum Offload—reduced CPU utilization by allowing the 3XP processor on the NIC to perform the checksum calculation of TCP/IP and UDP/IP packets
- 802.1P Packet Priority Offload—reduces CPU utilization by allowing the 3XP processor on the NIC to perform the insertion of the 802.1Q tag header into the packet

Enabling Offloads   Windows 2000 provides the capability to individually enable or disable each of the four offload features. (The default setting for these features is enabled.)

> **i>** *NOTE: For users running the Beta 3 version of Microsoft Windows 2000, the Offload function must be globally enabled in Windows 2000 before individual offload features can be enabled or disabled.*
>
> *See the readme.txt file in the root of the* EtherCD *for the latest information about enabling and disabling offload features in the Beta 3 version of Windows 2000.*

To enable or disable individual Offload settings in Windows 2000:

1 Click the **My Network Places** desktop icon.

The Network and Dial-up Connections screen appears.

2 Click the **Local Area Connection** icon.

The Local Area Connection Properties screen appears.

3 Click **Configure**.

The 3Com EtherLink 10/100 NIC with 3XP processor (3CR990-TX-9x) screen appears.

4 Click the **Advanced** tab.

5 Select **Enable Offloads** in the Property list box.

6 Enter the hex number below for the desired offload state in the Value entry box.

7 Close all open windows.

The following table shows the hex values for the offload functions:

> **i>** *NOTE: The default hex value is F: all offloads enabled.*

Hex Value	Offload Function Enabled	Hex Value	Offload Function Enabled
0	Offloads disabled	8	802.1P Packet Priority
1	IPSec	9	802.1P Packet Priority IPSec
2	TCP Segmentation	A	802.1P Packet Priority TCP Segmentation
3	TCP Segmentation IPSec	B	802.1P Packet Priority TCP Segmentation IPSec
4	IP and TCP Checksum	C	802.1P Packet Priority IP and TCP Checksum
5	IP and TCP Checksum IPSec	D	802.1P Packet Priority IP and TCP Checksum IPSec
(continued)			
6	IP and TCP Checksum TCP Segmentation	E	802.1P Packet Priority IP and TCP Checksum TCP Segmentation

Hex Value	Offload Function Enabled	Hex Value	Offload Function Enabled
7	IP and TCP Checksum	F	802.1P Packet Priority
	TCP Segmentation		IP and TCP Checksum
	IPSec		TCP Segmentation
			IPSec

3 NIC INSTALLATION

3

Installing the NIC

This procedure graphically illustrates how to install the 3CR990 NIC in your PC or server.

⚠️ *CAUTION: Windows 2000 users: If you are running Windows 2000 on your PC or server, you must run the Preinstallation program before you install the NIC in your system.*

For more information
Go to: **Windows 2000**.

1

2

PCI
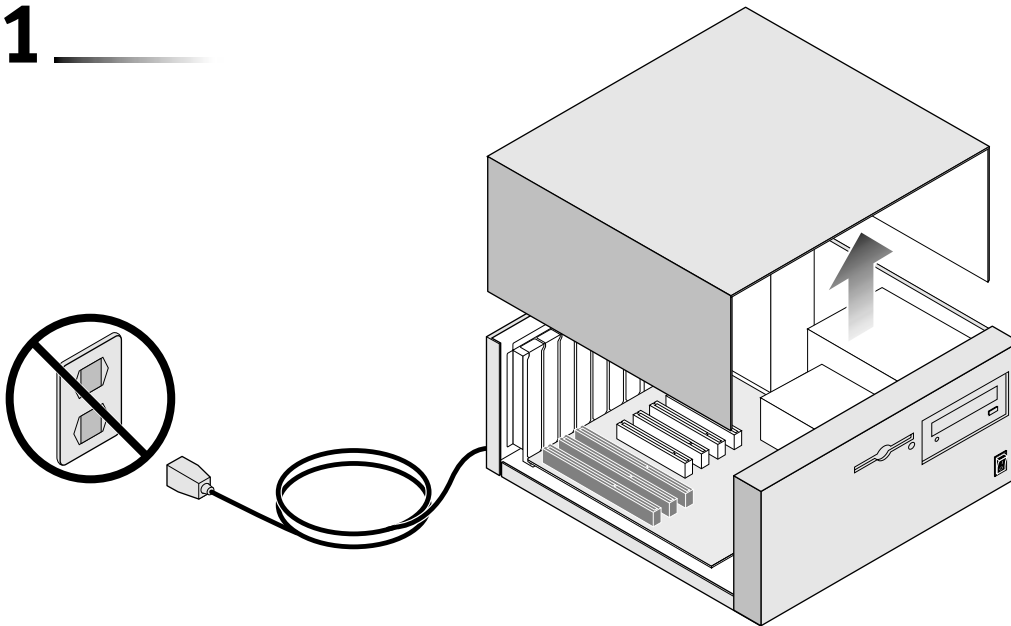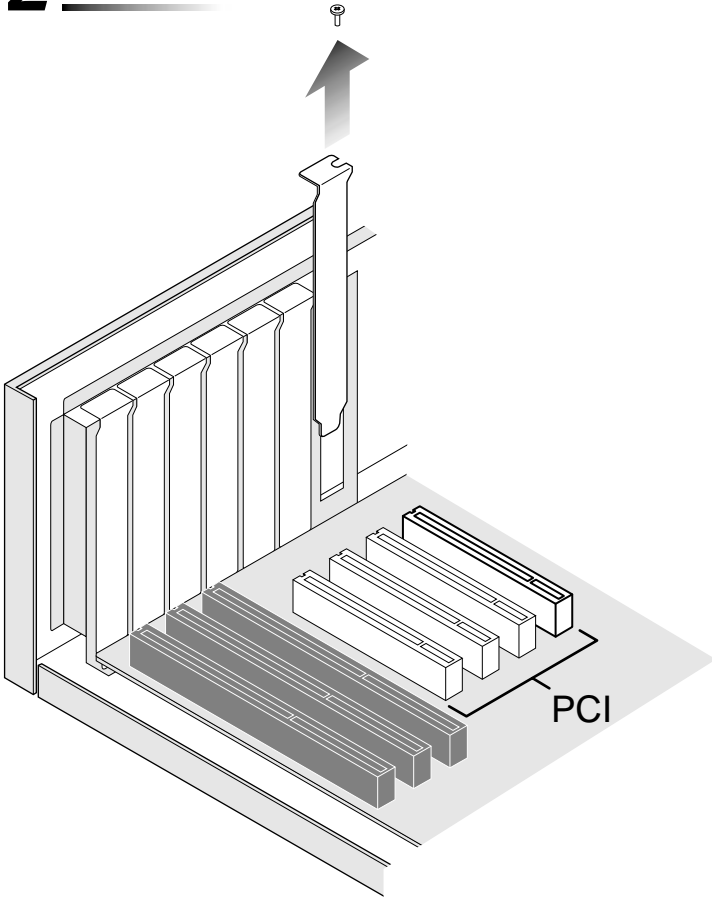
3
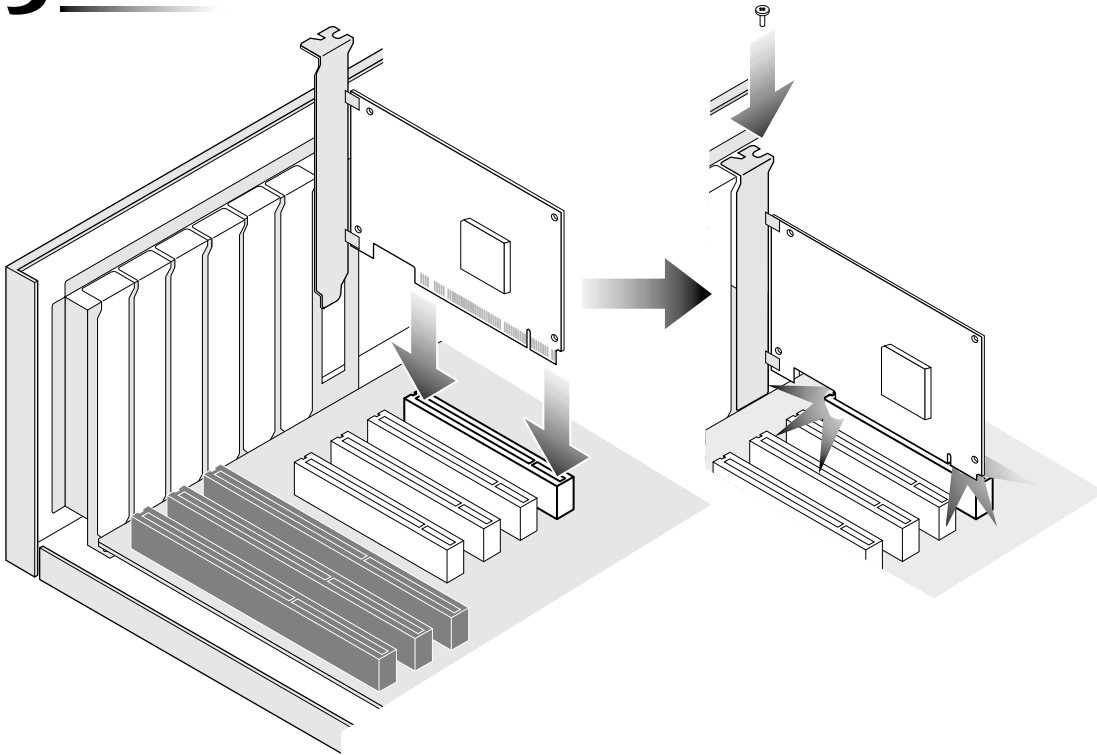
3A

Remote Wake-Up Cable
2.1 PCI specifications–compliant

4

5

TX DATA
ACT
10   L
100 N
     K
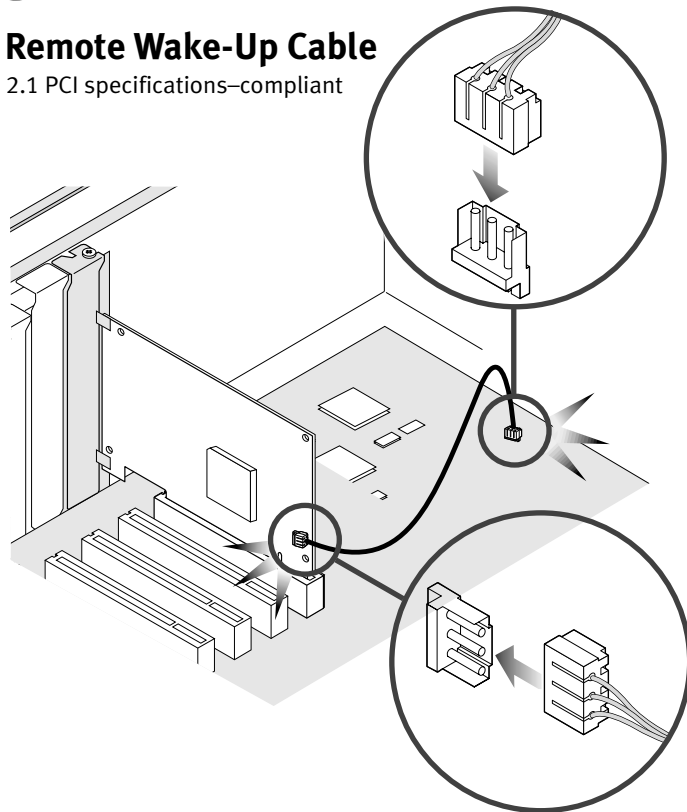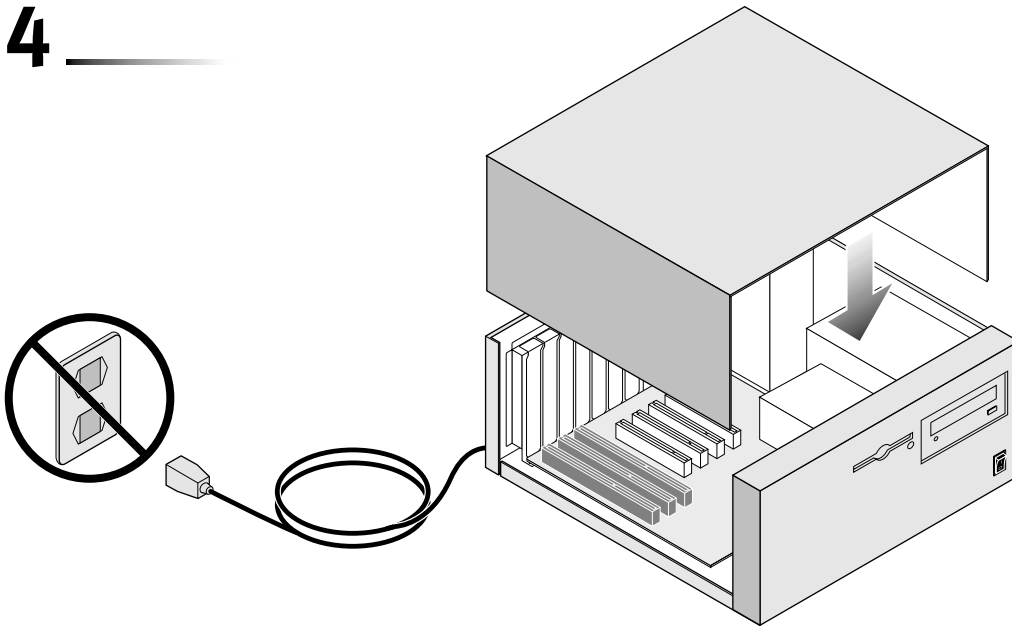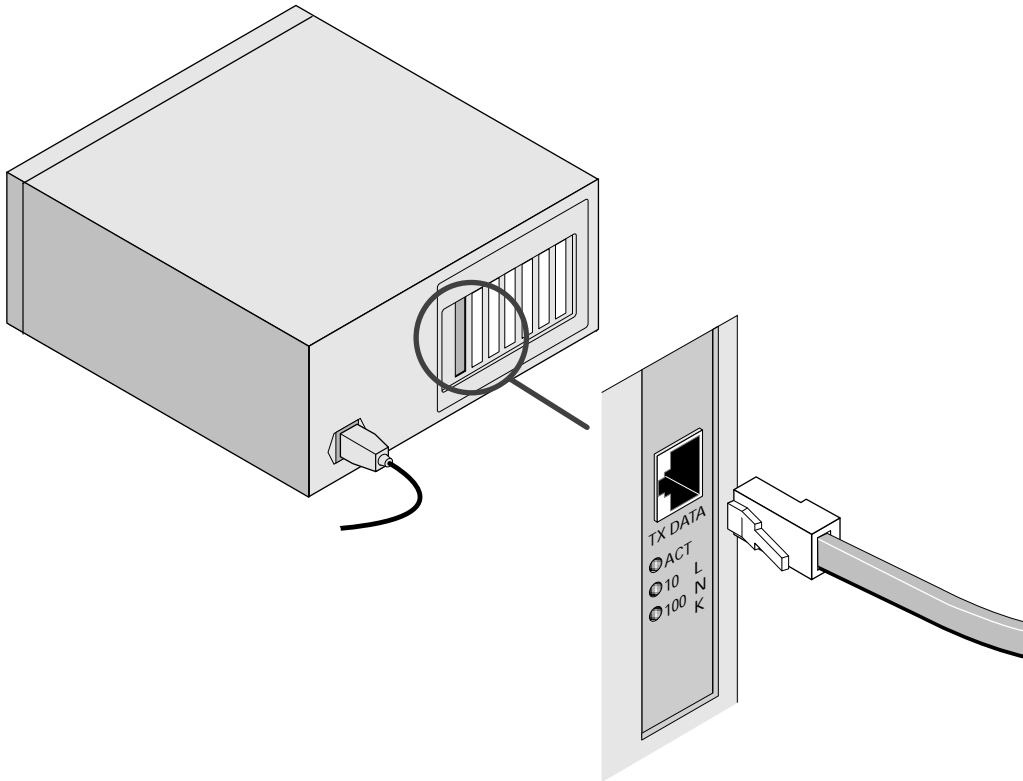
6
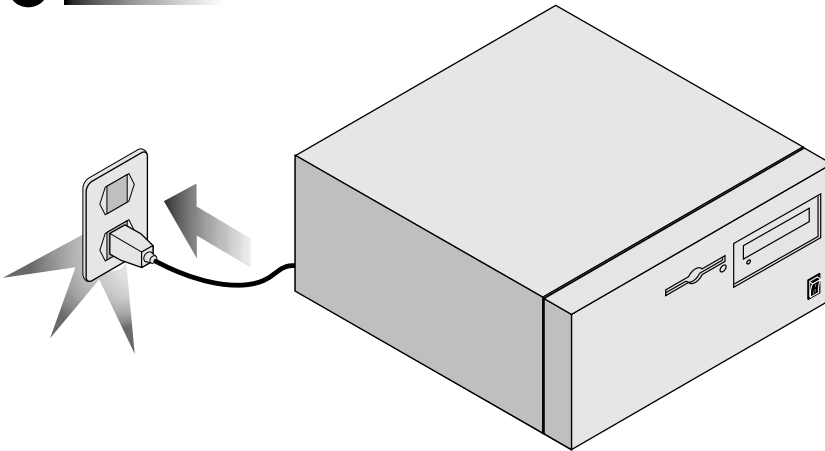
7
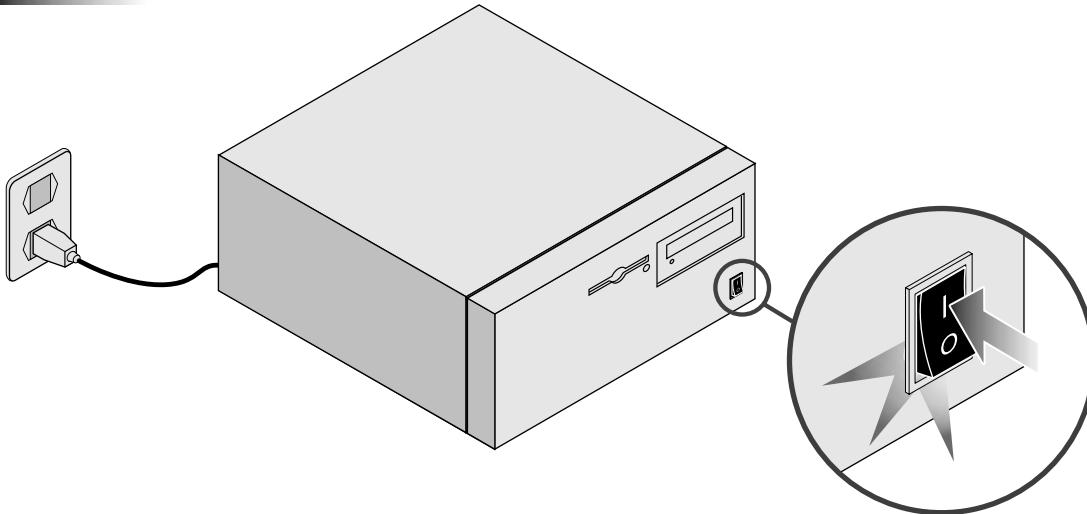
The next step is to install the software.

What do you want to do?

Go to: **Windows 2000**.

Go to: **Windows 95**.

Go to: **Windows NT 4.0**.

Go to: **Windows NT 3.51**.

Go to: **NetWare Drivers**.

If you are installing multiple NICs in:

- Windows 2000, Windows 9x, or Windows NT

  Go to: **Multiple NICs**.

- A NetWare server

  Go to: **Multiple NICs**.

4

WINDOWS DRIVERS

Windows 2000

This section describes how to install the network driver and NIC software in a PC or server running Windows 2000.

⚠️ *CAUTION: You must run the Preinstallation program before you install the NIC in your PC. If you have already completed the Preinstallation procedure for Windows 2000 and installed the NIC, go to step 7 in this procedure.*

To install the software:

1 Turn the PC power on and insert the *EtherCD* in the CD-ROM drive.

The 3Com *EtherCD* Welcome screen appears.

If the *EtherCD* Welcome screen does not appear

Go to: **EtherCD Navigation**.

2 Click **NIC Software**.

The NIC Software screen appears.

3 Click **Drivers and Diagnostics**.

The Drivers and Diagnostics screen appears.

4 Click **NIC Preinstallation**.

5 Click **NIC Installation with Windows 2000**, and then click **Done**.

When the Preinstallation program is completed, the message "Preinstallation complete" appears.

6 Exit the *EtherCD* installation, shut down the system, turn the PC power off, install the NIC in the PC, and connect the network cable to the NIC and your network port.

For information about installing the NIC in your PC

Go to: **NIC Installation**.

7 Turn the PC power on.

The Found New Hardware screen appears, and then the Found New Hardware Wizard starts.

8 Click **Next**.

The Install Hardware Device Drivers screen appears.

9 Select **Search for a suitable driver for my device (recommended)**, and then click **Next**.

The Locate Driver Files screen appears.

10 Select the **CD-ROM drives** option, clear any other checked options, and click **Next**.

The Driver Files Search Results screen appears.

Windows finds the driver on the CD.

11 Click **Next**.

Files are copied, and then the message "Windows has finished installing the software for this device" appears.

12 Click **Finish**.

The software installation is complete. To verify that the installation was successful

Go to: **Verifying Successful Installation**.

To change configuration settings

Go to: **3Com DOS Configuration Program**.

Windows 98

This section describes how to install the network driver and NIC software in a PC or server running Windows 98.

Before installing the NIC software:

- Make sure that the NIC is installed in the PC and connected to the network.
- Make sure that you have the Windows 98 installation files. These files may be on a CD or diskettes, or they may have been copied to your hard disk when Windows 98 was installed on your PC.

i *NOTE: If you encounter problems during the installation, see TROUBLE.TXT (located in the HELP directory on the EtherCD) for troubleshooting tips.*

To install the software:

1 Turn the PC power on.

Windows detects the NIC. The Add New Hardware Wizard starts.

2 Click **Next**.

The Add New Hardware Wizard screen prompts you to select an option.

3 Select the **Search for the best driver for your device (Recommended)** option, and then click **Next**.

The Add New Hardware Wizard screen prompts you for the driver location.

4 Select the **CD-ROM drive** option and clear any other check options that are selected.

5 Insert the *EtherCD* in the CD-ROM drive, and then click **Next**.

Windows finds the driver file for the device.

6 Click **Next**.

Files are copied.

The Insert Disk screen appears, prompting you for the Windows 98 CD-ROM.

7 Click **OK**.

The Copying Files dialog box appears.

8 Remove the *EtherCD* from the CD-ROM drive, insert the Windows 98 CD, enter the path to the CD-ROM drive, and click **OK**.

The Add New Hardware Wizard displays a message informing you that Windows has finished installing the software.

9 Click **Finish**.

The Systems Settings Change screen appears, prompting you to restart your computer.

10 Click **Yes** to restart your computer.

i> *NOTE: You must restart your computer to complete the installation.*

To verify that the installation was successful

Go to: **Verifying Successful Installation**.

Windows 95

This section describes how to install the network driver and NIC software in a PC or server running Windows 95.

! *CAUTION: Do not install a 3CR990 NIC while installing Windows 95 OSR2 using the "Custom" option. Install Windows 95 OSR2 first, then install the 3CR990 NIC.*

Before installing the NIC software:

- Make sure that the NIC is installed in the PC and connected to the network.
- Make sure that you have the Windows 95 installation files. These files may be on a CD or diskettes, or they may have been copied to your hard disk when Windows 95 was installed on your PC.

i> *NOTE: If you encounter problems during the installation, see W95NDIS.TXT and TROUBLE.TXT (located in the HELP directory on the* EtherCD*) for troubleshooting tips.*

To begin the driver installation, turn the PC power on. Windows detects the NIC and depending on the version of Windows 95 that you have installed, either the New Hardware Found screen appears, or the Update Device Driver Wizard starts.

Go to: **New Hardware Found**.

Go to: **Update Device Driver Wizard**.

New Hardware Found   If the New Hardware Found screen appears, follow this procedure to install the NIC driver:

1 Select the **Driver from disk provided by hardware manufacturer** option, and then click **OK**.

The Install From Disk screen appears.

2 Insert the *EtherCD* in the CD-ROM drive, enter the path to the CD-ROM drive, and click **OK**.

- If networking has already been installed on your PC, go to step 4.

- If this is the first time that networking is being installed on your PC, the Identification tab of the Network screen appears. Go to step 3.

3 In the specified fields of the Identification tab screen, enter the following information, and then click **Close**.

- **Computer Name**—Identifies the PC on the network for other users. This entry must be a unique name of 15 characters or fewer, containing no spaces.

- **Workgroup**—Identifies the group (for example, your department name) to which your PC belongs. If your computer is connected to a peer-to-peer network, this entry must be exactly the same for all the PCs in your network.

- **Computer Description**—Displays additional details to other users on the network about this PC. For example, you could specify that the PC is connected to a printer. Filling in this field is optional.

4 The Insert Disk screen appears, prompting you for the Windows 95 CD-ROM. Click **OK**.

The Copying Files screen appears.

5 Do one of the following:

- If the Windows 95 files were not copied to your hard drive, remove the *EtherCD* from the CD-ROM drive, insert the Windows 95 CD, enter the path to the CD-ROM drive, and then click **OK**.

- If the Windows 95 files were copied to your hard drive, enter the path to the directory containing these files, and then click **OK**.

Files are copied. The Systems Settings Change screen appears, prompting you to restart your computer.

6 Click **Yes**.

> **i** *NOTE: You must restart your computer to complete the installation.*

The installation is complete. To verify that the installation was successful

Go to: **Verifying Successful Installation.**

> **i** *NOTE: After Windows restarts, double-click the Network icon in the Windows Control Panel and make sure that the configuration settings are properly set for your network environment. Contact your system manager for assistance.*

Update Device Driver Wizard

If the Update Device Driver Wizard starts, follow this procedure to install the NIC driver:

1 Insert the *EtherCD* in the CD-ROM drive, and then click **Next**.

Windows finds the driver.

2 Click **Finish**.

- If networking has already been installed on your PC, go to step 4.

- If this is the first time that networking is being installed on your PC, the Identification tab of the Network screen appears. Go to step 3.

3 In the specified fields of the Identification tab screen, enter the following information, and then click **Close**.

- **Computer Name**—Identifies the PC on the network for other users. This entry must be a unique name of 15 characters or fewer, containing no spaces.

- **Workgroup**—Identifies the group (for example, your department name) to which your PC belongs. If your computer is connected to a peer-to-peer network, this entry must be exactly the same for all the PCs in your network.

- **Computer Description**—Displays additional details to other users on the network about this PC. For example, you could specify that the PC is connected to a printer. Filling in this field is optional.

4 The Insert Disk screen appears, prompting you for the *EtherCD*. Click **OK**.

The Copying Files screen appears.

5 Enter the path to the CD-ROM drive, and then click **OK**.

Files are copied. The Insert Disk screen appears, prompting you for the Windows 95 CD-ROM.

6 Click **OK**.

The Copying Files screen appears.

7 Do one of the following:

- If the Windows 95 files were not copied to your hard drive, remove the *EtherCD* from the CD-ROM drive, insert the Windows 95 CD, enter the path to the CD-ROM drive, and then click **OK**.

- If the Windows 95 files were copied to your hard drive, enter the path to the directory containing these files, and then click **OK**.

Files are copied. The Systems Settings Change screen appears, prompting you to restart your computer.

8 Click **Yes**.

> **i** *NOTE: You must restart your computer to complete the installation.*

The driver installation is complete. To verify that the installation was successful

Go to: **Verifying Successful Installation**.

> **i** *NOTE: After Windows restarts, double-click the Network icon in the Windows Control Panel and make sure that the configuration settings are properly set for your network environment. Contact your system manager for assistance.*

Windows NT 4.0

This section describes how to install the network driver and NIC software in a PC or server running Windows NT 4.0.

To install the software:

1 Turn the PC power on.

2 Right-click the **Network Neighborhood** icon, then select **Properties**.

The Network screen appears.

3 Select the **Adapters** tab.

If networking has not been previously installed on your system, Windows asks you if you want to install networking. Click **Yes**.

See the WINNT.TXT file (located in the Help directory on the *EtherCD*) or your Windows NT documentation for detailed instructions about installing networking.

4 Click **Add**.

The Select Network Adapter screen appears.

5 Insert the CD in the CD-ROM drive, and then click **Have Disk**.

The Insert Disk screen appears.

6 Make sure that the correct path to your CD-ROM drive appears in the entry box, and then click **OK**.

The Select OEM Option screen appears.

7 Make sure that the correct 3Com NIC name is selected, and then click **OK**.

Files are copied. The Network screen appears with the 3Com NIC name listed in the Network Adapters list box.

8 Click **Close**.

If the Microsoft TCP/IP Properties screen appears, consult your system administrator for further information.

The Network Settings Change screen appears, prompting you to restart your computer.

9 Click **Yes**.

i > *NOTE: You must restart your computer to complete the installation.*

The installation is complete. To verify that the driver was successfully installed

Go to: **Verifying Successful Installation**.

Windows NT 3.51

This section describes how to install the network driver and NIC software in a PC or server running Windows NT 3.51.

To install the software:

1 Make sure that the NIC is installed in your PC and that it is connected to the network.

2 Turn the PC power on.

3 In the Main window of the Program Manager, double-click the **Control Panel** icon and then the **Network** icon.

The Network Settings screen appears.

4 Click **Add Adapter**.

The Add Network Adapter screen appears.

5 Open the Network Adapter Card list box, and then scroll and select **<Other> Requires disk from manufacturer**.

6 Click **Continue**.

The Insert Disk screen appears.

7 Insert the *EtherCD* in the CD-ROM drive, make sure that the correct path to your CD-ROM drive appears in the entry box, and then click **OK**.

The Select OEM Option screen appears.

8 Make sure that the 3Com NIC is selected, and then click **OK**.

Files are copied.

The Network Settings screen appears. Make sure that the name of the installed NIC appears in the list of installed adapter cards and that it is selected.

9 Click **OK**.

The TCP/IP Configuration screen appears.

10 Assign an IP address to your PC.

There are two ways to assign an IP address: automatically or manually. Your network administrator will specify which method to use, and if required, provide an IP address for you to use.

- To obtain an IP address automatically (this method requires an active connection to a DHCP server):

Make sure that the correct NIC name is displayed and selected.

a Select the **Enable Automatic DHCP Configuration** check box.

b Click **Yes** to the Windows NT confirmation screen that appears, and then click **OK**.

The Network Settings Change screen appears, prompting you to restart your computer.

c Remove the *EtherCD* from the CD-ROM drive, and then click **Restart Now**.

The NIC is installed and TCP/IP is configured.

The installation is complete. To confirm that the installation was successful

Go to: **Verifying Successful Installation**.

- To specify an IP address manually:

a Type the IP address, subnet mask address, and default gateway address in their respective entry fields.

b Click **OK**.

You are prompted to restart your PC.

c Remove the *EtherCD* from the CD-ROM drive, and then click **Restart Now**.

The NIC is installed and TCP/IP is configured. The installation is complete. To confirm that the installation was successful

Go to: **Verifying Successful Installation**.

To change configuration settings

Go to: **3Com DOS Configuration Program**.

Verifying Successful Installation

This section describes how to verify that a NIC installation under Windows 2000, Windows 98, Windows 95, or Windows NT is successful.

Follow the instructions appropriate for your operating system.

Windows 2000

To verify that the NIC is successfully installed:

1 Right-click the **My Computer** icon, and then click **Properties**.

2 Select the **Hardware** tab, and then click **Device Manager** in the middle panel.

3 Click the **+** symbol next to Network Adapters in the list.

The absence of a red X or a yellow exclamation point (!) next to the name of the NIC name confirms successful installation.

If you encounter problems

Go to: **Troubleshooting**.

Windows 98 and Windows 95

To verify that the NIC is successfully installed:

1 Right-click the **My Computer** icon, and then click **Properties**.

The System Properties screen appears.

2 Select the **Device Manager** tab.

3 Double-click **Network adapters** and make sure that the name of the NIC appears.

The absence of a red X or a yellow exclamation point (!) next to the name of the NIC name confirms successful installation.

If you encounter problems

Go to: **Troubleshooting**.

Windows NT 4.0

To verify that the NIC is successfully installed:

1 In the Windows task bar, click **Start**, **Programs**, **Administrative Tools**, and then **Windows NT Diagnostics**.

The Windows NT Diagnostics screen appears.

2 Select the **Resources** tab.

If EL99x appears in the displayed list in the Device column, the driver is successfully installed.

If you encounter problems

Go to: **Troubleshooting**.

3 Click **OK** to exit.

Windows NT 3.51   To verify that the NIC is successfully installed:

1   Double-click the **File Manager** icon.

2   From the Disk menu select **Connect Network Drive**.

The presence of network server names confirms successful installation.

If you cannot connect a network drive, the installation was not successful.

Go to: **Troubleshooting**.

Multiple NICs   This section describes how to install multiple 3CR990 NICs in a PC running Windows 2000, Windows 95, Windows 98, or Windows NT 4.0.

These procedures ensure that the NICs maintain separate resource assignments and are installed free of conflicts.

⚠ *CAUTION: You must use these procedures to install multiple 3C990 NICs. Failure to follow these procedures may lead to problems requiring you to reinstall your operating system.*

Follow the procedure that is appropriate for your operating system.

Windows 2000   To install multiple NICs:

1   Turn the PC power on and insert the *EtherCD* in the CD-ROM drive.

The 3Com *EtherCD* Welcome screen appears.

If the *EtherCD* Welcome screen does not appear

Go to: **EtherCD Navigation**.

2   Click **NIC Software**.

The NIC Software screen appears.

3   Click **Drivers and Diagnostics**.

The Drivers and Diagnostics screen appears.

4   Click **NIC Preinstallation**.

5   Click **NIC Installation with Windows 2000**, and then **Done**.

When the Preinstallation program is completed the message "Preinstallation complete" appears.

6   Click Exit to close the *EtherCD* navigator. Shut down the system, turn the PC power off, physically install all of the NICs in the PC, and then connect network cables to the installed NICs and the network ports.

For information about installing the NIC in your PC

Go to: **NIC Installation**.

7   Turn the PC power on.

The Found New Hardware screen appears, and then the Found New Hardware Wizard starts.

8 Click **Next**.

The Install Hardware Device Drivers screen appears.

9 Select **Search for a suitable driver for my device (recommended)**, and then click **Next**.

The Locate Driver Files screen appears.

10 Select the **CD-ROM drives** option, clear any other checked options, and click **Next**.

The Driver Files Search Results screen appears.

Windows finds the driver on the *EtherCD*.

11 Click **Next**.

Files are copied, and then the message "Windows has finished installing the software for this device" appears.

12 Click **Finish**.

13 Repeat steps 8–12 as each NIC is discovered by Windows.

Windows 95 and Windows 98

To install multiple NICs:

Install the first NIC in your PC and connect it to the network.

⚠ *CAUTION: Do not physically install the second NIC in your PC until you complete the NIC driver installation for the first NIC, following the steps below.*

1 Turn the PC power on and start Windows.

2 When Windows detects the NIC and prompts you for the *EtherCD*, insert the *EtherCD* in the CD-ROM drive, and then click **OK**.

3 Follow the prompts on the screen to install the NIC driver and software.

4 After the NIC driver is installed, reboot the PC.

5 After the PC reboots, exit Windows and turn the PC power off. Make sure that the PC power cord is unplugged.

6 Install the second NIC in your PC and connect it to the network.

7 Plug the PC power cord in, turn the PC power on, and then start Windows.

Windows detects the second NIC. The second NIC uses the same driver and software as the first NIC.

When Windows starts, the second NIC appears under Network adapters in the Device Manager.

8 Repeat the process for each additional NIC to be installed.

Windows NT 4.0   To install multiple NICs:

1 Physically install all of the NICs in your PC and connect each NIC to the network.

2 Turn the PC power on and start Windows NT.

3 Double-click the **My Computer** icon, then the **Control Panel** icon, and then the **Network** icon.

The Network screen appears.

4 Select the **Adapters** tab, and then click **Add**.

The Select Network Adapter screen appears.

5 Click **Have Disk**.

6 Insert the *EtherCD* in the CD-ROM drive, and then click **OK**.

7 Make sure that the correct path to your CD-ROM drive appears in the entry box, and then click **OK**.

The Select OEM Option screen appears with the name of one of the NICs selected. Only one NIC appears on this screen.

8 Make sure that the correct NIC is selected, and then click **OK**.

Files are copied.

9 Close the Network screen.

If you are prompted for network information, enter the requested information.

10 Follow the prompts on the screen to install the NIC driver and software.

After the NIC driver is installed, restart the PC.

i ▷ **NOTE:** *Depending on the manufacturer of your PC, after the PC restarts, you may have to repeat steps 3 through 11 for each additional NIC to be installed.*

The NICs are installed and operational.

5

NETWARE DRIVERS

Obtaining NetWare Loadable Modules

Although NetWare Loadable Modules (NLMs) are provided on the *EtherCD*, you can always obtain the most current NLMs from the Novell Web site.

Go to: **http://www.support.novell.com**.

NetWare Server	NLM Name
NetWare 3.12	ETHERTSM.NLM NBI31X.NLM MSM31X.NLM
NetWare 4.10, 4.11, and 5.0	ETHERTSM.NLM NBI.NLM MSM.NLM

NOTE: *3CR990 NICs do not support NetWare 3.11 and 4.0x servers.*

NetWare Server Driver

The NWSERVER directory on the *EtherCD* contains the network driver file (3C99X.LAN), which must be used for servers running NetWare 3.12, 4.10, 4.11, or 5.0. NetWare Loadable Modules (NLMs), which are in the same directory, are additional required files.

To obtain the most current NLMs from Novell

Go to: **http://www.support.novell.com**.

NOTE: *To upgrade the NetWare driver for a NetWare server, you must create installation diskettes from the* EtherCD *that accompanied this product. Use these diskettes to install the NetWare server driver.*

For information on how to create installation diskettes

Go to: **Making NIC Installation Diskettes**.

NetWare 3.12

To upgrade the driver in a NetWare 3.12 server:

1 Obtain the MSM31X.NLM, ETHERTSM.NLM, and NBI31X.NLM files from Novell and copy them to the directory on your hard disk where other NLM files are located. This is typically in the sys:system directory. You need a NetWare client system to copy the NLM files to the server.

2 Copy the LAN driver file (3C99x.LAN) to the same directory.

3 Add the following two lines to the AUTOEXEC.NCF file:

```
load 3c99x.lan slot=<slot> NAME=<name> FRAME=<frametype>
bind ipx to <name> net=<number>
```

NOTE: If you copy the NLM files to a different directory, you must specify the path in the preceding load statement.

4 Save and exit the file, and then restart the server.

NetWare 4.10, 4.11, and 5.0

To upgrade the driver in a NetWare 4.10, 4.11, or 5.0 server:

1 Obtain the MSM.NLM, ETHERTSM.NLM, and NBI.NLM files from Novell and copy them to the directory on your hard disk where other NLM files are located. This is typically in the sys:system directory. You need a NetWare client system to copy the NLM files to the server.

2 Insert installation diskette 2 in drive A.

3 At the server prompt, type: **load inetcfg**, and then press Enter.

The Internetworking Configuration screen appears.

4 In the displayed menu, select **Boards**, and then press Enter.

5 Press Insert.

A list of currently installed drivers appears.

6 Press Insert again.

The New Driver dialog box appears.

7 Specify the directory: **a:\nwserver\3c99x.lan**, and then press Enter.

An updated list of installed drivers appears.

8 Select **3C99x**, and then press Enter.

You are prompted to name the NIC.

9 For example, enter: **3c99x_1**, and then press Enter.

You are prompted for the slot number. For information on how to verify the slot number

Go to: **Verifying the PCI Slot Number**.

10 Enter the slot number, and then press Enter.

11 Press Esc, Enter (to save), and then Esc.

The Internetworking Configuration screen appears.

12 Select **Bindings**, and then press Enter.

The configured protocols for installed NICs appears. (This list will be empty if no protocols are currently bound to the NIC.)

13 Press Insert.

The Select From the List of Configured Protocols screen appears.

For NetWare 5.0:

a The default **To a Network Interface** is selected. Press Enter.

The Select a Configured Network Interface screen appears.

b Select the board. For example, enter: **3c99x_1**, and then press Enter.

14 When prompted, enter the network number, and then press Enter.

15 In the Frame Type field, press Enter to display a list of frames, choose a frame, and press Enter.

16 Press Esc.

You are prompted to save the changes.

17 Press Enter to save the changes.

The configured Protocol to Network Interface Bindings screen appears.

18 Press Esc to Exit.

The main menu appears.

- NetWare 4.x and earlier: Restart the server.

- NetWare 5.0:

a Select **Reinitialize System**.

b Press Enter to reinitialize.

c Press Esc exit from the program.

Multiple NICs

These sections provide procedures for upgrading drivers for multiple installed NICs and installing multiple NICs (new installation) in a NetWare server.

Upgrading Drivers

To upgrade drivers for installed 3Com NICs:

1 Uninstall the NIC software for all NICs. For more information

Go to: **Uninstalling NIC Software**.

2 Remove all but the first NIC from the server.

3 Follow the driver installation procedure for a single NIC.

Go to: **NetWare 4.10, 4.11, and 5.0**.

4 Install the next NIC, and then repeat steps 3 and 4 until all NICs are installed.

New Installation

If you do not have either NetWare Support Pack 6 or NetWare version 4.2 installed, make sure that all of the NLM files have been copied to the server before you start this procedure.

To install multiple NICs in a Netware 4.0, 4.11, or 5.0 server:

1 Install all of the NICs in the server.

2 Follow the installation procedure for a single NIC.

Go to: **NetWare 4.10, 4.11, and 5.0**.

Verifying the PCI Slot Number

To verify the PCI slot number that the NIC is installed in:

1 Boot the NetWare server with the -na option. (This prevents the AUTOEXEC.NCF from loading.)

Example:

```
server -na
```

2 Issue the load command for the NIC LAN driver without a slot parameter.

Example:

```
load c:\nwserver\3c99x.lan
```

3 NetWare will list the valid slot number(s) for the NIC, depending on how many NICs are installed. The values appearing in the list are the slot values that you should use.

Example:

After you issue the command, a message appears. At the end of the message, additional text similar to the following appears:

```
Total of 2 3C99x PCI adapter card(s) found. Supported slot values are
2,3.
Slot:2
```

6

IP SECURITY

Overview

The 3CR990 NICs accelerate IP security (IPSec) data encryption from supported operating systems that provide this offload capability. This feature is currently available in the Microsoft Windows 2000 operating system.

IPSec consists of two parts: encryption/decryption and authentication. To send or receive encrypted data in a PC running Windows 2000 with a 3CR990 NIC installed, you must first create a security policy, and then enable encryption on the NIC. The security policy establishes and defines how encrypted network traffic between your PC and a specified server occurs.

Authentication enables the receiver to verify the sender of a packet by adding key fields to a packet without altering the packet data content.

The following table shows the available levels of encryption:

Encryption Type	Encryption Level	Description
AH	medium	Authentication only
ESP	high	Authentication and encryption
Custom	varies	This provides encryption and an extra authentication that includes the IP header.
		Custom allows you to select options for both AH and ESP, such as MD%/SHA-1 and DES/3DES. And you can select the rate at which new keys are negotiated.
		Microsoft uses IKE key exchange to renew keys every x seconds or y bytes. However, this practice is computationally very high in overhead. Some users may set these values low and have frequent key updates. Users more concerned with performance will set these values higher.
		For more information, see the Microsoft documentation about creating IPSec flows.

Creating a Security Policy

The process you use to create and enable a security policy will depend on your network environment requirements. The following is an example of one approach to creating a security policy.

NOTE: You must complete all of the sequences in this section to establish and enable a security policy for transmitting and receiving encrypted data over the network.

Defining the Console   This sequence establishes the Console and defines its parameters.

To define the Console:

1 In the Windows taskbar, click **Start**, **Programs**, **Accessories**, and then **Command Prompt**.

2 At the DOS prompt, type MMC and press Enter.

The Console1 screen appears.

3 In the menu click **Console** and then **Add/Remove Snap-in**.

The Add/Remove Snap-in screen appears.

4 Click **Add**.

The Add Standalone Snap-in screen appears.

5 Select **IP Security Policy Management**, and then click **Add**.

The Select which computer this Snap-in will manage screen appears.

6 Enable the **Local computer** option.

7 Click **Finish**, **Close**, and then **OK**.

Creating the Policy   This sequence creates and names the new security policy.

The Console1and Console Root screen appears with *IP Security Policies on Local Machine* displayed in the list.

1 In the left pane, click **IP Security Policies on Local Machine**.

2 Right-click inside the right pane below the list items.

3 From the pop-up menu, select **Create IP Security Policy.**

The IP Security Policy Wizard Starts.

4 Click **Next**.

The IP Security Policy Name screen appears.

5 Enter a name for the new security policy that you are creating. You can enter a description to help you identify this policy.

6 Click **Next**.

The Requests for Secure Communication screen appears.

7 Clear the **Activate the default response rule** check box.

8 Click **Next** and then **Finish**.

A screen appears with the name of the new security policy in the title bar.

9 Click **Add**.

The Security Rule Wizard starts.

10 Click **Next**.

The Tunnel Endpoint screen appears.

11 Enable the default option **This rule does not specify a tunnel**, and then click **Next**.

The Network Type screen appears.

12 Enable the default option **All network connections**, and then click **Next**.

The Authentication Methods screen appears.

13 Enable the **Use this string to protect the key exchange (preshared key)***:* option, type the appropriate string text in the entry field, and then click **Next**.

Creating a Filter   This sequence creates a filter for the policy.

The IP Filter List screen appears.

1 Click **Add**.

A new IP Filter List screen appears.

2 Enter a name for the filter, and then click **Add**.

The IP Filter Wizard starts.

3 Click **Next**.

The IP Traffic Source screen appears.

4 Click **Next**.

The IP Traffic Destination screen appears.

5 Select **A Specific IP Address** in the pull-down list.

The IP Address entry box appears on the IP Traffic Destination screen.

6 Enter destination IP address, and then click **Next**.

The IP Protocol Type screen appears.

7 Accept the default, and then click **Next**.

8 Click **Finish** to close the IP Filter Wizard.

9 Click **Close** to close the IP Filter List screen.

Binding the Filter   This sequence attaches the new filter to the policy.

The IP Filter List screen appears.

1 Enable the option for the new filter name and make sure that the new filter name is selected.

2 Click **Next**.

Creating the Filter Action   This sequence defines how the filter acts on the policy.

The Filter Action screen appears.

1 Click **Add**.

The Filter Action Wizard starts.

2 Click **Next**.

The Filter Action Name screen appears.

3 Enter a name (for example: 3DES to the Server), and then click **Next**.

The Filter Action General Options screen appears.

4 Accept the default, and then click **Next**.

The screen, Communicating with computers that do not support IPsec, appears.

5   Accept the default value, and then click **Next**.

The IP Traffic Security screen appears.

6   Select **Custom** and then click **Settings**.

The Custom Security Method Settings screen appears.

7   Enable the **Data integrity and encryption (ESP):** check box, and then make the appropriate selections in the Integrity and algorithms list boxes.

8   Click **OK**, **Next**, and then **Finish**.

Binding the Filter Action   This sequence attaches the new filter action to the filter and policy.

The Filter Action screen appears.

1   Enable the filter action option and make sure that the filter name is selected. (In this example, we used the filter name: **3DES to the Server**.

2   Click **Next**, **Finish**, and then **Close**.

The newly created policy appears in the right pane of the Console Root\IP Security Policies on Local Machine screen.

3   Exit this screen and, when prompted, save the new policy information. Use a meaningful name for future reference.

You can modify this security policy by double clicking the icon that is created when you save the policy in the previous step.

Enabling Encryption   An encryption policy must exist in the Console Root\IP Security Policies on the Local Machine screen before you can enable encryption on the 3CR990 NIC.

To enable encryption:

1   Right-click the desired policy **icon** in the right pane of the screen.

2   Select **Assign**.

3   A green plus (+) symbol appears on the policy icon to indicate that encryption is toggled on.

Disabling Encryption   An encryption policy must exist in the Console Root\IP Security Policies on the Local Machine screen, and be enabled, before you can disable encryption on the 3CR990 NIC.

To disable encryption:

1   Right-click the desired policy **icon** in the right pane of the screen.

2   Select **Un-assign**.

3   The absence of a green plus (+) symbol on the policy icon indicates that encryption is toggled off.

7
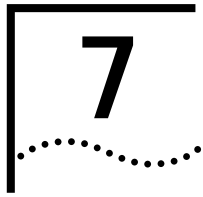
UPGRADING DRIVERS

Windows 2000

To upgrade to the current NIC driver:

1 Right-click the **My Computer** icon.

2 Select **Properties** on the pop-up menu.

The System Properties screen appears.

3 Select the **Hardware** tab.

4 Click **Device Manager** in the middle panel.

The Device Manager screen appears.

5 Click the **+** symbol next to Network adapters.

6 Double-click **3Com EtherLink 10/100 PCI NIC with 3XP Processor (3CR990-TX-9X)**.

A screen appears with the name of the NIC in the title bar.

7 Select the **Driver** tab, click **Update Driver**, and follow the instructions as they appear.

Windows 98

To upgrade to the current NIC driver:

1 Make sure that the *EtherCD* is in the CD-ROM drive.

2 Right-click the **My Computer** icon, and then select **Properties**.

3 Select the **Device Manager** tab, and then double-click **Network adapters**.

4 Select the name of the 3Com NIC, and then click **Properties**.

5 Select the **Driver** tab, and then click **Update Driver**.

The Update Device Driver Wizard screen appears.

6 Click **Next**.

The Update Device Driver Wizard screen reappears.

7 Select the **Display a list of all drivers in a specific location, so you can select the driver you want** option, and then click **Next**.

The Select Device screen reappears.

8 Click **Have Disk**.

The Install From Disk screen appears.

9 Make sure that the correct path to the CD-ROM drive appears in the entry box, and then click **OK**.

The Select Device screen reappears.

10 Click **OK**.

After files are copied and updated, the 3Com EtherLink screen Driver tab reappears.

The Insert Disk screen appears prompting for the *EtherCD.*

11 Click **OK**.

12 Make sure that the correct path to the CD-ROM drive appears in the entry box, and then click **OK**.

The Update Device Driver Wizard screen appears.

13 Click **Next**.

The Insert Disk dialog box appears prompting for the *EtherCD*.

14 Click **OK**.

15 Make sure that the correct path to the CD-ROM drive appears in the entry box, and then click **OK**.

The Insert Disk dialog box appears prompting for the Windows 98 CD.

16 Click **OK**.

17 Make sure that the correct path to the CD-ROM drive appears in the entry box, and then click **OK**.

Files are copied and the Update Device Driver Wizard screen appears.

18 Click **Finish**.

The Systems Settings Change dialog box appears prompting you to restart your computer.

19 Click **Yes**.

The NIC driver is installed.

Windows 95

You must determine which version of operating system is installed on your PC before upgrading a Windows 95 driver.

Determining the Version

To determine which version of Windows 95 is installed on your PC:

1 Right-click the **My Computer** icon and click **Properties**.

The System Properties window is displayed.

2 Check the version number on the General screen, under System:

- If 4.00.950 is displayed

  Go to: **Windows 95 Version A (Build 950)**.

- If 4.00.950B is displayed

  Go to: **Windows 95 OSR2**.

Windows 95 Version A (Build 950)

To upgrade to the current NIC driver in a PC running Windows 95 version A, you must remove the old NIC driver software, and then reinstall the current driver software.

- To remove the old NIC driver

  Go to: **Windows 98 and Windows 95**.

- To reinstall current NIC driver software

  Go to: **Windows 95**.

Windows 95 OSR2   To upgrade to the current NIC driver in a PC running Windows 95 OSR2:

1 Make sure that the *EtherCD* is in the CD-ROM drive.

2 Right-click the **My Computer** icon, and then select **Properties**.

3 Select the **Device Manager** tab, and then double-click **Network adapters**.

4 Select the name of the 3Com NIC, and then click **Properties**.

5 Select the Driver tab, and then click **Update Driver**.

The Update Device Driver Wizard screen appears.

6 Select the **No, select driver from list** option, and then click **Next**.

The Select Device screen appears.

7 Click **Have Disk**.

The Install From Disk screen appears.

8 Make sure the path to the CD-ROM drive appears in the entry box, and then click **OK**.

The Select Device screen reappears.

9 Click **OK**.

After files are copied and updated, the 3Com EtherLink screen Driver tab reappears.

10 Click **Close**.

The NIC driver is installed.

Windows NT 4.0   To upgrade to the current NIC driver:

1 Make sure that the *EtherCD* is in the CD-ROM drive.

2 Double-click the **Network** icon.

The Network screen appears.

3 Select the **Adapters** tab.

The 3Com EtherLink NIC is selected in the Network Adapters list box.

4 Click **Update**.

The Windows NT Setup screen appears.

5 Enter the path to the CD-ROM drive, and then click **Continue**.

Files are copied, and then the Network screen appears.

6 **Click Close**.

More files are copied, and then the Network Settings Change dialog box appears prompting you to restart your computer.

7 Click **Yes**.

The NIC driver is installed.

Windows NT 3.51

To upgrade to the current NIC driver:

1 Make sure that the *EtherCD* is in the CD-ROM drive.

2 Double-click the **Control Panel** icon, and then the **Network** icon.

The Network Settings screen appears.

3 Click **Update**.

The Windows NT Setup screen appears.

4 Enter the path to the CD-ROM drive, and then click **Continue**.

The Network Settings screen appears.

5 Click **OK**.

Files are copied, and then you are prompted to restart Windows NT.

6 Click **Restart Now**.

The NIC driver is installed.

8
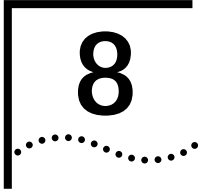
CONFIGURATION

Configuration Options

Changing configuration settings can have a substantial effect on your network and your PC. Before you change these settings, contact your system administrator.

The following table shows configurable options, descriptions, default values, and available settings.

Network Parameter	Description	Factory Default Setting	Optional Settings
NetBoot ROM	Provides the ability to boot a PC over the network.	Disabled	■ Disabled ■ Enabled
Duplex	Specifies the type of duplex mode. (See the descriptions following this table.)	Auto Select	■ Half Duplex ■ Full Duplex ■ Auto Select
Media Type	Determines the type of media your network is using. To automatically determine the media type, select **Auto Select**.	Auto Select	■ 100BASE-TX (100 Mb/s) ■ 10BASE-T (10 Mb/s) ■ Auto Select
SMB Bus Address	(Future use)	Not used	Not used
Remote Wakeup	Provides the ability to power-up a network PC remotely	Default Setting (Remote Wake-Up is Enabled)	■ Disabled ■ Default Setting ■ Custom Setting
TCP/IP Keep Alive	Maintains a TCP/IP protocol connection	Disabled	■ Disabled ■ Default Setting ■ Custom Setting
Workgroup Keep Alive	Maintains workgroup browsing capability	Disabled	■ Disabled ■ Default Setting ■ Custom Setting

Definitions

Full Duplex—sets the NIC to operate in full-duplex mode, which enables two-way traffic to occur. To use this setting, the hub or switch that you are connected to must support full-duplex. You must also set the Media Type manually to the appropriate setting for your network.

Half Duplex—sets the NIC to operate in half-duplex mode. To use this setting, you must also set the Media Type manually to the appropriate setting for your network.

Auto Select—allows the NIC to connect automatically at the duplex mode of the connected hub or switch.

3CR990 NICs support full-duplex. These NICs automatically run in full-duplex mode if the switch that you are connected to supports auto negotiation and full-duplex.

3Com DOS Configuration Program

The configuration program within the DOS diagnostics program is used to configure a NIC installed in a PC running Windows 2000, Windows NT 3.51, or DOS.

i > *NOTE: To change configuration settings in Windows 2000, you can use either the DOS diagnostics program or the Advanced tab (accessible through the My Network Places icon).*

i > *NOTE: On the Configuration screen, when you choose the Auto Select setting for Media Type, the setting for Duplex is automatically changed to Auto Select. Selecting Auto Select for Duplex automatically changes the Media Type setting to Auto Select.*

To run the DOS diagnostics program:

1 Boot to DOS (see note following), and then insert the *EtherCD* in the CD-ROM drive.

i > *NOTE: For PCs running Windows 2000 or Windows NT 3.51, do not run the DOS diagnostics program from the MS-DOS box. Exit Windows, reboot with a DOS-bootable diskette, and then run the program.*

If you do not have a DOS-bootable diskette

Go to: **Making a DOS-Bootable Diskette**.

2 Enter the following at the DOS prompt:

```
d:\3c99xcfg.exe
```

If multiple NICs are installed in the PC, select **Select NIC** on the first screen to display a list of installed NICs. Use the arrow keys to select the NIC that you want to configure and press Enter.

3 Use the arrow keys to scroll the list and make a selection. Press Enter.

4 Continue this procedure for other options. For more information on a specific option, select the option and press **F1**

i > *NOTE: Press Esc to return to a previous screen. If a secondary window is open, press Esc to close the window.*

3Com NIC Diagnostics Program

The 3Com NIC diagnostics program (3Com NIC Doctor) is a Windows-based program used to troubleshoot and configure NICs installed in PCs running Windows 98, Windows 95, or Windows NT 4.0.

When the Network Connectivity test evaluates the network connection, it is possible to receive the message, "No packets were received." This could be interpreted by the user as a failure when in some cases the connection can be functioning properly.

For more information

Go to: **To Run the Network Test**.

Starting the 3Com NIC Diagnostics Program

To start the NIC diagnostics program:

1 Make sure that the NIC is installed and connected to the network and that the network driver is installed.

2 Click **Start** in the Windows taskbar.

3 Select **Programs**, and then **3Com NIC Utilities**.

4 Click **3Com NIC Doctor**.

The General screen appears.

5 Select the desired tab.

Displaying Settings

To display the current configuration settings for the NIC:

1 Start the NIC diagnostics program.

Go to: **Starting the 3Com NIC Diagnostics Program**.

The General screen appears.

2 On the General screen, click **NIC Details**.

The NIC Details screen appears.

Each configuration setting is displayed with its current value.

i **NOTE:** *For information about a statistic, click the Help button on the Statistics screen.*

3 Click **OK** to exit this screen.

Changing Settings

To change configuration settings using the 3Com NIC diagnostics program:

1 Start the NIC diagnostics program.

The General screen appears.

2 Select the **Configuration** tab.

The NIC Configuration Settings screen appears.

3 Under Network Parameter, select a setting.

i **NOTE:** *On the Configuration tab, when you choose the Auto Select setting for Media Type, the setting for Duplex is automatically changed to Auto Select. Selecting Auto Select for Duplex automatically changes the Media Type setting to Auto Select.*

4 Select a new value from the list of available options in the Set Value list box.

5 Repeat the process for each setting that you want to change.

Before clicking OK, you can undo any unsaved configuration changes that you make. To undo changes, click **Undo Changes**.

To reset the default settings, click Set Factory Defaults. (See the table following step 6.)

6 To save the new settings, click **OK**.

The following table shows the factory default settings for network parameter default options. For more information about Remote Wake-Up features and Alerts, see the WIN2000.TXT file in the Help directory on the *EtherCD* that shipped with this product

Network Parameter	Factory Default Setting	Options for Factory Default Setting	Factory Default Settings for Options
NetBoot ROM	Disabled	none	none
Duplex	Auto Select	none	none
Media Type	Auto Select	none	none
SMB Bus Address		none	none
Remote Wakeup	Default Setting	Magic Packet	Enabled
		Link Event	Disabled
		Wake-On-Error	Disabled
			Selecting any setting automatically sets this option to Enabled.
		Wake-On-Timer	Disabled
TCP/IP Keep Alive	Disabled	ARP Replies	Disabled
		DHCP Lease Renewal	Disabled
		Wake-On-ARP	Disabled
		Wake-On-Ping	Disabled
		Respond-To-Ping	Disabled
Workgroup Keep Alive	Disabled	MAC Keep-Alive	Disabled
		Novell Watchdog Replies	Disabled

9

TROUBLESHOOTING

Accessing the 3Com KnowledgeBase

To access a database of technical information that can help you diagnose and solve 3CR990 NIC installation, configuration, and upgrade problems

Go to: **http://www.knowledgebase.3com.com**.

Troubleshooting the Installation

Follow these troubleshooting tips if you have trouble installing or configuring your NIC, or if the NIC installation fails.

⚠ *CAUTION: Before inserting or removing the NIC from the PC, turn the PC power off and unplug the power cord.*

- Make sure that the NIC is correctly installed in a PCI slot. Check for specific hardware problems, such as broken traces or loose or broken solder connections.

  Go to: **NIC Installation**.

- Inspect all cables and connections. Check the length and rating of the cable. Make sure that the cable segment is compliant with the requirements for a 3CR990 NIC.

  Go to: **Cabling Requirements**.

- Make sure that you are using the latest BIOS for your PC. If your BIOS has not been upgraded in the previous 12 months, contact your PC manufacturer to obtain the current version of your BIOS software.

- Run the NIC diagnostics tests.

  Go to: **Running Diagnostics Programs**.

- Replace the failed NIC with a working NIC and run the diagnostics tests again, using the same option settings as those used on the failed NIC. If the working NIC passes all tests, the original NIC is probably defective. For information on product repair

  Go to: **Returning Products for Repair**.

- Check the connectors. Examine the cable for obvious signs of damage, wear, or crimping. Substitute a known working cable. Check the length and rating of the cable. Make sure that the cable complies with 10BASE-T or 100BASE-TX recommendations.

  Go to: **10BASE-T Description**.

  Go to: **100BASE-TX Description**.

- Check whether the NIC software is correctly installed.

  Go to: **Verifying Successful Installation**.

- If the problem persists

  Go to: **Technical Support**.

Interpreting the LEDs

The 3CR990 NICs have light-emitting diodes (LEDs) that can assist with network troubleshooting. The following table describes the LED conditions and meanings.

LED	State	Meaning
10 LNK (link)	On	If drivers are installed, the 10BASE-T connection is active.
		If drivers are not installed, the NIC is receiving power.
	Off	Something is preventing the connection between the NIC and the hub or switch.
100 LNK (link)	On	If drivers are installed, the 100BASE-TX connection is active.
		If drivers are not installed, the NIC is receiving power.
	Off	Something is preventing the connection between the NIC and the hub or switch.
ACT (activity)	Blinking	Network traffic is present.
	Steady	Heavy network traffic is present.
	Off	No network traffic is present.

If a link LED indicates a problem, check the following:

1 Ensure that your network hub or switch and the cable connected to your NIC comply with the specifications appropriate for your network connection.

2 Ensure that the hub or switch is powered on.

Running Diagnostics Programs

The 3CR990 NICs use two types of NIC diagnostics programs: a DOS-based diagnostics program and a Windows-based diagnostics program.

NOTE: Before starting any diagnostics program, close all running applications.

Use the 3Com DOS diagnostics program if you are running any of the following operating systems:

- Windows 2000
- Windows NT 3.51
- DOS

Use the Windows-based 3Com NIC diagnostics program if you are running any of the following operating systems:

- Windows 98
- Windows 95
- Windows NT 4.0

NOTE: The following sections explain how to start both NIC diagnostics programs. However, specific instructions are provided only for using the Windows-based 3Com NIC diagnostics program.

3Com DOS Diagnostics Program

To start the 3Com DOS diagnostics program:

1 Ensure that the *EtherCD* is in the CD-ROM drive.

2 At the DOS prompt, enter the following command:

```
\3c990cfg.exe
```

NOTE: For PCs running Windows 2000 or Windows NT 3.51, do not run the DOS diagnostics program from the MS-DOS box in Windows. Exit Windows, reboot with a DOS-bootable diskette, and then run the program.

For more information about how to make a DOS-bootable diskette

Go to: **Making a DOS-Bootable Diskette**.

For more information about the 3Com DOS Diagnostics program

Go to: **3Com DOS Configuration Program**.

3Com NIC Diagnostics Program

To start the 3Com Windows-based NIC diagnostics program:

1 Make sure that the NIC is installed and connected to the network and the driver is installed.

2 Click **Start** in the Windows taskbar.

3 Select **Programs**, and then **3Com NIC Utilities**.

4 Click **3Com NIC Doctor**.

The 3Com NIC Diagnostics General (tab) screen appears.

For more information about the 3Com NIC Diagnostics program

Go to: **3Com NIC Diagnostics Program**.

General Tab

Select the General tab to display the node address, I/O address, and device ID for the installed NIC.

This screen also allows you to show or not show the 3Com icon in the Windows system tray and enable Auto Echo, which sets the PC to respond automatically to requests from other PCs that run the Remote Wake-Up test.

Configuration Tab

Select the Configuration tab to view and modify configuration settings for the installed NIC.

Statistics Tab

Select the Statistics tab to view network traffic statistics about the installed NIC.

Diagnostics Tab

Select the Diagnostics tab to access diagnostics tests that you can run on the installed NIC.

Support Tab

Select the Support tab to access various 3Com customer support resources.

Flash Update Tab

Select the Flash Update tab to update firmware for the installed NIC.

Accessing the 3Com NIC Help System

The 3Com NIC Help system is a Windows Help application that includes numerous Help topics about 3CR990 NICs.

> **NOTE:** *To access the Help system from within the 3Com NIC diagnostics program, click the Help button on any screen.*

To access 3Com NIC Help:

1 Click **Start** in the Windows taskbar.

2 Select **Programs** and then **3Com NIC Utilities**.

3 Select **3Com NIC Doctor Help**.

The main Help screen appears.

4 Click **Help Topics** to display a list of Help topics or click **Find** to search for a Help topic.

Running NIC Diagnostics Tests

This section describes diagnostics tests available for 3CR990 NICs.

To verify that the network connection and NIC are functioning correctly, run the Network test. Run the NIC test to check the physical components, connectors, and circuitry on the NIC.

Run the Remote Wake-Up test if your PC supports Remote Wake-Up. For more information about Remote Wake-Up

Go to: **Remote Wake-Up**.

> **NOTE:** *Applications other than the NIC diagnostics tests are not able to access the network while diagnostics tests are running.*

To run the NIC test, Network test, or Remote Wake-Up test:

1 Start the 3Com NIC diagnostics program.

Go to: **3Com NIC Diagnostics Program**.

2 Select the **Diagnostics** tab.

The Diagnostics screen appears.

To Run the Network Test   Run the Network test to check the NIC's connectivity to the network.

To successfully pass the Network Connectivity test, at least one of the following conditions must be met:

- A Windows client running on the same network. This client must have a successfully installed Windows diagnostics program that is currently not running.
- A NetWare server running on the same network.
- A DHCP server running on the same network.
- A DNS server running on the same network with TCP/IP properties configured for the DNS server.

To run the Network test:

1 Click **Run Network Test** on the Diagnostics screen.

The Network Connectivity Test screen appears.

2 Click **Start**.

While the test is running, a progress bar indicates test progress.

If the test fails:

- Make sure that the network cable is properly connected to the NIC.
- Make sure that the hub or switch to which the NIC is connected is powered on.
- Make sure that the ACT link LED is on.
- Make sure that the network cable complies with the appropriate length and other specifications for the network.

If the test passes, the NIC is connected to the network and functioning correctly.

3 Click **Close**.

To Run the NIC Test   Run the NIC test to check the physical components, connectors, and circuitry on the NIC.

To run the NIC test:

1 Click **Run NIC Test** on the Diagnostics (tab) screen.

   The NIC Test screen appears.

2 Click **Perform NIC Test**.

   While the test is running, a progress bar indicates test progress.

   If the test fails, a message indicates the error type. Click the **Help** button in the error message screen to obtain more information.

   If the test passes, the NIC is functioning correctly.

3 Click **Close**.

To Run the Remote Wake-Up Test   You need at least two PCs on your network that contain a 3Com NIC with *EtherDisk 4.0* (or later) or *EtherCD Version 1.0 for the 3CR990 Family* software to run the Remote Wake-Up test.

To run the Remote Wake-Up test:

1 On the first PC, enable Auto Echo:

   a Open the 3Com NIC diagnostics program and make sure that Auto Echo is enabled on the General screen.

   b Close the 3Com NIC diagnostics program.

   c Make sure that the PC remains powered on and connected to the network.

2 On the second PC, run the Remote Wake-Up test.

To run the Remote Wake-Up test on the second PC:

1 Click **Run Remote Wakeup Test** on the Diagnostics screen.

   The Remote Wake-Up test screen appears.

> **i**   *NOTE: If the Run Remote Wakeup Test button is not available, either the NIC that is installed in the PC does not support Remote Wake-Up or Magic Packet is not enabled.*

2 Click **Test Remote Wake Up** to verify that another PC exists on the network that has the *EtherDisk 4.0 (*or later) or *EtherCD Version 1.0 for the 3CR990 Family* software and that Auto Echo is enabled on that PC.

   If the test passes, another PC with the Auto Echo feature enabled was detected on the network.

   If the test fails, another PC with the Auto Echo feature enabled was *not* detected on the network. You will not be able to run the Remote Wake-Up test (the **Remote Wake Up Restart** button will be unavailable).

3 Enter the number of seconds in the **Seconds Until Wakeup** entry box that the PC remains shut down until it receives a wake-up packet from the first PC.

4 Click **Test Remote Wake Up Restart**.

The PC shuts down.

- If the PC automatically powers on after the number of seconds specified in the Seconds Until Wakeup entry box, Remote Wake-Up is functioning correctly.

- If the PC does not power on, Remote Wake-Up is not functioning.

Go to: **Troubleshooting Remote Wake-Up**.

Viewing Network Statistics

You can monitor network statistics from the 3Com NIC diagnostics program.

To view statistical information about the network:

1 Start the 3Com NIC diagnostics program.

For instructions on how to start the 3Com NIC diagnostics program

Go to: **3Com NIC Diagnostics Program**.

2 Select the **Statistics** tab.

The Statistics screen appears.

The information is updated by the NIC every five seconds.

For a description of each statistic, click the Help button on the Statistics screen, and click the link for the statistics descriptions.

3 Click **OK** to exit the NIC diagnostics program.

Accessing 3Com Support Services

The 3Com NIC diagnostics program provides access to several support services such as the 3Com World Wide Web site, BBS information, and customer support information databases.

To access 3Com support services:

1 Start the 3Com NIC diagnostics program.

For instructions on how to start the 3Com NIC diagnostics program

Go to: **3Com NIC Diagnostics Program**.

2 Select the **Support** tab.

The Support screen appears.

- Select **Diagnostics** to open the **Diagnostics** tab and run NIC tests.

  For instructions on how to run the NIC tests,

  Go to: **Running NIC Diagnostics Tests**.

- Click **Support Databases** to display a Help system containing customer support databases about the NIC in these categories:

  - Release notes—Display tips about installing and using the NIC.

  - Frequently asked questions—Display common questions asked by customers and answered by 3Com customer support experts.

  - KnowledgeBase topics—Display NIC compatibility topics.

- Click **BBS Information** to display the 3Com BBS telephone numbers and modem speeds.

- Click **http://www.3com.com** to access the 3Com World Wide Web site. You need a web browser installed on your PC and you must have an active Internet Service Provider (ISP) connection to access the World Wide Web.

- Click **Problem Report** to generate a report about a NIC problem. Fill in the information as requested. You can then e-mail this report to 3Com.

3Com Tray Icon

If the 3Com icon is visible in the Windows system tray, double-click the icon to start the 3Com NIC diagnostics program.

NOTE: If a red circle with a line through it appears over the 3Com icon, there is no connection between the NIC and the network.

To show the 3Com icon in the Windows system tray:

1 Start the 3Com NIC diagnostics program.

For instructions on how to start the program

Go to: **3Com NIC Diagnostics Program**.

2 On the **General** screen, select the **Show Icon in System Tray** option.

3 Close the 3Com NIC diagnostics program.

When you drag your mouse cursor over the 3Com icon, but before you double-click the icon, a network statistics box appears, displaying the following information:

- Frames Sent and Received—A count of the number of frames (packets) sent and received by the NIC since the last time statistics were reset.

- Link Speed—The speed (10 Mbps or 100 Mbps) at which the NIC is connected to the network.

The information is updated each time that you move your mouse cursor over the 3Com icon.

Troubleshooting Remote Wake-Up

If your PC supports Remote Wake-Up and fails to boot when a wake-up packet is sent over the network, perform these troubleshooting steps:

1 Make sure that the PC meets Remote Wake-Up requirements.

For information on Remote Wake-Up requirements

Go to: **Remote Wake-Up**.

2 Make sure that you are using the latest driver for the NIC.

A driver is on the *EtherCD* that ships with the NIC. Download the latest driver from the 3Com World Wide Web site:

Go to: **http://www.3com.com/**.

3 Perform the Remote Wake-Up test.

For information of how to run this test

Go to: **Running NIC Diagnostics Tests**.

4 Check the BIOS in the PC.

a Boot the PC and access the BIOS.

If you do not know how to access the BIOS, consult the reference manual for your PC or contact your PC vendor.

b Locate the Wake-Up on LAN setting and verify that it is enabled.

For more troubleshooting tips

Go to: **http://www.knowledgebase.3com.com**.

NOTE: For more information on PCI specifications and Remote Wake-Up

Go to: **Remote Wake-Up**.

Remote Wake-Up Cable

This procedure applies to 2.1 PCI specification-compliant PCs that support Remote Wake-Up using a cable connected to the 3-pin connector on the NIC and the PC motherboard.

1 Turn off the PC power, remove the PC cover, and check the Remote Wake-Up cable connection.

Make sure that the Remote Wake-Up cable is plugged into the NIC and to the PC motherboard. Unplug and reconnect the cable to ensure a good connection.

2 Replace the Remote Wake-Up cable with a known functioning Remote Wake-Up cable and perform the Remote Wake-Up test again.

3 If the previous steps have failed, install a known functioning Remote Wake-Up NIC in the PC and connect the Remote Wake-Up cable.

If Remote Wake-Up works with the new NIC installed, contact your network vendor for a replacement NIC.

If Remote Wake-Up does not work with the new NIC installed, there may be a problem with the PC motherboard. Contact your PC vendor.

For more troubleshooting tips

Go to: **http://www.knowledgebase.3com.com**.

Troubleshooting a Network Connection

When working with 10BASE-T or 100BASE-TX cabling, concentrators, and NICs from different vendors, it is possible to connect everything but still have no network communication.

To narrow the range of possible causes of common network connection problems:

1 Determine whether your equipment complies with the 10BASE-T or 100BASE-TX standard.

This is particularly important for data concentrators (hubs or repeaters).

2 Connect a straight-through cable from the PC to the hub.

The hub performs an internal crossover so that the signal can go from TD+ to RD+ and TD– to RD–. When you look at an RJ-45 connector from the front (that is, the opposite side from where the wires enter the connector), pin 1 is identified on the right side when the metal contacts are facing up.

3 Make sure that the TD+ and TD– wires are twisted together, and that the RD+ and RD– are twisted together.

Using wires from opposing pairs can cause signals to be lost.

Troubleshooting Hubs   A crossover cable can be used to identify the type of failure when hub performance or connectivity is in question.
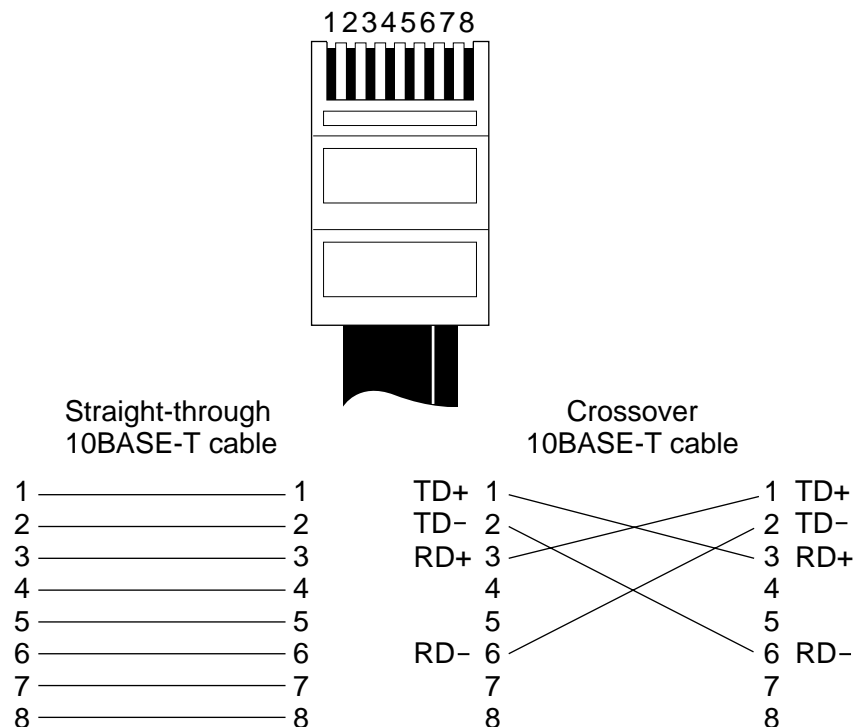
To use a crossover cable:

1 Connect a file server and a client PC back-to-back with a crossover cable to verify that the NIC and network operating system are properly configured.

2 To make a crossover cable, connect TD+ to RD+ and TD– to RD–.

The cable performs the crossover that is usually performed by the hub.

Cabling Pinouts   The following illustration compares the cabling pinouts for straight-through and crossover cables.

If the file server and client PC function together as a small network, then either the existing cabling or the hub is failing.

When a crossover cable is used, the LED on the NIC functions differently than it would under normal operating conditions. For example, with a correct crossover connection, the LED lights, whereas with a straight-through connection, the LED does not light. If you make a crossover cable and the polarity is mismatched (that is, TD+ to RD– instead of TD+ to RD+), the LED blinks.

A
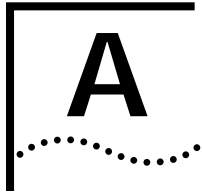
SPECIFICATIONS

NIC Specifications

The following table provides environmental, interface, and standards information for the EtherLink 10/100 PCI network interface cards with 3XP processor (3CR990 family).

Hardware	
Memory	128 K external RAM
Bus interface	*PCI Local Bus Specification, Revision 2.2*
	32-bit bus
PCI master	Supports bus master scatter-gather DMAs.
Dimensions	Length:5.24 in/13.31 cm
	Width: 3.35 in/8.51 cm
Power requirement	+5 V ±5% operating 1.26A maximum for normal operation (375 mA for low power mode)
Network Interface	
10 Mbps Ethernet 10BASE-T	Ethernet IEEE 802.3 industry standard for a 10 MBPS baseband CSMA/CD local area network
100 Mbps Ethernet 100BASE-TX	Ethernet IEEE 802.3u industry standard for a 100 MBPS baseband CSMA/CD local area network
Environment	
Operating temperature	32˚ to 158˚F (0˚ to 70˚C)
Storage temperature	−22˚ to 194˚F (−30˚ to 90˚C)
Operating humidity	10 to 90% noncondensing
Storage humidity	10 to 90% noncondensing
Altitude	−984 ft to 9,840 ft (−300 to 3,000 m)
Standards Conformance	
IEEE 802.3x full-duplex, auto-negotiation, and flow control	
IEEE 802.1p (General Attribute Registration protocol) for multicast addresses	
Microsoft PC98	
PCI 2.1 and 2.2	
DMI 2.0 and ACPI	

Network Connection Criteria   The following table provides network connection criteria for the 3CR990 NICs.

NIC	Cable	Network Cable Connector	Transceiver	Maximum Network Segment	Speed	Media Type
3CR990-TX-9X	Category 3, 4, or 5 unshielded twisted-pair	RJ-45	On-board	328 ft/100 m	10/100 Mbps	10BASE-T 100BASE-TX

Network Cable   This section provides information about various network cable standards and descriptions of those standards for EtherLink 10/100 PCI NICs.

Cabling Requirements   The cable type, quality, distance, and connectors must comply with the Electronic Industries Association/Telecommunications Industries Association (EIA/TIA) 568 *Commercial Building Wiring Standard* and the Technical Services Bulletin TSB38 standards.

Twisted-Pair Cable   Twisted-pair cable consists of copper wires surrounded by an insulator. Two wires are twisted together (the twisting prevents interference problems) to form a pair, and the pair forms a circuit that can transmit data. A cable is a bundle of one or more twisted pairs surrounded by an insulator.

Unshielded twisted pair (UTP) is the most commonly used type of twisted-pair cable. Shielded twisted pair (STP) provides protection against crosstalk. Twisted-pair cable is now commonly used in Ethernet, Fast Ethernet, and other network topologies.

Unshielded Twisted-Pair Cable Categories   The following table shows the five categories of unshielded twisted-pair cable as defined by the EIA/TIA.

Category	Use
1	Traditional telephone cable.
2	Data transmissions up to 4 MHz.
3	Voice and data transmission up to 25 MHz. The cable typically has four pairs of wires. Category 3 is the most common type of installed cable found in older corporate wiring schemes.
4	Voice and data transmission up to 33 MHz. The cable normally has four pairs of wire. This grade of UTP is not common.
5	Voice and data transmission up to 125 MHz. The cable normally has four pairs of copper wire and three twists per foot. Category 5 UTP is the most popular cable used in new installations.

10BASE-T Description   10BASE-T is the Institute of Electrical and Electronics Engineers (IEEE) 802.3 standard for Ethernet signaling over unshielded twisted-pair wire at 10Mbps.

Ethernet, as the most widely used network protocol, uses 10BASE-T as its primary cabling scheme. Ethernet characteristics include:

- A data rate of 10 Mbps
- A broadcast architecture
- A specific media-access control (MAC) scheme

The 10BASE-T name indicates a signaling speed of 10 Mbps and twisted-pair wiring. *Base* stands for baseband, which denotes a technique for transmitting signals as direct-current pulses rather than modulating them onto separate carrier frequencies.

A wiring topology using 10BASE-T specifies a wiring hub, cable arranged in a star configuration, and unshielded twisted-pair cable. Each node has a separate cable run that must not exceed 328 ft. (100 meters) from the node to the hub.

100BASE-TX Description
100BASE-TX is the IEEE 802.3u standard for Fast Ethernet signaling over Category 5 UTP or STP wire at 100Mbps.

Based on an extension to the IEEE 802.3 Ethernet specification, Fast Ethernet characteristics include:

■ A data rate of 100 Mbps

■ A broadcast architecture

■ A specific media-access control (MAC) scheme

A wiring topology using 100BASE-TX specifies a wiring hub, cable arranged in a star configuration, and Category 5 UTP or STP wiring. Each node has a separate cable run that must not exceed 328 ft. (100 meters) from the node to the hub.

RJ-45 Connector Pin Assignments
The following figure shows the pin layout for the RJ-45 connector socket on the NIC backplate.
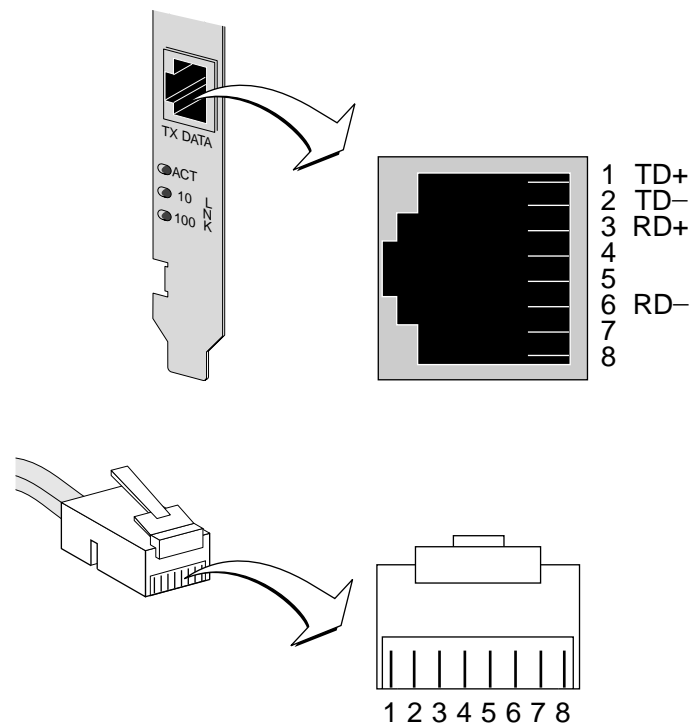
Flow Control

The 3CR990 NICs utilize flow control technology to throttle the incoming data packet stream and prevent the loss of packets. IEEE 803.2x flow control prevents the input buffers of a device from overflowing. By using *pause frames* to communicate buffer status between linked transmitting and receiving devices (transmitters and receivers). A receiver sends a pause frame to tell a transmitter to stop the transmission of data frames for a specified period, allowing the receiver's input port buffers to empty before receiving new packets.

Pause Frames

When a transmitter receives pause frames, it suspends transmission for the specified period. When the receiver's input buffers can store packets again, it can either send another pause frame to tell the transmitter to resume transmission, or wait for transmission to resume at the end of the specified period.

With *asymmetric* flow control, only one of two linked devices can receive pause frames. With *symmetric* flow control, both linked devices can send and receive pause frames.

Link Negotiation

Related to flow control is the auto-negotiation capability, in which linked devices advertise their flow control capabilities and automatically select the best common mode of communication.

Rare cases (for example, linking to a device that does not support auto-negotiation) may require that auto-negotiation be disabled on a port, thereby enabling *forced link* on that port. When forced link is enabled, linked devices must have matching flow control capabilities. For example, a port that is set for forced link and reception flow control can connect successfully only with a port that is set for forced link and transmission flow control.
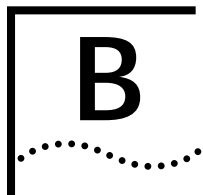
B TECHNICAL SUPPORT

Register this Product

The United States government places registration requirements on using data encryption products. To obtain customer support for 3CR990 NICs, you are required to register your NIC product with 3Com. You can register this product electronically or by U.S. mail. For more information about how to register this product

Go to: **Product Registration**.

Online Technical Services

This information is correct at the time of publication. For the very latest, 3Com recommends that you access the 3Com Corporation World Wide Web site.

Go to: **http://knowledgebase.3com.com**.

3Com offers worldwide product support 24 hours a day, 7 days a week, through the following online systems:

- World Wide Web site
- 3Com FTP site
- 3Com Bulletin Board Service (3Com BBS)
- 3ComFacts℠ automated fax service

World Wide Web Site

Access the latest networking information on the 3Com Corporation World Wide Web site.

Go to: **http://knowledgebase.3com.com**.

This service provides access to online support information such as technical documentation and software library, as well as support options ranging from technical education to maintenance and professional services.

3Com FTP Site

Download drivers, patches, software, and MIBs across the Internet from the 3Com public FTP site. This service is available 24 hours a day, 7 days a week.

To connect to the 3Com FTP site, enter the following information into your FTP client:

- Hostname: `ftp.3com.com` (or `192.156.136.12`)
- Username: `anonymous`
- Password: `<your Internet e-mail address>`

NOTE: A user name and password are not needed with Web browser software such as Netscape Navigator or Internet Explorer

3Com Bulletin Board Service

The 3Com BBS contains patches, software, and drivers for 3Com products. This service is available through analog modem or digital modem (ISDN) 24 hours a day, 7 days a week.

Access by Analog Modem

To reach the service by modem, set your modem to 8 data bits, no parity, and 1 stop bit. Call the telephone number nearest you:

COUNTRY	DATA RATE	TELEPHONE NUMBER
Australia	Up to 14,400 bps	61 2 9955 2073
Brazil	Up to 14,400 bps	55 11 5181 9666
France	Up to 14,400 bps	33 1 6986 6954
Germany	Up to 28,800 bps	4989 62732 188
Hong Kong	Up to 14,400 bps	852 2537 5601
Italy	Up to 14,400 bps	39 2 27300680
Japan	Up to 14,400 bps	81 3 3345 7266
Mexico	Up to 28,800 bps	52 5 520 7835
P.R. of China	Up to 14,400 bps	86 10 684 92351
Taiwan, R.O.C.	Up to 14,400 bps	886 2 377 5840
U.K.	Up to 28,800 bps	44 1442 438278
U.S.A.	Up to 53,333 bps	1 847 262 6000

Access by Digital Modem

ISDN users can dial in to the 3Com BBS using a digital modem for fast access up to 64 Kbps. To access the 3Com BBS using ISDN, use the following number:

1 847 262 6000

3ComFacts Automated Fax Service

The 3ComFacts automated fax service provides technical articles, diagrams, and troubleshooting instructions on 3Com products 24 hours a day, 7 days a week.

Call 3ComFacts using your Touch-Tone telephone:

1 408 727 7021

Support from Your Network Supplier

If additional assistance is required, contact your network supplier. Many suppliers are authorized 3Com service partners who are qualified to provide a variety of services, including network planning, installation, hardware maintenance, application training, and support services.

When you contact your network supplier for assistance, have the following information ready:

- Product model name, part number, and serial number
- A list of system hardware and software, including revision levels
- Diagnostic error messages
- Details about recent configuration changes, if applicable

If you are unable to contact your network supplier, see the following section on how to contact 3Com.

Support from 3Com

If you are unable to obtain assistance from the 3Com online technical resources or from your network supplier, please call the 3Com technical telephone support phone number at the location nearest you.

When you contact 3Com for assistance, have the following information ready:

- Product model name, part number, and serial number
- A list of system hardware and software, including revision levels
- Diagnostic error messages
- Details about recent configuration changes, if applicable

The following table provides a list of worldwide technical telephone support numbers:

Country	Telephone Number
ASIA PACIFIC RIM	
Australia	1 800 678 515
Hong Kong	800 933 486
India	61 2 9937 5085
Indonesia	001 800 61 009
Japan	0031 61 6439
Malaysia	1800 801 777
New Zealand	0800 446 398
Pakistan	61 2 9937 5085
Philippines	1235 61 266 2602
P.R. of China	10800 61 00137
	or
	021 6350 1590
Singapore	800 6161 463
S. Korea	
From anywhere in S. Korea:	82 2 3455 6455
Seoul:	00798 611 261
Taiwan, R.O.C.	0080 611 261
Thailand	001 800 611 2000
EUROPE	
From anywhere in Europe,	
phone:	+31 (0)30 6029900
fax:	+31 (0)30 6029999
From the following European countries, you may use the toll-free numbers:	
Austria	06 607468
Belgium	0800 71429
Denmark	800 17309
Finland	0800 113153
France	0800 917959
Germany	0130 821502
Hungary	00800 12813
Ireland	1 800 553117
Israel	177 3103794
Italy	1678 79489
Netherlands	0800 0227788
Norway	800 11376
Poland	0800 3111206
Portugal	05 05313416
South Africa	0800 995014
Spain	900 983125
Sweden	020 795482
Switzerland	0800 55 3072
U.K.	0800 966197

Country	Telephone Number
LATIN AMERICA	
Argentina	AT&T +800 666 5065
Brazil	0800 13 3266
Chile	1230 020 0645
Colombia	98012 2127
Mexico	01 800 CARE (01 800
Peru	2273)
Puerto Rico	AT&T +800 666 5065
Venezuela	800 666 5065
	AT&T +800 666 5065
NORTH AMERICA	1 800 NET 3Com (1 800 638 3266)

Returning Products for Repair

Before you send a product directly to 3Com for repair, you must first obtain a Return Materials Authorization (RMA) number. Products sent to 3Com without RMA numbers will be returned to the sender unopened, at the sender's expense.

To obtain an RMA number, call or fax:

Country	Telephone Number	Fax Number
Asia, Pacific Rim	65 543 6500	65 543 6348
Europe, South Africa, and Middle East	+ 44 1442 435860	+ 44 1442 435718
From the following European countries, you may call the toll-free numbers; select option 2 and then option 2:		
Austria	06 607468	
Belgium	0800 71429	
Denmark	800 17309	
Finland	0800 113153	
France	0800 917959	
Germany	0130 821502	
Hungary	00800 12813	
Ireland	1800553117	
Israel	177 3103794	
Italy	1678 79489	
Netherlands	0800 0227788	
Norway	800 11376	
Poland	00800 3111206	
Portugal	05 05313416	
South Africa	0800 995014	
Spain	900 983125	
Sweden	020 795482	
Switzerland	0800 55 3072	
U.K.	0800 966197	
Latin America	1 408 326 2927	1 408 326 3355
U.S.A. and Canada	1 800 NET 3Com (1 800 638 3266)	1 408 326 7120

C
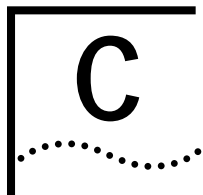
SUPPORTED DRIVERS

Additional Drivers

Text file names and driver names for some of the other drivers supported by 3CR990 NICs appear in the following table. The text files are included in the HELP directory on the *EtherCD*.

i **NOTE:** *DOS drivers are not supported for 3CR990 NICs. However, they are provided on the* EtherCD *to accommodate those environments requiring over-the-network installations.*

Network Operating System	Text File Name	Network Driver Name
Windows 98	WIN98.TXT	EL99XND5.SYS
Windows 95 OSR2	W95NDIS.TXT	EL99XND4.SYS
Windows 95 Build 950	W95NDIS.TXT	EL99XND3.SYS
Windows NT 4.0	WINNT.TXT	EL99XND4.SYS
Windows NT 3.51	WINNT.TXT	EL99XND3.SYS
NetWare 3.12, 4.1x, and 5.0 Servers	NETWARE.TXT	3C99X.LAN

For a list of additional supported network drivers and instructions on how to install them, access the 3Com World Wide Web site.

Go to: **http://www.support.3com.com/software**.
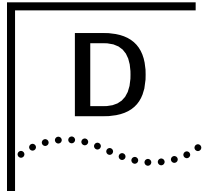
UNINSTALLING NIC SOFTWARE

Windows 2000

Follow this procedure to uninstall the NIC software in a PC running Windows 2000:

1 Right-click the **My Computer** icon.

2 Select **Properties** on the pop-up menu.

The System Properties screen appears.

3 Select the **Hardware** tab.

4 Click **Device Manager** in the middle panel.

The Device Manager screen appears.

5 Click the **+** symbol next to Network adapters.

6 Double-click **3Com EtherLink 10/100 PCI NIC with 3XP Processor (3CR990-TX-9X)**.

A screen with the name of the NIC in the title bar appears.

7 Select the **Driver** tab, and then click **Uninstall**.

The Confirm Device Removal screen appears.

8 Click **OK**.

The Device Manager screen appears.

9 Close all open windows, exit Windows, shut down the system, turn the PC power off, and remove the NIC from the PC.

Windows 98 and Windows 95

Follow this procedure to uninstall the NIC software in a PC running Windows 98 or Windows 95:

1 Double-click the **My Computer** icon, the **Control Panel** icon, and then the **Network** icon.

The Network window appears, displaying the Configuration screen.

2 Select the name of the NIC in the installed components list, click **Remove**, and then click **OK**.

The NIC driver and diagnostics software are removed from the PC.

Windows prompts you to restart the computer.

- If you are physically removing the NIC from the PC, click **No**. Do not restart the PC until you shut down the system, turn the power off, and remove the NIC from the PC.

- If you are reinstalling the NIC software, click **Yes** to restart the PC.

Windows NT 4.0

Follow this procedure to uninstall the NIC software in a PC running Windows NT 4.0:

1 Double-click the **My Computer** icon, the **Control Panel** icon, and then the **Network** icon.

The Network screen appears.

2 Click the **Adapters** tab.

3 Select the name of the NIC in the Network Adapters box, and then click **Remove**.

4 Click **Yes** to confirm the removal.

5 Click **Close** to close the Network screen.

Windows prompts you to restart the computer.

- If you are physically removing the NIC from the PC, click **No**. Do not restart the PC until you shut down the system, turn the power off, and remove the NIC from the PC.

- If you are reinstalling the NIC software, click **Yes** to restart the PC.

Windows NT 3.51

To uninstall the NIC software in a PC running Windows NT 3.51:

1 In the Main Program window, double-click the **Control Panel** icon, and then the **Network** icon.

The Network Settings screen appears.

2 In the Installed Adapter Cards panel, select the name of the installed NIC and click **Remove**.

A warning message appears.

3 Click **Yes** to confirm the removal.

The Network Settings screen reappears. The NIC no longer appears in the Installed Adapters panel.

4 Click **OK**.

The NIC driver and diagnostics software are removed from the PC.

Windows prompts you to restart the computer.

- If you are physically removing the NIC from the PC, click **No**. Do not restart the PC until you shut down the system, turn the power off, and remove the NIC from the PC.

- If you are reinstalling the NIC software, click **Yes** to restart the PC.

E
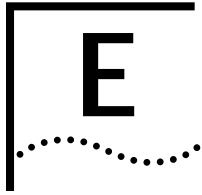
MBA BOOT ROM

Enabling or Disabling the Boot ROM Setting

The default boot ROM (factory) setting on the NIC is Disabled. This setting can be changed through the 3Com NIC diagnostics program.

i   *NOTE: For detailed information on using, configuring, and troubleshooting the MBA boot ROM, see the documentation for MBA on the* EtherCD *that shipped with this product.*

To enable or disable the NIC boot ROM setting using the 3Com NIC diagnostics program:

1 Start the 3Com NIC diagnostics program.

For instructions on how to start the Windows-based NIC diagnostics program

Go to: **3Com NIC Diagnostics Program**.

2 Click the **Configuration** tab.

The Configuration screen appears.

3 Under Network Parameter, select **Boot PROM**.

4 Open the Set Value list box and select **Enabled** to enable the boot ROM or **Disabled** to disable the boot ROM.

5 Click **OK**.

Booting with the MBA Boot ROM

The boot process for the MBA boot ROM varies depending on the type of PC you have (BBS BIOS-compatible or non-BBS BIOS-compatible).

If your PC was purchased recently, it may be BBS (BIOS Boot Specification) BIOS-compatible. The BBS determines how the system BIOS identifies boot devices in a PC (such as a CD-ROM drive, a hard drive, or a floppy drive), allows the user to select the boot order of these devices, and then attempts to boot from each device sequentially.

Refer to your PC documentation if you do not know which type of PC you have.

BBS BIOS-Compatible PCs

To enable a BBS BIOS-compatible PC to boot from the network using the MBA boot ROM:

1 Make sure that the boot ROM setting for the NIC is Enabled.

For instructions

Go to: **Enabling or Disabling the Boot ROM Setting**.

2 Manually set the MBA as the first boot device in the BIOS for your PC.

Refer to your PC documentation for instructions on accessing and configuring the BIOS.

3 Reboot the PC.

The MBA attempts to boot from the network using the default protocol
TCP/IP DHCP.

To change the default protocol or any other MBA configurations, press Ctrl+Alt+B
when the following message appears:

```
Initializing MBA. Press Ctrl+Alt+B to configure...
```

If the network boot fails, the following message appears:

```
Network boot aborted, press any key to continue
```

The BIOS continues to the next device in the boot order (for example, the local
hard drive).

> **NOTE:** *To cancel the network boot on a BBS BIOS-compatible PC, press Esc
> anytime during the network boot process.*

**Non-BBS
BIOS-Compatible PCs**

To enable a non-BBS BIOS-compatible PC to boot from the network using the
MBA boot ROM:

1 Make sure that the NIC's boot ROM setting is Enabled.

For instructions

Go to: **Enabling or Disabling the Boot ROM Setting**.

2 Change the MBA's default boot setting from Local to Network.

To change the default boot setting or any other MBA configurations, use the
MBACFG utility located on the MBA utility diskette included with your NIC or press
Ctrl+Alt+B when the following message appears:

```
Initializing MBA. Press Ctrl+Alt+B to configure...
```

> **NOTE:** *For more information on using, configuring, and troubleshooting the
> MBA boot ROM, see the documentation that came with MBA on the* EtherCD*.*

F
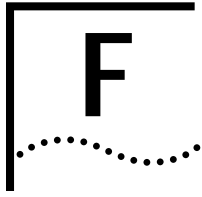
DYNAMICACCESS TECHNOLOGY

DynamicAccess Features

Dynamic*Access®* technology is an advanced network driver that improves performance, management, and control of your network. Dynamic*Access* technology is copied to your hard drive, but not installed, when you install the NIC software.

Dynamic*Access* technology adds intelligence to the NIC by integrating the following features:

- Distributed RMON (dRMON)—Enables full RMON reporting on all network segments, including switched networks, without needing to place dedicated RMON probes throughout the network

- Traffic Prioritization—Ensures that business-critical and delay-sensitive traffic (such as multimedia applications) has priority over normal data

- Fast IP—Eliminates router bottlenecks and improves performance in switched networks

- Efficient multicast control—prevents flooding of switched networks by multicast applications such as video training, stock quotes, or online news

For detailed information about Dynamic*Access* technology, access the 3Com World Wide Web site.

Go to: **http://www.3com.com/dynamicaccess**.

Client PC Requirements

Dynamic*Access* technology can only be installed on a PC running Windows 2000, Windows 95, Windows 98, Windows NT 4.0, or Windows NT 3.51.

⚠ *CAUTION: If you plan to install DynamicAccess technology on a multiprocessor PC running Windows NT 4.0, Service Pack 4, you must first download and install the appropriate Microsoft patch.*

Go to: **http://www.3com.com/dynamicaccess/hotfixes**.

Failure to install the patch will result in system failure.

The minimum client requirements and recommended Microsoft Service Packs (if any) for Dynamic*Access* technology are listed in the following table.

Operating System	PC Requirements	Recommended Microsoft Service Pack
Windows 2000	486/76 MHz CPU 16 MB RAM (32 MB recommended) 5 MB available hard drive space	None required
Windows 95	486/76 MHz CPU 16 MB RAM (32 MB recommended) 5 MB available hard drive space	Windows 95 OSR2 or Service Pack 1
Windows 98	486/76 MHz CPU 16 MB RAM (32 MB recommended) 5 MB available hard drive space	Service Pack 1
Windows NT 4.0	Pentium/100 MHz CPU 32 MB RAM 5 MB available hard drive space	Service Pack 4
Windows NT 3.51	Pentium/100 MHz CPU 32 MB RAM 5 MB available hard drive space	Service Pack 5

Installing DynamicAccess Technology

Dynamic*Access* technology is copied to your hard drive, but not installed, when you install the NIC software.

To install Dynamic*Access* technology:

1 Make sure that the NIC and the NIC software are installed on your PC.

To confirm the NIC installation

Go to: **Verifying Successful Installation**.

⚠️ *CAUTION: If you have a multiprocessor PC that is running Windows NT 4.0, Service Pack 4, download and install the appropriate Microsoft patch before beginning the installation. Failure to install the patch will result in system failure. To download this patch. To download this patch*

Go to: **http://www.3com.com/dynamicaccess/hotfixes**.

2 Start Windows.

3 Insert the *EtherCD* in the CD-ROM drive.

4 When the *EtherCD* Welcome screen appears, select **NIC Software**, **Dynamic*Access* ®Technology**, and then **Install Dynamic*Access*® LAN Agent Version 2.0 now**.

Dynamic*Access* technology is installed. To verify that the installation was successful

Go to: **Verifying Successful Installation**.

If the *EtherCD* Welcome screen is not displayed, follow these steps:

1 Double-click the **DA15.EXE** file on your hard drive.

The DA15.EXE file is automatically copied to your hard drive during the NIC driver installation into the following directory:

- Windows 95/98 — C:\WINDOWS\SYSTEM
- Windows NT 4.0 — C:\WINNT\SYSTEM32
- Windows NT 3.51 — C:\WINNT35\SYSTEM32

The file is expanded and the Dynamic*Access* technology is installed on your PC.

2 Restart the PC.

i *NOTE: You must restart your PC to complete the installation.*

Dynamic*Access* technology is installed. To verify that the installation was successful,

Go to: **Verifying Successful Installation**.

Verifying Successful Installation

After Dynamic*Access* technology is installed, the following changes are visible in the Windows Network dialog box:

- For each physical NIC installed in the PC, a virtual NIC entry appears in the list of network adapters.

  All protocols are re-bound to the virtual NIC. The bindings to the physical NIC are still intact.

- A 3Com Dynamic*Access* technology entry appears as a protocol.

- A 3Com Dynamic*Access* technology icon in installed in the Windows Control Panel.

Configuring DynamicAccess Technology

Contact your system administrator before using Dynamic*Access* technology at your site.

i *NOTE: DynamicAccess technology configuration instructions are intended for network administrators who have experience installing software and using management tools for an Ethernet network.*

These instructions are for configuring Dynamic*Access* technology on a local PC. You can obtain the complete configuration instruction set by expanding the downloadable file that contains the Dynamic*Access* technology software.

Go to: **http://www.3com.com/dynamicaccess**.

i *NOTE: You need a Web browser to view the complete configuration instruction set. You do not need to reinstall the software.*

Follow this procedure to configure Dynamic*Access* technology on a local PC:

1 Double-click the **3Com Dynamic*Access*** icon in the Windows Control Panel.

The Traffic Prioritization tab of the DynamicAccess Software Setup screen appears.

2 Select the tab containing the information that you want to configure.

- Traffic Prioritization—Allows you to prioritize applications, which can ease bottlenecks in your network and allow critical applications to take network precedence.

- Fast IP—Allows you to enable and configure Fast IP.

- Administration—Allows you to set Dynamic*Access* technology control panel access, set VLAN options, enable efficient multicast control, and enable the prioritizing of multicast traffic.

Removing DynamicAccess Technology

To remove Dynamic*Access* technology from your PC, follow the instructions appropriate for your operating system.

i *NOTE: For specific instructions on configuring any of the Dynamic*Access technology *options, click Help on the 3Com Dynamic*Access *Technology* screen or access the 3Com World Wide Web site:*

http://www.3com.com/dynamicaccess.

i *NOTE: Contact your system administrator before you remove Dynamic*Access technology *from your PC.*

Windows 95/98

If the 3Com Dynamic*Access* Control Panel Administration utility is set to *Read Only*, you cannot remove the Dynamic*Access* technology. You must change the access to *Read/Write* and then remove Dynamic*Access* technology.

i *NOTE: Your network connections will break if you select the DA Transport protocols from either the virtual NIC or the physical NIC and click Remove.*

Follow this procedure to remove Dynamic*Access* technology from a PC running Windows 95 or Windows 98:

1 Double-click the **Add/Remove Programs** icon in the **Control Panel**.

2 Select the **Dynamic*Access* Technology** entry and click **Remove**.

3 Restart the PC when prompted.

Dynamic*Access* technology is removed from the PC.

Windows NT 4.0 and   Follow this procedure to remove Dynamic*Access* technology from a PC running
Windows NT 3.51   Windows NT 4.0 or Windows NT 3.51:

1 Double-click the **Network** icon in the **Control Panel**.

2 Select the **DAPassThru Driver Transport** protocol.

- Windows NT 4.0—this protocol is located on the Protocols tab.

- Windows NT 3.51—this protocol is located in the list of installed network software on the Network Settings screen.

3 Click **Remove**.

4 Close the **Network** screen, and then restart the PC when prompted.

Dynamic*Access* technology is removed from the PC.

INDEX

WARRANTY AND REGULATORY COMPLIANCE INFORMATION

3Com Corporation Limited Warranty

ETHERLINK 10/100 PCI NETWORK INTERFACE CARD WITH 3XP PROCESSOR

HARDWARE	3Com warrants this hardware product to be free from defects in workmanship and materials, under normal use and service, for the following length of time from the date of purchase from 3Com or its authorized reseller:
	Lifetime
	Spare Parts and Spares Kits 90 days
	3Com's sole obligation under this express warranty shall be, at 3Com's option and expense, to repair the defective product or part, deliver to Customer an equivalent product or part to replace the defective item, or if neither of the two foregoing options is reasonably available, 3Com may, in its sole discretion, refund to Customer the purchase price paid for the defective product. All products that are replaced will become the property of 3Com. Replacement products may be new or reconditioned. 3Com warrants any replaced or repaired product or part for ninety (90) days from shipment, or the remainder of the initial warranty period, whichever is longer.
SOFTWARE	3Com warrants that each software program licensed from it will perform in substantial conformance to its program specifications, for a period of ninety (90) days from the date of purchase from 3Com or its authorized reseller. 3Com warrants the media containing software against failure during the warranty period. No updates are provided. 3Com's sole obligation under this express warranty shall be, at 3Com's option and expense, to refund the purchase price paid by Customer for any defective software product, or to replace any defective media with software which substantially conforms to applicable 3Com published specifications. Customer assumes responsibility for the selection of the appropriate applications program and associated reference materials. 3Com makes no warranty or representation that its software products will meet Customer's requirements or work in combination with any hardware or applications software products provided by third parties, that the operation of the software products will be uninterrupted or error free, or that all defects in the software products will be corrected. For any third party products listed in the 3Com software product documentation or specifications as being compatible, 3Com will make reasonable efforts to provide compatibility, except where the non-compatibility is caused by a "bug" or defect in the third party's product or from use of the software product not in accordance with 3Com's published specifications or user manual.
YEAR 2000 WARRANTY	In addition to the Hardware Warranty and Software Warranty stated above, 3Com warrants that each product sold or licensed to Customer on and after January 1, 1998 that is date sensitive will continue performing properly with regard to such date data on and after January 1, 2000, provided that all other products used by Customer in connection or combination with the 3Com product, including hardware, software, and firmware, accurately exchange date data with the 3Com product, with the exception of those products identified at 3Com's Web site, http://www.3com.com/products/yr2000.html, as not meeting this standard. If it appears that any product that is stated to meet this standard does not perform properly with regard to such date data on and after January 1, 2000, and Customer notifies 3Com before the later of April 1, 2000, or ninety (90) days after purchase of the product from 3Com or its authorized reseller, 3Com shall, at its option and expense, provide a software update which would effect the proper performance of such product, repair such product, deliver to Customer an equivalent product to replace such product, or if none of the foregoing is feasible, refund to Customer the purchase price paid for such product.
	Any software update or replaced or repaired product will carry a Year 2000 Warranty for ninety (90) days after purchase or until April 1, 2000, whichever is later.
OBTAINING WARRANTY SERVICE	Customer must contact a 3Com Corporate Service Center or an Authorized 3Com Service Center within the applicable warranty period to obtain warranty service authorization. Dated proof of purchase from 3Com or its authorized reseller may be required. Products returned to 3Com's Corporate Service Center must be pre-authorized by 3Com with a Return Material Authorization (RMA) number marked on the outside of the package, and sent prepaid and packaged appropriately for safe shipment, and it is recommended that they be insured or sent by a method that provides for tracking of the package. The repaired or replaced item will be shipped to Customer, at 3Com's expense, not later than thirty (30) days after 3Com receives the defective product.
	Dead- or Defective-on-Arrival. In the event a product completely fails to function or exhibits a defect in materials or workmanship within the first forty-eight (48) hours of installation but no later than thirty 30) days after the date of purchase, and this is verified by 3Com, it will be considered dead- or defective-on-arrival (DOA) and a replacement shall be provided by advance replacement. The replacement product will normally be shipped not later than three (3) business days after 3Com's verification of the DOA product, but may be delayed due to export or import procedures. When an advance replacement is provided and Customer fails to return the original product to 3Com within fifteen (15) days after shipment of the replacement, 3Com will charge Customer for the replacement product, at list price.
	3Com shall not be responsible for any software, firmware, information, or memory data of Customer contained in, stored on, or integrated with any products returned to 3Com for repair, whether under warranty or not.
ADDITIONAL SERVICES	*Telephone Support*, with coverage for basic troubleshooting only, will be provided for five (5) years, on a commercially reasonable efforts basis. Telephone support from 3Com is available from 3Com only if Customer purchased this product directly from 3Com, or if Customer's reseller is unable to provide telephone support. Please refer to the Technical Support appendix in the user guide for telephone numbers.
	3Com's Web and Bulletin Board Service are available at no charge, and provide software and firmware upgrades, a bug list, and technical information about 3Com products.
WARRANTIES EXCLUSIVE	IF A 3COM PRODUCT DOES NOT OPERATE AS WARRANTED ABOVE, CUSTOMER'S SOLE REMEDY FOR BREACH OF THAT WARRANTY SHALL BE REPAIR, REPLACEMENT, OR REFUND OF THE PURCHASE PRICE PAID, AT 3COM'S OPTION. TO THE FULL EXTENT ALLOWED BY LAW, THE FOREGOING WARRANTIES AND REMEDIES ARE EXCLUSIVE AND ARE IN LIEU OF ALL OTHER WARRANTIES, TERMS, OR CONDITIONS, EXPRESS OR IMPLIED, EITHER IN FACT OR BY OPERATION OF LAW, STATUTORY OR OTHERWISE, INCLUDING WARRANTIES, TERMS, OR CONDITIONS OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, SATISFACTORY QUALITY, CORRESPONDENCE WITH DESCRIPTION, AND NON-INFRINGEMENT, ALL OF WHICH ARE EXPRESSLY DISCLAIMED. 3COM NEITHER ASSUMES NOR AUTHORIZES ANY OTHER PERSON TO ASSUME FOR IT ANY OTHER LIABILITY IN CONNECTION WITH THE SALE, INSTALLATION, MAINTENANCE OR USE OF ITS PRODUCTS.

3COM SHALL NOT BE LIABLE UNDER THIS WARRANTY IF ITS TESTING AND EXAMINATION DISCLOSE THAT THE ALLEGED DEFECT OR MALFUNCTION IN THE PRODUCT DOES NOT EXIST OR WAS CAUSED BY CUSTOMER'S OR ANY THIRD PERSON'S MISUSE, NEGLECT, IMPROPER INSTALLATION OR TESTING, UNAUTHORIZED ATTEMPTS TO OPEN, REPAIR OR MODIFY THE PRODUCT, OR ANY OTHER CAUSE BEYOND THE RANGE OF THE INTENDED USE, OR BY ACCIDENT, FIRE, LIGHTNING, OTHER HAZARDS, OR ACTS OF GOD.

LIMITATION OF LIABILITY

TO THE FULL EXTENT ALLOWED BY LAW, 3COM ALSO EXCLUDES FOR ITSELF AND ITS SUPPLIERS ANY LIABILITY, WHETHER BASED IN CONTRACT OR TORT (INCLUDING NEGLIGENCE), FOR INCIDENTAL, CONSEQUENTIAL, INDIRECT, SPECIAL, OR PUNITIVE DAMAGES OF ANY KIND, OR FOR LOSS OF REVENUE OR PROFITS, LOSS OF BUSINESS, LOSS OF INFORMATION OR DATA, OR OTHER FINANCIAL LOSS ARISING OUT OF OR IN CONNECTION WITH THE SALE, INSTALLATION, MAINTENANCE, USE, PERFORMANCE, FAILURE, OR INTERRUPTION OF ITS PRODUCTS, EVEN IF 3COM OR ITS AUTHORIZED RESELLER HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES, AND LIMITS ITS LIABILITY TO REPAIR, REPLACEMENT, OR REFUND OF THE PURCHASE PRICE PAID, AT 3COM'S OPTION. THIS DISCLAIMER OF LIABILITY FOR DAMAGES WILL NOT BE AFFECTED IF ANY REMEDY PROVIDED HEREIN SHALL FAIL OF ITS ESSENTIAL PURPOSE.

DISCLAIMER

Some countries, states, or provinces do not allow the exclusion or limitation of implied warranties or the limitation of incidental or consequential damages for certain products supplied to consumers, or the limitation of liability for personal injury, so the above limitations and exclusions may be limited in their application to you. When the implied warranties are not allowed to be excluded in their entirety, they will be limited to the duration of the applicable written warranty. This warranty gives you specific legal rights which may vary depending on local law.

GOVERNING LAW

This Limited Warranty shall be governed by the laws of the State of California, U.S.A. excluding its conflicts of laws principles and excluding the United Nations Convention on Contracts for the International Sale of Goods.

3Com Corporation
5400 Bayfront Plaza
Santa Clara, CA 95054
(408) 326-5000

Regulatory Compliance Information

FCC CLASS B STATEMENT

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1 This device may not cause harmful interference, and

2 This device must accept any interference received, including interference that may cause undesired operation.

WARNING: 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, and the Canadian Department of Communications Equipment Standards entitled, "Digital Apparatus," ICES-003.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 receiver.

■ Connect the equipment into an outlet on a circuit different from the one which the receiver is connected to.

■ Consult the dealer or an experienced radio/TV technician for help.

The user may find the following booklet prepared by the Federal Communications Commission helpful:

The Interference Handbook

This booklet is available from the U.S. Government Printing Office, Washington, D.C. 20402. Stock No. 004-000-00345-4.

Tested to comply with the FCC Standards for home and office use.

NOTE: In order to maintain compliance with the limits of a Class B digital device, 3Com requires that you use quality interface cables when connecting to this device. Changes or modifications not expressly approved by 3Com could void the user's authority to operate this equipment. Refer to the manual for specifications on cabling types.

FCC DECLARATION OF CONFORMITY

We declare under our sole responsibility that the

Model:	Description:
3CR990-TX-95	EtherLink 10/100 PCI Network Interface Card with 3XP processor (56-bit encryption model)
3CR990-TX-97	EtherLink 10/100 PCI Network Interface Card with 3XP processor (3DES encryption model)

to which this declaration relates, is in conformity with the following standards or other normative documents:

■ ANSI C63.4-1992 Methods of Measurement

■ Federal Communications Commission 47 CFR Part 15, subpart B
  15.107 (e) Class B Conducted Limits
  15.109 (g) Class B Radiated Emissions Limits

3Com Corporation, 5400 Bayfront Plaza, P.O. Box 58145, Santa Clara, CA 95052-8145

INDUSTRY CANADA CLASS B EMISSION COMPLIANCE STATEMENT	This Class B digital apparatus complies with Canadian ICES-003.

AVIS DE CONFORMITÉ À LA RÉGLEMENTATION D'INDUSTRIE CANADA	Cet appareil numérique de la classe B est conform à la norme NMB-003 du Canada.

VCCI CLASS B STATEMENT

> この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に
> 基づくクラスB情報技術装置です。この装置は、家庭環境で使用することを目的
> としていますが、この装置がラジオやテレビジョン受信機に近接して使用される
> と、受信障害を引き起こすことがあります。
> 取扱説明書に従って正しい取り扱いをして下さい。

This is a Class B product based on the standard of the Voluntary Control Council for Interference from Information Technology Equipment (VCCI). If this is used near a radio or television receiver in a domestic environment, it may cause radio interference. Install and use the equipment according to the instruction manual.

3COM END USER SOFTWARE LICENSE AGREEMENT

IMPORTANT: Read Before Using This Product

YOU SHOULD CAREFULLY READ THE FOLLOWING TERMS AND CONDITIONS BEFORE USING THIS PRODUCT. IT CONTAINS SOFTWARE, THE USE OF WHICH IS LICENSED BY 3COM CORPORATION ("3COM") TO ITS CUSTOMERS FOR THEIR USE ONLY AS SET FORTH BELOW. IF YOU DO NOT AGREE TO THE TERMS AND CONDITIONS OF THIS AGREEMENT, DO NOT USE THE SOFTWARE. USING ANY PART OF THE SOFTWARE INDICATES THAT YOU ACCEPT THESE TERMS.

LICENSE: 3Com grants you a nonexclusive license to use the accompanying software program(s) (the "Software") subject to the terms and restrictions set forth in this License Agreement. You are not permitted to lease, rent, distribute or sublicense the Software or to use the Software in a time-sharing arrangement or in any other unauthorized manner. Further, no license is granted to you in the human readable code of the Software (source code). Except as provided below, this License Agreement does not grant you any rights to patents, copyrights, trade secrets, trademarks, or any other rights in respect to the Software.

The Software is licensed to be used on any workstation or any network server owned by or leased to you provided that the Software is used only in connection with a 3Com adapter. You may reproduce and provide one (1) copy of the Software and supporting documentation for each such workstation or network server on which the Software is used as permitted hereunder. Otherwise, the Software and supporting documentation may be copied only as essential for backup or archive purposes in support of your use of the Software as permitter hereunder. You must reproduce and include all copyright notices and any other proprietary rights notices appearing on the Software and the supporting documentation on any copies that your make.

ASSIGNMENT; NO REVERSE ENGINEERING: You may not transfer or assign the Software and/or this License Agreement to another party without the prior written consent of 3Com. If such consent is given and you transfer or assign the Software and/or this License Agreement, then you must at the same time either transfer any copies of the Software as well as the supporting documentation to the same party or destroy any such materials not transferred. Except as set forth above, you may not transfer or assign the Software or your rights under this License Agreement.

Modification, reverse engineering, reverse compiling, or disassembly of the Software is expressly prohibited. However, if you are a European Community ("EC") resident, information necessary to achieve interoperability of the Software with other programs within the meaning of the EC Directive on the Legal Protection of Computer Programs is available to you from 3Com upon written request.

EXPORT RESTRICTIONS: The Software covered by this License Agreement contains data encryption code, which is unlawful to export from the US or Canada without an approved United States Dept. of Commerce export license. You agree that you will not export or re-export the Software or accompanying documentation (or any copies thereof) or any products utilizing the Software or such documentation in violation of any applicable laws or regulations of the United States and the country in which you obtained them.

TRADE SECRETS; TITLE: You acknowledge and agree that the structure, sequence and organization of the Software are the valuable trade secrets of 3Com and its suppliers. You agree to hold such trade secrets in confidence. You further acknowledge and agree that ownership of, and title to, the Software and all subsequent copies thereof regardless of the form or media are held by 3Com and its suppliers.

UNITED STATES GOVERNMENT LEGEND: All technical data and computer software is commercial in nature and developed solely at private expense. The Software is delivered as Commercial Computer Software as defined in DFARS 252.227-7014 (June 1995) or as a commercial item as defined in FAR 2.101(a) and as such is provided with only such rights as are provided in this License Agreement, which is 3Com's standard commercial license for the Software. Technical data is provided with limited rights only as provided in DFAR 252.227-7015 (Nov 1995) or FAR 52.227-14 (June 1987), whichever is applicable. You agree not to remove or deface any portion of any legend provided on any licensed program or documentation delivered to you under this License Agreement.

TERM AND TERMINATION: This license will expire fifty (50) years from the date that you first use the Software, if it is not earlier terminated. You may terminate it at any time by destroying the Software and documentation together with all copies and merged portions in any form. It will also terminate immediately if you fail to comply with any term or condition of this License agreement. Upon such termination you agree to destroy the Software and documentation, together with all copies and merged portions in any form.

GOVERNING LAW: This License Agreement shall be governed by the laws of the State of California as such laws are applied to agreements entered into and to be performed entirely within California between California residents and by the laws of the United States. You agree that the United Nations Convention on Contracts for the International Sale of Goods (1980) is hereby excluded in its entirety from application to this License Agreement.

LIMITED WARRANTY; LIMITATION OF LIABILITY: All warranties and limitations of liability applicable to the Software are as sated on the Limited Warranty Card or in the product manual, whether in paper or electronic form, accompanying the Software. Such warranties and limitations of liability are incorporated herein in their entirety by this reference.

SEVERABILITY: In the event any provision of this License Agreement is found to be invalid, illegal or unenforceable, the validity, legality and enforceability of any of the remaining provisions shall not in any way be affected or impaired and a valid, legal and enforceable provision of similar intent and economic impact shall be substituted therefor.

ENTIRE AGREEMENT: This License Agreement sets forth the entire understanding and agreement between you and 3Com, supersedes all prior agreements, whether written or oral, with respect to the Software, and may be amended only in a writing signed by both parties.

3Com is a registered trademark of 3Com Corporation.

3Com Corporation
5400 Bayfront Plaza
P.O. Box 58145
Santa Clara, CA 95052-8145
(408) 326-5000

Free Manuals Download Website

http://myh66.com

http://usermanuals.us

http://www.somanuals.com

http://www.4manuals.cc

http://www.manual-lib.com

http://www.404manual.com

http://www.luxmanual.com

http://aubethermostatmanual.com

Golf course search by state

http://golfingnear.com

Email search by domain

http://emailbydomain.com

Auto manuals search

http://auto.somanuals.com

TV manuals search

http://tv.somanuals.com