TOKENLINK® III 16/4 ISA ADAPTER USER GUIDE

A member of the TokenLink III product family
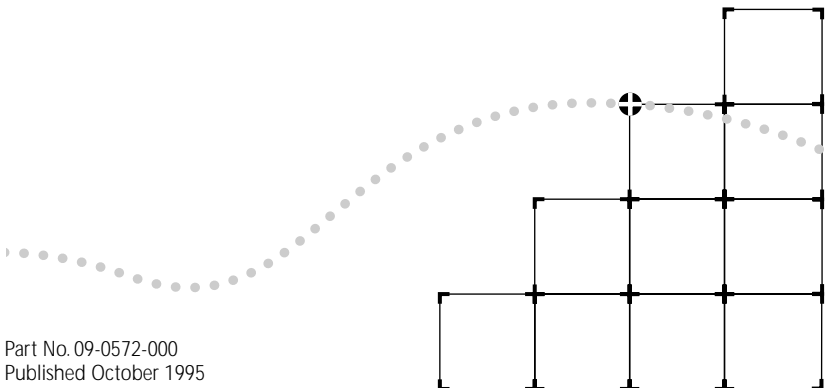
LIFETIME WARRANTY

3Com's EtherLink®, TokenLink® III 16/4, Fast EtherLink, FDDILink™, and 3Com Impact™ ISDN ISA adapters have a Lifetime Warranty.

To ensure the very best 3Com service and support, take the time to complete the product registration card.

Any defective 3Com adapter will be repaired or replaced, at 3Com's option, for as long as the adapter resides in its original IBM® Personal Computer, Personal System/2®, or compatible computer (driver software is covered by the standard 90-day limited software warranty).
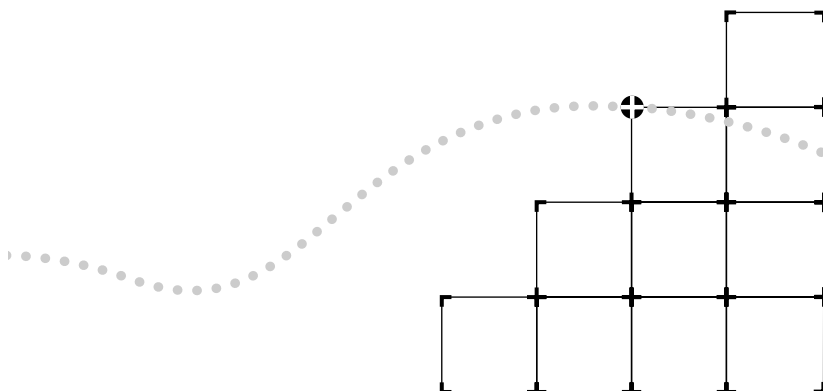
Customers in the countries shown below should send the completed registration card to the appropriate address. Customers in other non-U.S. locations should send the registration card to the U.S. address on the front of the card.

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  Citibank Plaza, Central
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ABOUT THIS GUIDE

Introduction

This guide describes how to install, configure, and troubleshoot the TokenLink® III 16/4 ISA (3C619C) adapter.

> *If the information in the README.TXT file shipped with your product differs from the information in this guide, follow the instructions in the README.TXT file.*

How to Use This Guide

The following table shows where to find specific information in this guide.

If you are looking for:	Turn to:
3C619C adapter overview	Chapter 1
3C619C adapter hardware installation procedures	Chapter 2
Instructions for using the AutoLink feature for NetWare	Chapter 3
Standard installation and configuration instructions	Chapter 4
Network drivers installation instructions	Chapter 5
Network driver installation instructions for Windows NT and Windows 95	Chapter 6
Troubleshooting tips and procedures	Chapter 7
3C619C Configuration and Diagnostic Program	Appendix A
3C619C adapter specifications and configuration descriptions	Appendix B
Error messages descriptions	Appendix C
Technical support	Appendix D
Definition of terms used in this guide	Glossary

Conventions

Table 1 and Table 2 list text and icon conventions that are used throughout this guide:

Table 1   Text Conventions

Convention	Description
Text represented as `screen display`	`This typeface` is used to represent displays that appear on your terminal screen, for example: `Login:`
Text represented as **`commands`**	**`This typeface`** is used to represent commands that you enter, for example: **`A: Install`**
Italics	*Italics* are used to denote *new terms* or *emphasis*.

Table 2   Notice Icons

Icon	Type	Description
	Information Note	Information notes call attention to important features or instructions.
	Caution	Cautions contain directions that you must follow to avoid immediate system damage or loss of data.
	Warning	Warnings contain directions that you must follow for your personal safety. Follow all instructions carefully.

1
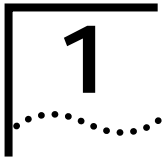
INTRODUCTION

The 3Com® TokenLink® III 16/4 ISA Token Ring Adapter (3C619C) is a 16-bit network adapter. The 3C619C adapter can be installed in any IBM®-compatible UL®-listed PC with an Industry Standard Architecture (ISA) bus or Extended Industry Standard Architecture (EISA) bus.

TokenLink III 16/4 ISA Token Ring Adapter Features

This adapter offers bandwidth and flexibility by supporting both 4- and 16-Mbps data rates over shielded and unshielded twisted-pair wiring without requiring an external media filter. The adapter can be configured automatically with the automatic configuration utility or manually with the 3C619C software. There are no DIP switches to set. The adapter also provides full EISA configuration support. The 3C619C adapter features include:

- Automatic adapter configuration

- Compliance with IEEE 802.5 standards

- 100% IBM compatibility

- Full duplex enabled

- Standard universal Boot PROM

The *TokenDisk®* diskette is supplied with the adapter. It includes the AutoLink™ auto installation program, the Configuration and Diagnostic Program, drivers, and driver agents for Transcend® PC Link SmartAgent™ software.

The 3C619C adapter can be configured in one of two modes: 3Com mode or IBM mode. 3Com mode increases the number of available IRQ channels from 4 to 8 and the number of I/O base addresses from 2 to 32. You can install up to six adapters per PC. 3Com drivers (Novell® NetWare® and NDIS) are supplied on the *TokenDisk* diskette to support these 3Com mode enhancements.

IBM mode provides the same configuration options as IBM 16/4 Token Ring Adapters: four IRQ channels and two I/O base addresses. You can use either 3Com drivers or IBM drivers with the adapter in IBM mode.

Installation and Configuration Options

The software on the *TokenDisk* diskette provides three methods for installing the adapter:

- AutoLink installation
- Standard installation and configuration
- Microsoft® Windows NT™ and Windows® 95 installation and configuration

Figure 1-1 depicts the installation process, including the cabling and network operating system options. The chapters listed contain detailed information for that step.

The three installation methods are described in the following sections.

AutoLink Installation

The AutoLink program can be used to make your PC a NetWare DOS ODI client. The AutoLink program configures and tests the 3C619C adapter, installs the client driver and NetWare client files, and modifies PC startup files to allow you to log in to a NetWare server after you reboot your PC. For more information about the AutoLink feature, see Chapter 3, "Using the AutoLink Feature for NetWare."

```
        ┌─────────────────────┐
        │   Inspect adapter   │
        └─────────────────────┘
                   │
                   ▼
        ┌─────────────────────┐
        │   Install adapter   │
        └─────────────────────┘
                   │
                   ▼
        ┌─────────────────────┐
        │ Connect adapter cable│
        └─────────────────────┘
                   │
                   ▼
              ◇ Network        STP
              cabling type ─────────────┐
                   ?                     │
                   │ UTP                 ▼
                   ▼           ┌─────────────────────┐
        ┌─────────────────────┐│ Connect adapter cable│
        │ Connect adapter cable││   to STP network    │
        │   to UTP network    │└─────────────────────┘
        └─────────────────────┘
```

Network cabling type ? — STP — Connect adapter cable to STP network

UTP — Connect adapter cable to UTP network

If memory manager is installed, exclude memory range D8000–DBFFF

Install single adapter as a NetWare DOS ODI client ? — No — Install adapter for Windows NT or 95 ? — Yes — Windows installation

Yes — No

Configure the adapter — } Chapter 4

Install network drivers — } Chapter 5

r 3 { Use AutoLink installation

Update network startup files

Reboot computer

Figure 1-1   Adapter Installation and Configuration

Standard Installation and Configuration

The standard installation and configuration procedures can be used to configure the 3C619C adapter, test the adapter, and install drivers. For more information about these procedures, refer to Chapter 4, "Standard Installation and Configuration," Chapter 6, "Installing the Network Driver for Windows," and Chapter 7, "Troubleshooting."

Windows Installation and Configuration

The Windows installation and configuration procedures can be used to configure the 3C619C adapter and install the network driver in Windows NT and Windows 95 operating systems. For more information about these procedures, refer to Chapter 6, "Installing the Network Driver for Windows."

Transcend PC Link SmartAgent Software

You can manage the 3C619C adapter using 3Com's Transcend PC Link SmartAgent software, purchased separately. Driver agents for use with this product are supplied on the *TokenDisk* diskette. Refer to the SMARTAGT.TXT file in the \SMARTAGT directory on the *TokenDisk* diskette and the *Transcend PC Link SmartAgent Software User Guide* for more information.

Troubleshooting

The *TokenDisk* diskette contains a DOS diagnostic program described in Chapter 7, "Troubleshooting," and in Appendix A, "Using the Configuration and Diagnostic Program." This program runs tests that provide the status of the adapter.

100% Compatibility

The 3Com TokenLink III 16/4 ISA token ring adapter is 100% compatible with any commercially available driver or application that functions with the generation of TROPIC™-based IBM adapter boards available at shipment of the 3Com TokenLink III ISA adapter (3C619C).

Money-Back Guarantee

If a 3Com TokenLink III 16/4 adapter is not 100% compatible (as defined above) with any driver or application written to function on an IBM adapter, 3Com will refund the purchase price of the adapter. Customers who believe the TokenLink III 16/4 adapter they have purchased is not compatible should contact the support group of the organization from which they purchased the adapter. For more information about technical support, see Appendix D.

2

INSTALLING THE 3C619C ADAPTER

This chapter describes how to install a 3Com 3C619C token ring adapter in an ISA or EISA PC and connect it to the network. The procedures in this chapter are designed for a first-time user. This chapter consists of the following sections:

- PC Requirements
- Taking Safety Precautions
- Inspecting the Adapter
- Installing the Adapter
- Connecting to the Network

The flowchart in Figure 2-1 depicts the 3C619C adapter installation process.
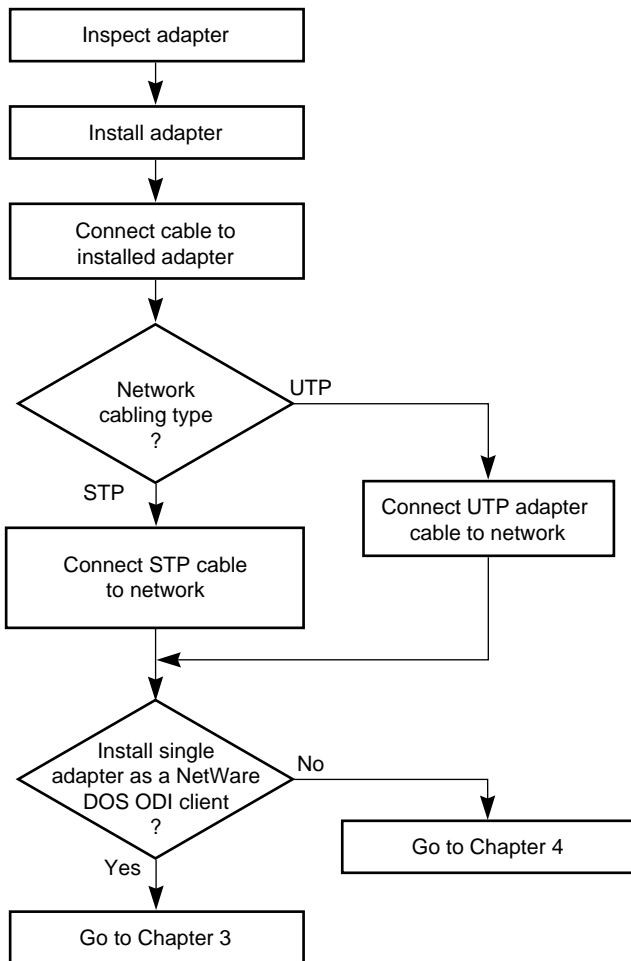
Figure 2-1   3C619C Adapter Installation

PC Requirements

Installation of the 3C619C adapter requires the following:

- An ISA- or EISA-bus PC with at least 640 K of RAM and an 80386 processor.

- An available 16-bit (ISA) or 32-bit (EISA) expansion slot.

- A high-density 3.5 inch floppy diskette drive.

- Network drivers.

- Cabling type 3 (UTP) or types 1 or 6 (STP).

- *TokenDisk* diskette with the installation, configuration, and diagnostic programs.

- One of the following operating systems:

  - OS/2® version 1.x or later (Novell® NetWare® OS/2 Requester)

  - NetWare 2.1x or 2.2 (Novell NetWare 286 Server)

  - NetWare 3.1x or later (Novell NetWare 386 Server)

  - MS-DOS® version 3.2 or later (Microsoft® DOS LAN Manager, Banyan® VINES® DOS workstation, Banyan VINES 386 Server, IBM® PC LAN Program, PC LAN Program, Novell NetWare DOS Requester, IBM DOS LAN Requester)

  - MS-OS/2 version 1.x or later (Microsoft OS/2 LAN Manager)

  - IBM OS/2 EE version 1.1 or later (IBM LAN Server/ LAN Requester, Communications Manager)

  - IBM OS/2 version 2.0 or later (IBM LAN Server)

  - Windows NT version 3.51 or later or Windows 95

- Available memory to load the 3C619C adapter driver from the network operating system. Depending on the LAN operating system, you may need additional free memory. Refer to the relevant network operating system (NOS) documentation for the exact memory requirements.

- Multistation access unit (MAU), controlled access unit (CAU), or dual access unit (DAU).

Taking Safety Precautions

WARNING: *The adapter board is installed in a PC that operates with voltages that can be lethal. Before you remove the cover of your PC, you must observe the following steps to protect yourself and prevent damage to the PC's components.*

1 Turn off the PC and unplug the unit from its power source.

2 Remove any jewelry from your hands and wrists.

3 Make sure to use only insulated or nonconductive tools.

Inspecting the Adapter

The contents of your 3C619C adapter package are listed below. If any of these items are missing, contact your authorized network supplier immediately.

- TokenLink III 16-bit ISA adapter (3C619C)
- *TokenLink III 16/4 ISA Adapter User Guide*
- *TokenDisk* diskette for the TokenLink III family of adapters

CAUTION: *The adapter is packed in an antistatic container to protect it during shipment. To avoid damaging highly static-sensitive components on the adapter or in the PC, be sure to reduce any static electricity on your body. You can also maintain grounding by wearing an electrostatic discharge wrist strap attached to the chassis.*

1 Carefully lift the adapter out of the box and set it aside.

2 Return all packing materials to the shipping container and store the container in a safe place.

If you need to return the adapter to 3Com, you must pack it in the original (or equivalent) packing material, or the warranty will be voided.

3 Remove the adapter from its antistatic bag.

4   Check the adapter for any visible signs of damage.

If you find a problem, immediately notify your authorized network supplier and the carrier that delivered the adapter.

After you have unpacked the adapter, complete the Product Registration Card at the back of this manual and return it to 3Com. Or call 1-800-NET-3Com for immediate registration.

Installing the Adapter

Install the 3C619C adapter as follows:

1   Remove the PC's cover and choose an empty expansion slot, as shown in Figure 2-2.
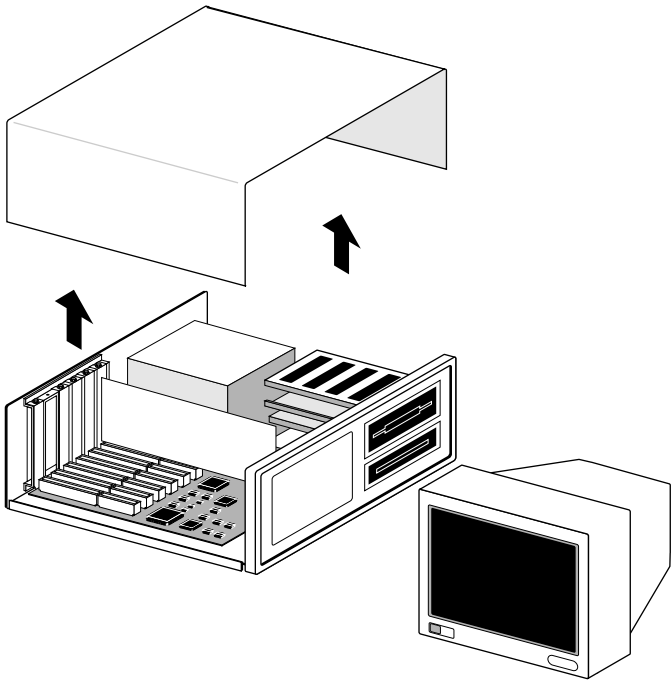
Figure 2-2   Removing the Cover
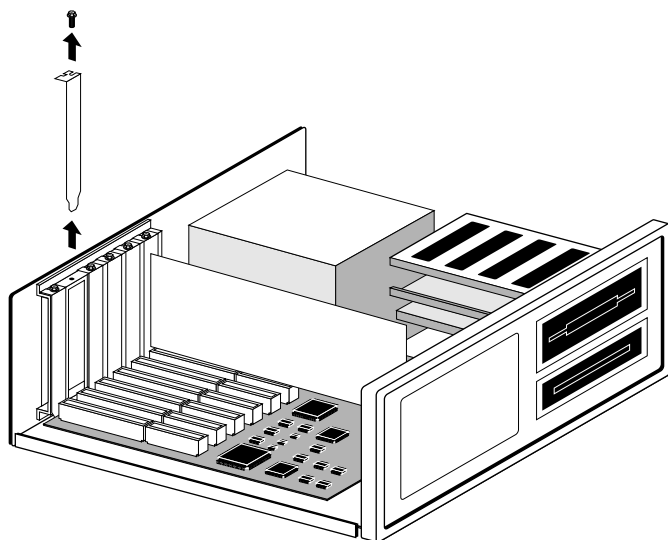
Figure 2-3 Removing the Backplate

2 Remove the screw holding the expansion slot's backplate, as shown in Figure 2-3.

Your PC may look different from the one illustrated, particularly if it is an EISA PC. With an EISA PC, use any empty slot.

3 Insert the 3C619C adapter into the empty expansion slot, as shown in Figure 2-4, and secure it with the screw you removed earlier.

4 Replace the PC's cover.

5 Proceed to the next section, "Connecting to the Network."
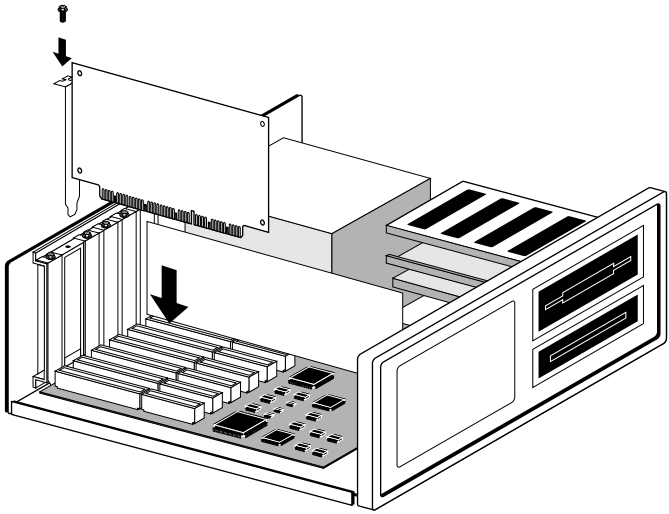
Figure 2-4 Installing the Adapter

Connecting to the Network

Connect one of the following types of network cables to the 3C619C adapter.

Type	Connector
Shielded twisted-pair (STP) cable	DB-9
Unshielded twisted-pair (UTP) cable	RJ-45

TokenLink III adapters support industry-standard token ring type 3 (UTP) or types 1 or 6 (STP) cabling. These types of cable follow IEEE 802.5 specifications.

⚠ **CAUTION:** *Make sure that you connect the cable only to the 3C619C adapter that you have just installed. Connecting the cable to any expansion card other than the network adapter could result in serious damage to the expansion card or the token ring network.*

Figure 2-5 and Figure 2-6 show the adapter connectors.

Connecting to Shielded Twisted-pair (STP) Cable

1 Locate the adapter's DB-9 connector on the backplate, as shown in Figure 2-5.

DB-9 port
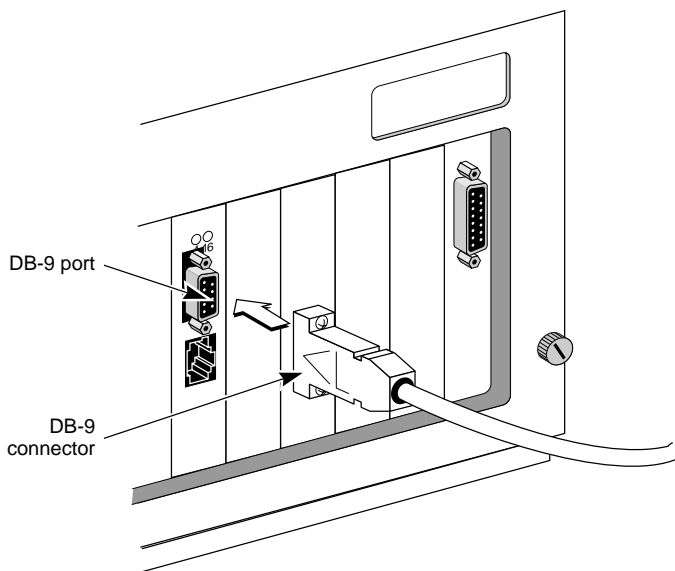
DB-9 connector

Figure 2-5 Attaching the STP Cable with the DB-9 Connector

2 Locate the DB-9 connector on the shielded twisted-pair cable.

3 Connect the cable's DB-9 connector to the adapter's DB-9 port, and secure it by tightening the two screws.

4 Connect the other end of the cable to a network dual access unit (DAU), a multistation access unit (MAU), or a controlled access unit (CAU).

If you have a NetWare server, proceed to Chapter 3. If you have any other type of network operating system, proceed to Chapter 4.

Connecting to Unshielded Twisted-pair (UTP) Cable

1 Locate the adapter's RJ-45 port on the backplate, as shown in Figure 2-6.

RJ-45 port
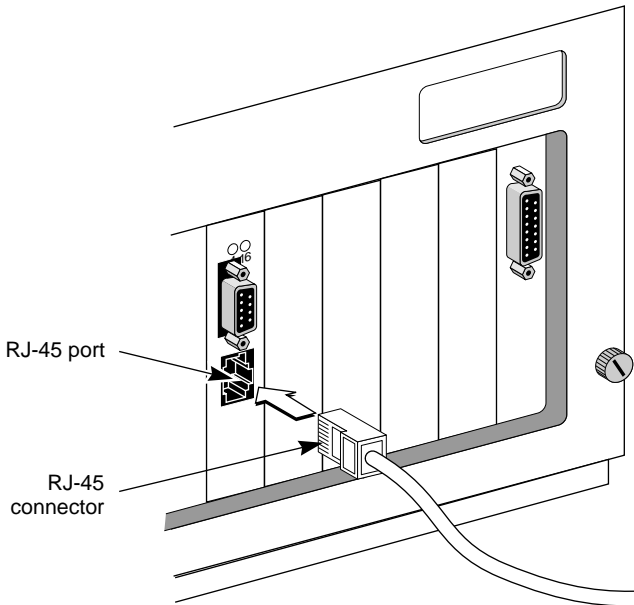
RJ-45 connector

Figure 2-6   Attaching the UTP Cable with the RJ-45 Connector

2 Align the RJ-45 plug on the end of the unshielded twisted-pair cable with the notch on the adapter's port.

3 Insert the RJ-45 plug into the adapter port.

4 Connect the other end of the cable to a dual access unit (DAU), a multistation access unit (MAU), or a controlled access unit (CAU).

ℹ *Do not daisy-chain token ring adapters or connect them back to back.*

If you have a NetWare server, proceed to Chapter 3. If you have any other type of network operating system, proceed to Chapter 4.

3 USING THE AUTOLINK FEATURE FOR NETWARE

The AutoLink auto installation feature for NetWare configures the adapter as a NetWare DOS ODI client. The AutoLink installation steps are depicted in Figure 3-1.

```
┌─────────────────────────────┐
│  If memory manager is installed, │
│     exclude memory range     │
│        D8000 – DBFFF         │
└─────────────────────────────┘
              │
              ▼
┌─────────────────────────────┐
│   Insert TokenDisk diskette. │
│   Make diskette drive active.│
└─────────────────────────────┘
              │
              ▼
┌─────────────────────────────┐
│      Type: AUTOLINK          │
└─────────────────────────────┘
              │
              ▼
┌─────────────────────────────┐
│    Select ring speed and     │
│     configuration mode       │
└─────────────────────────────┘
              │
              ▼
┌─────────────────────────────┐
│      Remove diskette         │
│    and reboot computer       │
└─────────────────────────────┘
```
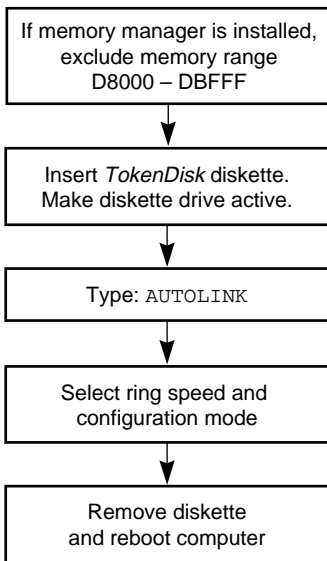
Figure 3-1   AutoLink Installation Process

This chapter describes the AutoLink program requirements, ways to avoid memory conflicts, and installation steps. See Chapter 5 for other NetWare and NDIS operating system information and see Chapter 6 for information about installing the network driver for Windows NT and Windows 95.

The AutoLink program performs the following functions:

- Configures the 3C619C adapter.

- Tests the adapter.

- Installs the DOS ODI client driver.

■ Logs in to the server and updates the NetWare client software if a 3Install account exists on the server; otherwise, the client software is installed from the *TokenDisk* diskette.

■ 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.)

> *If you want to configure the adapter manually, see Chapter 4, "Standard Installation and Configuration."*

AutoLink Requirements

Verify that you meet the following requirements.

■ The 3C619C adapter must be installed in your PC and connected to the network.

■ NetWare on the server must be version 2.2 or later.

■ After running the AutoLink program, you need an account on the target NetWare server with an assigned user ID and password to log in to the server.

AutoLink Options

■ A 3Install account on the server allows the AutoLink program to download the NetWare client software from the server instead of from the *TokenDisk* diskette. This feature can be used to install newer versions of the software or to customize your installation.

Installation instructions for creating the 3Install account and preparing the server can be found in the A:\QINSTALL\SERVER\README.TXT file on the *TokenDisk* diskette.

■ The AUTOLINK.CFG file can be used to modify the AutoLink process. The AUTOLINK.CFG file in the *TokenDisk* diskette's root directory contains default settings and descriptions of the AUTOLINK.CFG parameters.

Avoiding Memory Manager Conflicts

If you are using a memory manager on your PC (all PCs running Microsoft Windows have a memory manager such as EMM386 or its equivalent), you need to inform the memory manager of the memory used by the 3C619C adapter. The 3C619C adapter in its default configuration requires a shared RAM page size of 16 K.

The following example assumes that you are using EMM386 and the default shared RAM address. Follow these steps to exclude the memory range used by the 3C619C adapter:

1 Make a backup copy of the CONFIG.SYS file. Type:

```
copy CONFIG.SYS CONFIG.OLD
```

2 Edit the CONFIG.SYS file on your PC to exclude the memory range that the 3C619C adapter is using. For example, modify the memory manager device statement by typing:

```
device=c:\windows\emm386.exe x=D800-DBFF noems
```

where *x* stands for exclude, followed by the memory range that the adapter is using.

> **i** *Refer to the manual that accompanied the memory manager software for additional instructions and information.*

3 Save the CONFIG.SYS file and exit the text editor.

4 Reboot the PC.

This completes the procedure for avoiding conflicts with a memory manager. You are now ready to run the AutoLink program.

Using the AutoLink Feature

Follow these steps to use the AutoLink feature:

1 Place the *TokenDisk* diskette in a floppy drive on your PC and make that drive the active drive. For example, type:

```
A: [Enter]
```

2 Type at the prompt:

```
AUTOLINK [Enter]
```

The first time you use the *TokenDisk* diskette, the 3Com software license appears.

3 To accept the terms and conditions of the 3Com end-user software license agreement, type:

```
Y
```

> **i** *To view the full text of the license agreement, press [F1].*

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

4 Enter the correct ring speed and configuration mode and press [Enter].

This adapter can run at 16 or 4 Mbps. The ring speed for the adapter and the network must be the same. Ask your system administrator for the correct ring speed.

Upon successful completion, a message appears, stating that the AutoLink program has completed the configuration.

5 Remove the *TokenDisk* diskette and press any key to reboot your PC.

The login prompt for a NetWare server appears.

6 Log in to the NetWare server using your user ID and password provided by your network administrator.

The 3C619C adapter is now a NetWare DOS ODI client. Installation and configuration are complete. If you have problems, see Chapter 7, "Troubleshooting," for help.

4

STANDARD INSTALLATION AND CONFIGURATION

This chapter describes how to configure the 3C619C adapter in a DOS or OS/2 PC, using the steps shown in Figure 4-1.

```
┌─────────────────────────────────┐
│ If memory manager is installed, │
│    exclude memory range         │
│       D8000 – DBFFF             │
└─────────────────────────────────┘
                 │
                 ▼
┌─────────────────────────────────┐
│   Insert TokenDisk diskette.    │
│   Make diskette drive active.   │
└─────────────────────────────────┘
                 │
                 ▼
┌─────────────────────────────────┐
│       Type: INSTALL             │
└─────────────────────────────────┘
                 │
                 ▼
          ╱  Auto  ╲
        ╱ configure for adapter ╲  No (manual configuration)
        ╲    desired    ╱
          ╲    ?   ╱
            │  Yes
```
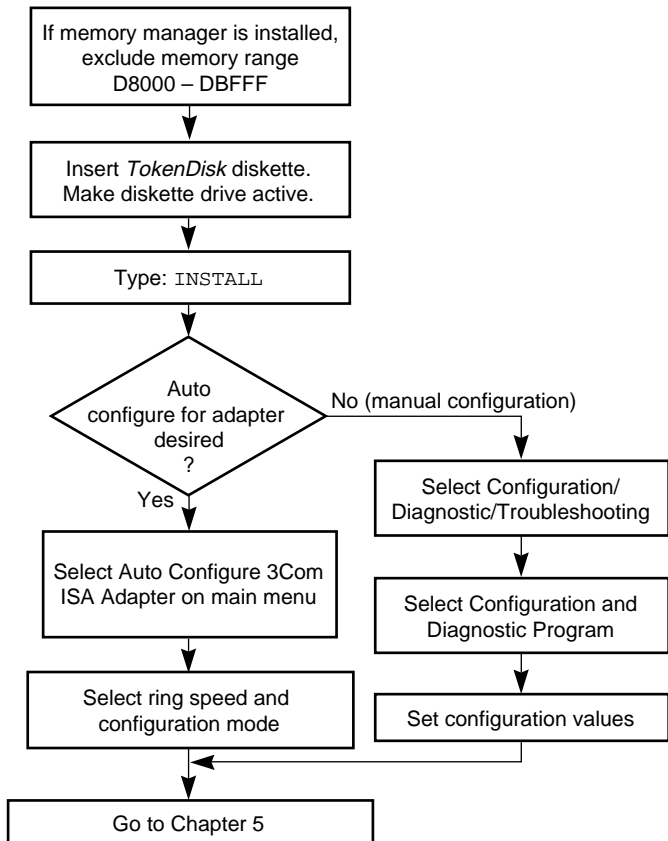
Figure 4-1   Standard Installation and Configuration

The standard installation and configuration process requires that you configure the adapter, install the network driver, and modify the network startup files.

The ISA adapter can be configured automatically or manually. Automatic configuration selects configuration values for the adapter. Manual configuration allows you to select the resources yourself.

If you are installing a single adapter and preparing your PC for use as a Novell NetWare DOS client, use the instructions in Chapter 3. If you are running Windows NT or Windows 95, see Chapter 6.

Configuration Requirements

Verify that you meet the following requirements in addition to those stated in Chapter 2.

■ The 3C619C adapter must be installed in your PC and connected to the network.

■ No drivers should be loaded.

Auto Configuring the 3C619C Adapter in an ISA PC

To configure the 3C619C adapter in an ISA PC, proceed as follows:

1 Make sure the 3C619C adapter has been properly installed in your PC and connected to the network (refer to Chapter 2 for instructions).

2 Boot your PC under DOS, version 3.2 or later.

When you configure adapters, memory conflicts may occur. To help prevent this, follow these rules:

a Do not load network drivers.

b Be aware that terminate and stay resident programs (TSRs) may cause memory conflicts.

c If you are using a memory management utility, you must inform it of the address ranges used by the 3C619C adapter. For example, add an exclude parameter to the EMM386 device statement in the CONFIG.SYS file such as:

```
DEVICE=C:\EMM386.EXE NOEMS X=D800-DBFF
```

3　Place the *TokenDisk* diskette in a floppy drive on your PC and make that drive the active drive. For example, type:

```
A: [Enter]
```

4　Type at the prompt:

```
INSTALL [Enter]
```

5　The first time you use the diskette to install the adapter software, a software license screen appears. To accept the terms and conditions of the 3Com end-user software license agreement, type:

```
Y
```

> *To view the full text of the license agreement, press [F1].*

6　Read the next screen and press [Enter].

7　When the main menu shown in Figure 4-2 appears, select Auto Configure 3Com ISA Adapter.

```
┌─────────── TokenDisk for the TokenLink III Adapter ───────────┐
│ ESC=Cancel                                           F1=Help   │
│                                                                │
│                      M A I N    M E N U                        │
│                                                                │
│   ┌────────────────────────────────────────────────────────┐  │
│   │  Auto Installation with Configuration (AutoLink)        │  │
│   │      NetWare DOS ODI Client                             │  │
│   │                                                         │  │
│   │  Standard Installation and Configuration                │  │
│   │      Auto Configure 3Com ISA Adapter                    │  │
│   │      Network Drivers ...                                │  │
│   │      Configuration/Diagnostic/Troubleshooting ...       │  │
│   │      General Information/Release Notes                   │  │
│   └────────────────────────────────────────────────────────┘  │
│                                                                │
│  Automatically configures the adapter to non-conflicting settings │
│                                                                │
└────────────────────────────────────────────────────────────────┘
[ENTER]=Execute Function
[↑↓]=Scroll
[F1]=Help  [ESC]=<Cancel>
```

Figure 4-2　Main Window with Auto Configure Selected

8 When prompted, select the operating mode and speed.

The 3C619C adapter offers the following choices:

- 3Com mode, 16 Mbps

- 3Com mode, 4 Mbps

- IBM mode, 16 Mbps

- IBM mode, 4 Mbps

3Com mode provides you with the features of IBM mode as well as additional I/O address options and IRQ channels that reduce the possibility of conflicts with other peripherals on the PC. IBM mode is compatible with existing IBM drivers. Table 4-1 shows the characteristics of 3Com mode and IBM mode.

Table 4-1   3Com Mode versus IBM Mode

IBM Mode	3Com Mode
Supports existing IBM 16/4 drivers	Requires 3Com drivers for expanded configuration settings. Supports existing IBM 16/4 drivers when the I/O Base Address = A20 or A24 and the IRQ = 2,3,6, or 7.
Maximum of 2 adapters	Maximum of 6 adapters
4 IRQ levels	8 IRQ levels
2 I/O Base addresses (A20h, A24h)	32 I/O Base addresses

When you select the configuration mode, the I/O Base Address, Interrupt Request Level, Ring Speed, BIOS/MMIO Base Address, and Shared RAM Address Range options on the adapter are automatically configured to settings that do not conflict with any other device in your PC. Upon successful completion of configuration, a message appears. Press any key to continue.

To change the settings manually, follow the steps in the next section, "Changing Software Option Settings."

To install the network driver, proceed to Chapter 5, "Installing Network Drivers," or Chapter 6, "Installing the Network Driver for Windows."

If you are running Windows NT or Windows 95 and installing a single adapter, the adapter's default configuration can be used. Install the driver as described in Chapter 6. If the configuration is not suitable, you can change the settings by following the procedure in this chapter.

The configuration program is DOS-based, so you must exit Windows 95 or Windows NT and reboot your system under DOS before using the configuration program.

Changing Software Option Settings

You should change the default settings of a 3C619C adapter only if a conflict with another device or card exists.

This section does not apply to ISA adapters in an EISA PC. To change software option settings in an EISA PC, use the EISA configuration utility that came with the PC.

For information on the settings of other standard devices, refer to the option Configuration/Diagnostic/Troubleshooting on the main menu and select Commonly Used Interrupts and I/O Base Addresses.

Table 4-2 lists the default settings for the adapter in 3Com and IBM mode. Refer to Appendix B, "Specifications," for more information about each option.

Table 4-2   Initial 3Com and IBM Mode Option Settings

Option	3Com Default Setting	IBM Default Setting
Configuration Mode	3Com	IBM
I/O Base Address	A20h (first adapter)	A20h (primary adapter)
Interrupt Request Level	2(9)	2(9)
Ring Speed	16 Mbps	16 Mbps
BIOS/MMIO Base Address	CC000	CC000
RAM Page Size	16 K	16 K
Shared RAM Address Range	D8000–DBFFF	D8000–DBFFF

(continued)

Table 4-2 Initial 3Com and IBM Mode Option Settings (continued)

Option	3Com Default Setting	IBM Default Setting
Memory Mode	16 bit	16 bit
I/O Mode	16 bit	16 bit
IRQ Driver Type	Edge Triggered	
AutoSwitch	Disabled	
Boot PROM	Disabled	
Zero Wait State	Enabled	

To change the software option settings, follow these steps:

1 Make sure the 3C619C adapter has been properly installed in your PC (refer to Chapter 2 for instructions).

2 Boot your PC under DOS, version 3.2 or later.

When you configure adapters, memory conflicts may occur. To help prevent this, follow these rules:

a Do not load network drivers.

b Be aware that terminate and stay resident programs (TSRs) may cause memory conflicts.

c If you are using a memory management utility, you must inform it of the address ranges used by the adapter. For example, add an exclude parameter to the EMM386 device statement in the CONFIG.SYS file such as:

```
DEVICE=C:\EMM386.EXE NOEMS X=D800-DBFF
```

3 Place the *TokenDisk* diskette in a floppy drive on your PC and make that drive the active drive. For example, type:

```
A: [Enter]
```

4 Type at the prompt:

```
INSTALL [Enter]
```

5 When the AutoLink Information screen appears, press [Enter].

6 From the main menu, select Configuration/Diagnostic/ Troubleshooting.

7   When the next screen appears, select Configuration and Diagnostic Program.

8   Highlight Install and press [Enter].

9   Press [Enter] to select Configure Adapter.

A screen similar to the one shown in Figure 4-3 appears.


```
┌─────────── Diagnostic and Manual Configuration Program ───────────┐
│ Quit   Install   Test   View   Select                    │F1=Help││
│ ┌─────────────────────────────────────────────────────────────┐  │
│ │                   Adapter Configuration                      │  │
│ │ ┌─────────── TokenLink III Adapter Configuration ─────────┐  │  │
│ │ │ Configuration Mode          3Com                        │  │  │
│ │ │ I/O Base Address            A20h                        │  │  │
│ │ │ Interrupt Request Level     3                           │  │  │
│ │ │ Ring Speed                  16 Mbps                     │  │  │
│ │ │ BIOS/MMIO Base Address      CC000h                      │  │  │
│ │ │ Shared RAM Address Range    D8000h - DBFFFh             │  │  │
│ │ │ Memory Mode                 16 bit                      │  │  │
│ │ │ I/O Mode                    16 bit                      │  │  │
│ │ │ IRQ Driver Type             Edge Triggered              │  │  │
│ │ │ Auto Switch                 Enabled                     │  │  │
│ │ │ Boot PROM                   Enabled                     │  │  │
│ │ └─────────────────────────────────────────────────────────┘  │  │
│ │                                                              │  │
│ │   Modify        File Options         OK          Cancel      │  │
│ └─────────────────────────────────────────────────────────────┘  │
│ [ENTER]=Change the Setting                                        │
│ [↑↓]=Scroll                                                       │
│ [Alt]+<Highlighted Key>=Execute Function                          │
└───────────────────────────────────────────────────────────────────┘
```

Figure 4-3   Adapter Configuration Screen

10   Use the arrow keys to highlight a desired parameter option and press [Enter].

A second dialog box appears.

11   Use the arrow keys to scroll through the list of settings for that option. Select a setting and press [Enter].

12   Continue this procedure with any of the other options.

13   Press [Tab] three times to highlight <OK>. Press [Enter].

You must highlight <OK> and press [Enter] to save the new settings to the adapter.

If you want to use the same settings on other adapters, you can save the configuration settings to a file. Select <Save> under the <File Options> command button in the Adapter Configuration dialog box. Enter a filename, for example:

3CTOK.SET

Select a directory using the arrow keys and press [Enter]. This saves the settings to the default file 3CTOK.SET in the directory you selected. Refer to the on-line help (by pressing [F1]) for more information.

Changing Settings for Multiple Adapters

To change the settings for multiple adapters, return to the main window of the Configuration and Diagnostic Program, press [F10], and select the next adapter to configure. Repeat steps 8 through 13 for each adapter. Select each adapter as it needs to be configured.

When all adapters have been set to the desired settings, proceed to Chapter 5, "Installing Network Drivers."

Video Conflicts with BIOS/MMIO and Shared RAM Addresses

Many PC video cards use the memory range from C0000 to C7FFF. The *TokenDisk* diskette configuration program supports settings within this same memory range for the BIOS/MMIO and Shared RAM address parameters. The configuration program identifies a conflict on most PCs, but will then allow this configuration to be saved.

If you save such a configuration despite a conflict with the video card, the PC will not operate until the adapter is removed. The adapter must then be reconfigured in a PC without the conflicting setting or must be returned to 3Com for reset.

3Com therefore strongly recommends using settings other than C0000, C2000, C4000, or C6000 for the ROM and Shared RAM addresses.

This completes the installation and configuration process. The next step is to install the network drivers. See Chapter 5, "Installing Network Drivers," or Chapter 6, "Installing the Network Driver for Windows."

5 INSTALLING NETWORK DRIVERS

This chapter describes how to install the network drivers. Figure 5-1 depicts the menu-driven network driver installation steps. For information on Windows NT or Windows 95, see Chapter 6.
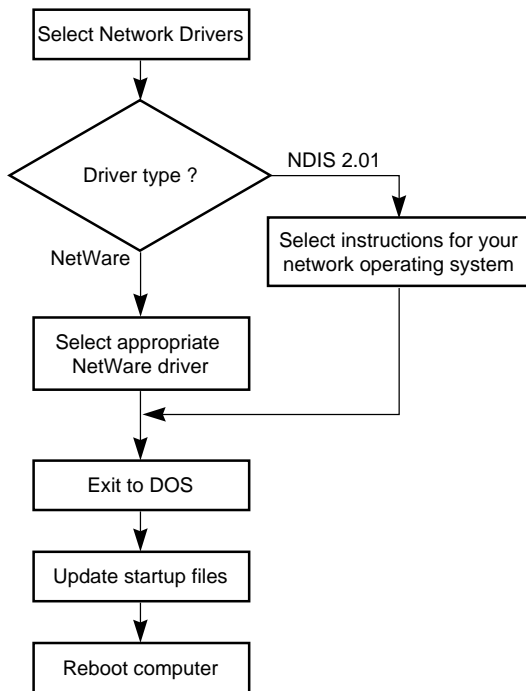
Figure 5-1   Network Drivers Installation Process

If you used the AutoLink feature, the NetWare DOS ODI driver is already installed. For more information, refer to Chapter 3, "Using the AutoLink Feature for NetWare."

The following network drivers are on the *TokenDisk* diskette:

- Novell NetWare DOS ODI driver (3CTOKEN.COM)

- NetWare OS/2® ODI (3CTOKEN.SYS)

- NetWare server driver (3CTOKEN.LAN)

- NDIS 2.01 DOS driver (TLNK3.DOS)

- NDIS 2.01 OS/2 driver (TLNK3.OS2)

- NDIS 3.0 driver for Windows NT and Windows 95

The NDIS 2.01 drivers support the following network operating systems:

- IBM LAN Server

- Banyan® VINES®

- DEC® PATHWORKS®

- 3Com 3+Open®

- Artisoft™ LANtastic®/AI

- Microsoft LAN Manager

You can also use IBM drivers. Instructions for using IBM drivers are described in the section "Using IBM Drivers" later in this chapter.

Installing the Novell NetWare Driver

If you did not use the AutoLink installation feature, you can use the Network Drivers menu options to copy the NetWare DOS ODI driver to the path you specify.

The following steps assume you have already configured the adapter, started the program on the *TokenDisk* diskette, and are at the main menu.

To copy the NetWare driver and NET.CFG file, follow these steps:

1 From the main menu shown in Figure 5-2, select Network Drivers and press [Enter].

2 When the next screen appears, select **Install Novell NetWare Drivers**, as shown in Figure 5-3, and press [Enter].

3 When the next screen appears, select **Copy DOS ODI Client Driver**.

```
┌─────────── TokenDisk for the TokenLink III Adapter ──────────┐
│ ESC=Cancel                                           F1=Help  │
│                                                               │
│                    M A I N    M E N U                         │
│                                                               │
│   ┌─────────────────────────────────────────────────────┐    │
│   │ Auto Installation with Configuration (AutoLink)      │    │
│   │     NetWare DOS ODI Client                           │    │
│   │                                                      │    │
│   │ Standard Installation and Configuration              │    │
│   │     Auto Configure 3Com ISA Adapter                  │    │
│   │     Network Drivers ...                              │    │
│   │     Configuration/Diagnostic/Troubleshooting ...     │    │
│   │     General Information/Release Notes                │    │
│   └─────────────────────────────────────────────────────┘    │
│                                                               │
│ Instructions for installing 3Com adapter drivers for popular NOSs │
│                                                               │
└───────────────────────────────────────────────────────────────┘
 [ENTER]=Execute Function
 [↑↓]=Scroll
 [F1]=Help  [ESC]=<Cancel>
```

Figure 5-2   Main Menu with Network Drivers Option Selected

```
┌─────────── TokenDisk for the TokenLink III Adapter ──────────┐
│ ESC=Cancel                                          │F1=Help  │
│                                                               │
│                  N E T W O R K    D R I V E R S               │
│                                                               │
│   ┌─────────────────────────────────────────────────────┐    │
│   │ Install Novell NetWare Driver ...                    │    │
│   │ NDIS Driver Installation and Information ...         │    │
│   │ Display Software Compatibility Information           │    │
│   │                                                      │    │
│   └─────────────────────────────────────────────────────┘    │
│                                                               │
│ Copy drivers for DOS and OS/2 clients, and V3.*, V4.* servers. │
│                                                               │
└───────────────────────────────────────────────────────────────┘
 [ENTER]=Execute Function
 [↑↓]=Scroll
 [F1]=Help  [ESC]=<Cancel>
```
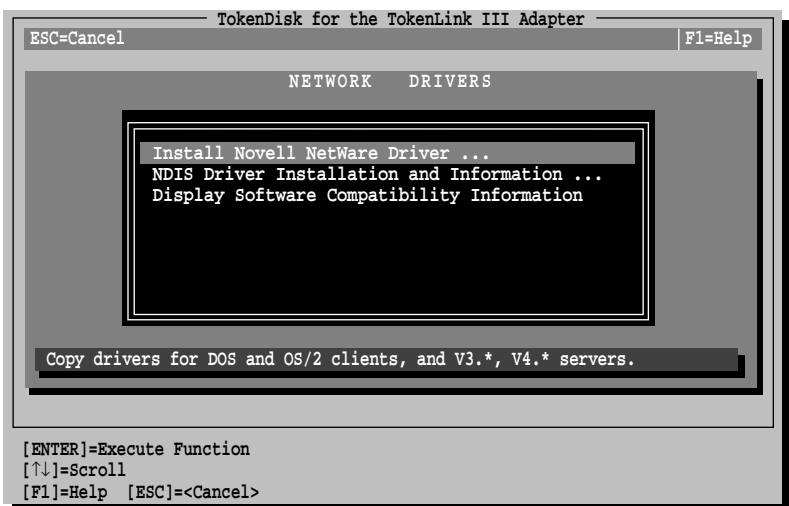
Figure 5-3   Network Drivers Menu

4 At the prompt, enter a path for the destination of the driver, or accept the default.

5 Exit to DOS and follow the instructions in the next section to make the necessary changes to your AUTOEXEC.BAT and CONFIG.SYS files.

Refer to Novell's *NetWare ODI Shell for DOS* or Novell's *Workstation for DOS and Windows* guide for more detailed information concerning other protocols and frame types.

Make sure to use the latest Novell files. Obtain these from the Novell forum on CompuServe® or your authorized reseller.

Updating the PC Startup Files

1 Modify the AUTOEXEC.BAT file to include the following commands:

```
LSL
3CTOKEN
IPXODI
VLM
F:
LOGIN
```

2 Edit your CONFIG.SYS file and include the following statements:

```
Files= <value>
Buffers= <value>
Lastdrive= Z
```

Novell recommends that *<value>* be at least 20 for each statement.

3 Reboot your PC.

This completes the manual NetWare DOS ODI client driver installation.

Installing the OS/2 Network Driver for NetWare

The *TokenDisk* diskette includes the Novell NetWare OS/2 ODI driver (\NETWARE\ODI\3CTOKEN.SYS). Instructions for installing this driver are provided in the \NETWARE\ODI\OS2REQ.TXT file.

Installing the Server Driver for NetWare

The *TokenDisk* diskette includes the driver and files for Novell NetWare 3.12 and 4.X servers. Refer to Novell documentation for instructions for using the INSTALL.NLM file to install the drivers for the 3C619C adapter.

NetWare Systems with Multiple Adapters

If you are installing more than one 3C619C adapter, you must modify your NET.CFG or AUTOEXEC.BAT file to load a driver for each adapter. Parameters must be added to the file to distinguish each adapter attached to the same driver.

Mode	Parameter	Values
ISA	PORT	200–2E0, 300–3E0, A20, A24
EISA	SLOT	1–8
IBM	PRIMARY	Optional for first adapter installed in IBM mode
	ALTERNATE	Use when second adapter is installed in IBM mode

Below is a sample NET.CFG file for an ISA PC with two 3C619C adapters configured in 3Com mode:

```
LINK DRIVER 3CTOKEN
   PORT 200

LINK DRIVER 3CTOKEN
   PORT 240
```

Installing the NDIS 2.01 Driver

The Network Driver Interface Specification (NDIS) was developed by Microsoft and 3Com. This software specification is used in network operating systems such as IBM LAN Server or Microsoft LAN Manager to create drivers for network adapters.

The NDIS Driver Installation and Information option on the Network Drivers menu shown in Figure 5-3 provides instructions for installing the NDIS driver.

The following steps assume you have already configured the adapter, started the program on the *TokenDisk* diskette, and are at the main menu.

To obtain driver installation instructions for your network operating system, follow these steps:

1 Select Network Drivers on the main menu and press [Enter].

2 Select NDIS Driver Installation and Information on the Network Drivers menu, and press [Enter].

3 Select your network operating system.

4 Follow the instructions provided.

Instructions for using the *TokenDisk* diskette as an automatic OEM import disk for IBM LAN Server 3.0, Microsoft LAN Manager, and Microsoft Windows for Workgroups are included.

If you choose not to use these NOS import procedures, you can manually install the NDIS 2.01 drivers by updating the PROTOCOL.INI and CONFIG.SYS PC startup files. Proceed to the next section for instructions.

Updating the PC Startup Files

This sample procedure describes how to modify the PROTOCOL.INI and CONFIG.SYS PC startup files to load the NDIS drivers for a PC running LAN Manager.

1 Create a LANMAN subdirectory from the root of your boot disk using the following command:

MD \LANMAN

2 Build a PROTOCOL.INI file in the LANMAN subdirectory.

The protocol manager, PROTMAN.DOS, places the PROTOCOL.INI file in the LANMAN subdirectory. The PROTOCOL.INI file contains information about the protocol manager, NDIS transport protocol, and your network adapter.

The following sample PROTOCOL.INI file uses NetBEUI (2.0) as the NDIS transport protocol with 3Com drivers.

```
[PROTOCOL MANAGER]
    DRIVERNAME = PROTMAN$

[NETBEUI_XIF]
    DRIVERNAME = NETBEUI$
    BINDINGS = TLNK3_NIF

[TLNK3_NIF]
    DRIVERNAME = TLNK3$
```

3 If you have not already done so, copy the 3Com DOS NDIS driver (TLNK3.DOS) into the LANMAN subdirectory.

The NDIS driver is located in the \NDIS\DOS subdirectory on the *TokenDisk* diskette.

4 Add the following lines to your CONFIG.SYS file (located in the root directory of your boot disk):

```
DEVICE = C:\LANMAN\PROTMAN.DOS/I:C:\LANMAN
DEVICE = C:\LANMAN\TLNK3.DOS
DEVICE = C:\LANMAN\<PROTOCOLDRIVER>.DOS
```

i *If you are using DOS 6.0, you must use the Microsoft Protocol Manager version 2.0 and not the 3Com Protocol Manager.*

Substitute the actual DOS PROTOCOL driver name, if appropriate, for PROTOCOLDRIVER.DOS.

NDIS Systems with Multiple Adapters

If you are installing more than one 3C619C adapter, the PROTOCOL.INI file must be modified to bind the driver to each adapter. Parameters must be added to the file to distinguish each adapter attached to the same driver. These parameters with their corresponding values are shown in the table below.

Mode	Parameter	Values
ISA	IOBASE=	0x200–0x2E0, 0x300–0x3E0, 0xA20, 0xA24
EISA	SLOT=	1–8
IBM	PRIMARY	Optional for first adapter installed in IBM mode
	ALTERNATE	Use when second adapter is installed in IBM mode

For an ISA PC with two 3C619C adapters configured in 3Com mode, you must add the following lines to the CONFIG.SYS file:

```
DEVICE = C:\LANMAN\PROTMAN.DOS/I:C:\LANMAN
DEVICE = C:\LANMAN\TLNK3.DOS
DEVICE = C:\LANMAN\TLNK3.DOS
DEVICE = C:\LANMAN\<PROTOCOLDRIVER>.DOS
```

Sample PROTOCOL.INI File

Below is a sample PROTOCOL.INI file for an ISA PC with two 3C619C adapters configured in 3Com mode:

```
[PROTMAN]
   DRIVERNAME = PROTMAN$

[NETBEUI_XIF]
   DRIVERNAME = NETBEUI$
   BINDINGS = "TLNK3_NIF", "TLNK3_NIF2"

[TLNK3_NIF]

; PROTOCOL.INI section for the 3Com
TokenLink III Adapter

   DRIVERNAME = TLNK3$
   IOBASE = 0x300

[TLNK3_NIF2]

; PROTOCOL.INI section for the 3Com
TokenLink III Adapter

   DRIVERNAME = TLNK32$
   IOBASE = 0x340
```

Updating the Current NDIS Driver

If you are updating an existing NDIS driver (rather than installing one for the first time), follow these steps:

1 From the main menu, select Network Drivers and press [Enter].

2 Select NDIS Driver Installation and Information.

3 Select Update NDIS Driver and press [Enter].

This option will update your current driver to the latest version. The NDIS 2.01 drivers are TLNK3.DOS and TLNK3.OS2.

4 Exit the program and remove the *TokenDisk* diskette.

5 Reboot your PC.

This completes the procedure for updating the NDIS 2.01 drivers.

Using IBM Drivers

The 3C619C adapter is fully IBM-compatible. Because of this, the 3C619C adapter can use the same drivers as IBM 16/4 Token Ring Adapters.

Obtaining IBM Network Drivers

Obtain IBM token ring drivers for the 3C619C adapter in one of the following ways:

■ Copy IBM 16/4 Token Ring Adapter drivers supplied with your network operating system.

■ Use the Remote Program Load (RPL) program to download IBM drivers from the network. Follow the procedures described in the next section, "Using Remote Program Load (RPL)."

■ Use the IBM 16/4 Token Ring Adapter drivers that accompany the latest version of IBM's LAN Support Program.

With IBM drivers, use only IBM mode settings.

To use the IBM 16/4 Token Ring Adapter drivers supplied with your network operating system, copy them to your PC and follow any provided instructions.

Using Remote Program Load (RPL)

The 3C619C adapter contains a built-in RPL facility for loading boot images from Novell NetWare, IBM LAN Server, Microsoft LAN Manager, and Banyan VINES servers.

If RPL is enabled on the adapter and on the network server, the PC can boot from a server on the token ring network using the configured adapter. This eliminates the need for local drives or diskettes. RPL can be disabled to allow the PC to boot from its hard disk or from a server using 3Com's utility 3TOKDIAG described below.

IBM documentation regarding installation and RPL operation for IBM 16/4 Token Ring Adapters is also valid for the 3C619C adapter.

RPL can only be used with I/O base addresses of A20h or A24h and IRQs of 2, 3, 6, or 7 whether in 3Com or IBM mode.

Before Using RPL

To execute the RPL code on the 3C619C adapter, the hard disk must be made a nonbootable device and the adapter must have the Boot PROM feature enabled. For more information about enabling the Boot PROM, see "Changing Software Option Settings" in Chapter 4. A definition is provided in Appendix B.

Refer to your network operating system documentation for instructions on how to create a boot image that loads the IBM token ring driver.

Enabling RPL

The following instructions explain how to use the RPL program when your PC has both a hard disk drive and a floppy disk drive. Refer to your network operating system documentation for the steps to be performed on the network to use RPL and for information on different drivers that you can load with RPL.

To enable RPL:

1 Boot your PC under DOS.

2 Make sure that the backup copy of the *TokenDisk* diskette is in a floppy drive on your PC.

3 At the diskette prompt, type:

   3TOKDIAG [Enter]

4 From the Install pull-down menu, select Configure Adapter.

5 Using the arrow keys, move to Boot PROM.

6 Press [Enter] and select Enable.

7 Press [Enter].

8 Select OK and press [Enter] to save the setting.

9 Remove the diskette from the drive and reboot the PC.

   The following message appears at the top of your screen:

   ```
   Type H to boot from the hard disk
   ```

10 Type **H** to boot from your local hard disk, or press any key to boot from the network server.

Disabling RPL

To disable RPL:

1 Boot your PC under DOS.

2 Make sure that the backup copy of the *TokenDisk* diskette is in a floppy drive on your PC.

3 At the diskette prompt, type:

`3TOKDIAG [Enter]`

4 From the Install pull-down menu, select Configure Adapter.

5 Using the arrow keys, move to Boot PROM.

6 Press [Enter] and select Disable.

7 Press [Enter].

8 Select OK and press [Enter] to save the setting.

9 Remove the diskette from the drive and reboot the PC.

This completes the description of how to use RPL with the 3C619C adapter.

6

INSTALLING THE NETWORK DRIVER FOR WINDOWS

This chapter describes how to install the network driver for Windows NT and Windows 95.

The 3Com NDIS 3.0 network driver supports Microsoft Windows NT Version 3.51 and Microsoft Windows 95.

Installing the Network Driver for Windows NT

The *TokenDisk* diskette includes the NDIS 3.0 driver (\WINNT351\ISA and \WINNT351\EISA) for use with Windows NT. Follow these instructions to install the 3Com NDIS 3.0 driver for Windows NT.

These instructions assume you are already running Microsoft Windows NT.

1 Insert the *TokenDisk* diskette into the floppy drive.

2 From the Main group, double-click on the Control Panel icon.

3 From the Control Panel group, double-click on the Network icon.

4 From the Network Settings dialog box, click the Add Adapter button.

5 From the Add Network Adapter dialog box, scroll to the bottom of the Network Adapter Card selection list. Highlight <Other> Requires disk from manufacturer.

6 Click the Continue button.

7 At the prompt, type `A:\WINNT351\ISA` if you installed the adapter in an ISA slot. Type `A:\WINNT351\EISA` if you installed the adapter in an EISA slot using the EISA configuration utility (that is, auto-sense is enabled and the I/O base address = EISA).

8 Click the OK button to select the 3C619C adapter.

The 3Com TokenLink III Adapter Setup selection box appears.

9 Click the Continue button to use the burned-in adapter address.

If you want to set a locally administered address (LAA), type the 12-digit LAA in the selection box (valid range = 400000000000h to 7FFFFFFFFFFFh) and click the Continue button.

10 Click the OK button.

A prompt appears, asking if you want to restart your computer.

11 Remove the *TokenDisk* diskette and click Restart now.

This completes the installation of the 3Com NDIS 3.0 driver for Windows NT.

Installing the Network Driver for Windows 95

The *TokenDisk* diskette includes the NDIS 3.0 driver (\WIN95). This procedure assumes you are already running Windows 95. Follow these instructions to install the 3Com NDIS 3.0 driver for Windows 95.

1 From the Windows 95 desktop, double-click on the My Computer icon.

2 From the My Computer group, double-click the Control Panel icon.

3 From the Control Panel group, double-click the Network icon.

4 From the Network dialog box, click Add.

5   From the Select Network Component Type dialog box, double-click Adapter.

6   From the Select Network Adapters dialog box, click Have Disk.

7   Insert the *TokenDisk* diskette in the floppy drive.

8   In the Copy Manufacturer's Files From selection box, type the following:

   `A:\WIN95`

9   Click OK.

10   In the Models selection box, highlight the correct adapter (either ISA or EISA).

   ■   Choose 3Com TokenLink III ISA (3C619B, 3C619C) in EISA mode if you installed the adapter in an EISA slot and used the EISA configuration utility to configure the adapter.

   ■   Choose 3Com Token Link III ISA (3C619B, 3C619C) if you installed the adapter in an ISA slot. You may also make this selection if the adapter is in an EISA slot with AutoSwitch disabled.

   TokenLink III ISA Adapter appears in the selection box.

11   Click OK.

12   From the Network dialog box, click OK.

13   In the Resources screen, click OK to accept the I/O base address.

14   Remove the diskette.

15   Click Yes to restart your PC to activate the driver.

   This completes the installation of the 3Com NDIS 3.0 driver for Windows 95.

7

TROUBLESHOOTING

This chapter describes information for isolating and solving problems. It contains the following sections:

- Adapter LEDs
- Using the *TokenDisk* Diskette Diagnostic Program
- Diagnostic Test Types
- Adapter Statistics and Information
- When Tests Fail
- Troubleshooting Tips
- Additional Information

Adapter LEDs

The 3C619C adapter has two light-emitting diodes (LEDs) on its backplate, as shown in Figure 7-1. The LEDs indicate the ring speed to which the adapter is configured and whether the adapter is inserted into the ring.
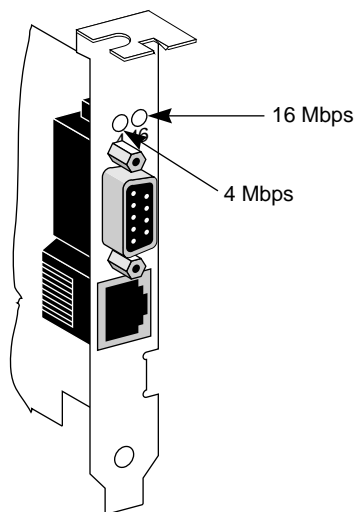
Figure 7-1 Adapter LEDs

When lit, the green LED (labeled "4") indicates that the adapter is set to 4 Mbps speed and is correctly inserted into the ring.

When lit, the yellow LED (labeled "16") indicates that the adapter is set to 16 Mbps and is correctly inserted into the ring.

Using the *TokenDisk* Diskette Diagnostic Program

Run the *TokenDisk* diskette Configuration and Diagnostic Program for your installed 3C619C adapter when you need to do the following:

- Test for setup/configuration
- Test for physical board problems
- View adapter statistics

The diagnostic program tests the adapter, not the network. Make sure to boot from DOS before running the diagnostic program because the *TokenDisk* diskette is not a bootable disk. Make sure that your PC has an 80386 or higher processor. The 3C619C adapter must be connected to the network for all tests.

i *If you have already installed the network driver, you need to reboot and press [F5] or use a DOS diskette to bypass the drivers before you run the diagnostic program. Use a DOS diskette if you are running DOS 5.0 or earlier. If you are running Windows NT, boot the DOS partition or boot from a DOS diskette to run the diagnostic program. If you are running Windows 95, exit Windows 95 and restart the PC in MS-DOS mode.*

Figure 7-2 depicts how to use the *TokenDisk* diskette diagnostic program.
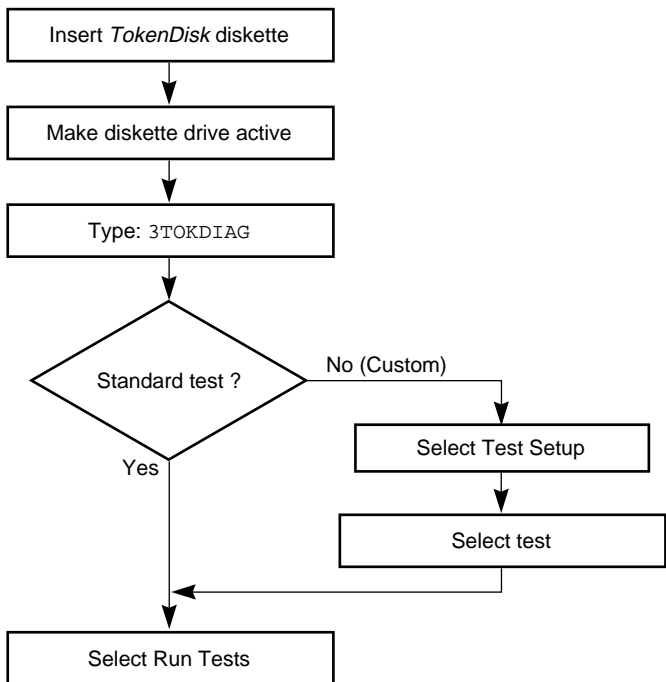
Figure 7-2 Diagnostic Flowchart

Diagnostic Test Types

The tests performed by the *TokenDisk* diskette Configuration and Diagnostic Program are divided into Group 1 and Group 2 tests.

> *A lobe cable must be connected from the selected adapter to a retiming concentrator or MAU for all tests.*

Group 1 Diagnostics

Group 1 diagnostics test physical components, connectors, and circuitry of the adapter. They include the following tests:

- MMIO Register Write/Read Test
- Boot PROM Test (if the Boot PROM is enabled)
- AIP Checksum Test
- Shared RAM Boundary/Domain Test
- Shared RAM Write/Read Test
- Timer Test
- Open Adapter for Ring Operation Test
- Ring Operations Test
- Close Adapter Test

Each of these tests is explained in more detail below.

MMIO Register Write/Read Test

This test verifies that the PC can access the adapter's memory mapped I/O registers correctly.

Boot PROM Test

This test verifies that the PC can access the Boot PROM correctly and verifies the integrity of the Boot PROM.

AIP Checksum Test

This test verifies that the adapter's node ID, channel identifier, and supported function identifiers such as data rate, shared RAM, and transmit buffer size are correct.

Shared RAM Boundary/Domain Test

This test verifies that the shared RAM base address is aligned on the proper address boundary according to the shared RAM page size setting and verifies that its domain does not conflict with that of the adapter ROM.

Shared RAM Write/Read Test

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

Timer Test

This test verifies the adapter's timer operation by comparing the adapter timing to the PC's timing.

Open Adapter for Ring Operation Test

This test prepares the adapter for an adapter ring operation test. This test verifies the adapter's ability to transmit data over the network. This test requires the adapter to be connected to an STP or a UTP media cable with a DAU, MAU, or CAU at the other end.

Ring Operations Test

This test assesses communication on the ring. The adapter must be attached to the ring in order for this test to be successful. The adapter also must be set to the correct ring speed.

Close Adapter Test

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

Group 2 Diagnostic

The Group 2 diagnostic (Adapter Wrap Test) is a wrap test that causes all user-transmitted data to be sent and received without going to the network.

A lobe cable must be connected from the selected adapter 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.

Running the Diagnostic Tests

The Configuration and Diagnostic Program can be started from the menus or the DOS command line. For command line instructions, see the INSTRUCT.TXT file in the \DIAG subdirectory on the *TokenDisk* diskette.

If you have already installed the network driver, you need to reboot and press [F5] or use a DOS diskette to bypass the drivers before you run the diagnostic program. Use a DOS diskette if you are running DOS 5.0 or earlier. If you are running Windows NT, boot the DOS partition or boot from a DOS diskette to run the diagnostic program. If you are running Windows 95, exit Windows 95 and restart the PC in MS-DOS mode.

These instructions assume that the *TokenDisk* diskette is in the floppy drive that is active.

1 To start the diagnostic program, type:

```
3TOKDIAG
```

2 From the Test pull-down menu shown in Figure 7-3, select Run Tests.

The Run Tests dialog box appears, similar to the one shown in Figure 7-4.

3 Press [Enter] to start the tests.

Each test is set up to run once unless you specify otherwise. The test results are displayed on the screen with "Passed" or "Failed" in the Results column.

If you want to run the tests continuously, select the Continuous option in the Test Setup dialog box, as described in the next section, "Changing the Test Setup."

```
┌──────── Diagnostic and Manual Configuration Program ────────┐
│ Quit   Install   Test   View   Select              │F1=Help │
│              ┌──────────────────────┐                       │
│              │ Run Tests...    (F5) │                       │
│              │ Test Setup...   (F6) │                       │
│              │                      │                       │
│              └──────────────────────┘                       │
│                                                             │
│              ┌──────── Selected Adapter ────────┐           │
│              │ 3Com 3C619C: Token Ring Address = 00608C112233 │
│              │     TokenLink III 16-bit ISA Adapter          │
│              │                                              │
│              └──────────────────────────────────┘           │
├─────────────────────────────────────────────────────────────┤
│ [ENTER]=Run the Diagnostic Tests                            │
│ [Alt]+<Highlighted Key>=Execute Function  [↑↓]=Scroll       │
│ [F1]=Help  [F3]=Exit  [F4]=Configure Adapter  [F6]=Test Setup│
└─────────────────────────────────────────────────────────────┘
```

Figure 7-3   Test Menu

```
┌──────── Diagnostic and Manual Configuration Program ────────┐
│ Quit   Install   Test   View   Select              │F1=Help │
│                           Run                               │
│              3Com 3C619C Token Ring Address = 0060BC112233   │
│        ┌──────────────── Test Results ────────────────┐     │
│        │ Group 1 Tests          Repetitions Completed  Results │↑│
│        │▶ MMIO Register Write/Read Test        0     Not Tested│
│        │ Boot PROM Test (If installed & recognized) 0 Not Tested│
│        │ AIP Checksum Test                     0     Not Tested│
│        │ Shared RAM Boundary/Domain Test       0     Not Tested│
│        │ Shared RAM Write/Read Test            0     Not Tested│
│        │ Timer Test                            0     Not Tested│
│        │ Open Adapter for Ring Operation Test  0     Not Tested│
│        │ Ring Operations Test                  0     Not Tested│
│        │ Close Adapter Test                    0              │
│        │                                                     │
│        │ Group 2 Tests          Repetitions Completed  Results│
│        │ Adapter Wrap Test                           Disabled │↓│
│        └─────────────────────────────────────────────────────┘
│         Waiting for <Start>            Pass     0  of  1      │
│ ┌─────┐ ┌────────┐ ┌───────────┐ ┌────┐ ┌─────┐ ┌──────────┐ ┌──────┐│
│ │Start│ │Continue│ │Test Setup...│ │Zoom...│ │Stats...│ │File Options...│ │Cancel││
├─────────────────────────────────────────────────────────────┤
│ [ENTER]=<Start> Begin Diagnostic Tests                      │
│ [Alt]+<Highlighted Key>=Execute Function                    │
│ [TAB]=Next Field  [SHIFT+TAB]=Previous Field  [F1]=Help  [ESC]=Cancel │
└─────────────────────────────────────────────────────────────┘
```
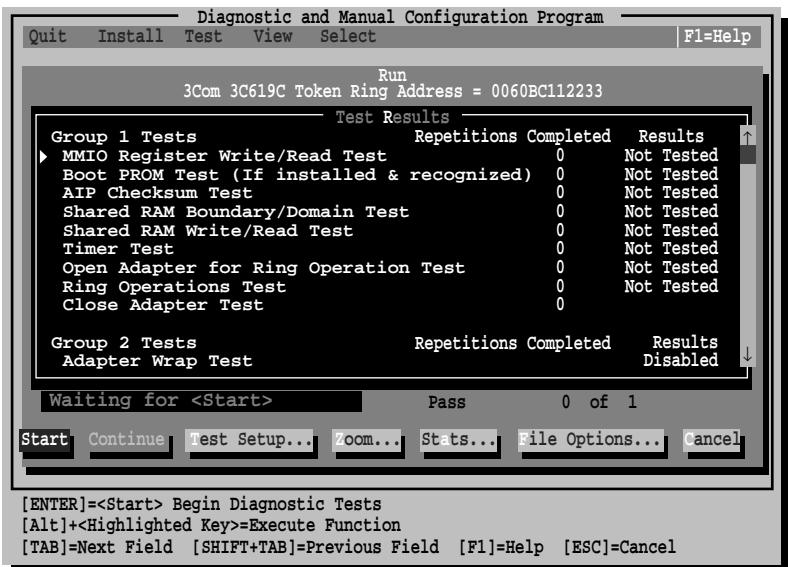
Figure 7-4   Run Tests Dialog Box

Changing the Test Setup

If you want to change the test parameters, follow these steps:

1   Choose the <Test Setup> command button in the Run Tests dialog box shown in Figure 7-4.

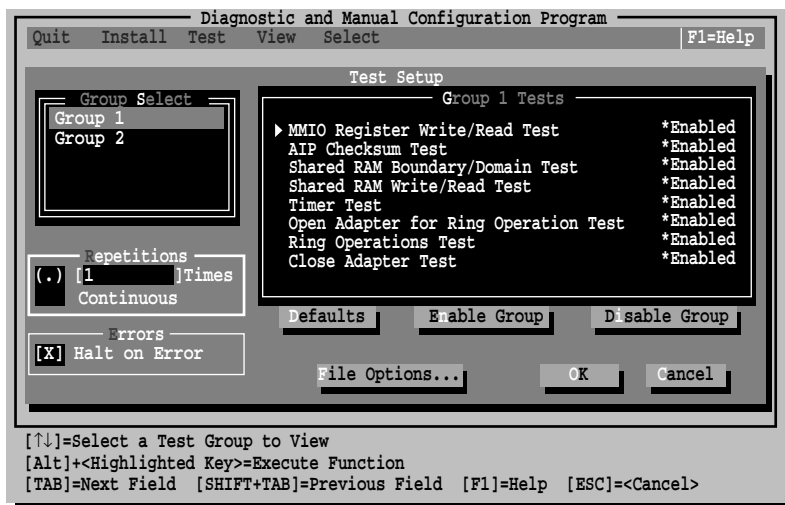The Test Setup dialog box appears, as shown in Figure 7-5.

```
┌──────────── Diagnostic and Manual Configuration Program ────────────┐
│ Quit    Install    Test    View    Select                │F1=Help │
│ ┌─────────────────────────────────────────────────────────────────┐ │
│ │                          Test Setup                             │ │
│ │ ┌── Group Select ──┐    ┌──────── Group 1 Tests ──────────┐     │ │
│ │ │ Group 1          │    ▶MMIO Register Write/Read Test  *Enabled │ │
│ │ │ Group 2          │     AIP Checksum Test              *Enabled │ │
│ │ │                  │     Shared RAM Boundary/Domain Test *Enabled │ │
│ │ │                  │     Shared RAM Write/Read Test     *Enabled │ │
│ │ │                  │     Timer Test                     *Enabled │ │
│ │ │                  │     Open Adapter for Ring Operation Test *Enabled │ │
│ │ └──────────────────┘     Ring Operations Test          *Enabled │ │
│ │ ┌── Repetitions ───┐     Close Adapter Test            *Enabled │ │
│ │ │(.) [1        ]Times                                           │ │
│ │ │    Continuous    │    ┌Defaults┐  ┌Enable Group┐ ┌Disable Group┐ │ │
│ │ └──────────────────┘                                           │ │
│ │ ┌──── Errors ──────┐                                           │ │
│ │ │[X] Halt on Error │   ┌File Options...┐  ┌  OK  ┐  ┌Cancel┐    │ │
│ │ └──────────────────┘                                           │ │
│ └─────────────────────────────────────────────────────────────────┘ │
│ [↑↓]=Select a Test Group to View                                    │
│ [Alt]+<Highlighted Key>=Execute Function                            │
│ [TAB]=Next Field  [SHIFT+TAB]=Previous Field  [F1]=Help  [ESC]=<Cancel> │
└──────────────────────────────────────────────────────────────────────┘
```

Figure 7-5   Test Setup Dialog Box

2   Press [Tab] to move from field to field and highlight any field within the Test Setup dialog box.

Within the Group Select area, use the arrow keys to highlight Group 1 or Group 2. Use the <Enable Group> or <Disable Group> command buttons to enable or disable a group of tests.

For a description of these tests, refer to the on-line help in the diagnostic program.

3   When you are satisfied with the new test setup, highlight the <OK> command button and press [Enter].

4   To run the tests, choose Run Tests from the Test menu and select the <Start> button.

When Tests Fail

If any test fails, you can get additional information by highlighting the test that failed in the Run Tests dialog box shown in Figure 7-4, and pressing [Enter]. You can also highlight the <Zoom> command button and press [Enter]. The program notifies you of the error and suggests actions you can take to solve the problem.

Adapter Statistics and Information

Use the adapter statistics and information feature to view statistics of adapter operation and current adapter configuration.

Adapter Statistics

Use the View pull-down menu and select Adapter Statistics, or press [F9] from the main screen. An example of the Adapter Statistics screen is shown in Figure 7-6. Press [F1] on this screen for a short explanation of the highlighted statistics. Use the scroll bar to display the full list of statistics on this screen.

```
┌─────────────── Diagnostic and Manual Configuration Program ───────────────┐
│ Quit    Install   Test    View    Select                        F1=Help   │
├───────────────────────────────────────────────────────────────────────────┤
│          3Com 3C619C Token Ring Address = 00608C112233                     │
│  ┌──────────────────────── Adapter Statistics ───────────────────────┐    │
│  │ Total frames transmitted:                              0           ↑│    │
│  │ Total frames received:                                 0            │    │
│  │ Receive with no buffer:                                0            │    │
│  │ Transmit errors:                                       0            │    │
│  │ Adapter check errors:                                  0            │    │
│  │ Line errors:                                           0            │    │
│  │ Internal errors:                                       0            │    │
│  │ Burst errors:                                          0            │    │
│  │ A/C errors:                                            0            │    │
│  │ Abort delimiters:                                      0            │    │
│  │ Invalid ARB commands:                                  0            │    │
│  │ Lost frame errors:                                     0           ↓│    │
│  └────────────────────────────────────────────────────────────────────┘    │
│                                                        ┌──────┐            │
│                                                        │Cancel│            │
│                                                        └──────┘            │
├───────────────────────────────────────────────────────────────────────────┤
│ [ENTER]=<Cancel>    [↑↓]=Scroll                                            │
│ [Alt]+<Highlighted Key>=Execute Function  [PgDn]=Page Down  [PgUp]=Page Up │
└───────────────────────────────────────────────────────────────────────────┘
```

Figure 7-6 Adapter Statistics

Adapter Information

Use the View pull-down menu and select Adapter Information, or press [F8] from the main screen. An example of the Adapter Information screen is shown in Figure 7-7.

```
┌─ Diagnostic and Manual Configuration Program ─┐
 Quit   Install   Test   View   Select              │F1=Help│
  ┌────────────────────────────────────────────────────┐
  │    3Com 3C619C: Token Ring Address = 00608C112233   │
  │  ┌──────────── Adapter Information ────────────┐     │
  │  │ Token Ring address:           00600C112233  │↑    │
  │  │ Date of Manufacture:          11/1/95       │     │
  │  │ Division Code:                6             │     │
  │  │ Product Code:                 BE            │     │
  │  │ Configuration Mode:           3Com          │     │
  │  │ I/O base address:             A20H          │     │
  │  │ Interrupt request level:      3             │     │
  │  │ Ring speed:                   16 Mbps       │     │
  │  │ BIOS/MMIO base address:       CC000H        │     │
  │  │ Boot PROM:                    Not Present   │     │
  │  │ Shared RAM base address:      D0000H        │     │
  │  │ Shared RAM size:              64 kB         │↓    │
  │  └──────────────────────────────────────────────┘    │
  │                              ┌──────┐                │
  │                              │Cancel│                │
  │                              └──────┘                │
  └────────────────────────────────────────────────────┘

[ENTER]=<Cancel>    [↑↓]=Scroll
[Alt]+<Highlighted Key>=Execute Function  [PgDn]=Page Down  [PgUp]=Page Up
```

Figure 7-7   Adapter Information

Use the scroll bar to display the full list of parameters on this screen.

When Tests Fail

If the diagnostic tests fail, the adapter may not be defective. The problem may be incorrect configuration settings, configuration settings that conflict with the settings of other boards, or improper installation.

If any test fails, you can get additional information by highlighting the test that failed in the Run Tests dialog box shown in Figure 7-4, and pressing [Enter]. You can also highlight the <Zoom> command button and press [Enter]. The program notifies you of the error and suggests actions you can take to solve the problem.

The following information is displayed on the screen, indicating what to do when the specific test fails.

MMIO Register Write/Read Test Failure

- Check the ROM base address setting on the adapter and make sure that it is not being used by another device.

- Run the test three times with a delay of at least 30 seconds between each test. If the error persists, power down the PC and try once more.

Boot PROM Test Failure

- Check the ROM base address setting on the adapter and make sure that it is not being used by another device.

- Refer to the "Configuration Options" section in Appendix B for more information.

AIP Checksum Test Failure

- Check the ROM base address setting on the adapter and make sure that it is not being used by another device.

- Run the test three times with a delay of at least 30 seconds between each test. If the error persists, power down the PC and try once more.

Shared RAM Boundary/Domain Test Failure

- Make sure the RAM base address is aligned according to the selected shared RAM size.

- Make sure the shared RAM address does not conflict with the adapter ROM or another device.

Shared RAM Write/Read Test Failure

■ Make sure the shared RAM address does not conflict with the adapter ROM or another device.

■ Run the test three times with a delay of at least 30 seconds between each test. If the error persists, power down the PC and try once more.

Timer Test Failure

■ The adapter's timer is incorrect or the PC timer is malfunctioning.

■ Run the test three times with a delay of at least 30 seconds between each test. If the error persists, power down the PC and try once more.

Open Adapter for Ring Operation Test Failure

■ Make sure a lobe cable is properly connected to the adapter and that the other end of the cable is connected to a DAU, MAU, or CAU.

■ Run the test three times with a delay of at least 30 seconds between each test. If the error persists, power down the PC and try once more.

Ring Operations Test Failure

■ Run the Group 2 Adapter Wrap Test. If the test is successful, the error condition may be related to the ring itself.

■ Make sure a lobe cable is properly connected to a MAU.

■ Make sure the selected adapter speed matches the ring speed.

■ Try another shared RAM address and size.

■ Retry the operation after delaying at least 30 seconds.

Close Adapter Test Failure

■ Make sure a lobe cable is properly connected to the adapter and that the other end of the cable is connected to a DAU, MAU, or CAU.

■ Run the test three times with a delay of at least 30 seconds between each test. If the error persists, power down the PC and try once more.

Adapter Wrap Test Failure (Group 2)

■ Make sure a lobe cable is properly connected to the adapter. For an adapter with UTP cabling, the other end of the cable needs to be connected to a MAU.

■ Try another shared RAM address and size.

■ Run the test three times with a delay of at least 30 seconds between each test. If the error persists, power down the PC and try once more.

Troubleshooting Tips

If the diagnostic tests fail, the adapter may not be defective. The problem may be incorrect option settings or option settings that conflict with the settings of other boards, or the adapter may be improperly installed. Follow these steps to test the adapter further.

⚠ **CAUTION:** *Make sure that you turn off the power before inserting or removing the adapter from the PC.*

1 Make sure that the 3C619C adapter is installed in a UL-listed PC containing an ISA or EISA bus.

2 Make sure that the board is seated firmly and all the way down in the slot. Check the adapter installation by reviewing the installation instructions in Chapter 2.

3 Inspect all cables and connections.

4 Make sure that the settings (memory allocations, interrupts, and so on) for the adapter do not conflict with the PC or other adapter boards installed in the PC.

Refer to Appendix B, "Specifications."

5 Install the adapter in another slot and run the diagnostic tests again to make sure the slot is not defective.

The slot may be defective. If the adapter passes the tests in the second slot, contact the reseller or manufacturer of the PC.

6 Install the adapter in another functioning PC and run the tests again.

Your PC may be defective. If the adapter passes the tests in the second PC, contact the reseller or manufacturer of the first PC.

7 Check the ring speed (4 or 16).

Use the View pull-down menu in the Configuration and Diagnostic Program and select Adapter Information to view the current adapter configuration.

8 If you have installed the adapter correctly and you still experience problems, check the software.

Make sure that you have properly configured your PC for the adapter. Refer to Chapter 3, "Using the AutoLink Feature for NetWare," and Chapter 4, "Standard Installation and Configuration."

Make sure that you have installed the correct drivers for the network operating system you are running (refer to Chapter 5 or Chapter 6).

9 Check for other conflicting devices, such as memory managers or hardware.

10 Disable the cache on your CPU.

11 Make sure that the bus speed on your PC is between 7.66 and 10 MHz.

12 Replace the failed adapter with a known working adapter. If the second adapter fails, something is probably wrong with the test environment, not the adapter.

Additional Information

Troubleshooting help can be found in three other locations. They are as follows:

- Error messages
- On-line information
- Technical Support appendix

Error Messages

Refer to Appendix C, "Error Messages," for a list of error messages that may appear when using the *TokenDisk* diskette Configuration and Diagnostic Program for the 3C619C adapter.

On-line Information

The [F1] key activates help information at any time during operation of the *TokenDisk* diskette Configuration and Diagnostic Program. In addition, the Configuration/ Diagnostic/Troubleshooting selection on the main menu contains information about the following topics:

- Commonly used interrupts and I/O base addresses
- Technical support

Technical Support

For any problems not discussed in this chapter, refer to Appendix D, "Technical Support," for information on 3Com's on-line technical services. 3ComFacts℠ provides technical tips and product information. Ask3Com℠ and the 3Com Bulletin Board Service (3ComBBS) provide *TokenDisk* diskette software updates, drivers, technical tips, and product information.

A USING THE CONFIGURATION AND DIAGNOSTIC PROGRAM

The *TokenDisk* diskette Configuration and Diagnostic Program is arranged in the hierarchy shown in Figure A-1.

Quit	Exit (F3)
	Command line help
	Driver installation help
	About
Install	Configure adapter (F4)
Test	Run (F5)
	Test setup (F6)
	Echo server (F7) not available
View	Adapter information (F8)
	Adapter statistics (F9)
Select	Select adapter (F10)
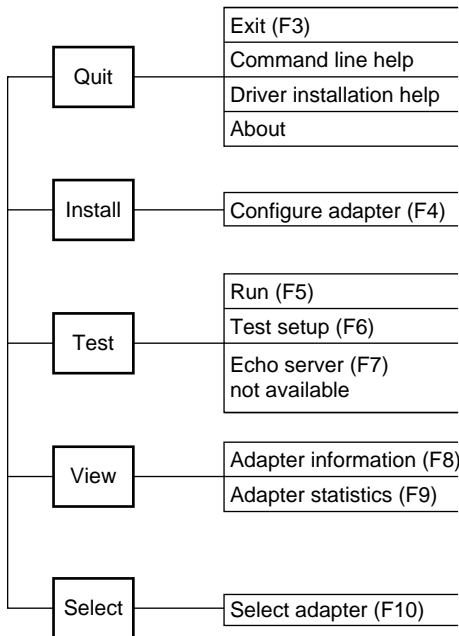
Figure A-1   Menu Hierarchy

You can use the keyboard (function keys or speed keys) or a mouse to access the command buttons. Each access method is discussed in this appendix.

Using the Keyboard

The following table describes the keys to use with the *TokenDisk* diskette Configuration and Diagnostic Program.

Table A-1 Definition of Keys

Key	Definition
Arrow Keys	Let you scroll through a list of menu items or a list box.
[Del]	Deletes the character at the cursor in a text edit box.
[End]	Moves the cursor to the last item in a list box.
[Enter]	Starts an action or accepts a selection or user-supplied data.
[Esc]	Cancels the current work and exits the dialog box.
[F1]	Displays a help screen for any item in a menu or dialog box.
[F3]	Exits the Configuration and Diagnostic Program.
[F4]	Configures the adapter.
[F5]	Accesses the Run dialog box.
[F6]	Accesses the Test Setup dialog box.
[F8]	Accesses the Adapter Information dialog box.
[F9]	Accesses the Adapter Statistics dialog box.
[F10]	Provides selection of an adapter when multiple adapters are installed.
[Home]	Moves the cursor to the first item in a list box.
[PgDn]	Moves the cursor down one screen.
[PgUp]	Moves the cursor up one screen.
[Shift]+[Tab]	Moves the cursor backward through the fields in a dialog box.
[Space Bar]	Inserts or removes a check from a check box. Also enables/disables individual tests in the Test Setup dialog box.
[Tab]	Moves the cursor forward through the fields in a dialog box.

Speed Keys

Press [Alt] and the highlighted letter in any menu item or command button to activate that function.

Using the Mouse

If you have a mouse, you can use it to click on any of the menu items, command buttons, or listed items in a dialog box. Make sure that a mouse driver is loaded.

Choosing a Menu Item

Listed below are the menu items in the *TokenDisk* diskette Configuration and Diagnostic Program. Each menu item is explained in the help screens. Press [F1], tab to the <Index> command button, and press [Enter] to see the list of help screens included in the program.

Table A-2 Definition of Menu Items

Menu	Menu Item	Description
Quit	Exit	Lets you exit the program.
	Command Line Help	Explains how to use the program from the command line.
	Driver Installation Help	Explains where to access the network drivers for the 3C619C adapter.
	About	Lists the program's version.
Install	Configure Adapter	Configures a selected adapter.
Test	Run Tests	Lets you run the diagnostic tests with the chosen test configuration and view the results.
		Test definitions are located in the on-line help.
	Test Setup	Lets you determine which tests to run.
	Echo Server	Not functional with this adapter.
View	Adapter Information	Lets you view specific adapter information.
	Adapter Statistics	Displays the network statistics maintained by the adapter.
		Definitions of the statistics are located in the on-line help.
Select	Select Adapter	Provides selection of an adapter when multiple adapters are present.

Using the File Options

The File Options are located in dialog boxes on the Run Tests, Test Setup, and Configure Adapter screens. The options are:

■ Load: loads a file from a selected directory.

■ Save: lets you save the currently displayed information to a file.

■ Print: prints the information currently displayed on the screen.

■ Cancel: lets you cancel the present operation.

Help

If you need additional information about any item in the Configuration and Diagnostic Program, press [F1] to display the help screen. Use the [PgDn] and [PgUp] keys or the arrow keys to scroll through the help screens.

Tab to the <Index> command button and press [Enter] to see the list of help screens included in the program.

The on-line help also describes the different parts of the dialog boxes. The Test Setup dialog box is shown in Figure A-2.
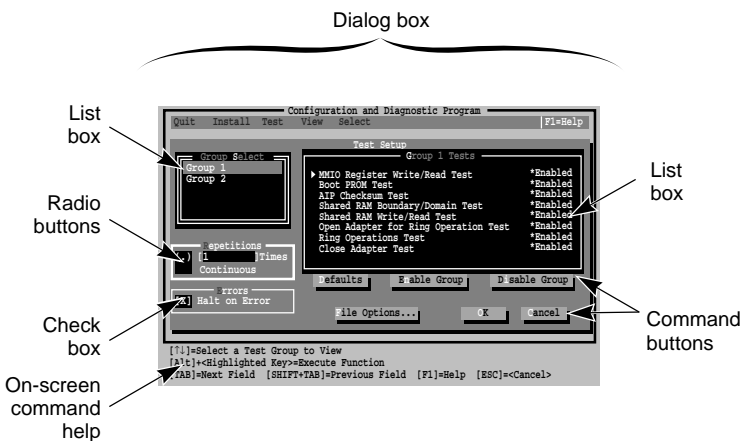
Figure A-2 Sample Dialog Box

To print the help file, first exit the program. At the DOS prompt, enter the print command applicable to your PC software. For example, type:

```
TYPE 3CTOKENG.HLP> PRN [Enter]
```

Exiting the Program

To exit the program, press [Esc] until the DOS prompt appears.

Using the Command Line

You can use the command line to run diagnostic tests for 3C619C adapters, or perform other functions. At the DOS prompt, type:

```
3TOKDIAG <command>
```

The command line keywords are listed in Table A-3. Each command has parameters that you need to specify. For a complete listing of all parameters, refer to the file INSTRUCT.TXT in the \DIAG directory.

Table A-3   Command Line Keywords

Command	Definition
CONFIGURE	Configures the adapter in one of three ways:
	(1) Automatically with the /AUTO parameter
	(2) Using a specified adapter configuration file
	(3) Using a command line configuration parameter
HELP	Lists all of the available commands and their definitions.
LANGUAGE	Invokes the program in full windows mode in a specified language if an external resource file is available for that language.
LIST	Displays a list of installed adapters recognized by this program and their assigned adapter numbers.
RUN	Executes the diagnostic tests on a selected adapter and writes the results to the screen, a file, or a printer.

You can get help information for specific commands such as RUN by typing HELP, then the command. For example, at the DOS prompt (such as A:\>) type:

```
3TOKDIAG HELP RUN
```
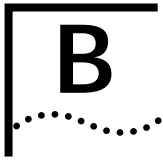
B
SPECIFICATIONS

This appendix describes the specifications for the 3C619C adapter and contains the following sections:

- Cabling
- Pin Assignments
- Configuration Options

Cabling

3C619C adapters support industry-standard token ring cabling that follows IEEE 802.5 specifications. Use cabling type 3 (UTP) or types 1 or 6 (STP).

Pin Assignments

The 3C619C adapter can be connected to a network with either a DB-9 or an RJ-45 connector. Figure B-1 and Figure B-2 illustrate the pin assignments for each of these connectors.
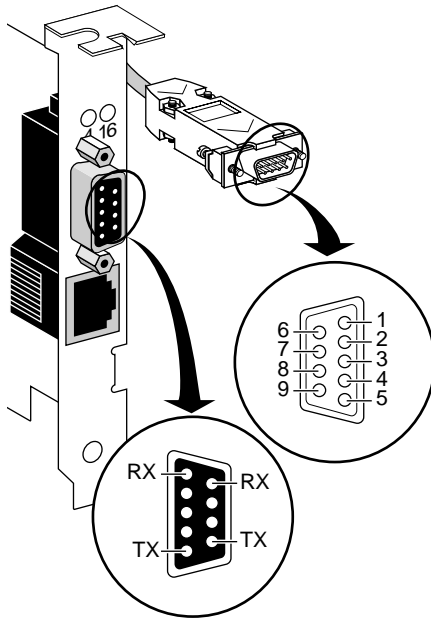
Figure B-1 DB-9 Connector Pin Assignments
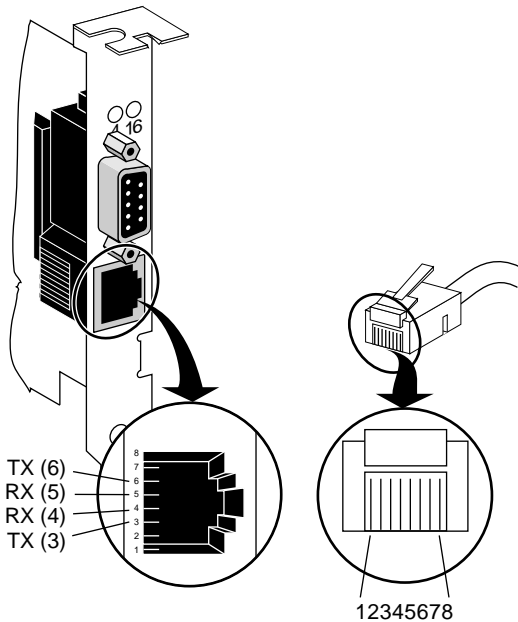
Figure B-2 RJ-45 Connector Pin Assignments

Configuration Options

This section contains the configuration options for the 3C619C adapter. The following options are available:

- Configuration Mode

- Ring Speed

- I/O Base Address

- BIOS/MMIO Address Location

- Shared RAM Page Size and Address Range

- Interrupt Request Level

- Memory Mode

- I/O Mode

- IRQ Driver Type

- AutoSwitch

- Boot PROM

Configuration Mode

This adapter provides the following two modes of operation:

- 3Com mode

- IBM mode

3Com mode increases the number of available IRQ channels from 4 to 8 and the number of I/O base addresses from 2 to 32. You can install up to six adapters per PC. 3Com drivers are supplied on the *TokenDisk* diskette to support these 3Com mode enhancements. The default is 3Com mode.

IBM mode provides the same configuration options as IBM 16/4 Token Ring Adapters: 4 IRQ channels and 2 I/O base addresses. You can continue to use IBM drivers with the adapter in IBM mode.

Ring Speed

The 3C619C adapter operates at either 4- or 16-Mbps ring speed. The adapter ring speed must match the speed of the token ring network. The default is 16 Mbps.

I/O Base Address

In IBM mode when only one adapter is installed, it is designated the Primary adapter. The Primary/Alternate option can be changed with the Configuration and Diagnostic Program. The base address allowed in IBM mode is A20h or A24h. The default is A20h.

In 3Com mode the adapters are designated by their I/O base addresses. The I/O base addresses allowed in 3Com mode are as follows, with the default in **bold**:

A20h	260h	2E0h	370h
A24h	270h	300h	380h
200h	280h	310h	390h
210h	290h	320h	3A0h
220h	2A0h	330h	3B0h
230h	2B0h	340h	3C0h
240h	2C0h	350h	3D0h
250h	2D0h	360h	3E0h

If a system resource conflict exists, you may have to change the settings of other adapters or options that are in your PC.

BIOS/MMIO Address Location

There are 16 possible 8 KB blocks of PC memory that can be assigned for accessing the ROM area of the 3C619C adapter. The factory default ROM address for the adapter is CC000–CDFFF. The 16 ROM address locations are as follows, with the default in **bold**:

C0000–C1FFF	D0000–D1FFF
C2000–C3FFF	D2000–D3FFF
C4000–C5FFF	D4000–D5FFF
C6000–C7FFF	D6000–D7FFF
C8000–C9FFF	D8000–D9FFF
CA000–CBFFF	DA000–DBFFF
CC000–CDFFF	DC000–DDFFF
CE000–CFFFF	DE000–DFFFF

The BIOS/MMIO address selected must not be assigned for use by any other adapter or option and cannot be the same as the RAM address for this adapter. If a system resource conflict exists, you may have to change the settings of other adapters or options that are in your PC.

Shared RAM Page Size and Address Range

There are 30 possible blocks of memory that can be assigned for accessing the RAM located on the 3C619C adapter. The factory default RAM size and address location for the adapter, which support RAM paging, are 16 KB / D8000–DBFFF.

RAM paging allows the software to access all 64 KB of RAM on the adapter one page (16 KB) at a time, while using only 16 KB of PC memory space. RAM paging is available for all 16 KB address ranges.

If a conflict exists, you may have to change the settings of other adapters or options that are in your PC. The 30 RAM address ranges are as follows, with the default in **bold**:

8 KB / C0000–C1FFF	8 KB / DE000–DFFFF
8 KB / C2000–C3FFF	16 KB / C0000–C3FFF
8 KB / C4000–C5FFF	16 KB / C4000–C7FFF
8 KB / C6000–C7FFF	16 KB / C8000–CBFFF
8 KB / C8000–C9FFF	16 KB / CC000–CFFFF
8 KB / CA000–CBFFF	16 KB / D0000–D3FFF
8 KB / CC000–CDFFF	16 KB / D4000–D7FFF
8 KB / CE000–CFFFF	**16 KB / D8000–DBFFF**
8 KB / D0000–D1FFF	16 KB / DC000–DFFFF
8 KB / D2000–D3FFF	32 KB / C0000–C7FFF
8 KB / D4000–D5FFF	32 KB / C8000–CFFFF
8 KB / D6000–D7FFF	32 KB / D0000–D7FFF
8 KB / D8000–D9FFF	32 KB / D8000–DFFFF
8 KB / DA000–DBFFF	64 KB / C0000–CFFFF
8 KB / DC000–DDFFF	64 KB / D0000–DFFFF

Interrupt Request Level

A 3C619C adapter can operate on one of four interrupt levels for IBM mode (2 [9], 3, 6, or 7), or one of eight interrupt levels for 3Com mode (2 [9], 3, 5, 6, 7, 10, 11, or 15).

The preferred interrupt level is 2, but the adapter can operate on any of the levels if necessary. If a conflict continues, you may have to change the setting of other adapters or options that are in your PC.

Other Configuration Options

The *TokenDisk* diskette Configuration and Diagnostic Program also allows the selection of the following additional parameters:

Memory Mode – allows operation with 8-bit or 16-bit memory interfaces. The default is 16-bit, but the 8-bit option is provided for backward compatibility with older PCs.

I/O Mode – allows operation with 8-bit or 16-bit I/O interfaces. The default is 16-bit, but the 8-bit option is provided for backward compatibility with older PCs.

IRQ Driver Type – provides a choice of IRQ signal drivers to the ISA bus. Level-sensitive relies on the motherboard circuitry for reliable operation and allows shared interrupts. Edge-triggered is more robust because it is independent of the motherboard circuitry, but it does not allow shared interrupts.

AutoSwitch – when enabled, allows installation of the adapter in an EISA PC by the EISA configuration utility without having to run the 3TOKDIAG program first. The default is disabled.

Boot PROM – when enabled, allows the PC to connect to a remote network. The default is disabled.

Zero Wait State – when enabled, allows the PC to communicate with the adapter more quickly. Some PCs may not operate correctly with this option enabled. The option can be disabled to solve this problem. The default is enabled.

3Com recommends that you not change the setting of these options.
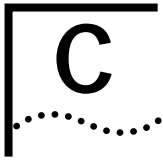
C | ERROR MESSAGES

This appendix contains an alphabetical list of the error messages that may appear when you use the *TokenDisk* diskette Configuration and Diagnostic Program for the 3C619C adapter. For information about running the adapter's diagnostic program, refer to Chapter 7, "Troubleshooting," and to Appendix A, "Using the Configuration and Diagnostic Program."

Messages

A diagnostic test name was found in the configuration file at line xxxx. Only configuration parameter variables are allowed. See the INSTRUCT.TXT file in the \DIAG subdirectory of this diskette for a description of the file format.

A lobe cable must be connected from the selected adapter to a retiming concentrator or MAU. The Open Adapter for Ring Operation Test and Adapter Wrap Test both take more than 30 seconds to complete their tasks.

A syntax error was found in the configuration file at line xxxx. The configuration file format is described in the INSTRUCT.TXT file in the \DIAG subdirectory of this diskette.

Adapter failed while trying to read the adapter configuration stored on the adapter. Save a new configuration to the adapter. If the problem persists, swap with a known good 3C619C and try again.

An adapter was configured for EISA mode, but the EISA configuration utility has not run yet. Exit this program, place your EISA configuration diskette in drive A, and reboot the PC.

An adapter was configured from EISA to ISA mode, but the EISA configuration utility has not run yet. Place your EISA configuration diskette in drive A, and reboot the PC.

An EISA configured adapter is installed in an ISA PC. Use the Configure Adapter option to reconfigure the I/O Base Address to an ISA setting (A20, A24, 200–2E0, or 300–3E0).

Attempting to configure the I/O Base Address to EISA mode. This is not allowed in an ISA PC. Choose another I/O Base Address (A20, A24, 200–2E0, or 300–3E0).

Invalid EISA system configuration. Exit the Configuration and Diagnostic Program and run your EISA configuration utility again.

The adapter is being configured for EISA mode at line xxxx in the configuration file. This is not allowed on an ISA PC. Change the I/O Base Address to an ISA value (A20, A24, 200–2E0, or 300–3E0).

The adapter is in EISA mode. This option can only be set using the EISA configuration utility. To reconfigure this option, exit this program, place your EISA configuration diskette in drive A, and reboot the PC.

The adapter was changed from EISA to ISA mode. Exit this program, place your EISA configuration diskette in drive A, and reboot the PC.

The adapter was changed from ISA to EISA mode. Exit this program, place your EISA configuration diskette in drive A, and reboot the PC.

The adapter was changed from ISA to EISA mode or from EISA to ISA mode. Exit this program, place your EISA configuration diskette in drive A, and reboot the PC.

The adapter's BIOS/MMIO base address is in conflict with another device installed in the system. To run diagnostic tests, you must reconfigure the adapter to another BIOS/MMIO base address.

The BIOS/MMIO domain conflicts with the Shared RAM domain.   Select another memory segment for either the Shared RAM or BIOS/MMIO domain.

The Configuration and Diagnostic Program supports up to six ISA adapters installed in the PC; more than six were detected. Remove the extra adapters before using this program.

The Interrupt Request Level xxxx is not supported by IBM mode. Change the Interrupt Request Level to either 2 (9), 3, 6, or 7.

The I/O Base Address xxxx is not supported by IBM mode. Change the I/O Base Address to either A20 or A24.

The selected BIOS/MMIO memory segment is being used by another device or software program installed in the PC. Do you want to save the configuration anyway?

The selected interrupt request level is being used by another device installed in the PC. Do you want to save the configuration anyway?

The selected I/O base address is being used by another device installed in the PC. Do you want to save the configuration anyway?

The selected shared RAM memory segment is being used by another device or software program installed in the PC. Do you want to save the configuration anyway?

The Shared RAM Base Address is not set to a correct address boundary. Please set it to a value in increments of the RAM Page Size setting.

The value xxxx at line xxxx in the configuration file is not supported. A list of supported option settings is provided in the INSTRUCT.TXT file in the \DIAG subdirectory of this diskette.

The value xxxx on the command line is not supported. Supported option settings are described in the INSTRUCT.TXT file in the \DIAG subdirectory of this diskette.

There is a conflict between the adapter's shared RAM and BIOS/MMIO domain. Select another memory segment for either the shared RAM or the BIOS/MMIO domain.

This option cannot be reconfigured while the adapter is set to EISA mode. To reconfigure this option, you need to set the adapter to ISA mode. To do this, select an I/O Base Address other than EISA (A20, A24, 200–2E0, or 300–3E0).

To run the Ring Operations Test, you must also enable the Open Adapter Test and Close Adapter Test.

Unable to configure xxxx at line xxxx in the configuration file. Use your EISA configuration utility to change this option.

Unable to configure xxxx. Use your EISA configuration utility to change this option.

Unable to locate an unused BIOS/MMIO base address. Try the following: 1. Boot the PC with no drivers or TSRs loaded. 2. If a Memory Manager is loaded, exclude from it the memory segment to be assigned to the 3C619C adapters.

Unable to locate an unused interrupt request level. Try starting the PC with no drivers or TSR's loaded, and run this program again.

Unable to locate an unused I/O base address. Try starting the PC with no drivers or TSR's loaded, and run this program again.

Unable to locate an unused shared RAM base address. Try the following: 1. Boot the PC with no drivers or TSR's loaded. 2. If a Memory Manager is loaded, exclude from it the memory segment to be assigned to the 3C619C adapters.

Unable to recognize value xxxx at line xxxx in the configuration file. Please change to a valid setting. A list of valid settings is provided in the INSTRUCT.TXT file in the \DIAG subdirectory of this diskette.

Unable to recognize value xxxx on the command line. Please change to a valid setting. Valid settings are described in the INSTRUCT.TXT file in the \DIAG subdirectory of this diskette.

Unable to recognize variable xxxx at line xxxx in the configuration file. Please change to a supported variable. A list of supported variables is provided in the INSTRUCT.TXT file in the \DIAG subdirectory of this diskette.

You are about to exit, but your new adapter configuration has not been saved. Do you want to exit without saving?

You must enable the Open Adapter Test and the Close Adapter Test simultaneously. Neither test can be run independently.
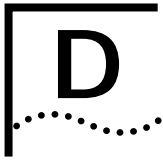
D TECHNICAL SUPPORT

3Com provides easy access to technical support information through the variety of services described in this appendix.

On-line Technical Services

3Com offers worldwide product support seven days a week, 24 hours a day, through the following on-line systems:

- 3Com Bulletin Board Service (3ComBBS)
- World Wide Web Site
- Ask3Com℠ on CompuServe®
- 3ComFacts℠ Automated Fax Service

3Com Bulletin Board Service

3ComBBS contains patches, software, and drivers for all 3Com products, as well as technical articles. This service is available via modem seven days a week, 24 hours a day. To reach the service, set your modem to 8 data bits, no parity, and 1 stop bit. Call the telephone number nearest you:

Country	Baud Rate	Telephone Number
Australia	up to 14400 baud	(61) (2) 955 2073
France	up to 14400 baud	(33) (1) 69 86 69 54
Germany	up to 9600 baud up to 9600 baud	(49) (89) 627 32 188 (49) (89) 627 32 189
Hong Kong	up to 14400 baud	(852) 537 5601
Italy (fee required)	up to 9600 baud	(39) (2) 273 00680
Japan	up to 14400 baud	(81) (3) 3345 7266
Singapore	up to 14400 baud	(65) 534 5693
Taiwan	up to 14400 baud	(886) (2) 377 5838 (886) (2) 377 5840
U.K.	up to 14400 baud	(44) (144) 227 8278
U.S.	up to 14400 baud	(1) (408) 980 8204

World Wide Web Site

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This service features news and information about 3Com products, customer service and support, 3Com's latest news releases, selected articles from 3TECH™, 3Com's award-winning technical journal, and more.

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Ask3Com is a CompuServe-based service containing patches, software, drivers, and technical articles about all 3Com products, as well as an interactive forum for technical questions. To use Ask3Com, you need a CompuServe account.

To use Ask3Com:

1 Log on to CompuServe.

2 Enter `go threecom`

3 Press [Return] to see the Ask3Com main menu.

3ComFacts Automated Fax Service

3Com Corporation's interactive fax service, 3ComFacts, provides data sheets, technical articles, diagrams, and troubleshooting instructions on 3Com products 24 hours a day, seven days a week. Within this service, you may choose to access CardFacts® for adapter information, or NetFacts® for network system product information.

■ **CardFacts** provides adapter installation diagrams, configuration drawings, troubleshooting instruction, and technical articles.

Document 9999 provides you with an index of adapter documents.

■ **NetFacts** provides data sheets and technical articles on 3Com Corporation's hub, bridge, router, terminal server, and software products.

Document 8888 provides you with an index of system product documents.

Call 3ComFacts using your touch-tone telephone. International access numbers are:

Country	Fax Number
Hong Kong	(852) 537 5610
U.K.	(44) (144) 227 8279
U.S.	(1) (408) 727 7021

Local access numbers are available within the following countries:

Country	Fax Number	Country	Fax Number
Australia	800 123853	Italy	1678 99085
Denmark	800 17319	Netherlands	06 0228049
Finland	98 001 4444	Norway	800 11062
France	05 90 81 58	Sweden	020 792954
Germany	0130 8180 63	U.K.	0800 626403

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:

■ Diagnostic error messages

■ A list of system hardware and software, including revision levels

■ Details about recent configuration changes, if applicable

If you are outside the U.S. and Canada, contact your local 3Com sales office to find your authorized service provider:

Country	Telephone Number	Country	Telephone Number
Australia (Sydney)	(61) (2) 959 3020	Mexico	(525) 531 0591
(Melbourne)	(61) (3) 653 9515	Netherlands	(31) (3) 402 55033
Belgium	(32) (2) 7164880	Singapore	(65) 538 9368
Brazil	(55) (11) 546 0869	South Africa	(27) (11) 803 7404
Canada	(905) 882 9964	Spain	(34) (1) 3831700
France	(33) (1) 69 86 68 00	Sweden	(46) (8) 632 91 00
Germany	(49) (89) 6 27 32 0	Taiwan	(886) (2) 577 4352
Hong Kong	(852) 868 9111	United Arab Emirates	(971) (4) 349049
Italy	(39) (2) 273 02041	U.K.	(44) (1628) 897000
Japan	(81) (3) 33457251		

Returning Products for Repair

A product sent directly to 3Com for repair must first be assigned a Return Materials Authorization (RMA) number. A product sent to 3Com without an RMA number 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
U.S and Canada	(800) 876 3266, option 2	(408) 764 7120
Europe	(44) (1442) 278000	(44) (1442) 236824
Outside Europe, U.S. and Canada	(1) (408) 492 1790	(1) (408) 764 7290

GLOSSARY

3Com mode

A mode of operation for the 3Com TokenLink III adapter that provides expanded configuration options for the adapter and drivers.

CAU

Controlled access unit.

Configuration

The software settings that allow different hardware components of a PC to communicate with one another.

DAU

Dual access unit.

Driver

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

EISA

Extended Industry Standard Architecture.

Hexadecimal

A number system with a base of sixteen. In hexadecimal, the first ten digits are 0–9 and the last six digits are represented by the letters A–F. Denoted in the manual by a number followed by "h."

IBM mode

A mode of operation for 3Com TokenLink III adapter with configuration options restricted to the same options provided by IBM 16/4 adapters. Either 3Com or IBM drivers can be used when the adapter is configured in IBM mode.

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.

Input/Output (I/O)

> The method, medium, or device (such as a keyboard, monitor, floppy disk, hard disk, network adapter, or printer) used to transfer data to a PC or from the PC back to a device, a network, and so on.

ISA

> Industry Standard Architecture.

LAN

> Local area network. A communications network within a limited physical area (up to about 6 miles or 10 kilometers) that provides high-speed (over 1 Mbps) data transmission. The basic components of a LAN are the boards that plug into each PC to connect it to the network, cabling, server hardware, and software for network control.

Lobe

> All network components in a specific lobe 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.

MAU

> Multistation access unit.

NDIS

> Network Driver Interface Specification. A software specification used in many operating systems, such as Microsoft's LAN Manager, to create drivers for network adapters. NDIS drivers support multiple protocols and multiple adapters and can be unloaded from memory to conserve conventional DOS RAM space.

NET.CFG

An ASCII file containing control information for network protocol elements of stations and servers for a Novell NetWare environment.

Network

A series of nodes such as PCs, terminals, or other peripherals interconnected by a communications channel.

Network adapter

A circuit board located inside each PC and server on the network. It allows the device to listen and talk to other stations and nodes on the network.

ODI

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

Protocol

A formalized set of rules that PCs use to communicate. Because of the complexity of communications between PCs and the need for different communication requirements, protocols have been divided into modular layers, in which each layer performs a specific function for the layer above.

Protocol layers

A model for describing the hierarchical set of or levels protocols in which each protocol layer obtains services from the layer below it and performs services for the layer above it.

PROTOCOL.INI

An ASCII file containing control information for network protocol elements of NDIS network stations and servers.

Token ring

A network that employs a ring topology and uses a token-passing method for ring access.

TSR

Terminate and stay resident. A program that upon execution, loads itself (or an executable portion of itself) into PC working memory (RAM). It can be activated at any time with a specified key sequence.

WAN

Wide area network. This is a network covering large distances (50 square miles or more) that may include packet-switched, or public data, and value-added networks.

INDEX

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HARDWARE: 3Com warrants its hardware products to be free from defects in workmanship and materials, under normal use and service, for the following lengths of time from the date of purchase from 3Com or its Authorized Reseller:

Internetworking products	One year
Network adapters	Lifetime
Ethernet stackable hubs and unmanaged Ethernet fixed port repeaters	Lifetime* (One year if not registered)
*Power supply and fans in these stackable hubs and unmanaged repeaters	One year
Other hardware products	One year
Spare parts and spares kits	90 days

If a product does not operate as warranted during the applicable warranty period, 3Com shall, at its option and expense, repair the defective product or part, deliver to Customer an equivalent product or part to replace the defective item, or refund to Customer the purchase price paid for the defective product. All products that are replaced will become the property of 3Com. Replacement products may be new or reconditioned. Any replaced or repaired product or part has a ninety (90) day warranty or the remainder of the initial warranty period, whichever is longer.

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(408) 764-5000

FCC CLASS A VERIFICATION STATEMENT

WARNING: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules, and the Canadian Department of Communications Equipment Standards entitled, "Digital Apparatus," ICES-003. These limits are designed to provide reasonable protection against harmful interference in a commercial installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case, the user will be required to correct the interference at the user's own expense.

Changes or modifications not expressly approved by 3Com could void the user's authority to operate this equipment.

CE NOTICE

Marking by the symbol **C E** indicates compliance of this equipment to the EMC directive of the European Community. Such marking is indicative that this equipment meets or exceeds the following technical standards:

- EN 55022—"Limits and Methods of Measurement of Radio Interference Characteristics of Information Technology Equiment."

- IEC 801-2—"Electromagnetic compatibility for industrial-process measurement and control equipment Part 2: Electrostatic discharge requirements."—Severity level 3.

- IEC 801-3—"Electromagnetic compatibility for industrial-process measurement and control equipment Part 3: Radiated electromagnetic field requirements."—Severity level 2.

- IEC 801-4—"Electromagnetic compatibility for industrial-process measurement and control equipment Part 4: Electrical fast transient/burst requirements."—Severity level 2.

- A "Declaration of Conformity" in accordance with the above standards has been made and is on file at 3Com Corporation.

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