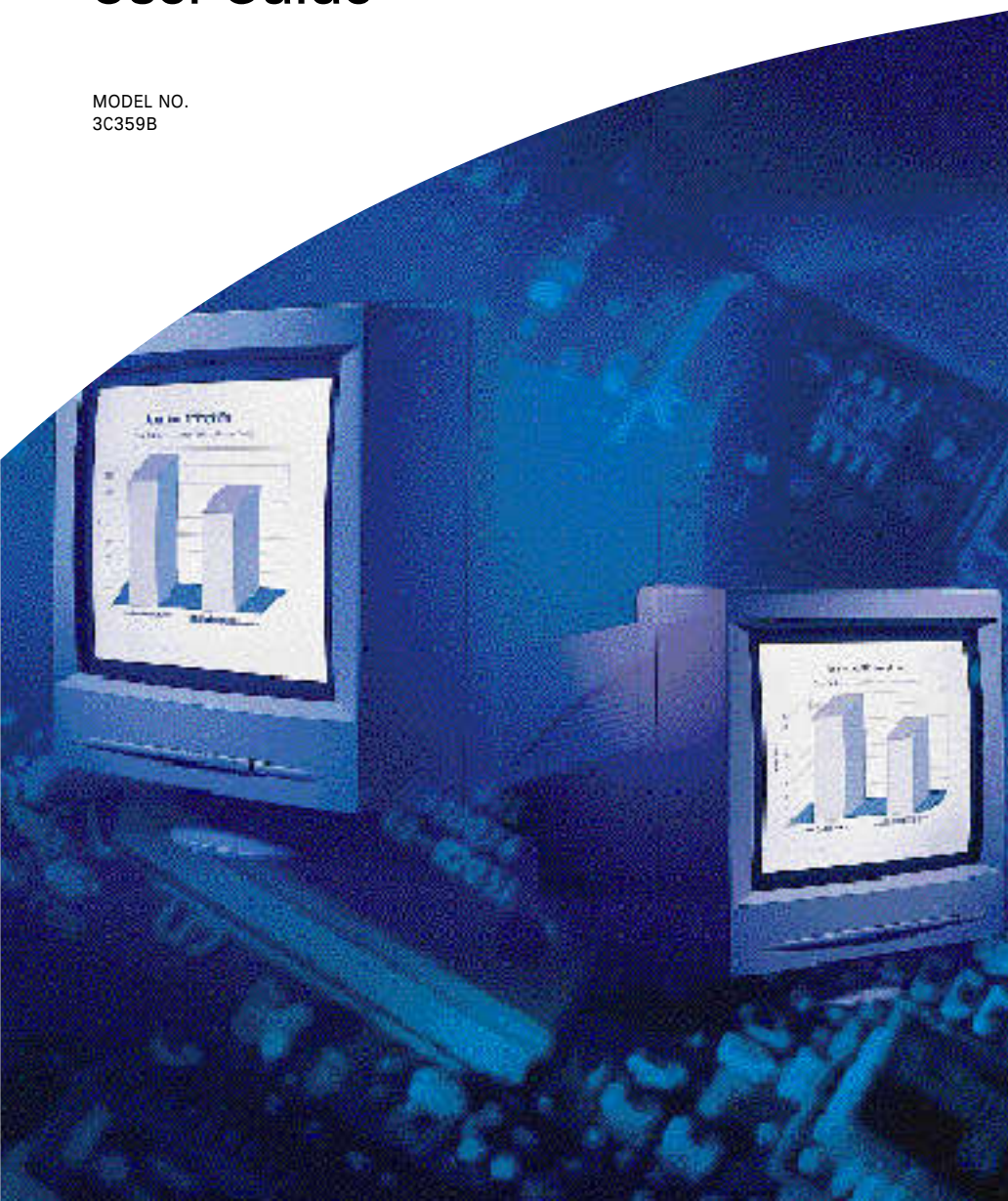
3Com TokenLink Velocity® XL

Token Ring PCI Network Interface Card User Guide

MODEL NO.
3C359B



TokenLink Velocity® XL PCI Network Interface Card User Guide

A member of the high-performance TokenLink Velocity family of network interface cards

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ABOUT THIS GUIDE

This guide describes installing, configuring, and troubleshooting the 3Com® 3C359B TokenLink Velocity® XL PCI network interface card (NIC). This NIC is referred to as the 3C359B NIC in this guide.

The HELP directory on TokenDisk® diskette 1 contains the latest technical information. You can also find the HELP directory on the TokenLink Velocity XL *CD in the \DISK_1 directory.*

This guide is intended for network installers who are familiar with local area networking (LAN) technology, token ring technology, and network interface card installation.

If release notes are shipped with your product and the information there differs from the information in this guide, follow the instructions in the release notes.

Most user guides and release notes are available in Adobe Acrobat Reader Portable Document Format (PDF) or HTML on the 3Com World Wide Web site:

http://www.3com.com/

You can download Acrobat Reader from the Adobe Systems Incorporated web site:

http://www.adobe.com/

Conventions

Table 1 and Table 2 list conventions that are used throughout this guide.

Table 1 Notice Icons

Icon	Notice Type	Description
	Information note	Information that describes important features or instructions
	Caution	Information that alerts you to potential loss of data or potential damage to an application, system, or device

(continued)

Table 1 Notice Icons (continued)

Icon	Notice Type	Description
	Warning	Information that alerts you to potential personal injury

Table 2 Text Conventions

Convention	Description
`Screen displays`	This typeface represents information as it appears on the screen.
`Syntax`	The word "syntax" means that you must evaluate the syntax provided and then supply the appropriate values for the placeholders that appear in angle brackets. Example: To enable RIPIP, use the following syntax: `SETDefault !<port> -RIPIP CONTrol = Listen` In this example, you must supply a port number for <port>.
`Commands`	The word "command" means that you must enter the command exactly as shown and then press Return or Enter. Commands appear in bold. Example: To remove the IP address, enter the following command: **`SETDefault !0 -IP NETaddr = 0.0.0.0`**
The words "enter" and "type"	When you see the word "enter" in this guide, you must type something, and then press Return or Enter. Do not press Return or Enter when an instruction simply says "type."
Keyboard key names	If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). Example: Press Ctrl+Alt+Del
Words in *italics*	Italics are used to: ■ Emphasize a point. ■ Denote a new term at the place where it is defined in the text. ■ Identify menu names, menu commands, and software button names. Examples: From the *Help* menu, select *Contents*. Click *OK*.

Year 2000 Compliance

For information on Year 2000 compliance and 3Com products, visit the 3Com Year 2000 Web page:

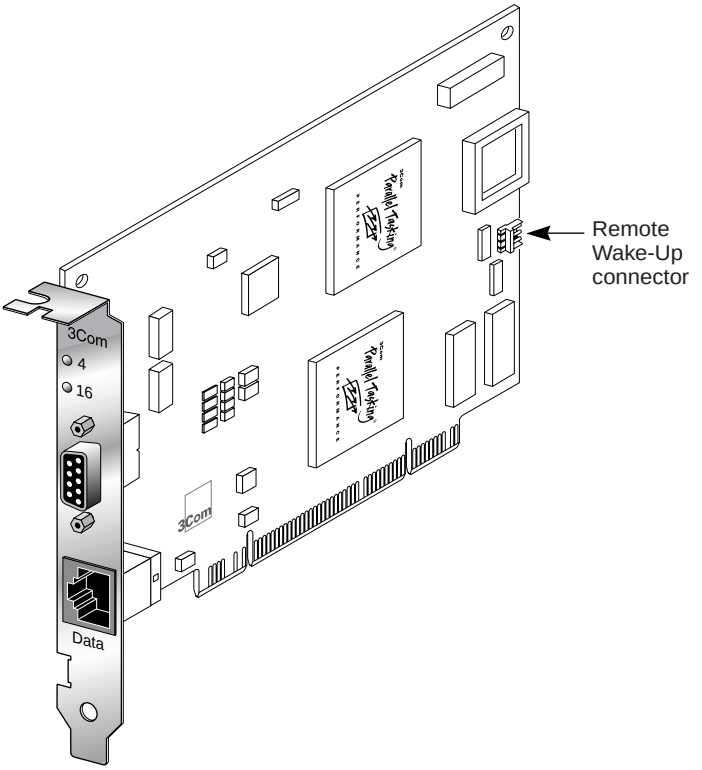
http://www.3com.com/products/yr2000.html

1 INTRODUCTION

The 3Com® 3C359B TokenLink Velocity® XL PCI network interface card (NIC) is a high-performance token ring network adapter for personal computers (PCs) equipped with the Peripheral Component Interconnect (PCI) bus.

The 3C359B NIC provides a high-performance 32-bit PCI local bus interface with bus mastering that runs at a clock speed of 33 MHz.

Figure 1 TokenLink Velocity XL PCI 3C359B NIC



High-Performance Features of the 3C359B NIC

The 3C359B NIC delivers the token ring industry's highest performance for the lowest cost, and is designed to provide years of trouble-free operation. This section describes the NIC's high-performance features.

Parallel Tasking II Performance

The 3C359B NIC's design incorporates new Parallel Tasking® II performance, which takes advantage of the latest developments in PCI bus design to deliver the fastest data throughput and lowest CPU utilization of any token ring NIC.

Parallel Tasking II performance is built upon a solid foundation of proven Parallel Tasking architecture, which introduced data pipelining and overlapping task processing to improve throughput and achieve the industry's fastest data transmission and reception speeds.

Dynamic*Access* Class of Service

The 3Com Dynamic*Access*® software adds intelligence to the 3C359B NIC for optimized performance and control. With Dynamic*Access* Class of Service (Traffic Prioritization), you can select time-critical applications that require the highest-priority access to your network—such as multimedia sessions. Based on your selection, the network device driver recognizes high-priority applications, prioritizes their data transmissions, and accelerates their data transmissions in the following ways:

- The NIC implements dual queues, allowing high-priority traffic to be queued for transmission before normal-priority traffic.
- High-priority traffic is allowed to request and use high-priority tokens (as specified in the IEEE 802.5 standard). This tends to reduce the latency experienced in acquiring a suitable token for transmission onto the network.

Class of Service (Traffic Prioritization) is available only with the Network Driver Interface Specification (NDIS) 5.0 and NDIS 4.0 miniport drivers supporting the following operating systems: Windows NT 4.0 and Windows 98.

Support for Full-Duplex/Dedicated Token Ring

Full-duplex/Dedicated Token Ring (DTR) is an enhancement to the IEEE 802.5 standard that allows a token ring switch port to be dedicated to a station.

In full-duplex mode, a station can simultaneously transmit and receive independent data streams for potential data throughput of 32 Mbps. The 3C359B NIC can operate in full-duplex mode when attached to a DTR switch.

Remote Wake-Up Support

The 3C359B NIC supports the capability to remotely wake-up a PC from a power-saving "sleep" state. The NIC monitors the network for certain kinds of packets (such as a Magic Packet, a directed packet, or packets that incorporate a wake-up pattern) while the PC is asleep. When the NIC detects a wake-up packet, it wakes up the PC. Once the PC is awake, you can perform software upgrades, backups, and other management tasks from a central location.

"Remote Wake-Up" is equivalent to other popular "wake-up" terms that are currently in use (for example, "Wake On LAN").

The 3C359B NIC's Remote Wake-Up support conforms to the Advanced Configuration and Power Interface (ACPI) specification and applies only to PCs that implement either the PCI Bus Power Management Interface Specification (versions 1.0 or 1.1) or a Remote Wake-Up connector on the PC motherboard. The connector allows a 3-wire cable to be connected between the NIC and the motherboard. See your PC system documentation to determine which mechanism is supported.

If your PC supports the 3-wire cable, then install the cable supplied with the 3C359B NIC after inserting the NIC into the appropriate slot. (See "Connecting the Remote Wake-Up Cable" in Chapter 2.)

If the PC has PCI bus power management, then insert the NIC without installing the cable. No cable is required.

After installing the NIC and attaching the Remote Wake-Up cable (if necessary), you must configure the PC's BIOS for Remote Wake-Up. See your PC's reference guide or contact your PC vendor for instructions on accessing the BIOS.

Your PC or server must have the following characteristics to use Remote Wake-Up:

- 3-pin Remote Wake-Up connector on the PC motherboard
- BIOS that supports Remote Wake-Up
- 5-volt standby power supply unit rated at a minimum of 600 milliamperes

Additionally, your PC must have a desktop or network management application capable of sending a wake-up packet such as a Magic Packet.

If you are unsure whether your PC meets the requirements listed described in this section, contact your PC vendor.

The NIC provides a network connection with or without the Remote Wake-Up cable installed.

For information on installing the Remote Wake-Up cable, see "Connecting the Remote Wake-Up Cable" in Chapter 2.

For information on testing Remote Wake-Up, see "Checking the Remote Wake-Up Function" in Chapter 6.

For more information on Remote Wake-Up, see the WAKEFAQ.TXT file located in the root directory on *TokenDisk* diskette 1 or in the \DISK_1 directory on the *TokenLink Velocity XL* CD.

Managed PC Boot Agent (MBA)

The 3C359B NIC includes a Boot ROM socket that supports the 3Com Managed PC Boot Agent® (MBA®), an optional package of multiprotocol preboot firmware and tools that is sold and documented separately.

The MBA adds management capabilities to the NIC by enabling the PC to boot from a server, rather than from its local drive.

This preboot support allows you to use management applications such as ON Technology's ON Command CCM

(Comprehensive Client Management), Intel Corporation's LANDesk Configuration Manager, and McAfee Associate's VirusScan 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, the MBA has a complete set of tools, utilities, and Pre-OS® software that enables network administrators to perform such tasks as:

- Reconfiguring multiple systems at once.
- Backing up hard drives automatically.

Other Features of the 3C359B NIC

The 3C359B NIC supports the following features:

- Completely automatic hardware configuration through PCI registration.
- Auto ring speed detection option that permits the 3C359B NIC drivers for all supported environments to detect and operate at the current ring data rate.
- LED ring speed indicators.
- Intelligent Auto Install software for easy installation of NetWare 16-bit client drivers.
- Plug and Play for worry-free installation.
- Promiscuous mode support for Windows 95/98, Windows NT, and Novell NetWare drivers. While operating in this mode, the NIC receives and forwards all network packets that arrive (regardless of the node to which they are addressed), allowing you to easily identify and resolve problems on the network.
- DOS diagnostic programs to aid problem solving.
- Full connectivity with IBM AS/400 and mainframe computers, and compatibility with legacy IBM applications.
- Multicast filtering.

- CISPR B and FCC B certification for reduced electromagnetic interference when using either STP or UTP cables.
- On-board RJ-45 and DB-9 ports for connecting UTP or STP cables without using an external media filter.

Installation Overview

This section outlines the major steps for completing a 3C359B NIC installation. It also indicates the sections in this guide that can help you at each stage.

Follow these steps to successfully install and configure the 3C359B NIC.

1 **Insert the 3C359B NIC in a PCI bus master slot in your PC. Connect the NIC to a compatible network component using the appropriate cables.**

See Chapter 2, "Installing the 3C359B NIC," for detailed instructions. Chapter 2 also provides instructions for installing the Remote Wake-Up cable for PCs equipped to use this feature.

2 **Install the network driver that is appropriate for your PC's operating system environment from the *TokenDisk* diskettes or from the *TokenLink Velocity XL* CD.**

Driver installation instructions in this guide are organized by operating system environment. See the table of contents to locate the chapter containing the installation instructions appropriate for your environment.

3 **Configure features that are appropriate for your installation, if necessary. For example:**

- Auto Ring Speed Detection:

  Automatically enabled for all drivers, this feature can be disabled (recommended for servers) if necessary.

- Class of Service:

  Automatically disabled, this feature can be enabled for the NDIS 5 and NDIS 4 drivers running under Windows NT or Windows 98.

- Locally Administered Address (LAA):

  You can manually define an LAA that overrides the NIC's universal address encoded during manufacturing.

See feature configuration instructions in the chapter for your operating system environment.

4 Run diagnostics, if necessary.

If you experience problems during the installation process, you can check the configuration setup and test for physical NIC problems by running the DOS Configuration and Diagnostic Program, located on *TokenDisk* diskette 1 or in the \DISK_1 directory on the *TokenLink Velocity XL* CD.

See Chapter 6, "Troubleshooting," for instructions on using the Configuration and Diagnostic Program. This chapter also describes how to isolate and solve various hardware and network cabling problems.

2 INSTALLING THE 3C359B NIC

This chapter describes inserting the 3C359B NIC in a PC and connecting the PC to a network.

Installation Requirements

Installing the 3C359B NIC requires the following:

- A PCI-bus personal computer with an 80486, Pentium, or other Intel-compatible processor
- A 32-bit or 64-bit PCI expansion slot that supports bus mastering
- A high-density 3.5-inch disk drive or CD-ROM drive
- Category 3, 4, or 5 UTP cables, or type 1 or 6 STP cables
- *TokenDisk* diskettes 1 and 2 (or *TokenLink Velocity XL* CD) containing the Intelligent Auto Install program, network driver software, the DOS Configuration and Diagnostic Program, and online user documentation (CD only)

Safety Precautions

WARNING: *PCs operate with voltages that can be lethal. Before removing the cover, follow these steps to protect yourself and the PC.*

1. **Remove any diskettes and CDs from the computer's disk drives.**
2. **Turn off the PC and unplug it.**

CAUTION: *To avoid permanent damage to the NIC or other computer circuitry, always turn off the computer's power when inserting or removing the NIC.*

3. **Disconnect all cables that are connected to the computer.**
4. **Remove jewelry from your hands and wrists.**

5 **Reduce any static electricity on your body.**

Each NIC is packed in an antistatic container to protect it during shipment. To avoid damaging any static-sensitive components after removal from the container, be sure to reduce any static electricity on your body.

One way to reduce static electricity is to touch an unpainted part of the computer's metal chassis. You can maintain grounding by wearing an antistatic wrist strap attached to the chassis.

6 **Verify that your tools are nonconducting or insulated.**

Your tools should include a flat-head screwdriver and a Phillips-head screwdriver. To avoid permanent damage to the NIC or other computer circuitry, use only insulated or nonconducting tools.

Unpacking and Inspecting the 3C359B NIC

Before you install the 3C359B NIC, make sure that you have the following items:

- TokenLink Velocity XL PCI 3C359B NIC
- *TokenDisk* diskettes 1 and 2
- *TokenLink Velocity XL* CD
- Remote Wake-Up cable (optional; install this cable only if your PC supports Remote Wake-Up and you want to use this feature)
- *TokenLink Velocity XL PCI Network Interface Card User Guide* and *Quick Guide*

If any of these items are damaged or missing, contact your shipper or network supplier.

1 **Unpack the 3C359B NIC and remove it from its antistatic container.**

2 **Lay the NIC on its antistatic container.**

3 **Inspect the NIC for visible signs of damage.**

If you find damage, immediately notify your authorized network supplier and the carrier that delivered the NIC.

Retain the original packing materials. If it is necessary to return the 3C359B NIC to 3Com, pack it in the original (or equivalent) packing material to maintain the warranty.

4 **If you have purchased the separate Managed PC Boot Agent (MBA) accessory, install it in the 3C359B NIC's boot ROM socket according to instructions supplied with the MBA.**

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Inserting the 3C359B NIC

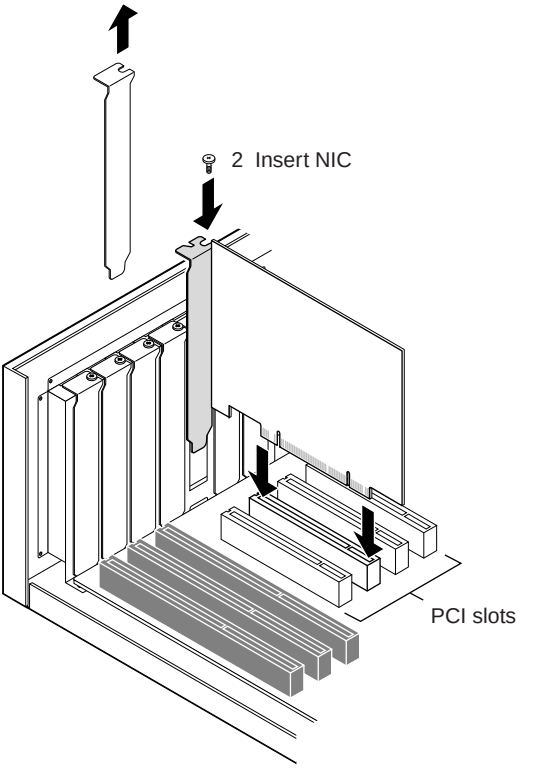
Follow these steps to insert the 3C359B NIC:

1 **Remove the computer's cover and select a PCI expansion slot that supports bus mastering.**

You can install the 3C359B NIC in either a standard bus master 32-bit slot, as shown in Figure 2 on page 26, or a newer bus master 64-bit slot. If both slot types are available in your PC, place the NIC in the 32-bit slot. Do not install the NIC in a *shared* PCI slot.

Verify that the selected slot is a PCI bus master slot by consulting your computer documentation, manufacturer, or vendor. Avoid any PCI slot next to an ISA slot. This is often a shared slot and does not support bus mastering.

Figure 2 Removing the Expansion Slot Cover



If you are planning to install the Remote Wake-Up cable, choose an empty PCI slot that is close to the 3-pin Remote Wake-Up connector on the PC motherboard.

2 **Unfasten and remove the expansion slot cover (Figure 2) from the selected bus master PCI slot.**

Store the expansion slot cover for future use, but retain the mounting screw for securing the NIC.

3 **Insert the 3C359B NIC in an empty PCI bus master slot and secure the mounting screw, as shown in Figure 2.**

Make sure the NIC is completely seated in the slot by pushing down firmly on both ends of the NIC. When the NIC is correctly seated, the gold connecting fingers inserted in the slot do not show.

Note the slot number of the NIC. You may need it during driver installation.

If you are installing the Remote Wake-Up cable, go to the next section, "Connecting the Remote Wake-Up Cable," to continue the installation. If you are not installing the cable, continue with step 4.

4 **Replace the unit's cover and reconnect any cables that you may have disconnected from other devices (see "Safety Precautions").**

Do not turn on the power to the PC.

5 **Go to "Connecting to the Network" later in this chapter.**

Connecting the Remote Wake-Up Cable

Connecting the Remote Wake-Up cable is optional. Connect this cable only if your PC supports Remote Wake-Up and you want to use this feature.

Your PC may conform to new PCI standards that eliminate the need for a Remote Wake-Up cable to deliver power to the 3C359B NIC. If your PC has PCI bus power management, then there is no need to install the cable. See your PC's system documentation for complete information.

***WARNING:** Make sure that the PC power cord is unplugged. Only properly trained and authorized personnel should perform service. Contact your PC manufacturer for information about safe service techniques.*

To connect the Remote Wake-Up cable:

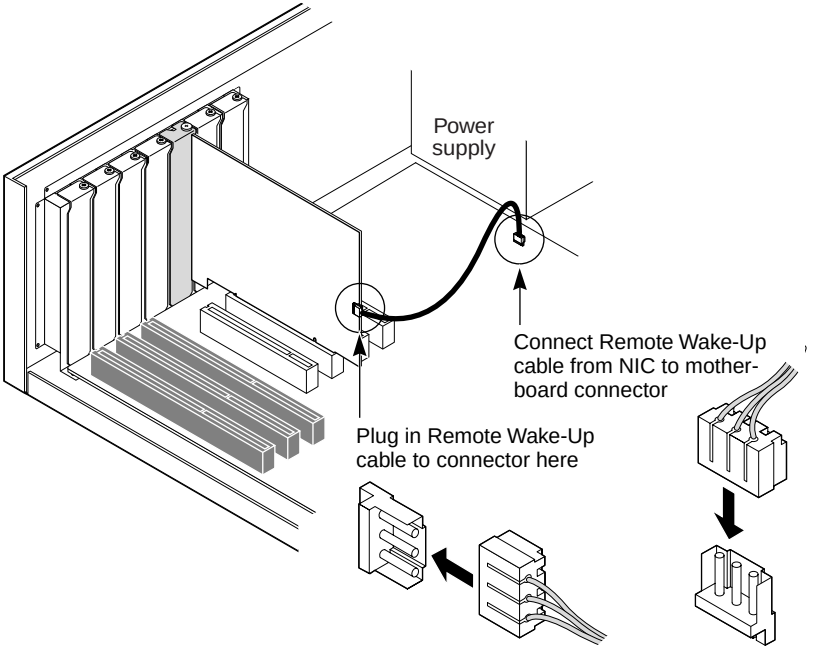
1 **Make sure that the NIC is properly installed in a PCI slot.**

2 **Insert the Remote Wake-Up cable included in your package into the connector on the NIC (see Figure 3).**

3 **Attach the cable to the connector on the PC motherboard (see Figure 3).**

Refer to your PC documentation if you need help with locating the connector.

Figure 3 Connecting the Remote Wake-Up Cable



4 Replace the PC cover.

Do not turn on the power to the PC.

Configuring the BIOS for Remote Wake-Up

To enable Remote Wake-Up (whether you use the cable or not), you must configure the PC's BIOS for Remote Wake-Up.

Do not configure the BIOS for Remote Wake-Up until you have connected to the network and completed loading the appropriate network driver as described later in this guide.

Your PC's BIOS typically contains user configurable settings for waking up the PC on Power Management Enable (PME) or LAN signals, settings which you can usually find under the Power or Boot categories of the BIOS. See your PC's reference guide or contact your PC vendor for instructions on accessing the BIOS.

Connecting to the Network

Follow these steps to connect the 3C359B NIC to the network:

1 **Connect one of the following network cable types to the 3C359B NIC:**

- Shielded twisted-pair (STP) cable with a DB-9 connector
- Unshielded twisted-pair (UTP) cable with an RJ-45 connector

The 3C359B NIC supports industry-standard token ring Category 3, 4 or 5 UTP or types 1 or 6 STP cabling. These cables meet IEEE 802.5 specifications. (See Appendix A, "Specifications," for detailed information regarding cable requirements and connector pin assignments for the 3C359B NIC.)

2 **Connect the other end of the cable to a network dual access unit (DAU), a multistation access unit (MAU), controlled access unit (CAU), or a token ring switch.**

The 3C359B NIC can operate in full-duplex (simultaneous send and receive) mode when attached to a Dedicated Token Ring (DTR)-enabled switch. Operating in full-duplex mode can optimize performance in switched environments by doubling the available bandwidth for high-powered PC's and servers running mission-critical applications.

Do not turn the power on until you are ready to install the network driver, as described in the following chapters. When power is turned on, the PCI system automatically configures the NIC.

3 NOVELL NETWARE ENVIRONMENTS

This chapter describes how to install a 3C359B NIC network device driver for various Novell NetWare network operating system environments.

Before you install a NetWare driver, make sure that the 3C359B NIC is inserted in the PC as described in Chapter 2.

Installing a DOS 16-Bit Client Driver

This section describes installing the DOS 16-bit client driver using two methods:

- Automatically, using the 3Com Intelligent Auto Install software utility
- Manually, using a NetWare installation utility and *TokenDisk* diskette or *TokenLink Velocity XL* CD

Installing a DOS 16-Bit Client Automatically

The 3Com Intelligent Auto Install software utility automatically configures one 3C359B NIC and installs the DOS 16-bit ODI client network driver for NetWare 3.12 and 4.1x systems. This section describes running the Intelligent Auto Install program.

Intelligent Auto Install Software Functions

Intelligent Auto Install software configures your PC as a NetWare DOS ODI client. The Intelligent Auto Install utility performs the following functions:

- Installs a DOS NetWare Universal Client Virtual Loadable Module (VLM) from *TokenDisk* diskette 1, or from the *TokenLink Velocity XL* CD.

The Intelligent Auto Install utility cannot be used to install multiple 3C359B NICs.

- Modifies the CONFIG.SYS, AUTOEXEC.BAT, and NET.CFG files. (The previous versions of these files are renamed CONFIG.3CM, AUTOEXEC.3CM, and NET.3CM.)

The Intelligent Auto Install utility is a DOS application. It cannot run in a Windows NT or Windows 95/98 DOS window, and it cannot be used to install an OS/2, Windows NT, or Windows 95/98 client. For these operating systems, use the manual installation procedure described later in this chapter.

Before Using the Intelligent Auto Install Utility

Make sure that the following steps have been performed before using the Intelligent Auto Install utility:

- The 3C359B NIC is installed in your DOS-based PC and is connected to the network.
- NetWare version 3.12 or 4.1x is installed on the server.
- A NetWare user account is available with a user ID and password.
- DOS version 3.2 or later is installed on the client PC, and the PC has been booted under DOS.
- The PC has at least 1 MB of free hard disk space.

Modifying Intelligent Auto Install Default Settings

Use the COMSLINK.CFG file to modify the Intelligent Auto Install process. The COMSLINK.CFG file in the \COMSLINK directory on *TokenDisk* diskette 1 (or on the *TokenLink Velocity XL* CD) contains default settings and descriptions of the COMSLINK parameters.

See the COMSLINK.TXT file in the \COMSLINK directory for information on customizing Intelligent Auto Install and server support.

Running the Intelligent Auto Install Program

The Intelligent Auto Install program loads the NetWare DOS ODI 16-bit client driver. To run the Intelligent Auto Install program, follow these steps:

1 **Install the 3C359B NIC and connect it to the network as described in Chapter 2.**

2 **Restart the PC from DOS, verifying that no network drivers are loaded.**

If you are using DOS version 6.x, press F5 after the "Starting MS-DOS..." message is displayed as DOS loads. This prevents any drivers or memory managers from loading. If you are using an earlier version of DOS, boot from a DOS diskette that does not contain drivers.

3 **If you are using the 3.5-inch diskettes, insert *TokenDisk* diskette 1 in the drive and enter:**

```
a:
```

If you are using the *TokenLink Velocity XL* CD, insert it in the CD-ROM drive and enter the drive letter. For example:

```
d:
```

4 **Enter:**

```
comslink
```

A COMSLINK window is displayed.

5 **From the COMSLINK Information window, press Enter.**

The first time you use Intelligent Auto Install (COMSLINK), the 3Com software license appears.

6 **To accept the terms and conditions, enter:**

```
y
```

To view the full text of the license agreement, press F1.

7 **When the information window appears, press Enter to continue.**

A status message appears, followed by a prompt for the ring speed of your network.

8 **Enter the ring speed.**

9 **When the auto installation process is finished, remove the *TokenDisk* diskette or *TokenLink Velocity XL CD* and restart your PC.**

The login prompt for a NetWare server appears.

10 **Log in to the NetWare server with your ID and password.**

Your PC is now configured as a NetWare DOS ODI client.

If you experience problems using Intelligent Auto Install, see the next section, "Intelligent Auto Install Troubleshooting." If you cannot connect to the NetWare server after running Intelligent Auto Install, see Chapter 6, "Troubleshooting."

Intelligent Auto Install Troubleshooting

If you experience problems when using the Intelligent Auto Install program, display or print the COMSLINK.LOG file, which contains a log of the events that occurred during the Intelligent Auto Install program installation and configuration process.

1. **To display the file, enter the following DOS command:**

   ```
   type comslink.log | more
   ```

2. **To print the file, connect to a local printer and enter:**

   ```
   copy comslink.log prn
   ```

   or

   ```
   print comslink.log
   ```

Installing a DOS 16-Bit Client Manually

If you did not use the Intelligent Auto Install utility, follow these steps to install the DOS 16-bit client driver for NetWare:

1. **Insert the *Novell NetWare Client for DOS and Microsoft Windows Disk* 1 and make that drive the active drive. For example, enter:**

   ```
   a:
   ```

2. **Enter the following command:**

   ```
   install
   ```

   Follow the displayed instructions as they appear.

3. **When prompted to select the driver for your network board, scroll down through the list titled *Network Boards*. Select *Other Drivers*, and press Enter.**

4. **If you are using the 3.5-inch *TokenDisk* diskettes, insert *TokenDisk* diskette 2 in the drive and make that drive the active drive. For example, enter:**

   ```
   a:
   ```

If you are using the *TokenLink Velocity XL* CD, insert it in the CD-ROM drive and enter the location of the DOS 16-bit client driver:

```
<drive>\disk_2\netware\nwclient
```

5 **Select *3Com TokenLink Velocity XL PCI* and press Enter.**

The program copies all relevant files and makes required changes to the AUTOEXEC.BAT and CONFIG.SYS files.

6 **Copy the microcode file TLNKP.MAC to the NetWare client directory on the hard drive.**

- If you are using the 3.5-inch *TokenDisk* diskettes, enter:

  ```
  copy a:\tlnkp.mac c:\nwclient
  ```

- If you are using the *TokenLink Velocity XL* CD, substitute the appropriate drive and DISK_2 designation in the path as follows:

  ```
  copy d:\disk_2\tlnkp.mac c:\nwclient
  ```

7 **Restart your PC to start the NetWare 16-bit client.**

This completes the procedure for manually installing a NetWare DOS 16-bit client driver.

Configuring the DOS 16-Bit Client Driver

You can edit the NET.CFG file to change the ring speed or transmit/receive mode. Follow these steps:

1 **Using a word processor or text editor, such as the DOS Editor, open the C:\NWCLIENT\NET.CFG file.**

2 **Scroll through the file and locate the following lines:**

```
LINK DRIVER TLNKPODI
```

3 **Add the appropriate keywords as shown below.**

```
LINK DRIVER TLNKPODI
   ringspeed <auto | 4 | 16>
   <classic | dtr>
```

where RINGSPEED AUTO forces the driver to detect the current ring speed and to connect at that speed. The default setting is AUTO. You do not need to specify the AUTO setting; it is automatically enabled. If the connection fails, try one of the other speed settings: 4 or 16. A setting of 4 forces the driver to always open the connection at

4 Mbps; a setting of 16 forces the driver to always open the connection at 16 Mbps.

The keyword CLASSIC sets the transmit/receive mode to the half-duplex Token Passing Protocol (TKP). The keyword DTR sets the transmit/receive mode to the full-duplex Transmit Immediate Protocol (TXI). Operating in TXI mode is recommended; if full-duplex mode fails, try TKP mode.

Installing DOS Client32

This section describes installing the TLNKPODI.LAN DOS Client32 driver for a NetWare Client32 environment. For the driver installation procedure, you need the Novell Client32 diskettes and either the *TokenLink Velocity XL* CD or *TokenDisk* diskette 2.

1. **Insert the Novell Client32 setup diskette 1 into a drive, switch to that drive, and enter the Install command. For example, if the diskette is in drive A, enter:**

   ```
   a:\install
   ```

2. **Read the Novell information window and press Enter.**

   The displayed window lists installation options.

3. **Use the arrow keys to move to the options you need. Press the spacebar to select the option.**

   The system prompts you for configuration information.

4. **Confirm the configuration and press Enter.**

5. **If your configuration requires TCP/IP, supply the IP Address, Router, Subnet Mask, DNS Domain, and Domain Name Server Address. Press Enter.**

6. **When prompted for the LAN Driver type, select 32-bit and press Enter.**

   The 32-bit Network Board Drivers window is displayed.

7. **When prompted to select the driver, scroll to *User specified 32-bit driver*.**

8. **Insert *TokenDisk* diskette 2 in the drive or the *TokenLink Velocity XL* CD in the CD-ROM drive.**

- If you are using the *TokenDisk diskette* (in Drive A for example), enter the following path:

  a:\netware\client32

- If you are using the *TokenLink Velocity XL* CD (in Drive D for example), enter the following path using the appropriate DISK_2 designation as follows:

  d:\disk_2\netware\client32

9 **Select *TokenLink Velocity XL PCI* and press Enter.**

The system allows you to change the configuration.

10 **To change a parameter, select it and press Enter. Type the new value. When you are finished changing parameters, press Enter.**

11 **When the path for the configuration files is displayed, verify that the path is correct and press Enter.**

12 **Press Enter again to return to DOS and edit the STARTNET.BAT file.**

13 **Add the NIC's slot number in the STARTNET.BAT file as follows:**

load c:\novell\client32\tlnkpodi.lan frame=token-ring msb slot=<nnnn>

where <nnnn> is the slot number.

If you do not know your NIC's slot number, you can turn off your PC, remove the cover, and check the slot.

14 **On the same LOAD line, you can set the NIC's ring speed as follows.**

load c:\novell\client32\tlnkpodi.lan...ringspeed=<auto | 4 | 16>

where <auto | 4 | 16> is the ring speed setting:

- **Auto** — Allows the NIC to automatically detect the ring speed. (This is the default setting.)
- **4** — Disables auto ring speed detection and sets the NIC ring speed at 4 Mbps.
- **16** — Disables auto ring speed detection and sets the NIC ring speed at 16 Mbps.

15 **Restart your workstation to start Client32.**

The system prompts you for the 3C359B NIC's slot when the TLNKPODI.LAN driver is loaded.

Installing an OS/2 Client Driver for NetWare

This section describes installing the driver for an OS/2 client. Before installing the OS/2 ODI driver from the *TokenDisk* diskette or *TokenLink Velocity XL* CD, ensure that the OS/2 operating system is installed and that the computer boots without errors. Install the 3C359B NIC as described in Chapter 2.

The Novell NetWare OS/2 ODI driver (TLNKPODI.SYS) is available on the *TokenLink Velocity XL* CD or *TokenDisk* diskette 1.

Selecting the Appropriate NIC Address

Before starting the OS/2 ODI client driver installation process, you should decide whether the 3C359B NIC will use the universal address or a locally administered address.

- **Universal address (UAA)—**A default address for the NIC. It is encoded on the NIC during manufacturing and is often called the "burned-in" address. For example: 00600891CCA8.
- **Locally administered address (LAA)—**A user-assigned address that overrides the NIC's universal address. This address must consist of 12 hexadecimal digits and must be unique throughout the network. Check with your network administrator for the appropriate address.

Avoid using the following sets of addresses: 40 00 xx xx xx xx, 7F FF xx xx xx xx, C0 00 xx xx xx xx, FF FF xx xx xx xx (where x is any hexadecimal value). Using these sets may cause a duplicate address test (DAT) failure, or incorrect recognition as a broadcast address.

Displaying the Universal Address

The Configuration and Diagnostic Program displays the 3C359B NIC's universal address. Follow these steps to display the universal address:

1 **Boot from a DOS diskette to run the diagnostic program. Display the DOS prompt.**

2 **If you are using the 3.5-inch *TokenDisk* diskettes, insert *TokenDisk* diskette 1 in the drive and make that drive the active drive. For example, enter:**

```
a:
```

If you are using the *TokenLink Velocity XL* CD (in Drive D for example), enter the following path:

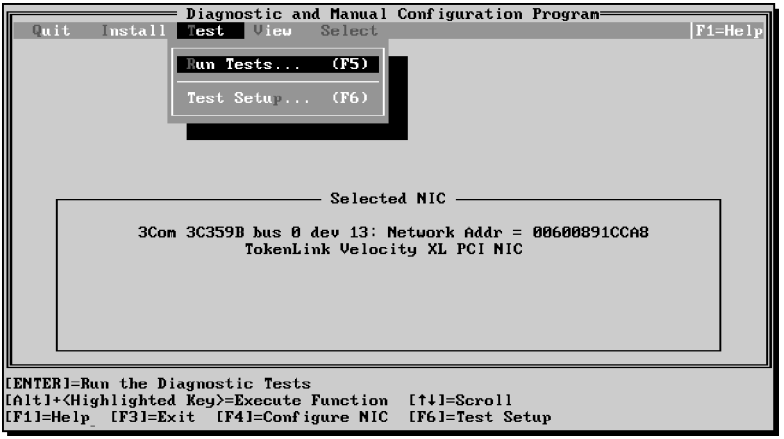
```
d:\disk_1
```

3 **Enter the following command:**

```
3pcid
```

The Configuration and Diagnostic Program window is displayed as shown in Figure 4.

Figure 4 Configuration and Diagnostic Program Window



4 **Record for future reference the 12-digit universal token ring address displayed on the Diagnostic and Configuration Program window (Figure 4). For example:**

```
Network Addr = 00600891CCA8
```

Next, continue with the next section to install Novell OS/2 Requester and the ODI LAN driver TLNKPODI.SYS.

Installing the Novell OS/2 Requester

Follow these steps to install Novell OS/2 Requester and the ODI LAN driver TLNKPODI.SYS:

1. **Insert the Novell *OS/2 Requester* diskette, WSOS2_1, in the drive.**
2. **At the OS/2 Full Screen prompt, make the drive containing the diskette the active drive. For example, enter:**

   ```
   a:
   ```

3. **At the A: prompt, enter:**

   ```
   install
   ```

   A *NetWare Workstation for OS/2 Installation Utility* menu appears.
4. **Select *Installation* from the menu and then *Requester on Workstation*.**
5. **Select a target directory for the Requester files. The default is C:\NETWARE. Select *OK*.**

   A new menu appears with four options:

   - Edit CONFIG.SYS and Copy All Files (default)
   - Only Edit CONFIG.SYS
   - Only Copy Requester Files
   - Only Copy ODI LAN Driver Files

6. **From this menu, select the option *Edit CONFIG.SYS and Copy All Files* and then select *OK*.**

   A dialog box appears, asking for an ODI LAN driver and presenting two options:

   - Do not upgrade the currently installed LAN driver
   - Choose from the list or type a driver name

7. **Enter the driver name for the *Token Velocity XL* PCI NIC:**

   ```
   tlnkpodi.sys
   ```

8. **When prompted, select the default configuration:**

   ```
   IPX Support for DOS or Windows (OFF)
   ```

9 Select *CONTINUE*.

A new menu appears with three optional protocols:

- SPX Support for OS/2 Sessions
- NetBIOS Emulation for OS/2 Sessions
- Remote Named Pipe Support

10 Select the appropriate protocol and save the configuration.

If no additional protocols are needed, do not select any of the three options. Bypass this section by choosing Save the configuration.

A new menu appears, asking if you want to save changes to the CONFIG.SYS file.

11 Save the file as C:\CONFIG.SYS and click *OK* to continue.

A new window appears, confirming that you want all files copied to C:\NETWARE.

12 Click *COPY* and follow the displayed instructions.

Continue the installation and insert the appropriate *OS/2 Requester* diskettes when prompted.

After the *OS/2 Utility* diskette is installed, a window appears that requests information about the ODI LAN drivers. The default ODI LAN driver is TLNKPODI.SYS.

13 Insert *TokenDisk* diskette 1 or the *TokenLink Velocity XL* CD in the appropriate drive.

14 Select *Copy Only the Default Driver* and click *OK*.

If you inserted the *TokenLink Velocity XL* CD at step 13, you must specify the location of TLNKPODI.SYS as follows:

```
d:\disk_1
```

15 Follow the displayed installation instructions and insert the appropriate *OS/2 Requester* diskettes when prompted.

When the installation is complete, a menu appears with the following menu bar items:

- Installation
- Configuration
- Utilities

- Readme
- Help

A message is displayed, stating that the installation process is complete. Follow the instructions, and continue with configuration steps in the following section.

Configuring the Novell OS/2 Requester

When you have followed the displayed instructions at the end of the Novell OS/2 Requester installation process, a message appears concerning certain configuration requirements.

After reading the message regarding configuration requirements, follow these steps:

1. **Click the *Configuration* menu bar item and select *"This Workstation..."* to check the NET.CFG file for the proper NIC configuration.**
2. **Verify the link driver header, node address, and frame type.**

   Your NET.CFG file should look similar to the following:

   ```
   LINK DRIVER TLNKPODI
      Node Address 00608C112233
      Frame Token-Ring MSB
      Frame Token-Ring_SNAP MSB
   ```

   The node address should be set to the UAA or the LAA. Modify and save the NET.CFG file if the node address and frame type are not correct.
3. **Remove the *OS/2 Requester* diskette and restart the PC.**

   This completes the procedure for installing the OS/2 client driver for NetWare.

Installing a NetWare Server Driver

This section contains information about installing the TLNKPODI.LAN NetWare server driver for the 3C359B NIC in the following environments:

- NetWare 3.12
- NetWare 4.1x
- NetWare 5.0

The driver and associated files are located in the \NETWARE\NWSERVER directory on *TokenDisk* diskette 2, or in the \DISK_2\NETWARE\NWSERVER directory on the *TokenLink Velocity XL* CD.

Driver Support

The TLNKPODI server driver is a high-performance NetWare 4.1x-compliant server driver. It can be used in the following environments:

- NetWare 5.0 servers
- NetWare 4.1x servers
- NetWare 3.12 servers
- NetWare servers running SFT III in NetWare 4.1 (as an IPX link, not as a mirrored server link)

The term "NetWare 4.1x-compliant" server driver in this file means that the HSM (hardware-specific module, or server driver) meets the Open Data-Link Interface (ODI) 3.3 specification. Netware 3.12 servers using ODI 3.3 drivers need updated files from Novell. If you are installing the driver in a NetWare 3.12 server, download the LANDR9 and 312PTA.EXE files from Novell's Web site.

Installation Instructions

This section has instructions for installing TLNKPODI in three ways:

- On a file server in an existing NetWare environment running NetWare 3.12 or 4.1x. These instructions also apply to a new installation or upgrade to NetWare 3.12.
- As part of a new NetWare 4.1x installation or an upgrade to NetWare 4.1x.
- As part of an upgrade to NetWare 5.0.

Instructions in this section are written for TokenDisk *diskettes. If you are using the* TokenLink Velocity XL *CD, substitute the appropriate path (using the \DISK_2 designation at the start of the path) where required.*

Installing the Driver in an Existing NetWare Environment

This section explains how to install TLNKPODI on a file server already running NetWare 3.12 or 4.1x. The instructions in this section should also be used for a new NetWare 3.12 installation or an upgrade to NetWare 3.12.

If you are in the process of upgrading to NetWare 4.1x, proceed to "Installing the Driver as Part of a New Server Installation or Upgrade to NetWare 4.1x."

If you are in the process of upgrading to NetWare 5.0, proceed to "Installing the Driver as an Upgrade to NetWare 5.0."

TokenDisk diskette 2 contains the server driver and versions of Novell NetWare Loadable Modules (NLMs) required for all NetWare 4.1x-compliant server drivers. You must use these NLMs, or more recent versions, with TLNKPODI.

Table 3 shows the names, locations, and versions of the support modules.

Table 3 Location of NetWare Support Modules

NetWare Version	Directory
4.1x or 5.0	\NETWARE\NWSERVER\41x_5.0\MSM.NLM \NETWARE\NWSERVER\41x_5.0\NBI.NLM \NETWARE\NWSERVER\41x_5.0\TLNKPODI.INF \NETWARE\NWSERVER\41x_5.0\TLNKPODI.LAN \NETWARE\NWSERVER\41x_5.0\TLNKPODI.LDI \NETWARE\NWSERVER\41x_5.0\TOKENTSM.NLM
3.12	\NETWARE\NWSERVER\3.12\MSM31X.NLM \NETWARE\NWSERVER\3.12\NBI31X.NLM \NETWARE\NWSERVER\3.12\TLNKPODI.LAN \NETWARE\NWSERVER\3.12\TOKENTSM.NLM

Deciding If Modules Need to Be Replaced At the server command prompt, enter MODULES. The resulting display shows what drivers and modules are currently running on the server. Locate the entries for MSM.NLM and TOKENTSM.NLM. (MSM31X.NLM appears as MSM.NLM.)

If any of the versions currently running is earlier than 2.50, you must replace modules MSM31X.NLM, MSM.NLM, or TOKENTSM.NLM.

The modules on *TokenDisk* diskette 2 (or in the \DISK_2 directory on the *TokenLink Velocity* CD) are version 2.50. You can load the server driver as described later in this chapter in "Using the LOAD Command."

CAUTION: *Using versions of MSM.NLM, MSM31X.NLM, and TOKENTSM.NLM earlier than 2.50 with TLNKPODI.LAN prevents the driver from loading.*

Replacing Support Modules To replace support modules with more recent versions, use the steps below to load the support modules from the *TokenDisk* diskette and copy them to the file server.

Instructions in this section are written for TokenDisk *diskettes. If you are using the* TokenLink Velocity XL *CD, substitute the appropriate path (using the \DISK_2 designation at the start of the path) where required.*

1. **Use the Unload command from the console command prompt to unload any existing server drivers that depend on the support modules you need to replace.**

   This command will completely unload the drivers from memory and will terminate communication with currently attached network users.

   The format of the command is:

   ```
   unload <driver_name>
   ```

2. **Unload the support modules by entering the commands in the order shown below:**

   ```
   unload tokentsm
   unload msm
   ```

3. **Load the support modules from *TokenDisk* diskette 2. Enter the following commands when the diskette is in drive A. Use a different drive if necessary:**

   NetWare 4.1x and 5.0 servers:

   ```
   load a:\netware\nwserver\41x_5.0\nbi
   load a:\netware\nwserver\41x_5.0\msm
   load a:\netware\nwserver\41x_5.0\tokentsm
   ```

   NetWare 3.12 servers:

   ```
   load a:\netware\nwserver\3.12\nbi31x
   load a:\netware\nwserver\3.12\msm31x
   load a:\netware\nwserver\3.12\tokentsm
   load a:\netware\nwserver\3.12\monitor
   ```

Copying Support Modules and the Driver to the File Server This section explains how to copy support modules and TLNKPODI.LAN to the file server. If you have replaced existing support modules, follow this procedure, so that the most current versions of the support modules load whenever you load a server driver.

The SYS volume on the file server must be mounted, you must have rights to copy files to the SYS:SYSTEM directory, and at least one server driver must be loaded and bound to a protocol.

Instructions in this section are written for TokenDisk *diskettes. If you are using the* TokenLink Velocity XL *CD, substitute the appropriate path (using the \DISK_2 designation at the start of the path) where required.*

1 **Locate a workstation with a diskette drive. This workstation must allow you to log in to the file server to which you will copy the NLMs.**

2 **Log in to the file server. Insert *TokenDisk* diskette 2 in the drive and copy the support files to the server.**

If drive F is mapped to the SYS volume, the sample commands shown below copy files from a diskette in the workstation's drive A to a NetWare 4.1x file server:

```
copy a:\netware\nwserver\41x_5.0\msm.nlm
f:\system
copy a:\netware\nwserver\41x_5.0\tokentsm.nlm
f:\system
```

3 **Enter the following command to copy the TLNKPODI.LAN server driver to F:SYS:SYSTEM:**

```
copy a:\netware\nwserver\41x_5.0\tlnkpodi.lan
f:\system
```

Using the LOAD Command You can enter the LOAD command from the server's console command prompt or you can include it in your AUTOEXEC.NCF file to load the driver automatically when you start the SERVER program. The format of the command is shown below:

```
load <path>\tlnkpodi <parameter_list>
```

where <path> is the full pathname to the location of TLNKPODI.LAN, if it is not at SYS:SYSTEM.

Each LOAD command must be entered on a separate, single line.

Table 4 summarizes the Load parameters that can be used with TLNKPODI.LAN. Detailed descriptions of the parameters begin after the table.

Table 4 TLNKPODI.LAN Load Parameters

Parameter	Units	Supported Values	Description
SLOT=	Decimal	Value assigned by PCI BIOS	Sets the slot number prompts.
FRAME=	Text	TOKEN-RING	Specifies the frame types supported on the network. Default = TOKEN-RING
NODE=	Hex	See detailed description in text.	Overrides the default node ID. Default = stored on board the NIC
NAME=	Any	N/A	Sets the optional logical board name (17 characters maximum). Default = absent

SLOT=<value> Required if there is more than one 3C359B NIC installed in the server; you will be prompted to supply a value if you do not enter one. This parameter specifies the slot number for the NIC. The slot number is automatically assigned by the PCI BIOS.

There are two ways you can supply a slot number for the NIC:

- Enter a value when prompted by the server.
- Manually find the slot number by loading the driver as described later in this chapter in "Finding the Slot Number Manually."

Regardless of the method you choose, you must supply a slot number for each 3C359B NIC installed in the server. Once you have noted the slot number of each NIC, you can include the LOAD and BIND commands in the server's AUTOEXEC.NCF file so the driver will be automatically loaded when you start the SERVER program.

After a server driver has been loaded, you can view the configuration of each driver (including LOAD command

parameters) using the CONFIG command from the server console command prompt.

At system boot, the PCI BIOS determines slot numbers for all PCI NICs. Adding or removing PCI NICs can cause the slot numbers of all other PCI NICs to change. Therefore, after adding or removing PCI NICs in your machine, you should verify the slot numbers used by all PCI NICs (including the 3C359B NIC) and change the LOAD command SLOT= parameters for them accordingly.

FRAME=<type> Specifies the frame type used by this logical board. (A "logical board" means a particular instance of loading the server driver.)

You do not need to include this parameter if you will be using only the default frame type, TOKEN-RING. But you must make sure the server driver is configured for all frame types used on the network.

If you want to use both frame types, you must load the driver twice, as shown below:

```
load tlknpodi slot=<value> frame=token-ring
load tlknpodi slot=<value>
frame=token-ring_snap
```

NODE=<node-ID> Specifies that the locally administered node ID parameter overrides the default globally administered node ID stored on the NIC. The node IP is a hexadecimal number in the range of locally administered node IDs permitted under IEEE guidelines. The node address you select must be unique. For example:

```
node=4000123AB678
```

Check with your network administrator for the appropriate address.

Avoid using the following sets of addresses: 40 00 xx xx xx xx, 7F FF xx xx xx xx, C0 00 xx xx xx xx, FF FF xx xx xx xx (where x is any hexadecimal value). Using these sets may cause a duplicate address test (DAT) failure, or incorrect recognition as a broadcast address.

NAME=<name> An optional name for identifying this logical board. NAME is commonly used when you bind a protocol to the driver. This parameter is limited to 17 alphanumeric characters and must be unique among all logical boards in the file server.

Finding the Slot Number Manually This section shows how to manually determine the slot numbers of two 3C359B NICs installed in a file server. You do not need to take these actions if you want to enter the slot numbers when prompted by the server.

The samples below show the server console display when two 3C359B NICs are installed.

This is the LOAD/BIND sequence for the first of two NICs:

```
FS1:load c:tlnkpodi
Loading module tlnkpodi.lan
   3Com TokenLink PCI Server MLID
   Version 1.00c [date]
   (C) Copyright 1993-97, 3Com Corp. All
   rights reserved
Supported slot values are 1,2
Slot: 1
Data Rate = 16 Mbps.
Max Packet Size = 17954
IO Address Base = F480
Memory Basic Address = FF9EFE800
IRQ = 10
Number of transmit buffers (DPDs) configured = 5.
Number of receive buffers (UPDs) configured = 3.
MicroCode Version String = 01.20 10/20/97
```

The supported slot values shown are for the two 3C359B NICs in the server. The next line is where you enter the address that you will use.

This is the LOAD/BIND sequence for the second of two NICs:

```
FS1:load c:tlnkpodi
Do you want to add another frame type for a
previously loaded board? n
Supported slot values are 4
Slot: 4
Data Rate = 16 Mbps.
```

```
Max Packet Size = 17954
IO Address Base = EC80
Memory Basic Address = FFDFFC00
IRQ = 11
Select board to bind:2
IPX LAN protocol bound to 3Com 3Com TokenLink
PCI Server MLID FS1:
```

Once you have determined the values for the NICs installed in the server, you can use the SLOT= parameter to load the driver either from the command line or by placing the LOAD command in the AUTOEXEC.NCF file to load automatically each time the server is started.

Using the BIND Command After loading the driver, use the BIND command to bind each NIC to a protocol. Enter the command from the server console command prompt, or include the command in the AUTOEXEC.NCF file to automatically bind the driver when you start the SERVER program.

```
bind {ipx | ip} [to] <name | drivername>
       {net=<number> | addr=<number>}
```

IPX | IP The name of the protocol to which you are binding the driver (IPX or IP). If you specify IP, other parameters are required; consult your TCP/IP documentation for more information.

NAME (Optional.) The name you assigned to the logical board with the Load command. If you use a logical board name, do not specify DRIVERNAME.

DRIVERNAME The name of the driver you are using. Do not use DRIVERNAME if you assigned a logical board name with the NAME parameter.

NET=<number> (IPX protocol only.) The unique IPX internal network number you have assigned to this network. It is a hexadecimal number up to eight characters long. For example:

```
net=5A
```

ADDR=<number> (TCP/IP protocol only.) The NIC's network address. The address must be unique on the internetwork. For example:

```
addr=192.45.67.8
```

To view the current configuration, enter the CONFIG command at the server's console command prompt.

Installing the Driver as Part of a New Server Installation or Upgrade to NetWare 4.1x

This section has instructions for loading TLNKPODI.LAN as part of a new NetWare server installation or an upgrade to NetWare 4.1x. The procedure shows the essential steps for installing the server driver only. For most installations, other steps will be required; consult your Novell documentation for information about any procedures not described below.

Instructions in this section are written for TokenDisk *diskettes. If you are using the* TokenLink Velocity XL *CD, substitute the appropriate path (using the \DISK_2 designation at the start of the path) where required.*

1. **At the *Load LAN Driver* menu, insert *TokenDisk* diskette 2 into the drive and press Alt+Esc to switch from the Install program to the server console command prompt.**

2. **Enter the following commands at the server console command prompt:**

   ```
   unload tokentsm
   unload msm
   ```

3. **From *TokenDisk* diskette 2, load the support modules required to run the server driver. Enter the following commands at the server console command prompt in the order shown:**

   ```
   load a:\netware\nwserver\41x_5.0\nbi
   load a:\netware\nwserver\41x_5.0\msm
   load a:\netware\nwserver\41x_5.0\tokentsm
   ```

   Typically, the modules that ship with NetWare 4.1x are an earlier version than 2.50. It is recommended that you use MSM.NLM and TOKENTSM.NLM version 2.50 or later with TLNKPODI.LAN.

4. **Press Alt+Esc to return to the Install program.**
5. **Press Insert to load an unlisted LAN driver, and then follow the prompts to specify the driver load path.**
6. **At the next menu, enter the following path:**

   `a:\netware\nwserver\41x_5.0`

   After a short delay, a menu appears, showing the TLNKPODI.LAN driver.
7. **Press Enter to select the TLNKPODI.LAN driver.**
8. **When asked if you want to copy the driver (to SYS:SYSTEM), respond Yes.**

   The next menu shows the parameters that can be used with the 3C359B token ring NIC driver.
9. **Press Enter to view a list of supported options for the selected parameter.**

   Additional help for the parameter is also displayed in the lower text box. You can also find a description of parameters and explanations earlier in this chapter in "Using the LOAD Command."
10. **After you have made selections for all 3C359B NIC driver parameters, press F10 to save the parameters and load TLNKPODI.LAN. Then follow the prompts to complete the server installation.**
11. **After completing the installation, copy the support modules MSM.NLM and TOKENTSM.NLM from *TokenDisk* diskette 2 to the server's SYS:SYSTEM directory.**

    Doing so causes the support modules to be auto-loaded by any of the server drivers, such as TLNKPODI.LAN. See "Copying Support Modules and the Driver to the File Server" earlier in this chapter for instructions.

Installing the Driver as an Upgrade to NetWare 5.0

This section has instructions for loading TLNKPODI.LAN as part of an upgrade to NetWare 5.0. The procedure shows the essential steps for upgrading the server driver only. For most upgrades, other steps will be required; consult your Novell documentation for information about any procedures not described below.

Instructions in this section are written for TokenDisk *diskettes. If you are using the* TokenLink Velocity XL *CD, substitute the appropriate path (using the \DISK_2 designation at the start of the path) where required.*

1. **At the *Load LAN Driver* menu, insert *TokenDisk* diskette 2 into the drive.**
2. **Press Insert to load an unlisted LAN driver, and then follow the prompts to specify the driver load path.**
3. **At the next menu, enter the following path:**

   `a:\netware\nwserver\41x_5.0`

   After a short delay, a menu appears, showing the TLNKPODI.LAN driver.
4. **Press Enter to select the TLNKPODI.LAN driver.**
5. **When asked if you want to copy the driver (to SYS:SYSTEM), respond Yes.**

   The next menu shows the parameters that can be used with the 3C359B token ring NIC driver.
6. **Press Enter to view a list of supported options for the selected parameter.**

   Additional help for the parameter is also displayed in the lower text box. You can also find a description of parameters and explanations earlier in this chapter in "Using the LOAD Command."
7. **After you have made selections for all 3C359B NIC driver parameters, press F10 to save the parameters and load TLNKPODI.LAN. Then follow the prompts to complete the server installation.**

UNBIND and UNLOAD Commands

You can use the UNBIND or UNLOAD commands to remove a driver (or logical board). The commands have the format shown below:

```
unbind ipx tlnkpodi <name>
unload tlnkpodi
```

The UNBIND command requires only that you reenter the BIND command, and does not affect the LOAD command. You can selectively unbind a protocol for a

particular logical board by specifying a board name, as shown in the command sample.

The UNLOAD command completely unloads the driver from memory. If you wish to reload the driver, you will be required to use the LOAD and BIND commands.

4 MICROSOFT WINDOWS ENVIRONMENT

This chapter describes how to install a 3C359B NIC network device driver for various Microsoft Windows environments.

Drivers Available for Windows

3Com provides the following network device drivers for the 3C359B NIC in these Microsoft Windows environments:

- Network Driver Interface Specification (NDIS) 5 miniport driver
- NDIS 4 miniport driver
- NDIS 3 miniport driver

NDIS 5 Miniport Driver

The NDIS 5 driver conforms to Microsoft's latest NDIS 5.0 miniport specification and supports the following Windows environments:

- Windows 98
- Windows 2000

The NDIS 5 driver provides the following 3C359B NIC capabilities:

- Dynamic*Access* Class of Service (Traffic Prioritization)
- Auto ring speed detection
- Promiscuous mode
- Locally administered network address (LAA) selection

Class of Service is disabled by default. You can enable this Dynamic*Access* feature during installation.

Auto ring speed detection is enabled by default during NDIS 5 driver installation. You can disable this feature during installation if desired.

Promiscuous mode is automatically enabled and controlled for the 3C359B NIC by applications that require this feature. No user control is necessary.

You can assign a locally administered address (LAA) that overrides the NIC's universal address "burned-in" during manufacturing.

NDIS 4 Miniport Driver

The NDIS 4 driver conforms to Microsoft's NDIS 4.0 miniport specification and supports the following Windows environments:

- Windows 95 (version 950b, OSR2)
- Windows 98
- Windows NT 4.0

The NDIS 4 driver supports all the 3C359B NIC features listed in the preceding section for the NDIS 5 driver.

NDIS 3 Miniport Driver

The NDIS 3 miniport driver is compatible with Microsoft's NDIS 3.x miniport specification, and supports the following Windows environments:

- Windows 95 (version 950 and version 950b, OSR2)
- Windows NT 3.51

*The NDIS 3 driver supports all the 3C359B NIC features listed in the preceding section for the NDIS 5 and NDIS 4 drivers except Dynamic*Access *Class of Service.*

Installing a 3C359B NIC Driver for Windows Environments

This section describes installing drivers for the following operating system environments:

- Windows 98
- Windows 95 version 950
- Windows 95 version 950b (OSR2)
- Windows NT 4.0
- Windows NT 3.51

Before Installing a Windows Driver

Before you install a Windows driver, make sure that the 3C359B NIC is inserted in the PC as described in Chapter 2, and that Windows is installed.

Have the Windows software accessible on diskettes, CD, or hard drive in case the installation utility requests protocol files from the Windows software library.

If your network environment uses the TCP/IP communications protocol, you must obtain from your network administrator all the information you will need to define an IP address during the installation process.

3Com recommends that you use the NetBEUI or TCP/IP protocol stacks when installing the 3C359B NIC in a Windows 95 client attaching to a Windows NT server.

Installing a Driver for Windows 98

To install the network driver in a PC running Windows 98:

1. **Make sure that the NIC is installed in your PC and that it is connected to the network, as described in Chapter 2.**
2. **Turn on the power to the PC.**

   Windows 98 detects the NIC. The Add New Hardware Wizard (Figure 5) starts.

Figure 5 Add New Hardware Wizard

3 **If you are using the 3.5-inch diskettes, insert *TokenDisk* diskette 1 in the drive, and then click *Next*. If you are using the *TokenLink Velocity* CD, insert it in the CD-ROM drive, and then click *Next*.**

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

5 **If you are using the 3.5-inch diskettes, select *Floppy disk drives*, and then click *Next*. If you are using the *TokenLink Velocity* CD, select *CD-ROM drives*, and then click *Next*.**

Windows finds the driver file for the device.

6 **Click *Next*.**

Files are copied.

If the Insert Disk window appears, prompting you to insert the *TokenDisk* diskette, click *OK*.

You're prompted for the Windows 98 CD.

7 **Insert the Windows 98 CD in the CD-ROM drive, and then click *OK*.**

If you don't have the Windows 98 CD, click *OK*. Enter the path for the Windows 98 installation files on your PC in the Copying Files entry box.

Files are copied. The installation is complete when you're prompted to click *Finish*.

8 **Click *Finish*.**

You're prompted to restart the PC.

9 **Click *Yes* to restart the PC.**

You must reboot your PC to complete the installation.

The driver installation for Windows 98 is complete. To confirm successful installation, see "Verifying Successful Installation" on page 65.

To disable auto ring speed detection and manually select the ring speed, see "Setting Ring Speed for Windows 95/98" on page 66 for more details.

To define a locally administered network address, see "Defining the LAA Address for Windows 95/98" on page 72 for more details.

To select applications for high-priority network access, see "Configuring Class of Service" on page 78 for more details.

Installing a Driver for Windows 95

This section describes installing the 3C359B NIC NDIS 4 driver or NDIS 3 driver for the following Microsoft Windows 95 versions:

- Version 950 (950a, or "retail" version)
- Version 950b (OEM Service Release 2, or OSR2)

About Microsoft Windows 95 Versions

The 3C359B NIC NDIS 4 driver installation procedures differ depending on the Windows 95 version installed on your PC.

Version 950 of Windows 95 If your PC did not come with Windows 95 already installed, you must install version 950 of Windows 95 (950a, or "retail" version) before you install the driver. Version 950 of Windows 95 is designed to upgrade Windows 3.x PCs.

Version 950b (OSR2) of Windows 95 Some PCs are sold with a special Windows 95 version already installed. Windows 95 OEM Service Release 2 (OSR2) is version 950b of Windows 95. An OEM Service Release is an updated version of a Microsoft product for PC original equipment manufacturers (OEMs) to preinstall on new PCs. Windows 95 version 950b contains some new hardware support and programs.

Finding the Windows 95 Version To determine which Windows 95 version you are using, open the Control Panel, select *System*, and read the System information under the General tab. If your release is version 4.00.950 (or 4.00.950a), you are using the "retail" version of Windows 95 (version 950). If your release is version 4.00.950b, you are using the OSR2 version of Windows 95 (version 950b).

Installing a Driver for Windows 95 Version 950

Follow these steps to install the NDIS 3 driver for Windows 95 (version 950). It is assumed that you have completed the 3C359B NIC installation procedure described in Chapter 2.

1 **Turn on the computer and start Windows 95.**

Windows 95 automatically detects the new hardware in the PC. Windows 95 displays the New Hardware Found window.

2 **Select *Driver from disk provided by hardware manufacturer* and click *OK*.**

Windows 95 displays the Install from Disk dialog box, which prompts you to insert the appropriate disk and to enter the directory location for the NDIS 3 driver.

3 **If you are using the 3.5-inch diskettes, insert *TokenDisk* diskette 2 in the drive. If you are using the *TokenLink Velocity XL* CD, insert it in the CD-ROM drive.**

4 **At the prompt, enter the appropriate path for the drive containing your *TokenDisk* diskette or *TokenLink Velocity XL* CD and the NDIS 3 driver.**

- If you are using the 3.5-inch *TokenDisk* diskettes, enter:

  `a:`

- If you are using the *TokenLink Velocity XL* CD, substitute the appropriate drive (drive D, for example) and the DISK_2 designation in the path as follows:

  `d:\disk_2`

5 **Click *OK*.**

If Windows 95 prompts you to insert the Windows 95 CD or diskettes to obtain files from the Windows 95 software library, insert the appropriate diskette or CD and continue as directed by the prompts.

6 **When the setup file has been read, select *TokenLink Velocity XL PCI Adapter* on the list and click *OK*.**

Windows 95 imports the driver, and the driver installation is complete.

7 Remove the *TokenDisk* diskette or *TokenLink Velocity XL* CD and restart your computer.

This concludes the procedure for installing the NDIS 3 driver for Windows 95 (version 950). To confirm successful installation, see "Verifying Successful Installation" on page 65.

Installing a Driver for Windows 95 Version 950b, OSR2

Follow these steps to install the driver for Windows 95 version 950b, OSR2. It is assumed that you are already running Windows 95.

During installation, have the Windows 95 software accessible on diskettes, CD, or hard drive in case the installation utility requests files from the Windows 95 software library.

1 Install the 3C359B NIC and start the computer.

Windows 95 detects the new hardware. *PCI Token Ring Controller* appears in the New Hardware Found dialog notice. The Update Device Driver Wizard dialog box appears.

2 Click *Next*.

3 Click *Other Locations*.

The Select Other Location dialog box appears.

4 If you are using 3.5-inch diskettes, insert *TokenDisk* diskette 2 in the drive. If you are using the *TokenLink Velocity XL* CD, insert it in the CD-ROM drive.

5 At the prompt, enter the appropriate path for the drive containing your *TokenDisk* diskette or *TokenLink Velocity XL* CD and the driver you want to install.

- Use the following path to install the NDIS 4 driver (recommended) from the *TokenDisk* diskette:

  `a:`

- If you are using the *TokenLink Velocity XL* CD, substitute the appropriate drive (drive D, for example) and the DISK_2 designation in the path as follows:

  `d:\disk_2`

6 **Verify that the Update Device Driver Wizard dialog box lists *3Com TokenLink Velocity XL PCI Adapter*, and click *Finish*.**

Have the Windows 95 software accessible in case the installation utility requests files from the Windows 95 software library. Insert the appropriate diskette or CD if prompted to do so.

Messages appear while files are being copied. The System Settings Change dialog box appears.

7 **Remove the *TokenDisk* diskette or *TokenLink Velocity XL* CD from the drive.**

8 **Click *Yes* to restart the computer.**

This concludes the procedure for installing a driver for Windows 95 version 950b, OSR2. To confirm successful installation, see "Verifying Successful Installation" on page 65.

To disable auto ring speed detection and manually select the ring speed, see "Setting Ring Speed for Windows 95/98" on page 66 for more details.

To define a locally administered network address, see "Defining the LAA Address for Windows 95/98" on page 72 for more details.

Installing a Driver for Windows NT 4.0

Follow these steps to install the 3Com NDIS 5 or NDIS 4 driver for Windows NT 4.0.

If your network environment uses the TCP/IP communications protocol, obtain from your network administrator all the information you need to define an IP address during the installation process before starting.

1 **In the My Computer group, double-click the *Control Panel* icon.**

2 **In the Control Panel group, double-click the *Network* icon.**

3 **In the Network dialog box, click the Adapters tab.**

4 **In the Adapters tab, click *Add*.**

5 **In the Select Network Adapter dialog box, click *Have Disk*.**

The Insert Disk dialog box appears.

6 **If you are using the 3.5-inch diskettes, insert *TokenDisk* diskette 2 in the drive. If you are using the *TokenLink Velocity XL* CD, insert it in the CD-ROM drive.**

7 **Accept the displayed default path by clicking *OK*.**

For example, if you are using the 3.5-inch diskettes, the following path is displayed:

a:

This path identifies the location of the driver files for Windows NT 4.0. The Select OEM Option dialog box appears.

8 **Select *3Com TokenLink Velocity XL PCI Adapter* and click *OK*.**

9 **Verify that *3Com TokenLink Velocity XL PCI Adapter* appears in the list in the Network Adapters tab and click *Close*.**

If your network environment uses the TCP/IP communications protocol, the Microsoft TCP/IP Properties dialog box is displayed. You must obtain from your network administrator all the information you need to define an IP address during the installation process. Continue after you have defined the NIC for TCP/IP.

Bindings messages appear, followed by a prompt to restart the computer.

10 **Remove the *TokenDisk* diskette or *TokenLink Velocity XL* CD from the drive.**

11 **Click *Yes* to restart the computer.**

This concludes the procedure for installing the driver for Windows NT 4.0. To confirm successful installation, see "Verifying Successful Installation" on page 65.

To disable auto ring speed detection and manually select the ring speed, see "Setting Ring Speed for Windows NT 4.0" on page 70 for more details.

To define a locally administered network address, see "Defining the LAA Address for Windows NT" on page 76 for more details.

To select applications for high-priority network access, see "Configuring Class of Service" on page 78 for more details.

Installing a Driver for Windows NT 3.51

Follow these steps to install the NDIS 3 driver for Windows NT 3.51.

1. **If you are using the 3.5-inch diskettes, insert *TokenDisk* diskette 2 in the drive. If you are using the *TokenLink Velocity XL* CD, insert it in the CD-ROM drive.**
2. **In the Main group, double-click the *Control Panel* icon.**
3. **In the Control Panel group, double-click the *Network* icon.**
4. **In the Network Settings dialog box, click *Add Adapter*.**
5. **In the Add Network Adapter dialog box, scroll to the bottom of the Network Adapter Card selection list. Select *<Other> Requires disk from manufacturer.***
6. **Click *Continue*.**
7. **Accept the displayed default path by clicking *OK* to select the NIC.**

   For example, if you are using the 3.5-inch diskettes, the following path is displayed:

   a:

   This path identifies the location of the NDIS 3 driver files for Windows NT 3.51.

   The driver files are copied to the C drive. A prompt appears, asking if you want to restart your computer.
8. **Remove the *TokenDisk* diskette or *TokenLink Velocity XL* CD and click *Restart now*.**

   This concludes the procedure for installing the NDIS 3 driver for Windows NT 3.51. To confirm successful

installation, see the next section, "Verifying Successful Installation."

Verifying Successful Installation

To confirm that the NIC is installed correctly in your PC, follow the steps appropriate for your operating system.

Windows 95 and Windows 98

To confirm that the NIC is installed correctly in a PC running Windows 95 or Windows 98:

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

   A list of devices appears on the Device Manager screen, arranged by type.

2. **Double-click *Network adapters*.**

   The name of the installed 3C359B NIC appears on the Device Manager screen.

   If a yellow exclamation point (!) or a red X appears next to the NIC name, the installation wasn't successful. See Chapter 6, "Troubleshooting," for more information.

3. **Double-click the name of the NIC to display a description of the NIC and its current status.**

   The message in the Device status panel confirms that the NIC is working properly.

4. **Click *Cancel* to close each dialog box. Then close the Control Panel and My Computer windows.**

   You've successfully installed and configured the 3C359B NIC.

Windows NT 4.0

To confirm that the NIC is installed correctly in a PC running Windows NT 4.0:

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

2. **Click the Adapters tab.**

   The 3C359B NIC should appear in the list of network adapters. If it doesn't appear, see Chapter 6 for troubleshooting information.

Windows NT 3.51

To confirm that the NIC is installed correctly in a PC running Windows NT 3.51:

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.

Selecting Ring Speed

This section describes how to set the ring speed for Windows 95/98 and Windows NT environments.

Setting Ring Speed for Windows 95/98

The auto ring speed detection option permits the 3C359B NIC's NDIS 4 or NDIS 5 driver to detect and operate at the current ring data rate. Auto ring speed detection is automatically enabled when you load the driver for Windows 95/98.

You can choose one of the following ring speed options:

- Enable auto ring speed detection (default setting)
- Disable auto ring speed detection and manually set the NIC ring speed to 16 Mbps or 4 Mbps

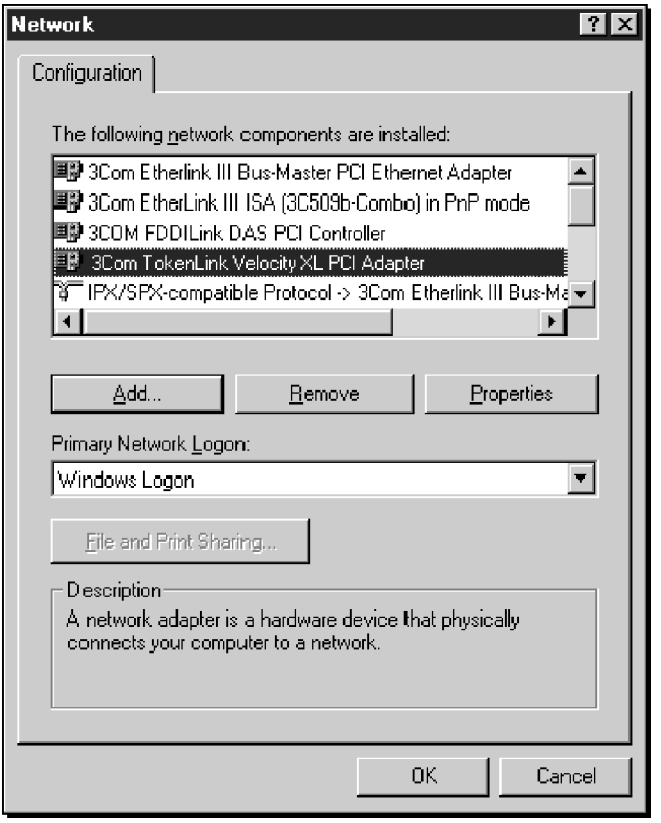
To access the ring speed option in a Windows 95/98 environment, follow these steps:

1 **In the My Computer group, double-click the *Control Panel* icon.**

2 **In the Control Panel group, double-click the *Network* icon.**

The Network window appears, as shown in Figure 6.

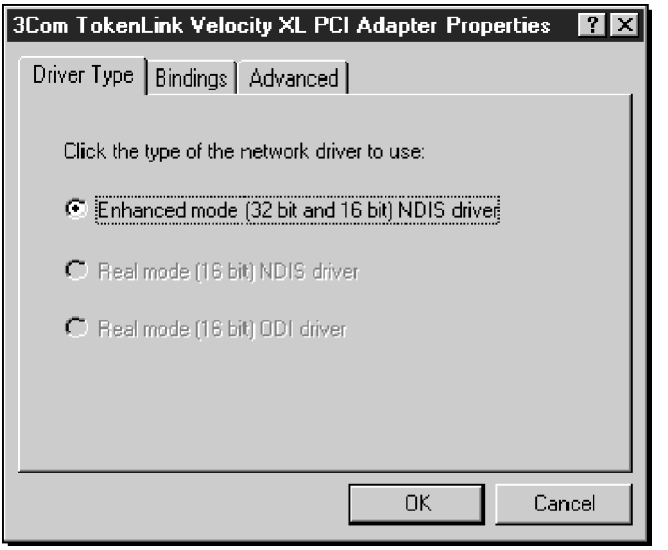
Figure 6 Network Window



3 In the Configuration tab, select *3Com TokenLink Velocity XL PCI Adapter* and click *Properties*.

The Driver tab of the 3Com TokenLink Velocity XL PCI Adapter Properties window appears, as shown in Figure 7.

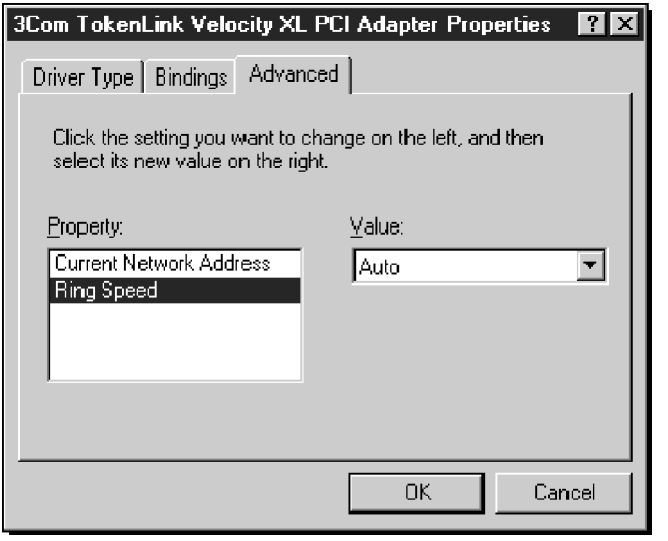
Figure 7 3Com TokenLink Velocity XL PCI Adapter Properties Window: Driver Tab



4 Click the Advanced tab.

The Advanced tab of the 3Com TokenLink Velocity XL PCI Adapter Properties window appears, as shown in Figure 8.

Figure 8 Displaying Ring Speed Setting



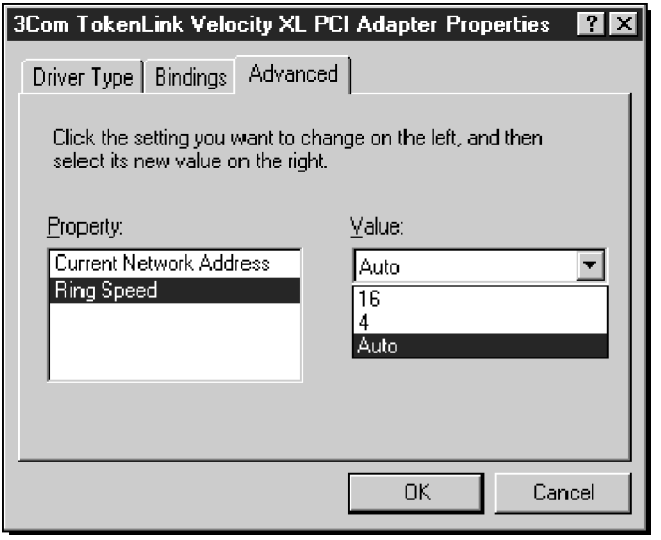
The default setting for *Ring Speed* is *Auto*.

5 **To manually set the ring speed, select *Ring Speed* in the Property list.**

6 **Position the mouse pointer on the down arrow button in the Value field. Press and hold down the left mouse button.**

The Advanced tab appears, as shown in Figure 9.

Figure 9 Manually Setting Ring Speed



7 **Select one of the following values:**

- **16** — Disables auto ring speed detection and sets NIC ring speed at 16 Mbps
- **4** — Disables auto ring speed detection and sets NIC ring speed at 4 Mbps
- **Auto** — Allows NIC to automatically detect ring speed

Your selection overrides the factory setting for the 3C359B NIC and any setting made through the DOS Configuration and Diagnostic Program.

8 **Click *OK*.**

Setting Ring Speed for Windows NT 4.0

Auto ring speed detection permits the 3C359B NIC's NDIS 5 or NDIS 4 driver to detect and operate at the current ring data rate. Auto ring speed detection is automatically enabled when you load the driver for Windows NT 4.0.

You can choose the following ring speed options:

- Enable auto ring speed detection (default setting)
- Disable auto ring speed detection and manually set the NIC ring speed to 16 Mbps or 4 Mbps

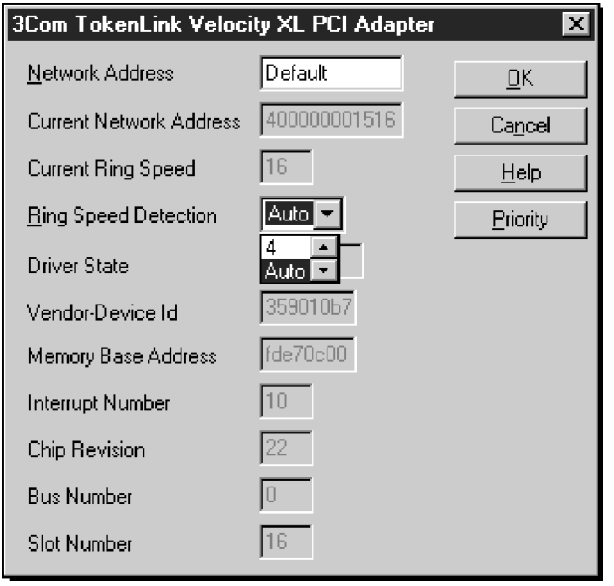
To access the ring speed detection option in a Windows NT environment, follow these steps:

1. **In the My Computer group, double-click the *Control Panel* icon.**
2. **In the Control Panel group, double-click the *Network* icon.**
3. **In the Network dialog box, click the Adapters tab.**
4. **In the Adapters tab, select *3Com TokenLink Velocity XL PCI Adapter* and click *Properties*.**

   The 3Com TokenLink Velocity XL PCI Adapter dialog box appears, as shown in Figure 10.
5. **To manually set the ring speed, position the mouse pointer on the down arrow button in the *Ring Speed Detection* field. Press and hold down the left mouse button to display the available options.**

   The ring speed detection menu displays the current ring speed options, as shown in Figure 10.

Figure 10 3Com TokenLink Velocity XL PCI Adapter Dialog Box



6 **Select one of the following values:**

- **16 —** Disables auto ring speed detection and sets NIC ring speed at 16 Mbps
- **4** — Disables auto ring speed detection and sets NIC ring speed at 4 Mbps
- **Auto —** Allows NIC to automatically detect ring speed

7 **Click *OK*.**

You can click the Priority *button to access the Dynamic*Access*: Select Adapter window (Figure 16) to enable and configure Class of Service. For more information about Class of Service, see "Configuring Class of Service" on page 78.*

This concludes the procedure for setting the 3C359B NIC ring speed in a Windows NT 4.0 environment.

Defining a Locally Administered Network Address

A default network address is encoded for the 3C359B NIC during manufacturing. This address is called the universal address (UAA), or "burned-in" address.

To customize the address for your network administration needs, you can assign a locally administered address (LAA) that overrides the NIC's universal address. The LAA address must consist of 12 hexadecimal digits and must be unique throughout the network.

In most cases, you will use the preset UAA address and not have to define an LAA address. Check with your network administrator before using this feature.

Defining the LAA Address for Windows 95/98

Use the following procedures in this section to perform the following actions in a Windows 95/98 environment:

- Display the current network address
- Set a new LAA address.

Displaying the Current Network Address for Windows 95/98

Follow these steps to display the current network address:

1. **Boot from a DOS diskette to run the diagnostic program. Display the DOS prompt.**
2. **If you are using the 3.5-inch *TokenDisk* diskettes, insert *TokenDisk* diskette 1 in the drive and make that drive the active drive. For example, enter:**

   ```
   a:
   ```

   If you are using the *TokenLink Velocity* CD (in Drive D for example), enter the following path:

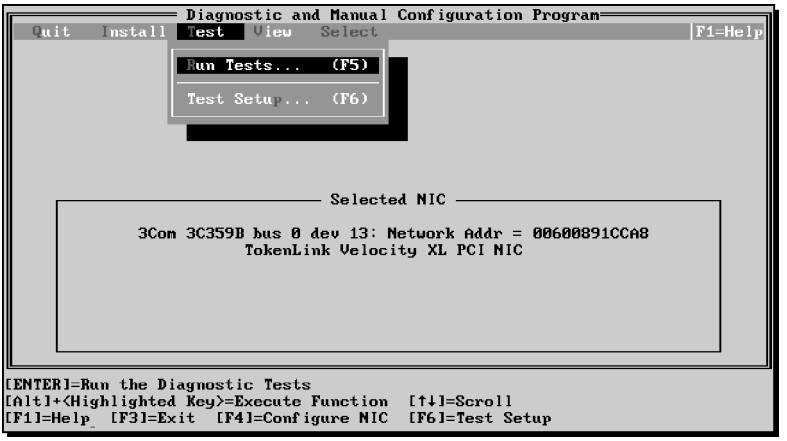
   ```
   d:\disk_1
   ```

3 Enter the following command:

`3pcid`

The Configuration and Diagnostic Program window is displayed, as shown in Figure 11.

Figure 11 Configuration and Diagnostic Program Window



4 Record for future reference the 12-digit universal token ring address displayed in the Configuration and Diagnostic Program window. For example:

`Network Addr = 00600891CCA8`

Setting the LAA Address for Windows 95/98

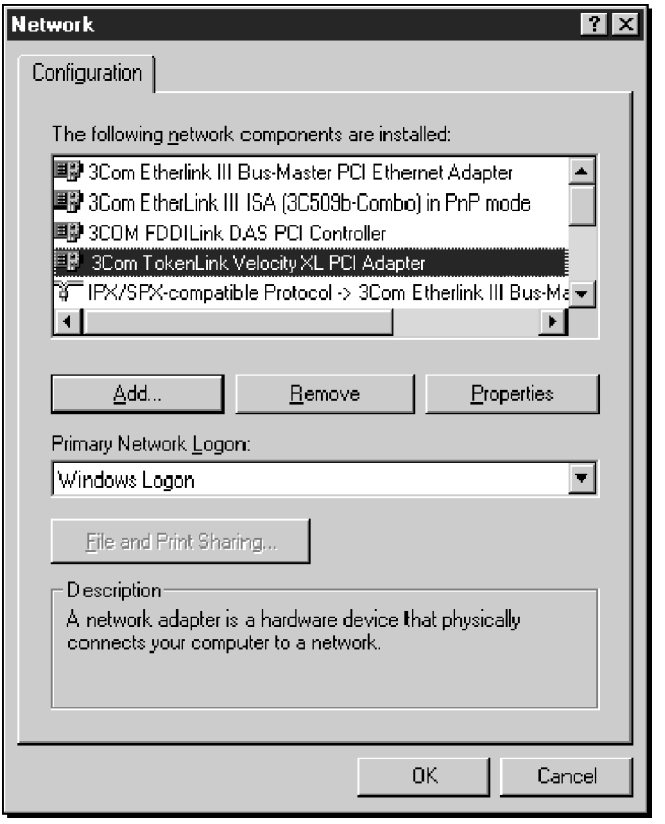
To set a locally administered address for a Windows 95/98 environment, follow these steps:

1 In the My Computer group, double-click the *Control Panel* icon.

2 In the Control Panel group, double-click the *Network* icon.

The Network window appears, as shown in Figure 12.

Figure 12 Network Window



3 In the Configuration tab, select *3Com TokenLink Velocity XL PCI Adapter* and click *Properties*.

The Driver tab of the 3Com TokenLink Velocity XL PCI Adapter Properties window appears, as shown in Figure 13.

4 Click the Advanced tab.

The Advanced tab of the 3Com TokenLink Velocity XL PCI Adapter Properties window appears, as shown in Figure 14.

Figure 13 3Com TokenLink Velocity XL PCI Adapter Properties Window: Driver Tab

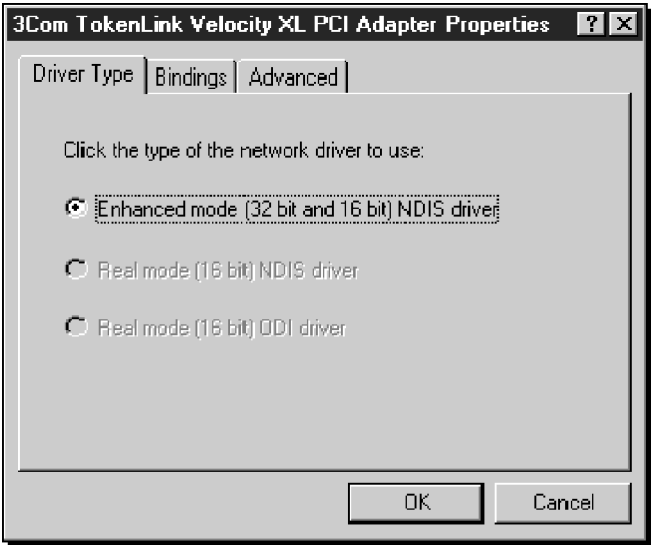
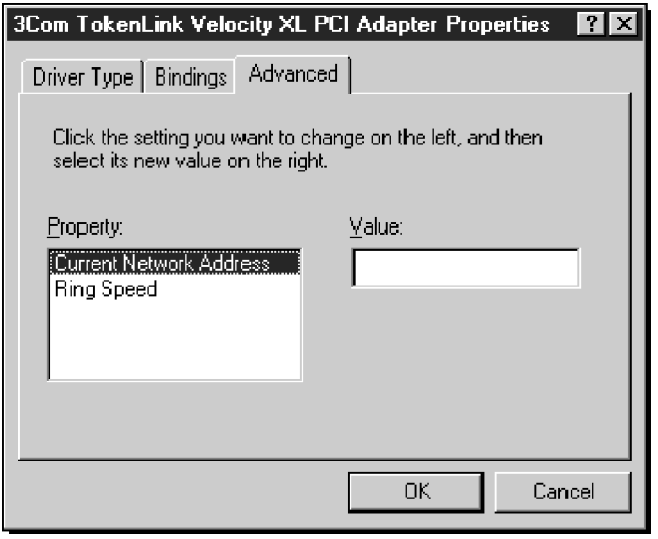


Figure 14 Entering Current Network Address



5 Select *Current Network Address* in the *Property* list.

6 **Enter a valid 12-digit locally administered address in the *Value* field.**

A valid 12-digit hexadecimal LAA value must fall within the range of locally administered node IDs permitted under IEEE guidelines, and it must be unique throughout the network. Check with your network administrator for the appropriate LAA address.

Avoid using the following sets of addresses: 40 00 xx xx xx xx, 7F FF xx xx xx xx, C0 00 xx xx xx xx, FF FF xx xx xx xx (where x is any hexadecimal value). Using these sets may cause a duplicate address test (DAT) failure, or incorrect recognition as a broadcast address.

7 **Click *OK*.**

8 **Restart the computer.**

Defining the LAA Address for Windows NT

To set a locally administered address for a Windows NT environment, follow these steps:

1 **In the My Computer group, double-click the *Control Panel* icon.**

2 **In the Control Panel group, double-click the *Network* icon.**

3 **In the Network dialog box, click the Adapters tab.**

4 **In the Adapters tab, select *3Com TokenLink Velocity XL PCI Adapter* and click *Properties*.**

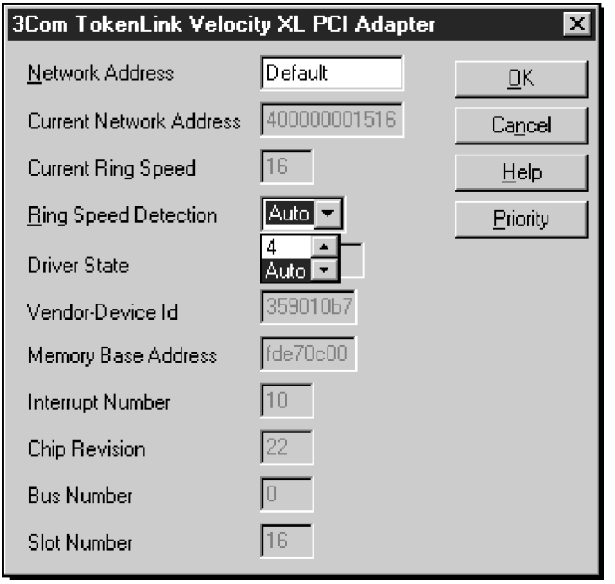
The 3Com TokenLink Velocity XL PCI Adapter dialog box appears, as shown in Figure 15. Note that the current network address is displayed in the second field.

5 **Enter a valid 12-digit locally administered address in the *Network Address* field.**

A valid 12-digit hexadecimal LAA value must fall within the range of locally administered node IDs permitted under IEEE guidelines, and it must be unique throughout the network. Check with your network administrator for the appropriate LAA address.

Avoid using the following sets of addresses: 40 00 xx xx xx xx, 7F FF xx xx xx xx, C0 00 xx xx xx xx, FF FF xx xx xx xx (where x is any hexadecimal value). Using these sets may cause a duplicate address test (DAT) failure, or incorrect recognition as a broadcast address.

Figure 15 3Com TokenLink Velocity XL PCI Adapter Dialog Box



6 Click *OK*.

You can click the Priority *button to access the Dynamic*Access*: Select Adapter window (Figure 16) to enable and configure Class of Service. For more information about Class of Service, see the next section.*

7 Restart the computer.

Configuring Class of Service

This section describes activating and configuring Dynamic*Access* Class of Service (Traffic Prioritization) support for Windows NT 4.0 or Windows 98.

Class of Service is available only with the 3C359B NIC NDIS 5 and NDIS 4 drivers. This feature is not available with other 3C359B NIC drivers. Although the NDIS 5 and NDIS 4 miniport drivers are compatible with Windows 95 (version 950b, OSR2), they do not currently provide Class of Service support for this version of Windows 95.

Class of Service (Traffic Prioritization) is an IEEE 802.5 supported feature that lets you select critical applications for high-priority network access. Class of Service prioritization allows stations running critical applications under Windows NT 4.0 or Windows 98 to access network bandwidth before other stations. The driver requests a priority token when the selected applications transmit data.

The Class of Service feature is disabled by default; if you want to take advantage of this feature, you must manually enable it after installing the driver.

Before Starting Class of Service Configuration

The 3C359B NIC must be installed before you configure Class of Service. For NIC installation instructions, see Chapter 2, "Installing the 3C359B NIC."

The driver must also be installed before you configure Class of Service. For installation instructions, see the earlier sections in this chapter.

Finally, you must also have installed the appropriate applications that you want to prioritize through Class of Service configuration.

Enabling Class of Service

The Class of Service feature is disabled by default. To enable Class of Service in a Windows NT 4.0 or Windows 98 environment, follow these steps:

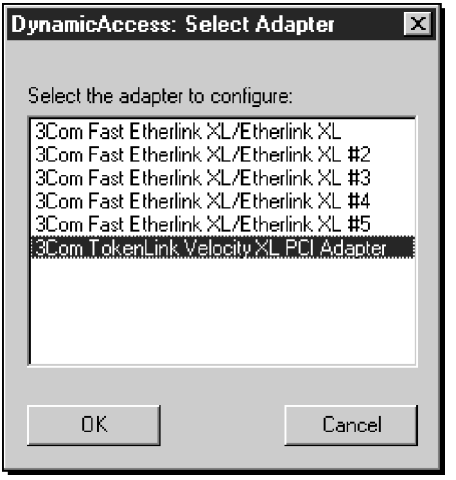
1 **In the Control Panel group, double-click the *3Com Class of Service* icon.**

The Dynamic*Access*: Select Adapter window appears (Figure 16).

*The 3Com Class of Service icon is loaded automatically with the NDIS 5 or NDIS 4 driver installation. In a Windows NT environment, you can also access the Dynamic*Access*: Select Adapter window by clicking the* Priority *button on the 3Com TokenLink Velocity XL PCI Adapter window (Figure 15).*

2 **Select *3Com TokenLink Velocity XL PCI Adapter*, as shown in Figure 16.**

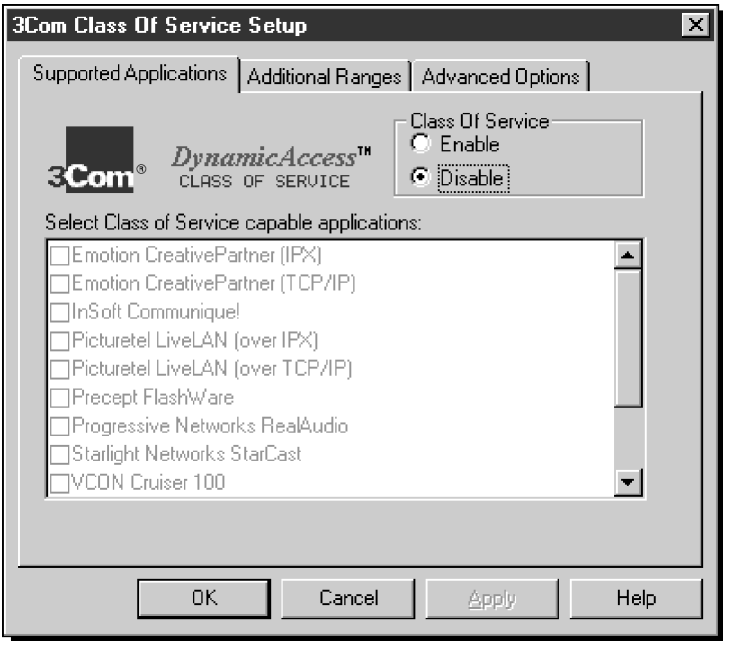
Figure 16 Dynamic*Access*: Select Adapter Window



3 **Click *OK*.**

The Supported Applications tab of the 3Com Class of Service Setup window appears, as shown in Figure 17. The Supported Applications tab automatically displays all applications on your PC that support Dynamic*Access* Class of Service.

Figure 17 3Com Class of Service Setup Window



If an application is not listed in the Supported Applications tab (Figure 17), you can obtain the necessary port or socket range from the application's manufacturer, and manually enter the information in the Additional Ranges tab (Figure 18); or you can set the range to include all applications.

4 Select the *Enable* radio button.

The default mode is *Disable*. When Class of Service is disabled, you cannot select applications shown in the Supported Applications Tab for high-priority network access. In addition, you cannot make changes to data shown in the Additional Ranges tab and Advanced Options tab. Selecting *Enable* gives you access to all three tabs of the 3Com Class of Service Setup window.

5 **Click the box next to each application that you want to have high-priority network access.**

Class of Service divides applications into two network access priority groups:

- High-priority
- Low-priority (normal-priority)

Applications that you select are marked for high-priority network access. Unselected applications are given low-priority (normal-priority) network access.

Based on your selections, the driver can recognize network traffic as high-priority when that traffic is generated by a chosen application.

6 **Click *OK*.**

7 **Restart the computer.**

Adding Class of Service Ranges and Protocols

You can add information for Class of Service applications that you want to prioritize but which are not listed on the 3Com Class of Service Setup window (Figure 17).

You must specify port or socket ranges as well as the network protocol being used. Obtain the information from the application manufacturer.

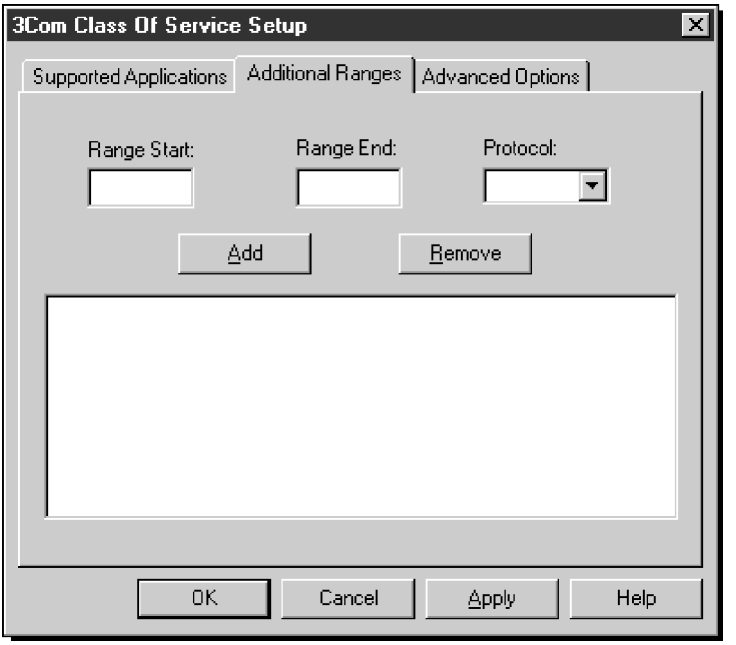
The Class of Service network driver uses these ranges to determine whether a packet should be treated as high-priority. If you are not able to obtain the range, you can set the entire range to 0000–9999.

To add the Class of Service ranges and protocols, follow these steps:

1 **Click the Additional Ranges tab.**

The Class of Service Additional Ranges window appears, as shown in Figure 18.

Figure 18 Class of Service Additional Ranges Window



2 **Enter the beginning of the port or socket range for the application in the Range Start box.**

The range start should be a hexadecimal value with a maximum of four digits.

3 **Enter the inclusive range end value of the port or socket range for the application.**

The range end should be a hexadecimal number with a maximum of four digits. If only one port or socket is needed, Range End should match Range Start.

4 **Select the protocol that the application uses.**

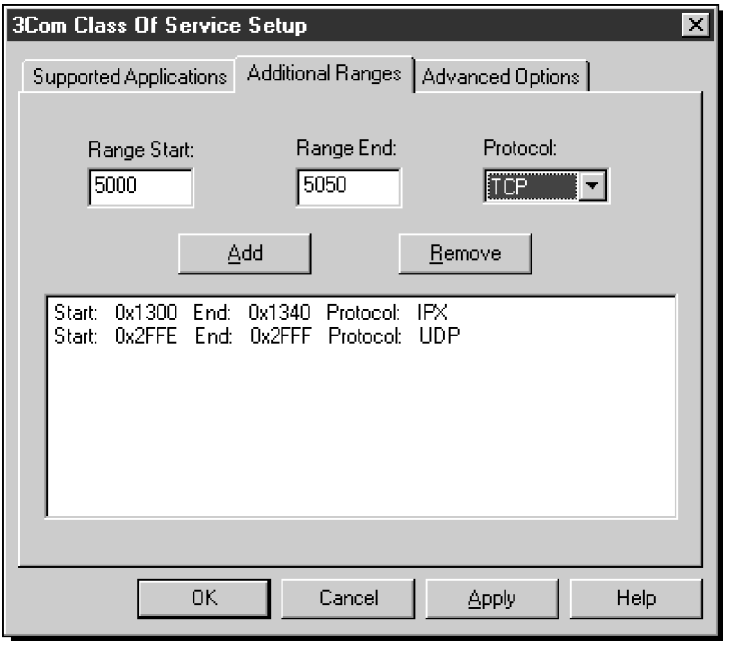
The protocol can be TCP, UDP, or IPX.

Some applications support multiple protocols and have port or socket ranges for each protocol. In this case, the range or protocol must match the protocol on the PC. For example, if only TCP/IP is installed, do not enter the socket range for IPX, because doing so will adversely affect driver performance.

5 Once the Range Start, Range End, and Protocol are entered press *Add*.

The range is added to the list, as shown in Figure 19.

Figure 19 Additional Ranges Window Showing Data



6 Click *OK* when you are finished.

To remove a range, select the range in the list and click *Remove*.

7 Restart the computer.

Using Class of Service Advanced Options

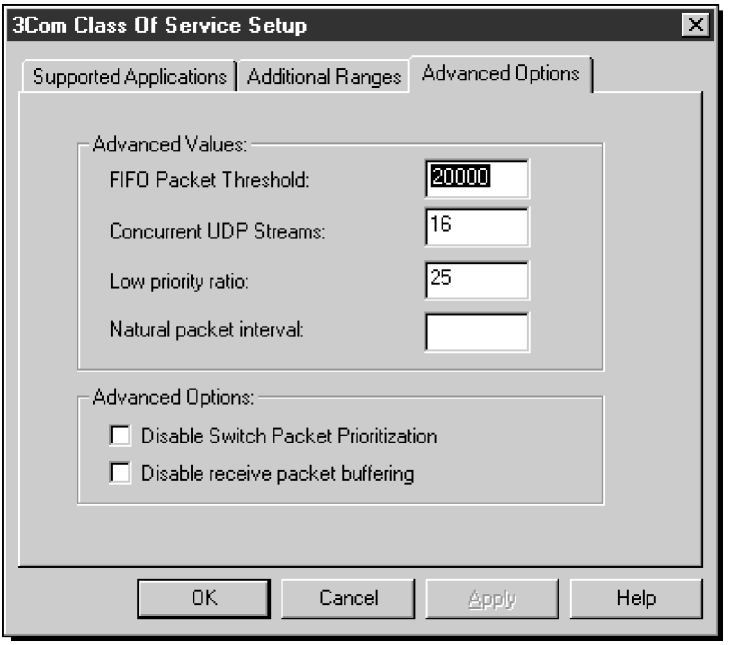
You can use Class of Service Advanced Options to adjust the network driver's handling of certain types of Class of Service traffic. The advanced options are set to certain default values recommended by 3Com. In general, you do not need to change these values, but you can do so if you wish. Contact network administration before changing these options.

To access the advanced options, follow these steps:

1 **Click the Advanced Options tab.**

The Class of Service Advanced Options window appears, as shown in Figure 20.

Figure 20 Class of Service Advanced Options Window



2 **Enter new information as required.**

3 **Click *OK* to set the new value.**

4 **Restart the computer to activate changes.**

Class of Service Advanced Options Settings

This section provides a detailed description of each Advanced Values field shown on the Class of Service Advanced Options window.

FIFO Packet Threshold This setting controls the number of non–Class of Service bytes the network driver will allow in the FIFO ahead of any Class of Service packets. A smaller number decreases the time between Class of Service

packets but can adversely affect performance. The default value of 20,000 is the recommended setting.

Concurrent UDP Streams This option controls the number of simultaneous multimedia UDP packet streams the network driver can handle at any time. For many applications, the number of UDP streams is the same as the number of connections.

For example, for videoconferencing with three people, applications use three UDP streams for the video data. The value must be a power of 2 (2, 4, 8) but the optimal value may vary depending on the PC and application.

A video server may support 32 connections, but a client may only want to conference with four other people at a time.

The default value of 16 is the recommended setting for most applications.

Low-Priority Ratio When Class of Service support is enabled, high-priority packets are always transmitted before low-priority packets. If a certain high-priority application sends out enough packets, no low-priority packets may be sent.

To prevent this problem, the driver uses a ratio value to periodically send out a low-priority packet (if one is waiting to be sent).

For example, if a value of 1000 is entered, one low-priority packet would be sent for every 1000 high-priority packets. The default value of 25 is the recommended setting for most applications.

Natural Packet Interval This field is not applicable. Any value entered in this field is ignored.

Disable Switch Packet Prioritization This option is not currently enabled. Any setting is ignored.

Disable Receive Packet Buffering This option is not currently enabled. Any setting is ignored.

5 IBM ENVIRONMENTS

This chapter describes how to install a 3C359B NIC network device driver for various IBM operating system environments.

This chapter also describes configuring 3C359B NIC connectivity to an IBM host computer (mainframe or AS/400) for various Windows environments.

Installing a Driver for Various IBM Environments

This section describes how to install a 3C359B NIC network device driver for various IBM operating system environments.

Installing the IBM LAN Support Program (DXMAID) and the DOS NDIS 2.01 Driver

Follow these steps to install the IBM LAN Support Program (DXMAID) and the DOS NDIS 2.01 driver for IBM host connectivity applications. The DOS NDIS 2.01 driver can also handle DOS LAN requests to IBM LAN Server.

1. **At the DOS prompt on a DOS machine, run the DXMAID installer from the *IBM LAN Support Program* diskette.**
2. **Press Enter at the first three Information windows.**
3. **In the Setup window, press Enter to accept all the default values.**
4. **If you are using the 3.5-inch *TokenDisk* diskettes, insert *TokenDisk* diskette 2 in the drive. If you are using the *TokenLink Velocity XL* CD, insert it in the CD-ROM drive.**
5. **In the Process Driver Diskette window, enter the path for the NDIS driver.**
   - If you are using the 3.5-inch *TokenDisk* diskettes, enter:

```
a:\ndis2\dos
```

- If you are using the *TokenLink Velocity XL* CD, substitute the appropriate drive (drive D, for example) and the DISK_2 designation in the path as follows:

```
d:\disk_2\ndis2\dos
```

6 **Insert the *IBM LAN Support Program* diskette in the drive when prompted.**

The Primary Adapter Driver shown is *3Com TokenLink Velocity XL PCI*.

7 **Press F4 to install the driver.**

8 **If you are using the 3.5-inch *TokenDisk* diskettes, insert *TokenDisk* diskette 1 in the drive when prompted.**

This completes the installation of DXMAID and the DOS NDIS 2.01 driver. Restart your computer and install your host connectivity application.

Installing a Driver for IBM DOS LAN Services

Follow these steps to install the NDIS 2.01 driver for IBM DOS LAN Services for IBM LAN Server 4.0 or IBM Warp Server:

1 **Create a temporary directory on your DOS PC. For example, enter:**

```
mkdir c:\temp
```

2 **If you are using 3.5-inch diskettes, insert *TokenDisk* diskette 2 in the drive. If you are using the *TokenLink Velocity XL* CD, insert it in the CD-ROM drive.**

3 **Copy the following files from the *TokenDisk* diskette or *TokenLink Velocity XL* CD to the temporary directory.**

- If you are using the 3.5-inch *TokenDisk* diskettes, enter:

```
copy a:\ndis2\dos\oemsetup.inf c:\temp
copy a:\ndis2\dos\tlpn2.dos c:\temp
```

- If you are using the *TokenLink Velocity XL* CD, substitute the appropriate drive (drive D, for example) and the DISK_2 designation in the path as follows:

```
copy d:\disk_2\ndis2\dos\oemsetup.inf c:\temp
copy d:\disk_2\ndis2\dos\tlpn2.dos c:\temp
```

4 **Insert *IBM DOS LAN Services* diskette 1 in the drive.**

5 **From the DOS prompt, enter:**

```
a:\install
```

6 **Press Enter when the welcome screen is displayed.**

7 **Press Enter to accept the default directory C:\NET as the location to install IBM DOS LAN Services.**

8 **From the list of network cards presented, select *Network Card Not Shown In List Below*.**

9 **Enter the path of the temporary directory for the OEMSETUP.INF file:**

```
c:\temp
```

10 **The *3Com TokenLink Velocity XL PCI* NIC is selected. Press Enter.**

11 **Enter the machine ID, user name, and domain name.**

12 **Press Enter to accept the list of options chosen.**

13 **Finish installing files from the IBM DOS LAN Services diskettes.**

14 **If you are using the 3.5-inch *TokenDisk* diskettes, insert *TokenDisk* diskette 2 in the drive.**

15 **Copy the microcode file TLNKP.MAC from the *TokenDisk* or *TokeLink Velocity XL* CD to your hard drive.**

- If you are using the 3.5-inch *TokenDisk* diskettes, enter:

  ```
  copy a:\tlnkp.mac c:\net
  ```

- If you are using the *TokeLink Velocity XL* CD, substitute the appropriate drive (drive D, for example) and the DISK_2 designation in the path as follows:

  ```
  copy d:\disk_2\tlnkp.mac c:\net
  ```

This completes the driver installation for IBM DOS LAN Services. Restart your computer and install your host connectivity application.

Using IBM MPTS to Install a Driver for OS/2

If your OS/2 network operating system has not yet been installed on your computer, install it now and follow its instructions for installing device drivers. If an OS/2 network operating system has previously been installed, follow the instructions here for using IBM Multiprotocol Transport Services (MPTS) to install device drivers.

1. **Start IBM MPTS by performing either of the following actions:**
   - From the OS/2 desktop, double-click the *MPTS* icon.
   - From an OS/2 window, go into the *IBMCOM* subdirectory and at the OS/2 prompt, enter:

     `mpts`
2. **Select *OK* on the MPTS logo panel.**
3. **Select *Install*.**

   You are prompted for the source of the NIF file.
4. **If you are using diskettes, insert *TokenDisk* diskette 2 in a drive (for example, drive A) and enter:**

   `a:\ndis2\os2`

   If you are using the *TokenLink Velocity XL* CD, insert it in the CD-ROM drive (for example, drive D) and enter:

   `d:\disk_2\ndis2\os2`
5. **When the Installation Complete message appears, select *OK*.**

   You are returned to the main menu.
6. **Select *Configure* in the MPTS dialog box.**
7. **In the Configure panel, verify that *LAN Adapters and protocols* is preselected, and then select *Configure* at the bottom of the panel.**
8. **In the Configure panel in the Network Adapters group box, select *3Com TokenLink Velocity XL PCI* and click *ADD*.**

You can edit parameter settings for the 3C359B NIC. Select the 3C359B NIC in the Current Configuration list box and click Edit*. When you are finished with the parameter settings, click* OK*.*

9 **In the Protocols list box, select the protocols used by your network application. Select each protocol and click *ADD*.**

If you are not sure which protocols to use, select IBM IEEE 802.2 and IBM OS/2 NetBIOS protocol drivers or ask your network administrator.

The protocol drivers you have selected will appear under the NIC driver name in the Current Configuration list box.

You can edit parameter settings for the protocols. Select a protocol and then click Edit.

10 **When you have finished selecting and editing protocols in the Configuration panel, click *OK*.**

11 **Click *Close* in the Configuration panel.**

12 **Click *Exit* in the MPTS dialog box.**

13 **Click *Exit* in the Update CONFIG.SYS panel to update the CONFIG.SYS file.**

14 **When you get the message that the CONFIG.SYS file has been successfully updated, click *OK*.**

15 **Click *Exit* in the Exiting MPTS panel.**

16 **If you are using the 3.5-inch *TokenDisk* diskettes, insert *TokenDisk* diskette 1 in the drive.**

17 **Copy the microcode file TLNKP.MAC from the *TokenDisk* to your hard drive.**

- If you are using the 3.5-inch *TokenDisk* diskettes, enter:

  `copy a:\tlnkp.mac c:\ibm\macs`

- If you are using the *TokenLink Velocity XL* CD, substitute the appropriate drive (drive D, for example) and the DISK_1 designation in the path as follows:

  `copy d:\disk_1\tlnkp.mac c:\ibm\macs`

18 **Shut down OS/2 and restart your computer to let the changes take effect.**

19 **At system startup, check for the following conditions to determine whether the NIC is working correctly and whether installation has been completed successfully:**

- The device driver files loaded successfully. There are no error messages.
- You are able to log on and communicate with the network.

If you experience problems, see Chapter 6, "Troubleshooting."

Installation of the driver for OS/2 is now complete.

Configuring IBM Host Connectivity

This section describes the initial phase of configuring 3C359B NIC connectivity to an IBM host computer (mainframe or AS/400) for various Windows environments. This phase involves adding the appropriate network protocol to enable host connectivity.

After adding the network protocol, install the host connectivity applications (such as client access and emulator applications) that are appropriate for your environment.

Adding the MS-DLC Network Protocol for Windows for Workgroups

Follow the steps in this section to add the Microsoft MS-DLC network protocol to the Windows for Workgroups Add Network Protocol list for the 3C359B NIC. The MS-DLC protocol is required for connectivity between your PC and an IBM host computer.

Before proceeding, make sure that you have the Microsoft MS-DLC network protocol available. If the MS-DLC protocol is not currently available, download it from the Microsoft Web site to a temporary storage location on your PC's hard disk or on a diskette.

1 **In the Windows for Workgroups Program Manager window, double-click the *Network* icon.**

2 **In the Network window, double-click the *Network Setup* icon.**

3 **In the Network Setup window, click *Network Drivers*.**

4 **In the Network Drivers window, make sure that *3Com TokenLink Velocity XL PCI Adapter* is displayed. Click *Add Protocol*.**

5 **In the Add Network Protocol window, select *Unlisted or Updated Protocol*. Click *OK*.**

6 **In the Install Driver window, enter the path for the MS-DLC protocol. If the protocol is stored on diskette, insert the diskette in the drive. Click *OK*.**

7 **In the Unlisted or Updated Protocol window, select *MS-DLC*. Click *OK*.**

The Network Driver window is displayed.

8 **Verify that the MS-DLC protocol is displayed under *3Com TokenLink Velocity XL PCI Adapter*. Click *Close*.**

The Network Setup window is displayed.

9 **Click *OK*.**

The MS-DLC files are copied, and the Network Setup window displays a message indicating that the AUTOEXEC.BAT, SYSTEM.INI, and PROTOCOL.INI files have been modified.

10 **In the Network Setup message window, click *OK*.**

The Windows Setup window displays the following message:

```
You need to quit Windows and restart your
computer so that changes you made will take
effect. Do not press CTRL+ALT+DEL to restart
your computer--this may cause you to lose work.
Restart the computer now?
```

11 **In the Windows Setup message window, click *Restart Computer*.**

This completes the procedure for adding the Microsoft MS-DLC network protocol to the Windows for Workgroups Add Network Protocol list for the 3C359B NIC.

After adding the network protocol, install the host connectivity applications (such as client access and emulator applications) that are appropriate for your environment.

Adding the 32-Bit DLC Network Protocol for Windows 95

Follow the steps in this section to add the Microsoft 32-bit DLC network protocol to the Windows 95 Network Protocols list for the 3C359B NIC. The 32-bit DLC protocol is required for connectivity between your PC and an IBM host computer.

Before proceeding, make sure that you have the Microsoft 32-bit DLC network protocol available. If you are using Windows 95 version 950 or 950a (the "retail" version), you must download the 32-bit DLC protocol from the Microsoft Web site to a temporary storage location on your PC's hard disk or on a diskette. Windows 95 version 950b, OSR2, includes the 32-bit DLC protocol.

1 **On the Windows 95 desktop, double-click the *My Computer* icon.**

2 **Double-click the *Control Panel* icon.**

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

4 **In the Network window, select *3Com TokenLink Velocity XL PCI Adapter* in the Configuration tab. Click *Add*.**

5 **In the Select Network Component Type window, select *Protocol*. Click *Add*.**

Windows builds the driver information database and displays the Select Protocol window.

6 **Select *Microsoft* in the Manufacturers list.**

7 **Do one of the following:**

- If you are using Windows 95 version 950b, OSR2, select *Microsoft 32-bit DLC* in the Network Protocols list.

  The Configuration tab of the Network window appears. Proceed to step 9.

- If you are using Windows 95 version 950 or 950a ("retail" version), click *Have Disk*.

  The Install From Disk window is displayed. Continue at step 8.

8 **If you are using Windows 95 version 950 or 950a ("retail" version), do one of the following:**

- If you have copied the Microsoft 32-bit DLC protocol to diskette, insert the diskette in the drive.
- If you have copied the DLC protocol to the hard drive, enter the appropriate path for the downloaded Microsoft 32-bit DLC protocol in the Install From Disk window. Click *OK*.

9 Verify that *Microsoft 32-bit DLC* is displayed for the *3Com TokenLink Velocity XL PCI Adapter* in the Configuration tab of the Network window. Click *OK*.

Windows copies the protocol files.The System Settings Change window displays the following message:

```
You must restart your computer before the new
settings will take effect. Do you want to
restart your computer now?
```

10 Click *Yes*.

This completes the procedure for adding the Microsoft 32-bit DLC network protocol to the Windows 95 Network Protocols list for the 3C359B NIC.

After adding the network protocol, install the host connectivity applications (such as client access and emulator applications) that are appropriate for your environment.

Adding the 32-Bit DLC Network Protocol for Windows NT

Follow the steps in this section to add the Microsoft 32-bit DLC network protocol to the Windows NT Network Protocols list for the 3C359B NIC. The 32-bit DLC protocol is required for connectivity between your PC and an IBM host computer.

1 On the Windows NT desktop, double-click the *My Computer* icon.

2 Double-click the *Control Panel* icon.

3 Double-click the *Network* icon.

4 In the Network window, select the Protocols tab. Click *Add*.

5 In the Select Network Protocol window, select *DLC Protocol*. Click *OK*.

6 Insert the Windows NT CD in the CD-ROM drive. In the Windows NT Setup window, enter the path for the Windows NT CD. For example:

```
d:\
```

The Protocols tab of the Network window is displayed.

7 Verify that *DLC Protocol* is displayed. Click *Close*.

Bindings messages are displayed. The Network Settings window displays the following message:

```
You must shut down and restart your computer
before the new settings will take effect. Do
you want to restart your computer now?
```

8 Click *Yes*.

This completes the procedure for adding the Microsoft 32-bit DLC network protocol to the Windows NT Network Protocols list for the 3C359B NIC.

After adding the network protocol, install the host connectivity applications (such as client access and emulator applications) that are appropriate for your environment.

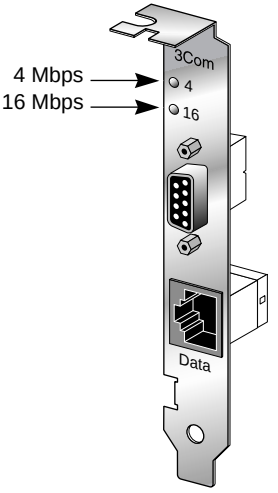
6 TROUBLESHOOTING

This chapter describes how to isolate and solve 3C359B NIC hardware and network cabling problems.

3C359B NIC LEDs

Light-emitting diodes (LEDs) on the backplate of the 3C359B NIC, shown in Figure 21, indicate the configured ring speed and whether or not the 3C359B NIC is inserted into the ring. The LEDs also light when drivers are loading and when the diagnostics program is running.

Figure 21 NIC LEDs



When the green LED (labeled "4") is lit, it indicates that the 3C359B NIC is set to 4 Mbps speed and is correctly inserted into the token ring network.

When the yellow LED (labeled "16") is lit, it indicates that the 3C359B NIC is set to 16 Mbps and is correctly inserted into the token ring network.

Using the Diagnostic Program

You can troubleshoot the 3C359B NIC configuration and test for physical board problems by running the DOS Configuration and Diagnostic Program.

Configuration instructions are described in Appendix B.

The diagnostic part of the program tests the 3C359B NIC, not the network. However, a lobe cable must be connected from the 3C359B NIC to a retiming concentrator or MAU for all tests. A lobe cable is the section of cable that attaches a ring station or network device to a MAU or wiring hub.

The diagnostic program does not function properly if the 3C359B NIC drivers are already installed and running in memory. You must bypass the drivers by performing a clean DOS boot before you run the diagnostic program. Use a DOS diskette if you are running a version of DOS earlier than DOS 6.x.

DOS Diagnostic Tests

The diagnostics test physical components, connectors, and circuitry of the 3C359B NIC, as follows.

Register Write/Read Test

This test verifies accurate writing and reading of the 3C359B NIC's control registers.

Local RAM Write/Read Test

This test verifies that the PC can correctly access the total 64 KB of available local RAM.

Timer Test

This test verifies the 3C359B NIC's timer operations by comparing the 3C359B NIC's timers to the PC's timer.

Open NIC for Ring Operation Test

This test prepares the 3C359B NIC for a NIC ring operation test and verifies the 3C359B NIC's ability to transmit and receive data over the network. This test requires you to connect to an STP or a UTP cable with a DAU, MAU, CAU, or token ring switch at the other end.

Ring Operations Test

This test assesses communication on the ring. The 3C359B NIC must be attached to the ring to run this test successfully. The 3C359B NIC also must be set to the correct ring speed.

Close NIC Test

This test verifies the 3C359B NIC's ability to close the 3C359B NIC and terminate the Ring Operations Test. The 3C359B NIC must have been previously opened.

Running the DOS Diagnostic Tests

If you are using Windows 95/98 or Windows for Workgroups, exit Windows and restart the PC in MS-DOS mode, or boot from a DOS diskette. If you are running Windows NT, boot from the DOS partition or boot from a DOS diskette to run the diagnostic program.

1 **If you are using the 3.5-inch diskettes, insert *TokenDisk* diskette 1 in the drive (for example, the A drive) and enter:**

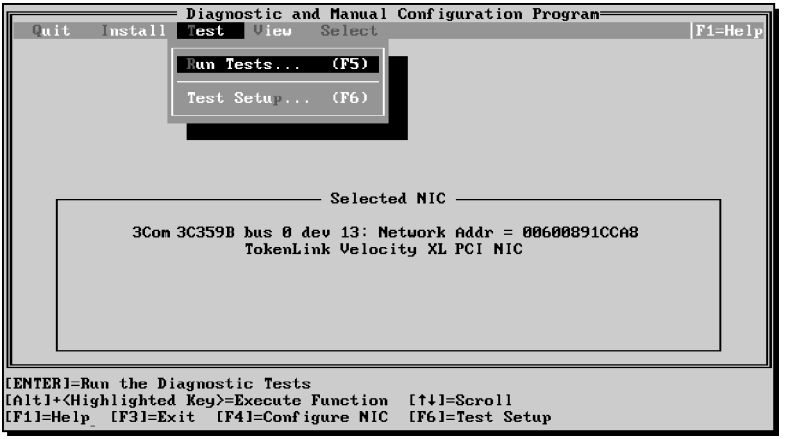
```
a:\3pcid
```

If you are using the *TokenLink Velocity XL* CD, insert it in the CD-ROM drive (for example, the D drive) and enter:

```
d:\disk_1\3pcid
```

The DOS Configuration and Diagnostic Program window is displayed with the *Test* menu selected, as shown in Figure 22.

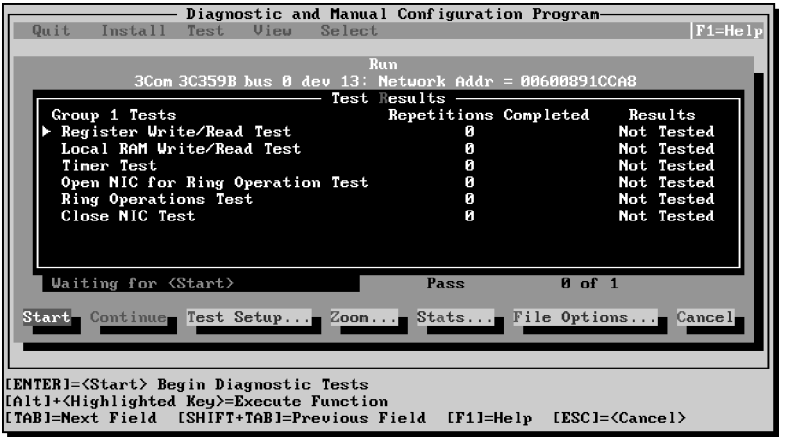
Figure 22 Test Menu



2 From the *Test* pull-down menu shown in Figure 22, select *Run Tests*.

The Run Tests dialog box appears, similar to the one shown in Figure 23.

Figure 23 DOS Diagnostic Program Run Tests Dialog Box



3 Press Enter to start the tests.

Each test runs once unless you specify otherwise. The test results are displayed with “Passed” or “Failed” in the Results column.

To run the tests continuously, select the *Continuous* option in the Test Setup dialog box, as described in the next section, "Changing the DOS Test Setup."

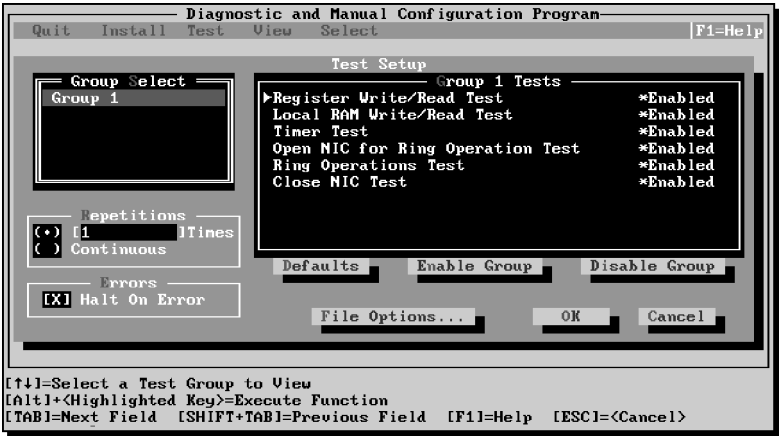
Changing the DOS Test Setup

To change the test parameters, follow these steps:

1 **Select *Test Setup* in the Run Tests dialog box and press Enter.**

The Test Setup dialog box appears, as shown in Figure 24.

Figure 24 DOS Diagnostic Program Test Setup Dialog Box



2 **Press Tab to move from field to field and select any field within the Test Setup dialog box.**

Within the Group Select area, use the arrow keys to select Group 1. (Future software enhancements will provide additional test groups.) Use the *Enable Group* or *Disable Group* options to enable or disable a group of tests.

For test descriptions, see "DOS Diagnostic Tests" earlier in this chapter.

3 **Select *OK* and press Enter.**

4 **To run the tests, select *Run Tests* from the *Test* menu and select *Start*.**

Checking the Remote Wake-Up Function

If the PC does not boot up when a Magic Packet wake-up packet is sent, perform these general troubleshooting steps:

1 **Verify that the Pattern and Wake on Magic Packet settings are enabled.**

   a Click the Network *Neighborhood* icon.

   b Click *Properties*.

   c Double-click the *3Com NIC* icon and click the Advanced tab.

   Make sure that Pattern and Wake on Magic Packet are enabled. If these settings do not exist, either the NIC is not a Remote Wake-Up NIC or the driver installation file is outdated. For the latest 3C359B NIC drivers and installation files, download the *TokenDisk* diskettes for the 3C359B NIC from the 3Com Web site:

   `http://www.3com.com/`

2 **If the driver version is current, the keywords are enabled, and the PC still does not wake up, check the BIOS.**

   a Boot the PC and enter the BIOS.

   b Locate the Wake-Up on PME signal or Wake-Up on LAN event setting.

   c Verify that the setting is enabled.

   If you experience difficulties locating these settings, consult the reference guide for your PC, or contact you PC vendor.

3 **Remove the PC cover and check the Remote Wake-Up connection.**

   Verify that the Remote Wake-Up cable is plugged in to the NIC as well as to the motherboard. Unplug and reinsert the cable if necessary.

4 If the NIC still does not wake up, install a Remote Wake-Up NIC and cable that are known to be working. Recheck the PC.

If the PC works (wakes up), contact your network vendor to replace the malfunctioning NIC. If the PC does not wake up as it should, there may be a problem with the PC's motherboard. Contact your PC vendor.

SPECIFICATIONS

This appendix lists 3C359B NIC specifications, connector pin assignments, and cable requirements.

3C359B NIC Specifications

The 3C359B NIC provides a high-performance 32-bit PCI local bus interface with bus mastering that runs at a clock speed of 33 MHz.

Network Interface

IEEE 802.5 token ring network with 16 Mbps or 4 Mbps transmission rate.

Physical Dimensions

Length: 14.605 cm (5.75 in)

Height: 10.668 cm (4.20 in)

Environmental Operating Range

Operating temperature: 0° to 55 °C (32° to 131 °F)

Storage –40° to 80 °C (–40° to 176 °F)

Relative humidity (noncondensing)

Operating: 10% to 90%

Storage: 5% to 95%

Power Requirements at 16 Mbps

0 mA @ +3.3 V, maximum
400 mA @ +5 V, maximum
2 mA @ +12 V, maximum (12 V is not required when the 3C359B NIC is powered through the Remote Wake-Up connector.)

Compatibility

PCI Local Bus Specification, Revision 2.1

PCI Bus Power Management Interface Specification, Revision 1.1

Advanced Configuration and Power Interface Specification, Revision 1.0

Bus Data Interface

32-bit bus mastering

Interrupts (IRQs)

Automatically allocated by system

Node ID

Globally administered node ID allocated by IEEE
Locally administered node ID optional

Cables and Connectors

Category 3, 4, 5 for UTP (RJ-45)
Type 1, 1A, 2, 6 for STP (DB-9)

Emissions Classifications

FCC Class B, digital device
EN55022 Class B
Canadian Class B digital apparatus
VCCI Class 2 category

European Community Classification

EE-Compliant

Safety Classifications

UL 1950 (ITE)
TUV EN60950:1992

Electromagnetic Susceptibility

EN50082-1

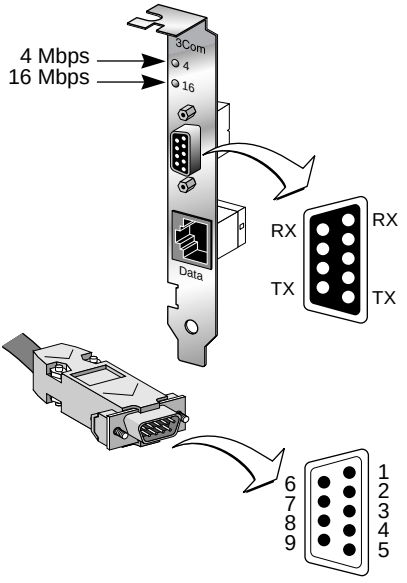
Connector Pin Assignments

You can connect the 3C359B NIC to a network through the NIC's DB-9 connector or RJ-45 connector. Pin assignments for both connector types are shown in the following sections.

DB-9 Connector Pin Assignments

You can use the 3C359B NIC's DB-9 connector to connect to shielded twisted-pair (STP) cabling (Type 1 or 6). The DB-9 connector pin assignments are shown in Figure 25.

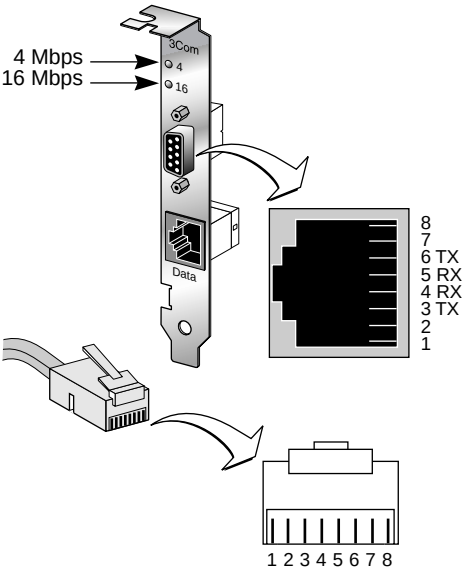
Figure 25 DB-9 Connector Pin Assignments



RJ-45 Connector Pin Assignments

You can use the 3C359B NIC's RJ-45 connector to connect to unshielded twisted-pair (UTP) cabling (Category 3, 4, or 5). The RJ-45 connector pin assignments are shown in Figure 26.

Figure 26 RJ-45 Connector Pin Assignments



Cable Requirements

The 3C359B NIC supports industry-standard token ring cabling that meets IEEE 802.5 specifications.

Connect shielded twisted-pair (STP) cables (type 1 or 6) to the 3C359B NIC's DB-9 connector (Figure 25).

Connect unshielded twisted-pair (UTP) cables (category 3, 4, or 5) to the 3C359B NIC's RJ-45 connector (Figure 26).

B CHANGING CONFIGURATION SETTINGS

You can change the 3C359B NIC's configuration settings through a DOS Configuration and Diagnostic Program provided on *TokenDisk* diskette 1 and on the *TokenLink Velocity XL* CD.

This appendix provides configuration instructions. Instructions for testing the NIC with the diagnostic part of the DOS Configuration and Diagnostic Program are located in Chapter 6, "Troubleshooting."

Using the Configuration Program

Before running the DOS Configuration and Diagnostic Program, perform a clean DOS boot from a DOS diskette (or the hard drive's DOS option, if provided) to ensure that no memory managers or drivers are loaded. The Configuration and Diagnostic Program does not run in a DOS window called from another operating system.

To change the configuration option settings for the 3C359B NIC, follow these steps.

1 **If you are using the 3.5-inch *TokenDisk* diskettes, insert *TokenDisk* diskette 1 in the drive and make that drive the active drive. For example, enter:**

```
a:
```

If you are using the *TokenLink Velocity XL* CD (in Drive D for example), enter the following path:

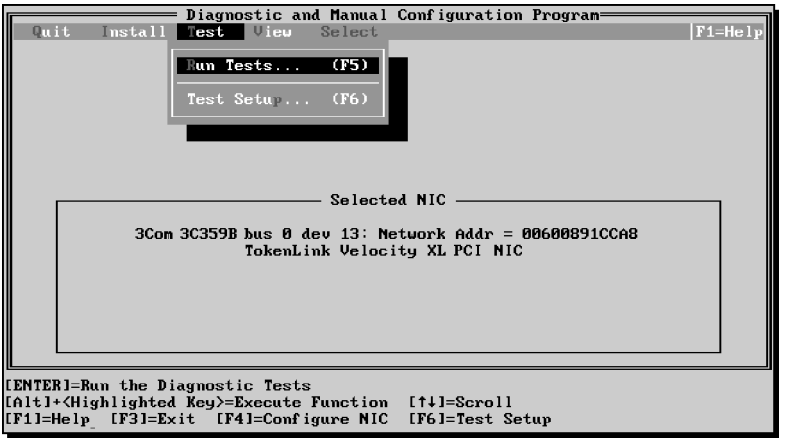
```
d:\disk_1
```

2 **Enter:**

```
3pcid
```

The DOS Diagnostic and Configuration Program screen is displayed with the *Test* menu selected, as shown in Figure 27.

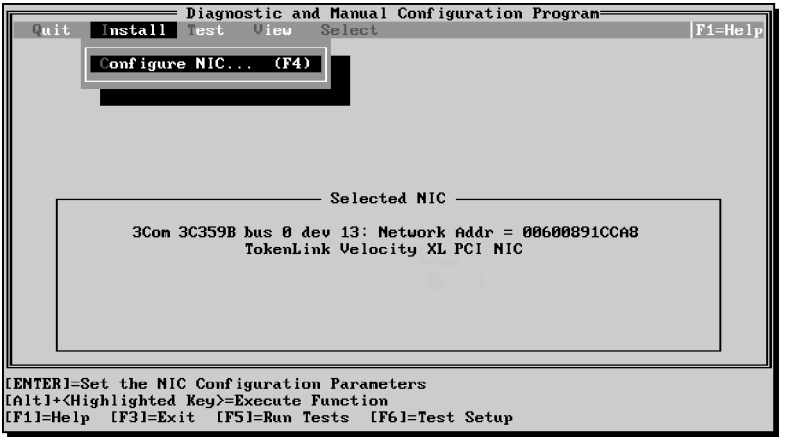
Figure 27 Configuration and Diagnostic Program Screen



3 Press Tab to select the *Install* pull-down menu shown in Figure 28.

You can use a mouse instead of keys to select options, provided a mouse driver is installed on your PC. When using a mouse, click the desired option.

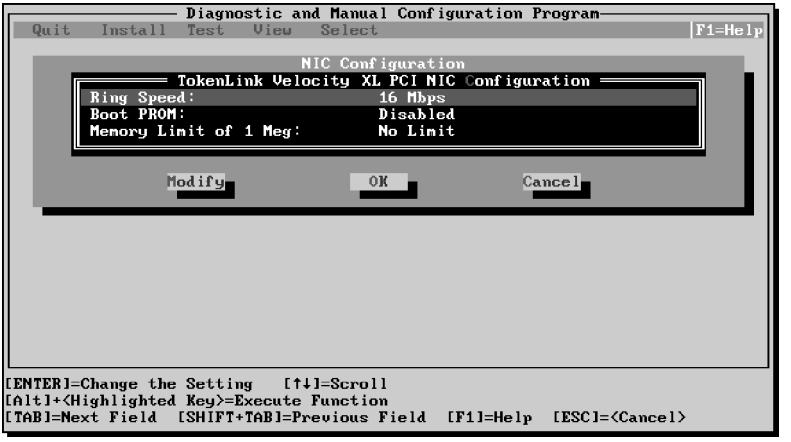
Figure 28 Install Menu



4 From the *Install* pull-down menu, press Enter to select *Configure NIC*.

The NIC Configuration screen appears, as shown in Figure 29.

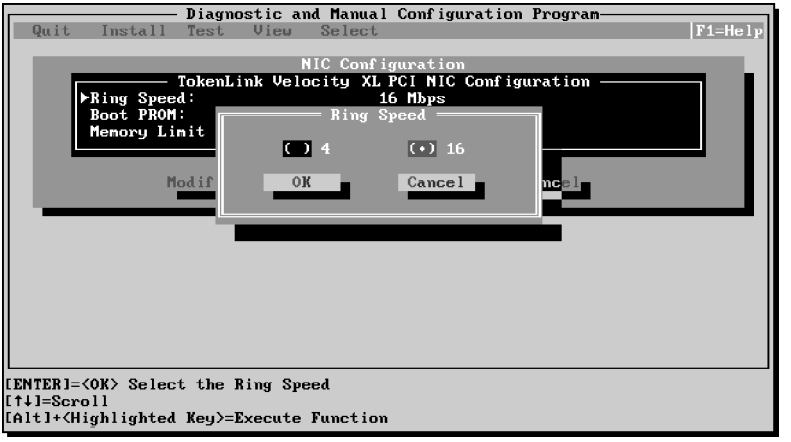
Figure 29 NIC Configuration Screen



5 Use the arrow (scroll) keys to select a configuration option that you want to change. Press Enter.

A dialog box similar to the one shown in Figure 30 appears to allow you to choose from available configuration settings.

Figure 30 Configuration Option Setting Dialog Box



Use the arrow keys to select the option you want, pressing Enter to display the dialog box for each option.

6 **When you have completed your configuration changes, press Tab until *OK* is selected.**

7 **Press Enter to save the new configuration settings for the NIC.**

Adjusting Configuration Settings

Configuration for the 3C359B NIC is automatic for all operating systems. When you turn on the computer after installing the NIC, Plug and Play (PnP) automatically assigns all resources.

Table 5 lists the default configuration settings of the 3C359B NIC at shipment.

Table 5 Initial Settings of 3C359B NIC Configuration Options

Configuration Option	Default Setting
Ring Speed	16 Mbps
Boot ROM	Disabled
Memory Limit of 1 MB	No Limit

Ring Speed

The 3C359B NIC operates at a ring speed of either 4 or 16 Mbps. The 3C359B NIC ring speed must match the speed of the token ring network. The default value is 16 Mbps.

The auto ring speed detection feature is enabled by default for all 3C359B NIC drivers. Auto ring speed detection overrides any manual setting of the ring speed through the 3C359B NIC configuration program. To disable auto ring speed detection and manually set the ring speed to either 16 Mbps or 4 Mbps, see "Selecting Ring Speed," on page 66.

It is recommended that you disable auto ring speed detection if you are installing the 3C359B NIC in a server. Otherwise, the server can fail to insert into the ring if it is the first station to come online and cannot detect a ring speed.

Boot ROM

To use this option, you must have installed the 3Com Managed PC Boot Agent (MBA) in the boot ROM socket on the NIC. (The MBA must be ordered separately. See installation instructions in the MBA user guide.) When enabled, the NIC allows the system to access BootWare residing in the MBA, enabling the PC to boot (with or without a hard drive) remotely from a LAN server in TCP/IP, NetWare, and RPL environments. The default setting is *Disabled*.

Memory Limit of 1 Megabyte

When disabled (set to *No Limit*), the MMIO address space can be mapped above the standard conventional memory address limit of 1 megabyte.

Changing Configuration for Multiple NICs

If you have more than one 3C359B NIC in your PC, you must select the NIC you want to configure.

From the DOS *Configuration and Diagnostic Program* menu (Figure 27), press Tab to select the *Select* pull-down menu. Select the 3C359B NIC you want to configure. Continue with configuration instructions as described earlier in this appendix.

C TECHNICAL SUPPORT

3Com provides easy access to technical support information through a variety of services. This appendix describes these services.

Information contained in this appendix is correct at time of publication. For the very latest, 3Com recommends that you access the 3Com Corporation World Wide Web site.

Online Technical Services

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)
- 3Com Facts℠ automated fax service

World Wide Web Site

Access the latest networking information on the 3Com Corporation World Wide Web site by entering the URL into your Internet browser:

`http://www.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>**

A user name and password are not needed with Web browser software such as Netscape Navigator and 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

3Com Facts Automated Fax Service

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

Call 3Com Facts 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, 3Com offers technical telephone support services. To find out more about your support options, 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

Below is 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
From Seoul:	00798 611 2230
Taiwan, R.O.C.	0080 611 261
Thailand	001 800 611 2000
Europe	
From anywhere in Europe, call:	+31 (0)30 6029900 phone +31 (0)30 6029999 fax
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

(continued)

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 2273)
Peru	AT&T +800 666 5065
Puerto Rico	800 666 5065
Venezuela	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	

(continued)

Country	Telephone Number	Fax Number
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

GLOSSARY

ACPI

Advanced Configuration and Power Interface. A power management specification developed by Microsoft, Toshiba, and Intel. ACPI, which will be part of Windows 98, enables the operating system to control the amount of power sent to each device attached to the computer. ACPI will enable manufacturers to produce computers that automatically power up as soon as you touch the keyboard. With ACPI, the operating system can turn off peripheral devices, such as CD-ROM players, when they are not in use. *See also* OnNow/(ACPI).

bus

A common pathway across which data can travel within a computer. This pathway is used for communication and can be established between two or more computer elements. In any computer, data travels over one or more buses between memory, the CPU, and peripheral components like NICs, video display adapters, SCSI controllers, and disk drives.

bus mastering

A bus design that allows NICs to move data and access the computer's memory and peripherals without support from the CPU.

CAU

Controlled access unit. An intelligent hub.

Class of Service (or Traffic Prioritization)

A 3Com Dynamic*Access* feature that helps to optimize network performance by letting you prioritize your applications for efficient network access. High-priority tokens are requested when the network transmits data for selected applications.

clean boot

A DOS boot with no memory managers or other programs (such as drivers) loaded in memory.

DAU

Dual access unit.

driver

A program, usually resident in the server or workstation memory, that controls the network hardware (such as NICs or controllers) or implements the protocol stacks through which higher-level applications communicate with the network hardware.

DTR

Dedicated Token Ring (DTR). An extension to the IEEE 802.5 standard that increases network performance in switched token ring environments. It allows data transmission using dedicated resources between the station and the concentrator. Transmissions can be either half-duplex or full-duplex.

Dynamic*Access* software

A 3Com set of features that adds intelligence to NICs to optimize network performance and provide enhanced network management and control.

full-duplex

A mode of operation in which a token ring station can simultaneously transmit and receive independent data streams. Dedicated transmissions occur between the station and switch; token passing no longer occurs.

hexadecimal

A number system with a base of 16. In hexadecimal, the first 10 digits are 0–9 and the last six digits are A–F. This number system is identified in this guide by a number or character followed by "h."

IEEE 802.5

The standard for the token ring access method and physical layer specifications developed by a subcommittee of the Institute for Electrical and Electronics Engineers (IEEE) 802 committee.

lobe

All network components in a specific area that physically connect to a specific MAU or wiring hub.

lobe cable

The section of cable that attaches a ring station or network device to a MAU or wiring hub.

Magic Packet

Technology developed by Advanced Micro Devices used to remotely wake up a PC that is in sleep or suspend mode on a network. This is accomplished by sending a specific packet of information, called a Magic Packet frame, to a PC on the network. When a PC that is capable of receiving the Magic Packet frame goes to sleep, it enables the Magic Packet mode in the LAN controller. When the LAN controller receives a Magic Packet frame over the network, it alerts the system to wake up.

MAU

Multistation access unit. A passive hub.

NDIS

Network Driver Interface Specification. A Windows software specification used in many operating systems to create drivers for network NICs. NDIS drivers support multiple protocols and multiple NICs and can be unloaded from memory to conserve conventional DOS RAM space. NDIS permits the high-level protocol components to be independent of the NIC by providing a standard interface. Windows NT 3.51 and 4.0 and Windows 95 support NDIS 3.0 and NDIS 4.0. Windows NT 4.0 and Windows 98 support NDIS 5.0.

ODI

Open Data-link Interface. A MAC-level specification developed by Novell and Apple Computer. Like NDIS, the ODI driver supports multiple protocols and NICs and can be unloaded from memory to conserve conventional DOS RAM space.

OnNow/(ACPI)

A comprehensive system-wide approach to system and device power control. OnNow is a term for a PC that is always on but appears to be off and responds immediately to user or other requests. *See also* ACPI.

Parallel Tasking architecture

A proprietary technique developed and patented by 3Com that provides significant performance improvement by allowing network interchanges of data to occur in parallel.

Parallel Tasking II technology

A proprietary PCI bus master interface developed by 3Com that builds on the earlier Parallel Tasking architecture to achieve faster data transfer rates and lower CPU utilization.

Parallel Tasking II technology removes any limits on the size of the data bursts across the PCI bus.

PCI

Peripheral Component Interconnect. The PCI 32-bit bus provides a processor-independent data path between a PC's central processing unit (CPU) and high-speed peripheral devices. The PCI bus supports multiple peripheral components and add-in cards at a peak bandwidth of 132 MBps, which is up to 10 times faster than that of ISA, EISA, and MCA PC buses. PCI provides full Plug and Play support for automatic NIC configuration in the PC.

promiscuous mode

A method by which a NIC receives and forwards all network packets that arrive, regardless of the node to which they are addressed. This feature allows easy identification and resolution of network problems.

Remote Wake-Up

Feature that permits remote power-up of PCs for after-hours administration. Remote Wake-Up powers on a PC in standby or suspend mode remotely using a wake-up packet (known as a Magic Packet) that is sent through the LAN from a network management station. When the NIC senses the packet, it asserts a Power Management Enable (PME) signal to the PC, which initiates the start-up process.

token ring

A network that employs a ring topology and passes tokens for ring access.

Traffic Prioritization

See Class of Service.

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