TokenLink® III
16-Bit Micro Channel®
Adapter Guide

A member of the TokenLink III product family

For 3Com User Group Information
1-800-NET-3Com
or your local 3Com office

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

Contents

Introduction
100% Compatibility xiv
Money-Back Guarantee xiv

Quick Start

Chapter 1 Installing the Hardware
System Requirements 1-1
Taking Safety Precautions 1-3
Inspecting the Adapter 1-3
Installing the Adapter 1-5
Connecting to the Network 1-8
Connecting to Shielded Twisted-pair (STP) Cable 1-8
Connecting to Unshielded Twisted-pair (UTP) Cable 1-10

Chapter 2 Using the MCA Reference Diskette
Backing Up the MCA Reference Diskette 2-1
Configuring with the MCA Reference Utility 2-3
Viewing or Changing the MCA Configuration 2-5

Chapter 3 Auto Installing NetWare DOS ODI Client Drivers

Chapter 4 Installing Other Network Drivers

Obtaining Network Drivers 4-2
Installing 3Com Drivers 4-3
Installing IBM Drivers 4-5
Using Remote Program Load (RPL) 4-6
Enabling RPL 4-6
Disabling RPL 4-7
Using a Modem to Download Drivers 4-8
Modifying Network Startup Files 4-9
NDIS Drivers 4-9
NetWare ODI Drivers 4-11
Installing Driver Agents for Transcend TokenLink SmartAgent Software (Optional) 4-13
NetWare ODI Client Node Installation 4-14
NDIS Client and Server Node Installation 4-16

Chapter 5 Diagnostics and Troubleshooting

Adapter LEDs 5-2
Using the *TokenDisk* Diskette Diagnostic and Manual Configuration Program 5-3
Running Diagnostic Tests 5-4
Changing the Test Setup 5-8
Adapter Statistics and Information 5-10
Adapter Statistics 5-10
Adapter Information 5-11
When Tests Fail 5-11
MMIO Register Write/Read Test Failure 5-12
Boot PROM Test Failure 5-12
AIP Checksum Test Failure 5-12
Shared RAM Boundary/Domain Test Failure 5-12
Shared RAM Write/Read Test Failure 5-13
Open Adapter for Ring Operation Test Failure 5-13
Ring Operations Test Failure 5-13
Close Adapter Test Failure 5-14
Adapter Wrap Test Failure (Group 2) 5-14

Troubleshooting Tips 5-14
Diagnostic Test Types 5-16
Group 1 Diagnostics 5-17
Group 2 Diagnostic 5-18
Additional Information 5-19
Error Messages 5-19
On-line Information 5-19
Technical Support 5-19

Appendix A *TokenDisk* Diskette Diagnostic and Manual Configuration Program
Using the Keyboard A-2
Speed Keys A-3
Using the Mouse A-3
Choosing a Menu Item A-4
Using the File Options A-5
Help A-6
Exiting the Program A-7
Using the Command Line A-7

Appendix B Specifications
Cabling B-1
Pin Assignments B-1
Configuration Options B-4
Ring Speed B-4
Primary/Alternate Adapter B-4
ROM Address Location B-5
Shared RAM Page Size and Address Range B-6
Interrupt Request Level B-7

Appendix C Error Messages
Warning Messages C-1
Error Messages C-1

Appendix D Technical Support
On-line Product Support D-1
    CardBoard Bulletin Board Service D-1
    3ComFacts Automated Fax Service D-2
    Ask3Com On-line Service D-3
    3Com Documentation on CD-ROM D-4
Support from Your Network Supplier D-4
    U.S. and Canada D-4
    Outside the U.S. and Canada D-5
Returning Products for Repair D-6

Glossary

Index

Figures and Tables

Figures

1-1. Removing the Cover 1-5
1-2. Removing the Backplate 1-6
1-3. Inserting the Adapter 1-7
1-4. Connecting the DB-9 Cable 1-9
1-5. Connecting the RJ-45 Cable 1-10

3-1. Main Menu 3-4

4-1. Main Menu 4-4

5-1. Adapter LEDs 5-2
5-2. Main Menu 5-5
5-3. Main Window with Adapter Selected 5-6
5-4. Run Tests Dialog Box 5-7
5-5. Test Setup Dialog Box 5-8
5-6. Adapter Statistics 5-10
5-7. Adapter Information 5-11

A-1. The Menu Hierarchy A-1
A-2. Sample Dialog Box A-6

B-1. DB-9 Connector Pin Assignments B-2
B-2. RJ-45 Connector Pin Assignments B-3

Tables

A-1. Definition of Keys A-2
A-2. Definition of Menu Items A-4
A-3. Command Line Keywords A-8

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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).

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Introduction

The 3Com® TokenLink® III Micro Channel® Token Ring Adapter (3C629B) is a 16-bit network adapter. It can be installed in any IBM®-compatible UL®-listed personal computer with a Micro Channel Architecture (MCA) bus.

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.

TokenLink III adapters can be managed remotely with Transcend™ TokenLink SmartAgent™ software. Driver agents for this product are supplied on the *TokenDisk*™ diskette.

3Com supplies Novell® NetWare® 386 drivers and NDIS drivers for NDIS 2.1 compliant network operating systems on the *TokenDisk* diskette.

TokenLink III adapters can also use the same drivers as IBM 16/4 Token Ring Adapters. IBM drivers can be obtained in one of the following ways:

- They can be downloaded from the network operating system.
- They can be downloaded from the IBM on-line bulletin board service (BBS).

- They can be installed using the IBM LAN Support Program version, 1.26 or later.

For instructions on downloading drivers from the IBM bulletin board, refer to Chapter 4, “Installing Network Drivers.”

100% Compatibility

The 3Com TokenLink III 16/4 adapter is 100% compatible with any driver or application commercially available to function with the generation of TROPIC™ chip-based IBM adapter boards available at initial shipment of the 3Com TokenLink III 16/4 adapter.

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. That support group should contact 3Com’s Customer Support organization at 1-800-876-3266—pick option 1, then option 3. Be prepared to describe the observed incompatibility in detail. A refund of the purchase price is the customer’s sole remedy and constitutes 3Com’s entire liability for noncompatibility.

Quick Start

Quick Start is for experienced token ring network users installing a single 3Com TokenLink III adapter. You should be familiar with PC hardware and token ring cabling.

NOTE: *If you have not installed token ring adapters before, use the procedures in Chapters 1 through 4 to install the TokenLink III MCA adapter. These chapters contain definitions, figures, and tables to aid first-time users.*

CAUTION: *The adapter is packed in an antistatic bag to protect it during shipment. To avoid damaging highly static-sensitive components on the adapter or in the computer, be sure to reduce any static electricity on your body.*

Perform the following Quick Start steps:

1. **Remove the adapter from its package and inspect it.**

2. **Install the adapter in an empty expansion slot of your computer, as explained in the hardware manual that came with your computer.**

3. **Replace the computer's cover.**

4. **Connect a token ring cable to the adapter.**

5. **Turn on the computer and run the MCA Reference Utility and accept all of the default values of its automatic configuration.**

   The TokenLink III adapter comes from the factory with the following configuration settings:

Primary/Alternate adapter	Primary
Shared RAM page size	16 K
Shared RAM address	D8000h–DBFFh
Adapter ring speed	16 Mbps
Interrupt request level	2

   If you need to modify any of these settings, refer to Chapter 2, “Using the MCA Reference Diskette,” in this manual.

6. **Install network drivers.**

   NetWare client and server drivers are located in the \NETWARE subdirectory on the *TokenDisk* diskette.

   NDIS drivers are located in the \NDIS\DOS and \NDIS\OS2 subdirectories on the *TokenDisk* diskette.

Chapter 1
Installing the Hardware

This chapter describes how to physically install the 3Com® TokenLink® III Micro Channel® Architecture (MCA) Token Ring Adapter (3C629B) in an MCA computer 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:

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

System Requirements

Installation of the TokenLink III MCA adapter requires the following:

- A Micro Channel Architecture (MCA)-bus personal computer with an available MCA expansion slot.
- An MCA Reference Utility on diskette or hard drive, with documentation.
- Network drivers.
- *TokenDisk* diskette.

- One of the following operating systems:
  - MS-DOS® version 3.2 or later
  - 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 higher (Novell NetWare 386 Server)
  - MS-DOS version 3.3 or later (IBM® PC LAN Program)
  - MS-DOS version 3.2 or later (Microsoft® DOS LAN Manager)
  - MS-OS/2 version 1.0 or later (Microsoft OS/2 LAN Manager)
  - OS/2 EE version 1.1 or later (IBM LAN Server/LAN Requester, Communications Manager)
  - OS/2 version 2.0 or later (IBM LAN Server 2.0)
  - MS-DOS version 3.3 or later (Banyan® VINES® DOS workstation)
  - MS-DOS version 3.3 or later (Banyan VINES 386 Server).
- Available memory to load the TokenLink III MCA adapter driver from the network operating system. Depending on the LAN operating system, you may need additional free memory. Refer to the appropriate network operating system (NOS) documentation for the exact memory requirements.

- Multistation access unit (MAU), controlled access unit (CAU), or dual access unit (DAU).
- Appropriate token ring network cabling.

Taking Safety Precautions

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

1. **Turn off the computer and unplug the unit from its power source.**
2. **Disconnect all cables that are connected to the main system unit.**
3. **Remove any jewelry from your hands and wrists.**
4. **Make sure to use only insulated or nonconductive tools.**

Inspecting the Adapter

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

- TokenLink III 16-bit MCA adapter (3C629B)
- *TokenLink III 16-Bit Micro Channel Adapter Guide*
- *TokenDisk* diskette for the TokenLink III family of adapters

CAUTION: *The adapter is packed in an antistatic bag to protect it during shipment. To avoid damaging highly static-sensitive components on the adapter or in the computer, 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.

NOTE: *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 TokenLink III MCA adapter as follows:

1. **Remove the computer's cover and choose an empty 16- or 32-bit expansion slot, as shown in Figure 1-1.**

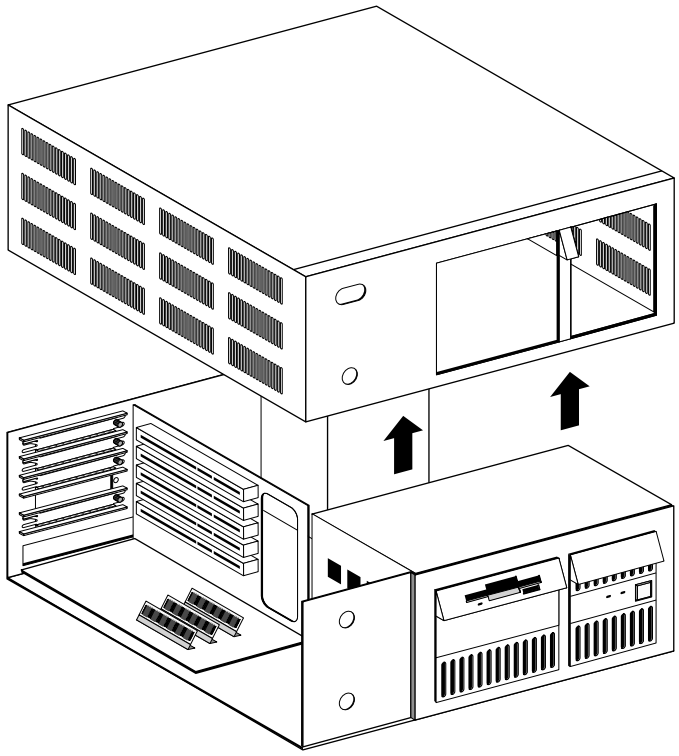

Figure 1-1. Removing the Cover

2. **Unscrew the knob or screw holding the expansion slot's backplate and remove it, as shown in Figure 1-2.**

NOTE: Your computer may look different from the one illustrated.

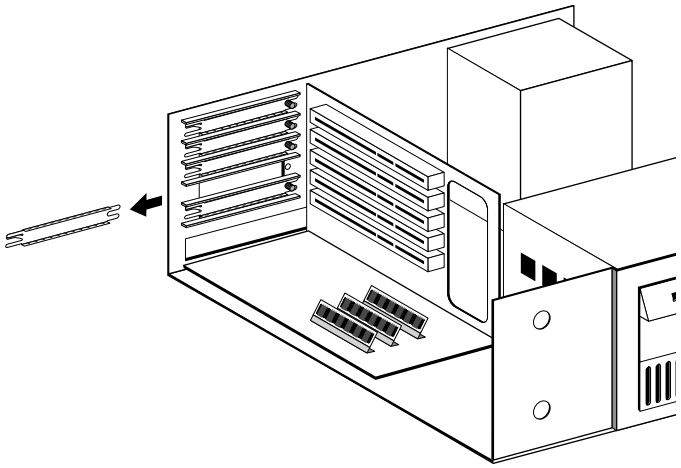

Figure 1-2. Removing the Backplate

3. **Insert the TokenLink III MCA adapter into the 16- or 32-bit expansion slot, as shown in Figure 1-3, and secure it with the knob or screw you loosened earlier. The end prongs of the adapter backplate go inside the computer chassis.**

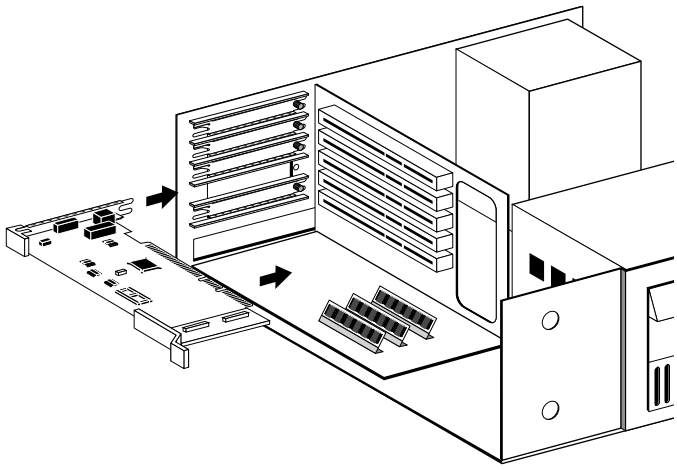

Figure 1-3. Inserting the Adapter

4. **Replace the computer's cover.**

5. **Reconnect all previously connected devices and cables.**

6. **Proceed to the next section, "Connecting to the Network."**

Connecting to the Network

Connect one of the following types of network cables to the TokenLink III MCA adapter.

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

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

Figures 1-4 and 1-5 show the adapter connectors.

Connecting to Shielded Twisted-pair (STP) Cable

TokenLink III adapters support industry-standard token ring cabling that follows IEEE 802.5 specifications.

1. **Locate the adapter's DB-9 connector on the backplate, as shown in Figure 1-4.**

2. **Locate the DB-9 connector on the STP cable, as shown in Figure 1-4.**

3. **Connect the cable's DB-9 connector to the adapter's DB-9 socket, as shown in Figure 1-4, and secure it by tightening the two screws.**

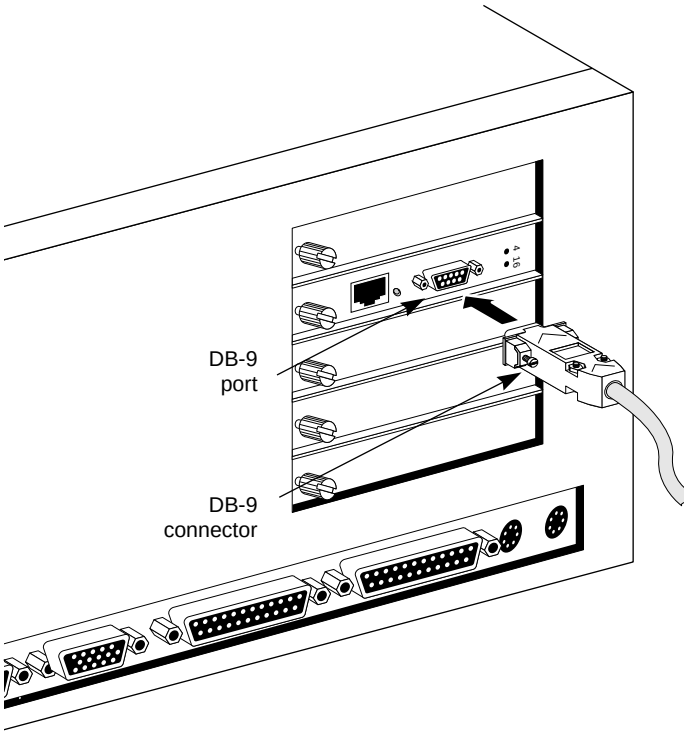

Figure 1-4. Connecting the DB-9 Cable

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).

Proceed to Chapter 2 to configure the adapter and the MCA computer.

Connecting to Unshielded Twisted-pair (UTP) Cable

TokenLink III adapters support industry-standard token ring cabling that follows IEEE 802.5 specifications.

1. **Locate the adapter's RJ-45 connector on the backplate, as shown in Figure 1-5.**

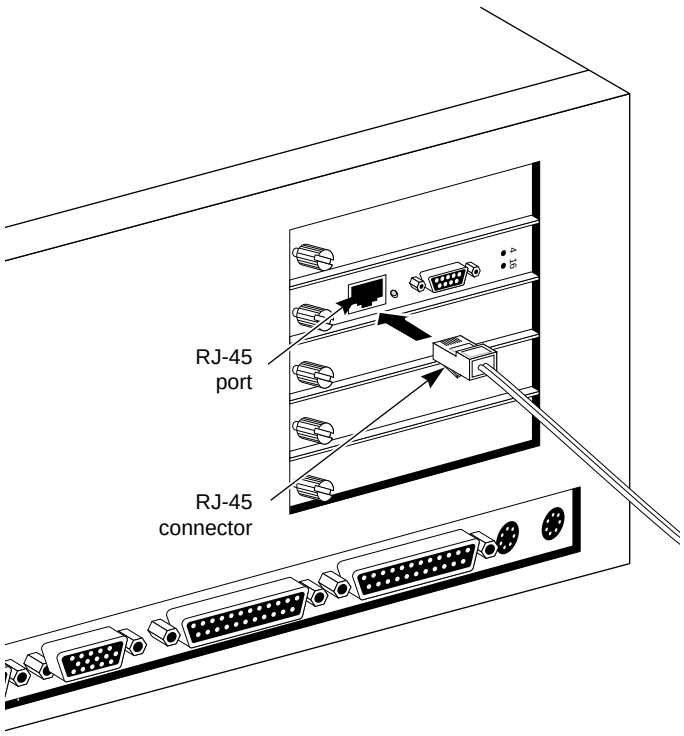

Figure 1-5. Connecting the RJ-45 Cable

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

3. **Insert the RJ-45 plug into the adapter socket.**

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).**

Proceed to Chapter 2 to configure the adapter and your MCA computer.

Chapter 2
Using the MCA Reference Diskette

This chapter explains how to configure the TokenLink III MCA adapter and your MCA personal computer. This chapter contains the following sections:

- Backing Up the MCA Reference Diskette
- Configuring with the MCA Reference Utility
- Viewing or Changing the MCA Configuration

Backing Up the MCA Reference Diskette

This section explains how to make a backup copy of the MCA Reference Utility diskette that came with your MCA personal computer. This diskette is referred to as the Reference diskette in this manual. On some Micro Channel computers, the MCA Reference Utility is located on the hard drive, and not on a diskette. If the Reference Utility is on your hard drive, disregard this section and proceed to the next section, "Configuring with the MCA Reference Utility." The Reference Utility program runs automatically when the computer is turned on if a change in hardware has been made.

NOTE: *If you are using a Micro Channel computer that is not manufactured by IBM, use the corresponding reference diskette provided with your computer. The procedures below may vary on other reference diskettes.*

1. **Insert the Reference diskette in the drive.**

2. **Turn on the computer.**

3. **When the screen with the following prompt appears, type N and press [Enter].**

   ```
   Autoconfigure the system? (Y/N)
   ```

4. **At the main menu, select the option to back up the Reference diskette, and follow the on-screen directions.**

5. **Remove the original Reference diskette from the drive.**

6. **Place the backup copy of the Reference diskette you just made in the drive.**

7. **At the main menu, choose the selection to copy the option diskette (the *TokenDisk* diskette), and follow the on-screen directions.**

   This selection copies the adapter description file (ADF) from the *TokenDisk* diskette (the option diskette) to your backup copy of the Reference diskette.

   When the copying is complete, continue with the section “Configuring with the MCA Reference Utility.”

Configuring with the MCA Reference Utility

Use the following steps to reconfigure your MCA computer so that it recognizes the new TokenLink III MCA adapter you just installed.

NOTE: *On some Micro Channel computers, the MCA Reference Utility is located on the hard drive, and not on a floppy diskette. If it is on the hard drive, the Reference utility starts automatically upon sensing the insertion or removal of an adapter. The following procedures assume that this utility is located on a diskette.*

1. **Put the backup copy of the Reference diskette in drive A and press [Ctrl]+[Alt]+[Del] to reboot.**

2. **When the screen with the following prompt appears, type Y and press [Enter].**

   ```
   Autoconfigure the system? (Y/N)
   ```

NOTE: *Depending on the version of the Reference diskette, either a dialog box or a menu may appear on the screen.*

The automatic configuration program sets up the configuration based on available computer resources and stores it in CMOS memory so that the new adapter is recognized when the computer is rebooted.

The adapter's default configuration (if there are no conflicts) is as follows:

Adapter ring speed:	16 Mbps
Primary/Alternate adapter:	Primary
ROM address range:	CC000–CDFFFh
Shared RAM/Address range and page size:	D8000–DBFFFh/16 KB
Interrupt level:	IRQ 2

If the configuration defaults are satisfactory, proceed to step 3. If they are not, proceed to the next section, "Viewing or Changing the MCA Configuration." Refer to Appendix B, "Specifications," for more information about configuration options.

NOTE: *If you are using a memory management utility, you must inform it of the RAM address range used by the MCA adapter. For example, add an exclude parameter on the EMM386 device in the CONFIG.SYS file such as:*

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

3. When configuration is complete, perform the following actions:

a. Exit the program and remove the backup copy of the Reference diskette.

b. Reboot your computer under DOS with no diskettes in the drive.

c. Go to Chapter 3 to install NetWare DOS ODI client drivers, or to Chapter 4 for installation of all other drivers.

Viewing or Changing the MCA Configuration

To verify or change the MCA configuration, follow these steps:

1. **Insert the backup copy of the Reference diskette in the disk drive.**

2. **Press [Ctrl]+[Alt]+[Del] to reboot.**

3. **Follow the prompts on the screen to view or change the settings.**

   For more information, refer to your MCA computer documentation.

4. **Remove the backup copy of the Reference diskette.**

5. **Reboot the system if you made changes to a configuration parameter.**

Go to Chapter 3 to install NetWare DOS ODI client drivers, or to Chapter 4 for installation of all other drivers.

Chapter 3
Auto Installing NetWare DOS ODI Client Drivers

This chapter explains how to use the AutoLink™ auto installation feature of the *TokenDisk* diskette to install NetWare DOS ODI client drivers. If you need to install other types of drivers, refer to Chapter 4, "Installing Other Network Drivers."

To use the AutoLink feature, you must meet the following requirements:

- Your network operating system must be NetWare 2.x, 3.1x, or 4.x.
- Your system administrator must configure a 3Install account on the server.
- Your computer must have an 80286 or higher processor.
- Your computer must have only one TokenLink III adapter installed in it.
- Your computer must be intended for use as a DOS ODI client.

NOTE: *The adapter must be configured with the MCA Reference diskette and connected to the network before the AutoLink feature can be used.*

The AutoLink auto installation feature performs the following functions:

- Installs all necessary software for a NetWare DOS ODI client
- Logs onto the server and updates the client software
- Modifies the CONFIG.SYS and AUTOEXEC.BAT files for NetWare users
- Runs diagnostic tests on the adapter

To ensure that your computer is configured with the latest client software, ask your system administrator to configure a 3Install account on the server.

Instructions for configuring a 3Install account are contained in the README.TXT file located in the \QINSTALL\SERVER directory on the *TokenDisk* diskette.

NOTE: *When diagnostic tests are performed on the adapter during auto installation, memory conflicts may occur. To help prevent this, follow these rules:*

(1) Do not load network drivers.

(2) Be aware that TSRs may cause memory conflicts.

(3) If you are using a memory management utility, you must inform it of the RAM address range used by the MCA adapter. For example, add an exclude parameter on the EMM386 device in the CONFIG.SYS file, such as:

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

To use the AutoLink auto installation feature, perform these steps:

1. **Make sure that you have booted the computer under DOS.**
2. **Make a backup copy of your *TokenDisk* diskette and place the backup copy in a floppy drive on your computer.**
3. **Make that drive the current drive.**

   For example, if the diskette drive is A, type the following command:

   ```
   A: [Enter]
   ```

4. **Type at the prompt:**

   ```
   INSTALL [Enter]
   ```

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

   ```
   Y [Enter]
   ```

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

   The auto installation screen appears.

6. **Read the screen and press [Enter].**
7. **When the main menu screen shown in Figure 3-1 appears, select NetWare DOS ODI Client and press [Enter].**

NOTE: Depending upon your network environment, auto installation may take several seconds to several minutes.

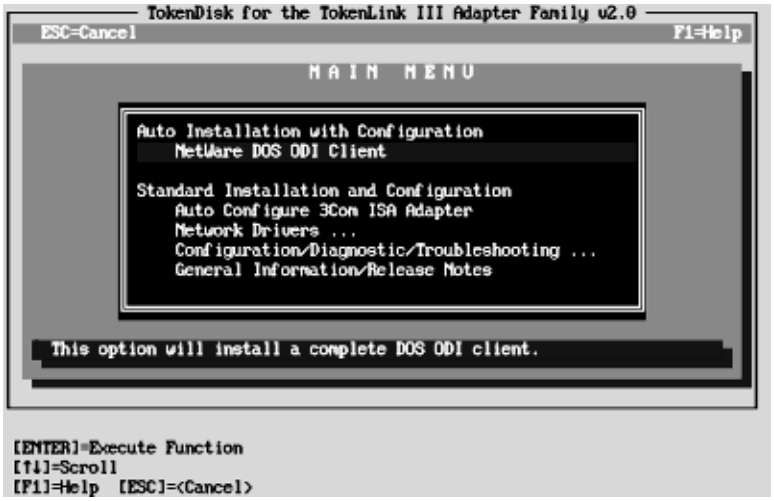

Figure 3-1. Main Menu

8. Reboot the computer when the auto installation process is finished.

When you do this, a DOS ODI client starts.

This concludes installation of the DOS ODI client drivers. If there are problems, refer to Chapter 5, "Diagnostics and Troubleshooting."

Chapter 4
Installing Other Network Drivers

This chapter describes how to install the network drivers for clients *other than* NetWare DOS ODI clients. Drivers allow the TokenLink III MCA token ring adapter to work with your network operating system.

NOTE: *The AutoLink auto installation feature only installs drivers for DOS ODI clients (refer to Chapter 2).*

This chapter contains the following sections:

- Obtaining Network Drivers
- Installing 3Com Drivers
- Installing IBM Drivers
- Using Remote Program Load (RPL)
- Using a Modem to Download Drivers
- Modifying Network Startup Files
- Installing Driver Agents for Transcend TokenLink SmartAgent Software (Optional)

Use the IBM 16/4 Token Ring adapter drivers provided with the network operating system, or the 3Com drivers supplied on the *TokenDisk* diskette. The TokenLink III MCA adapter is fully IBM-compatible. Because of this, the adapter can use the same drivers as IBM 16/4 Token Ring Adapters. An on-board universal boot PROM with Remote Program Load (RPL) can be used to download these drivers from popular network operating systems.

The RPL feature may be enabled or disabled as required. Refer to the section “Using Remote Program Load (RPL).”

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

Obtaining Network Drivers

Obtain token ring drivers for the TokenLink III MCA adapter in one of the following ways:

- Install 3Com drivers from the *TokenDisk* diskette, using the menu selections. To obtain 3Com driver updates, refer to the section “CardBoard Bulletin Board System” in Appendix D, “Technical Support.”
- Copy IBM 16/4 Token Ring Adapter drivers supplied with your network operating system.
- Use the Remote Program Load (RPL) program to load drivers from the network. Follow the procedures described in the section “Using Remote Program Load (RPL)” later in this chapter.
- Download IBM 16/4 Token Ring adapter drivers from the IBM bulletin board service (BBS). For more details, refer to the section “Using a Modem to Download Drivers” later in this chapter.
- Use the IBM 16/4 Token Ring adapter drivers that accompany the latest version of IBM’s LAN Support Program.

Installing 3Com Drivers

To install 3Com drivers if you have not used the AutoLink feature, follow these steps:

1. **Make sure that you have booted the computer under DOS.**

2. **Place the *TokenDisk* diskette in a floppy drive on your computer.**

3. **Make that drive the current drive.**

   For example, if the diskette drive is A, type the following command:

   ```
   A: [Enter]
   ```

4. **Type at the prompt:**

   ```
   INSTALL [Enter]
   ```

   The auto installation screen appears.

5. **Read the screen and press [Enter].**

6. **When the main menu screen shown in Figure 4-1 appears, select Network Drivers and press [Enter].**

7. **When the Network Drivers screen appears, select Install Novell NetWare Drivers to install NetWare drivers or Display NDIS Driver Information to install NDIS drivers and press [Enter].**

8. **Perform one of the following procedures, depending upon your choice of driver:**

   - *For NetWare drivers:*

     a. When the next screen appears, select the driver of your choice.

     b. When prompted to do so, enter a path for the destination of the driver.

     c. Make the changes to your AUTOEXEC.BAT (or network startup file) and CONFIG.SYS files to load the token ring driver when the computer initializes.

        Sample procedures for a DOS ODI driver are provided in the section “Modifying Network Startup Files” later in this chapter.

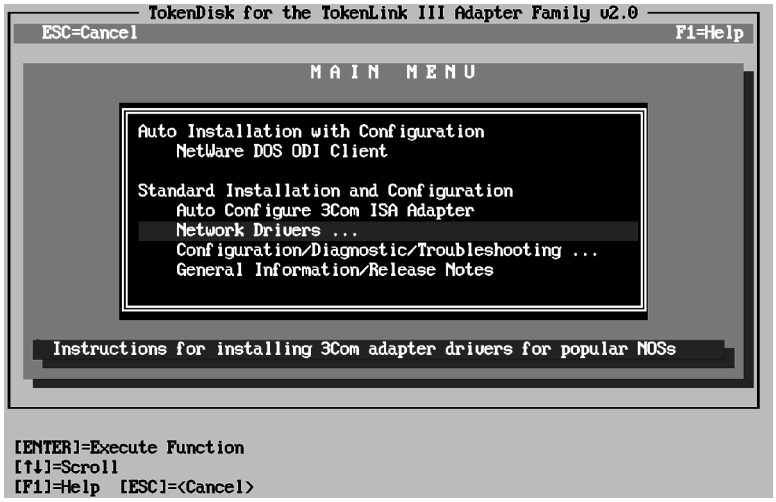

Figure 4-1. Main Menu

- *For NDIS drivers:*

  The *TokenDisk* diskette contains a subdirectory structure and files that make it an OEM import disk for IBM LAN Server 3.0 or earlier, IBM OS/2 LAPS, or Microsoft LAN Manager.

  a. When the next screen appears, select the instructions for your network operating system.

  b. Follow the instructions to either import the 3Com driver or modify your PROTOCOL.INI and CONFIG.SYS files.

     Sample procedures for modifying the PROTOCOL.INI and CONFIG.SYS files are provided in the section “Modifying Network Startup Files” later in this chapter.

Installing IBM Drivers

To install IBM drivers, follow these steps:

1. **Install the IBM 16/4 Token Ring drivers supplied with your network operating system or the IBM LAN Support Program.**

2. **Follow the procedures described in the section “Modifying Network Startup Files” later in this chapter.**

Using Remote Program Load (RPL)

The TokenLink III MCA adapter contains a built-in RPL facility for loading drivers from Novell NetWare, IBM LAN Server, Microsoft LAN Manager, and Banyan VINES. If RPL is enabled on the adapter and on the network server, the system can boot from a server on the token ring network and thereby eliminate the need for local drives or diskettes. The RPL on the adapter can be disabled to allow the system to boot from its hard disk.

In order to execute the RPL code on the TokenLink III MCA adapter, the hard disk must be made a nonbootable device. The file 3CTOKRPL.EXE is provided on the *TokenDisk* diskette for this purpose. This program deactivates the active DOS partition within the hard disk without affecting the contents of the hard disk.

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

Enabling RPL

The following instructions explain how to use the RPL program. 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. **Perform the steps necessary to enable your computer to boot from the network.**

2. **Make sure that you have booted your computer under DOS.**

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

4. **At the diskette prompt, type:**

   ```
   3CTOKRPL.EXE [Enter]
   ```

   The following prompt appears on the screen:

   ```
   Change bootable partition to non-bootable (y/n)?
   ```

5. **When this prompt appears, type the following:**

   ```
   y [Enter]
   ```

6. **Remove the diskette from the drive and reboot the computer.**

Your computer should now boot from the network. Although your computer is not able to boot from the hard disk, you can still access the hard disk and any files or applications residing on it.

Disabling RPL

To disable RPL:

1. **Make sure that the *TokenDisk* diskette is in a floppy drive on your computer.**

2. **At the diskette prompt, type:**

   ```
   3CTOKRPL.EXE [Enter]
   ```

   The following prompt appears on the screen:

   ```
   Change nonbootable partition to bootable (y/n)?
   ```

3. **When this prompt appears, type the following:**

   ```
   y [Enter]
   ```

4. **Remove the diskette from the floppy drive and reboot the computer.**

Using a Modem to Download Drivers

This section explains how to access the IBM bulletin board service (BBS) that contains network drivers for token ring adapters. All files at the BBS are made available in an "as is" condition.

Use the following procedure to download the driver:

1. **Using a modem, dial the IBM bulletin board number.**

   Use the following modem parameters: up to 14,400 baud, 8 data bits, no parity, 1 stop bit.

2. **Register with the BBS.**

3. **Choose D (download selected files) from the BBS Main Menu 4.**

4. **Type the name of the file.**

   If unsure of the file you want, use one of the following options:

   - (L) List files. Directory 32 contains the NDIS and ODI drivers. Directory 17 lists adapter drivers for token ring.

   - (S) Search for specific files or groups of files (searching for "NDIS" lists all NDIS drivers available on the BBS).

5. **Choose the download protocol and download the file.**

Modifying Network Startup Files

In certain cases when the AutoLink feature is not used, you must make changes to your AUTOEXEC.BAT (or network startup file) and CONFIG.SYS files to load the token ring driver when the computer initializes. This section describes when you need to do this and includes sample procedures for the following drivers:

- NDIS for DOS
- ODI for DOS

NOTE: *For complete information, refer to the documentation that came with the IBM LAN Support Program or with your network operating system.*

NDIS Drivers

If you are installing 3Com drivers, the *TokenDisk* diskette contains a subdirectory structure and files that make it an OEM import disk for IBM LAN Server 3.0, IBM OS/2 LAPS, or Microsoft LAN Manager. Instructions are provided for each in the Display NDIS Driver Information submenu. Instructions for changing the PROTOCOL.INI, CONFIG.SYS, and AUTOEXEC.BAT files for IBM LAN Server 2.0, Banyan VINES, DEC® PATHWORKS®, 3Com 3+Open®, and Artisoft™ LANtastic®/AI are also provided.

If you are installing IBM drivers, follow the procedures described in your network operating system documentation.

A sample procedure for the 3Com NDIS driver for DOS is as follows:

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, locates the PROTOCOL.INI file in the LANMAN subdirectory.

   NOTE: *The PROTOCOL.INI file contains information about the protocol manager, NDIS transport protocol, and your network adapter.*

   Following is a sample PROTOCOL.INI file using 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.**

   NDIS drivers are located in the \NDIS\DOS and \NDIS\OS2 subdirectories on the *TokenDisk* diskette.

4. **For a 3Com driver, 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
```

NOTE: *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.

NetWare ODI Drivers

Novell's Open Data-link Interface (ODI) adds functionality to new and existing NetWare computer environments. It allows NetWare clients to utilize most frame types and protocols necessary to access various types of file servers and mainframes without the need to reboot the workstation.

If you did not use the AutoLink auto installation software feature, you must modify your AUTOEXEC.BAT and CONFIG.SYS files to complete your installation.

This section provides sample procedures for installing the ODI driver on a DOS computer. Refer to Novell's *NetWare ODI Shell for DOS* or Novell's *Workstation for DOS and Windows* guide if you require more detailed information concerning other protocols and frame types.

NOTE: *Make sure to use the latest Novell files. Obtain these from the Novell forum on CompuServe℠ or your authorized reseller.*

For example, to install a DOS ODI driver for NetWare 3.11, use the following procedure:

1. **From the Novell WSGEN diskette's root directory, copy the NETx.COM file to your computer.**

   The x in NETx refers to the DOS version running on your computer. For example, if you are using DOS 3.31, you would copy the NET3.COM file.

2. **From the WSGEN diskette's DOSODI subdirectory, copy the LSL.COM and IPXODI.COM files to your computer.**

   These are the link support layer and protocol stacks, respectively.

NOTE: *You may also need the files NETBIOS.EXE and INT2F.COM if you are running full NetBIOS applications. Check with the vendor of your application.*

3. **If you have not already done so, copy the 3Com adapter driver (\NETWARE\ODI\3CTOKEN.COM on the *TokenDisk* diskette) to your computer.**

   NetWare client and server drivers are located in the \NETWARE subdirectory on the *TokenDisk* diskette.

4. **Create or modify the AUTOEXEC.BAT file so that it includes the following commands:**

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

5. **Create or modify your CONFIG.SYS file to include the following statements:**

   ```
   Files= <value>
   Buffers= <value>
   ```

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

If you are using IBM drivers, replace 3CTOKEN with TOKEN in the above examples.

Installing Driver Agents for Transcend™ TokenLink SmartAgent™ Software (Optional)

Transcend TokenLink SmartAgent software is a 3Com network management software product that allows remote management of TokenLink III adapters and their PCs. It includes a stand-alone Microsoft Windows-based graphical management utility and a translation function for communicating to any SNMP manager system. SmartAgent software offers enhanced manageability of TokenLink III adapters as well as support for IBM adapters. You can use the *TokenDisk* diskette to install the driver agents required by SmartAgent software, but you must purchase the Transcend TokenLink SmartAgent software separately. For more information, contact your TokenLink III reseller, or call 1-800-NET-3Com.

This section provides sample driver agent installation procedures for the following:

- NetWare ODI client nodes
- NDIS client and server nodes

Driver agents for other types of nodes may be available in the future.

NOTE: *Do not install these driver agents on the PCs designated to run the LinkWatch™ Monitor Token Ring utility or SoftHub™/DOS Token Ring. These nodes have their own specialized driver agents that are automatically installed by the Monitor Token Ring utility and SoftHub/ DOS Token Ring installation programs.*

NetWare ODI Client Node Installation

SmartAgent driver agent installation consists of the following activities:

- Install the driver agent.
- Modify the network startup batch file.
- Modify the NET.CFG file and restart the PC to load the driver agent.

Your station should already be configured to attach to the network. Install the SmartAgent ODI driver agents as follows:

1. **Copy the following files from the \LNKWATCH\ODI directory on the *TokenDisk* diskette to your network directory:**

   DTA.SYS
   DTASTART.EXE

2. **Install the driver agent as a device driver in the CONFIG.SYS file.**

   Go to the root directory of your boot drive and add the following line to the CONFIG.SYS file:

   ```
   DEVICE=<drive>\<network directory>\<dta.sys>
   ```

   For example, you might enter:

   ```
   DEVICE=c:\network\dta.sys
   ```

3. **Use an ASCII text editor to modify the AUTOEXEC.BAT file or your network startup batch file.**

   Add the following line after the lines that execute the Novell LSL.COM file and the token ring adapter driver:

   ```
   c:\<network directory>\dtastart.exe
   ```

   An example of an AUTOEXEC.BAT file after the insertion of this line might be as follows (the added line is indicated in **bold type**, and *adapter* represents the token ring adapter driver filename).

   ```
   c:\network\lsl
   c:\network\adapter
   c:\network\dtastart.exe
   ```

4. **Use an ASCII text editor to modify the NET.CFG file.**

   DTA_NET.CFG is a sample file on the *TokenDisk* diskette in the \LNKWATCH\ODI directory that you can use as a template to add to the NET.CFG file:

```
Protocol DME
    BIND #1
    USER_NAME “Your Name”
    NODE_NAME “Your Node Name”
    NODE_LOCATION “Your Node Location”
; SET PASSWORD ACCORDING TO YOUR
; NETWORK ADMINISTRATOR’S INSTRUCTIONS
; NODE_PASSWORD “ABCDEFGH”
    PHONE_NUMBER “Your Phone Number”
    NOTES “Miscellaneous text”
    NOTES “and more text”
```

The lines that begin with a semicolon (;) are commented out. All lines are required for viewing user information except NOTES and NODE_PASSWORD. NOTES adds optional information. Use NODE_PASSWORD to allow remote adapter disabling. Do not indent the Protocol DME line. The other lines must be indented by at least one space or a tab.

NOTE: *Do not duplicate lines that already exist in your NET.CFG file.*

5. **Restart the PC to load the driver agent.**

NDIS Client and Server Node Installation

SmartAgent driver agent installation consists of the following activities:

- Install 3Com driver agent files from the *TokenDisk* diskette.
- Update the PROTOCOL.INI file and reboot your computer.

Your station should already be configured to attach to the network. Install the SmartAgent TokenLink NDIS driver agents as follows:

1. **Use the DOS command to create a directory for the 3Com driver agent as follows:**

   ```
   md <new directory name>
   ```

2. **Insert the *TokenDisk* diskette in the diskette drive.**

3. **Copy one of the driver agent files from the \LNKWATCH\NDIS directory of the *TokenDisk* diskette into the newly created directory.**

   The type of operating system (DOS or OS/2) determines which file to load.

   - DTA.DOS (for a DOS station)
   - DTA.OS2 (for an OS/2 station)

4. **Go to the root directory of your boot drive and specify the driver agent file as a device driver. To do this, add the following line to the CONFIG.SYS file below the protocol manager line:**

   ```
   DEVICE=<drive>\<network directory>\<dta file name>
   ```

   For example, you might enter:

   ```
   DEVICE=c:\network\dta.dos
   ```

5. **Use an ASCII text editor to modify the PROTOCOL.INI file.**

   The *TokenDisk* diskette contains an example of the PROTOCOL.INI file called DTA_PROT.INI in the \LNKWATCH\NDIS directory.

Use the DTA_PROT.INI file as the basis for your own PROTOCOL.INI file, or edit your PROTOCOL.INI file to include the correct information.

The DTA_PROT.INI file is shown below. A semicolon (;) at the beginning of a line indicates a comment.

```
[DME]
   DRIVERNAME = DME$
; THE BINDINGS LINE MUST REFERENCE MODULE
; [ADAPTERNAME] WHERE [ADAPTERNAME] INDICATES
; THE SECTION RELATED TO THE INSTALLED 3COM
; ADAPTER
   BINDINGS = TLNK3_NIF
   USER_NAME = "Your Name"
   NODE_NAME = "Your Node Name"
   NODE_LOCATION = "Your Node Location"
; SET PASSWORD ACCORDING TO YOUR NETWORK
; ADMINISTRATOR'S INSTRUCTIONS
; NODE_PASSWORD = "ABCDEFGH"
   PHONE_NUMBER = "Your Phone Number"
   NOTES = "Miscellaneous text"
   NOTES = "More text"
```

NOTE: *Make sure the number of receive buffers for the TokenLink III adapter driver is 10 or more, for example:*

```
[TLNK3_NIF]
       DRIVERNAME = TLNK3$
       RECVBUFS = 10
       .....
       .....
```

6. **Reboot the computer.**

Chapter 5
Diagnostics and Troubleshooting

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

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

Adapter LEDs

The TokenLink III MCA adapter has two light-emitting diodes (LEDs) on its backplate, as shown in Figure 5-1. The LEDs indicate the ring speed to which the adapter is configured and whether the adapter is inserted into the ring.

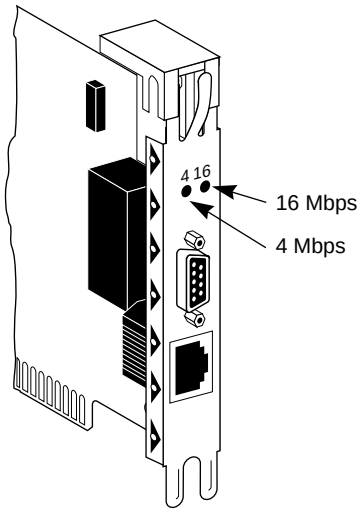

Figure 5-1. Adapter LEDs

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 and Manual Configuration Program

Run diagnostic tests for your installed TokenLink III MCA token ring adapter when you need to do the following:

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

NOTE: *Use only* TokenDisk *diskette version 2.0 or later.*

Connect a lobe cable from the selected adapter to a retiming concentrator or MAU before performing any diagnostic tests.

The diagnostic portion of the *TokenDisk* Diagnostic and Manual Configuration 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 computer has an 80286 or higher processor.

NOTE: *When you run the Diagnostic and Manual Configuration Program, memory conflicts may occur. To help prevent this, follow these rules:*
(1) Do not load network drivers.
(2) Be aware that TSRs may cause memory conflicts.

(3) If you are using a memory management utility, you must inform it of the RAM address range used by the MCA adapter. For example, add an exclude parameter on the EMM386 device in the CONFIG.SYS file such as:

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

Running Diagnostic Tests

To start the diagnostic tests, follow these steps:

1. **Make sure that you have booted the computer under DOS.**

2. **Place the *TokenDisk* diskette in a diskette drive on your computer.**

3. **Make that drive the current drive.**

   For example, if the diskette drive is A, type the following command:

   ```
   A: [Enter]
   ```

4. **Type at the prompt:**

   ```
   INSTALL [Enter]
   ```

5. **When the auto installation screen appears, press any key.**

   The main menu appears, as shown in Figure 5-2.

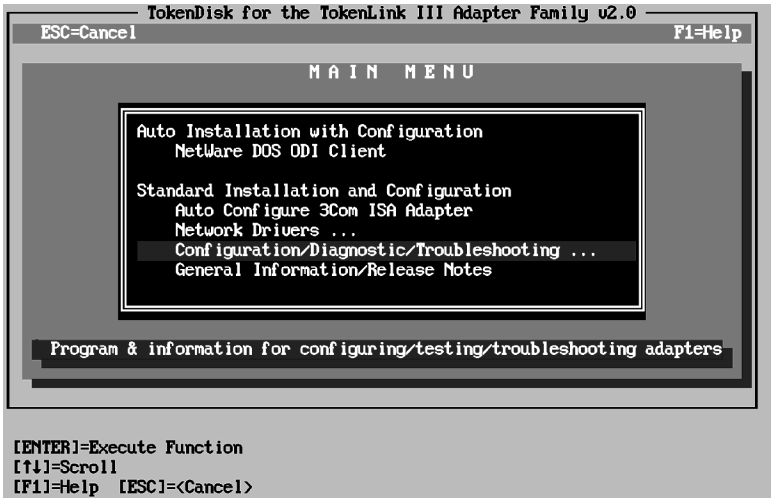

Figure 5-2. Main Menu

6. **Select the option Configuration/Diagnostic/ Troubleshooting.**

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

8. **When the next screen appears, press [Enter].**

   The next screen shows the installed adapter and its token ring address. If you have installed more than one adapter, multiple adapters are listed. In this case, select one with the arrow key and press [Enter]. The screen shown in Figure 5-3 appears.

Figure 5-3. Main Window with Adapter Selected

9. From the Test pull-down menu, select Run Tests.

The Run Tests dialog box appears, as shown in Figure 5-4.

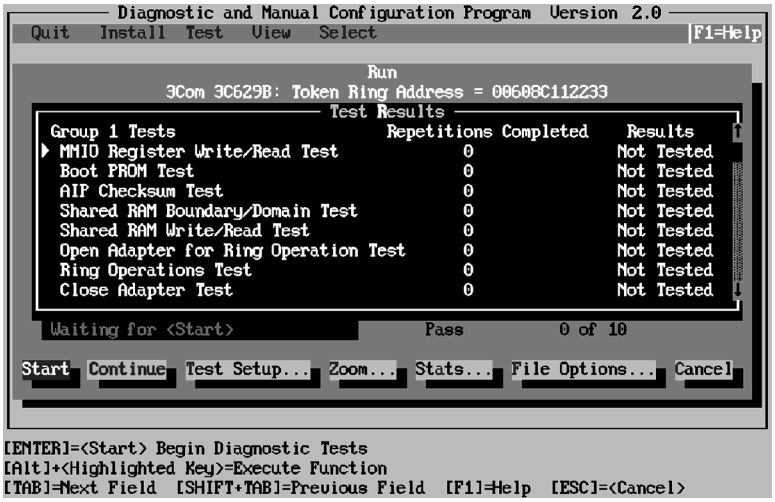

Figure 5-4. Run Tests Dialog Box

10. 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, go to the Repetitions box on the Test Setup screen shown in Figure 5-5, and select Continuous (and deselect Halt on Error) in the Errors box. The tests will continue to run until you abort them. Refer to the section “Changing the Test Setup” for more information.

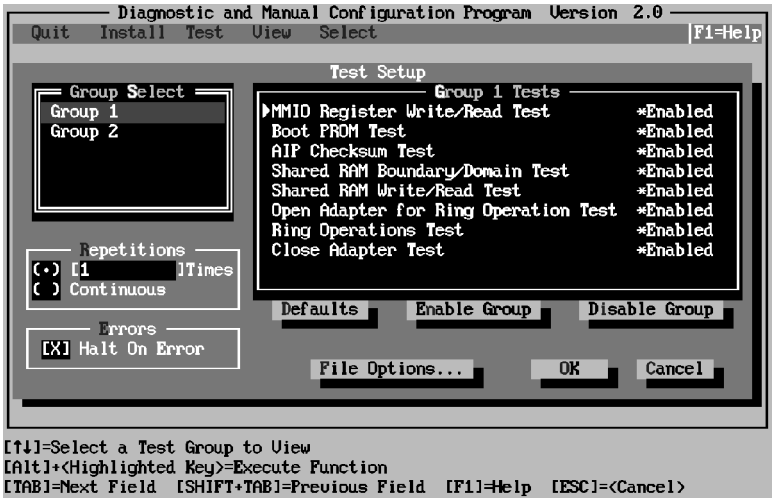

Figure 5-5. Test Setup Dialog Box

Changing the Test Setup

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

1. **Choose Test Setup in the Test menu on the adapter selection screen or the <Test Setup> command button in the Run Tests dialog box shown in Figure 5-4.**

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

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 or the section "Diagnostic Test Types" at the end of this chapter.

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.**

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 screen that appears is shown in Figure 5-6. Use the [Tab] key to select a statistic, and press [F1] on this screen for a short explanation of the selected statistic.

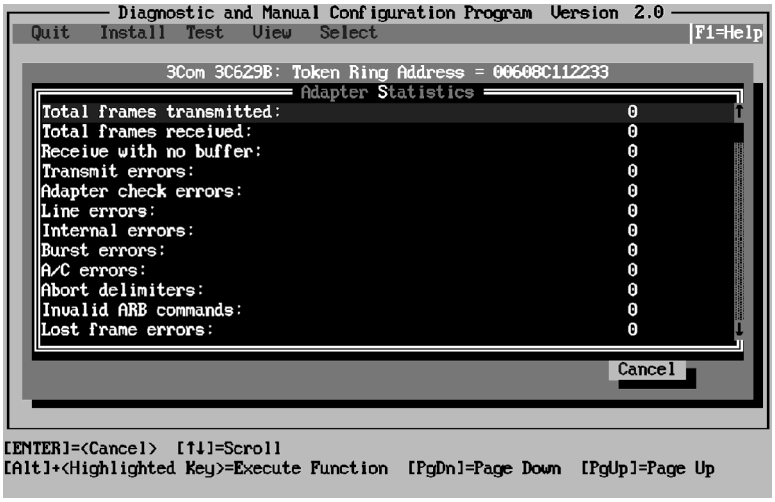

Figure 5-6. Adapter Statistics

Adapter Information

Use the View pull-down menu and select Adapter Information, or press [F8] from the main screen. An example of the screen that appears is shown in Figure 5-7. Use the tab key to select a configuration parameter and press [F1] for a short explanation of the selected configuration parameter.

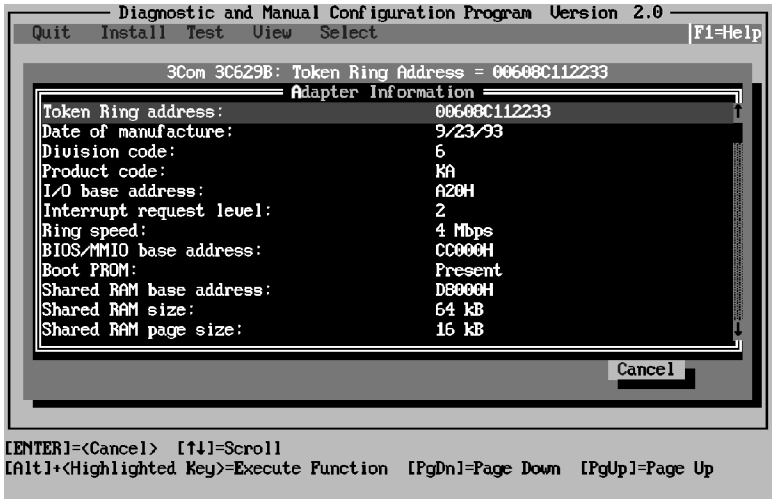

Figure 5-7. Adapter Information

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 5-4, 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 system 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 system 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 system 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 system and try once more.

Ring Operations Test Failure

- Run the Group 2 Adapter Wrap Test. If the test executes successfully, the error condition may be related to the ring itself.
- Make sure the selected adapter speed matches the ring speed.
- Try another shared RAM address and page 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 system 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 page size.
- Run the test three times with a delay of at least 30 seconds between each test. If the error persists, power down the system 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 computer.*

1. **Make sure that the TokenLink III MCA token ring adapter is installed in an MCA computer or in any compatible UL-listed personal computer containing an MCA 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 1.**

3. **Inspect all cables and connections.**

4. **Make sure that the settings (memory allocations, interrupts, and so on) set by the Reference diskette for the adapter do not conflict with the system or other adapter boards installed in the computer.**

   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 computer.

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

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

7. **Check the ring speed (4 or 16).**

   Use the View pull-down menu in the Diagnostic and Manual Configuration 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 configured your computer for the adapter. Refer to Chapter 2, "Using the MCA Reference Diskette."

   Make sure that you have installed the correct drivers for the network operating system you are running (refer to Chapters 3 and 4).

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

10. **Disable the cache on your CPU.**

11. **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.**

Diagnostic Test Types

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

NOTE: *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
- AIP Checksum Test
- Shared RAM Boundary/Domain Test
- Shared RAM Write/Read 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 computer can access the adapter's memory mapped I/O registers correctly.

Boot PROM Test

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

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.

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.

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 Diagnostic and Manual Configuration Program for the TokenLink III MCA adapter.

On-line Information

The [F1] key activates help information at any time during operation of the *TokenDisk* diskette Diagnostic and Manual Configuration 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^{SM} provides technical tips and product information. Ask3Com^{SM} and CardBoard^{SM} provide *TokenDisk* diskette software updates, drivers, technical tips, and product information.

Appendix A
TokenDisk Diskette Diagnostic and Manual Configuration Program

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

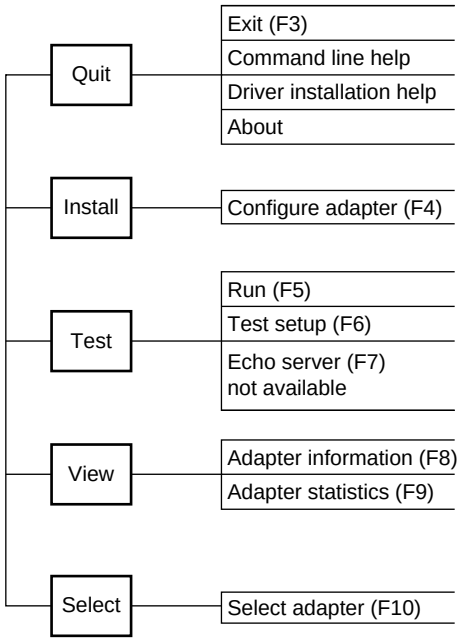

Figure A-1. The Menu Hierarchy

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 Diagnostic and Manual Configuration 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 Diagnostic and Manual Configuration Program.
[F4]	Configures the adapter (not applicable for MCA adapters).
[F5]	Accesses the Run dialog box.
[F6]	Accesses the Test Setup dialog box.
[F8]	Accesses the Adapter Information dialog box.

(continued)

Table A-1. Definition of Keys (continued)

Key	Definition
[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 Diagnostic and Manual Configuration 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 TokenLink III adapters.
	About	Lists the program's version.
Install	Configure Adapter	Not functional with this 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.

(continued)

Table A-2. Definition of Menu Items (continued)

Menu	Menu Item	Description
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 and Test Setup screens. The options are:

- Load: loads a file from a selected directory (Test Setup screen only).
- 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 Diagnostic and Manual Configuration 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 system software. For example, type:

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

Exiting the Program

To exit the program, press [Esc], select OK at the prompt "Do you want to exit the program?", and press [Esc] until the DOS prompt appears.

Using the Command Line

You can use the command line to run diagnostic tests for TokenLink III adapters or to 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
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 system prompt (such as A:\>) type:

```
3TOKDIAG HELP RUN
```

Appendix B
Specifications

This appendix contains various specifications for the TokenLink III MCA adapter. This appendix contains the following sections:

- Cabling
- Pin Assignments
- Configuration Options

Cabling

TokenLink III MCA 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 TokenLink III MCA adapter can be connected to a network with either a DB-9 or an RJ-45 connector. Figures B-1 and B-2 illustrate the pin assignments for each of these connectors.

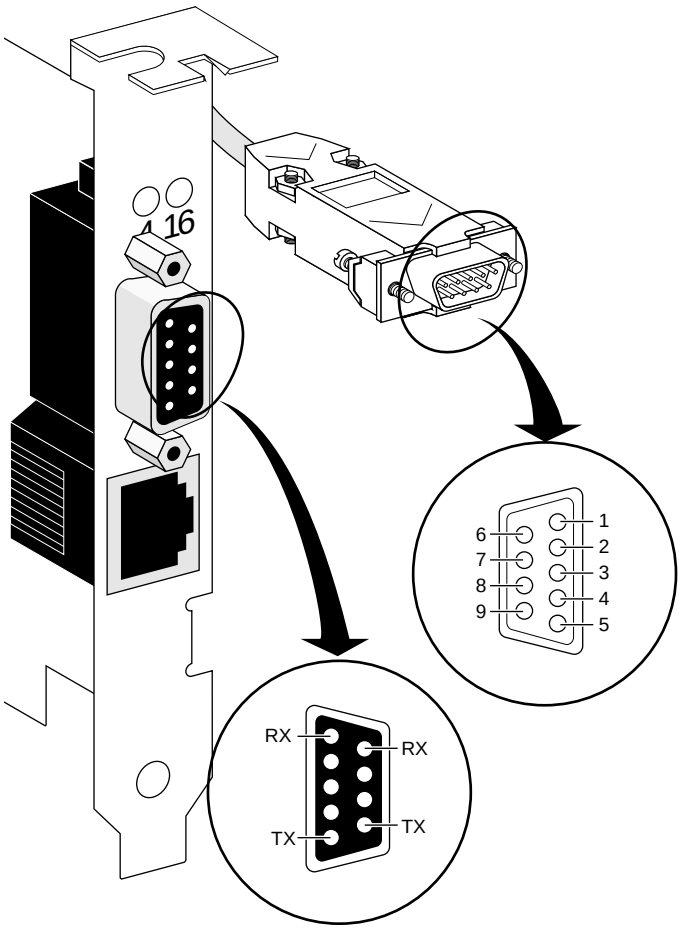

Figure B-1. DB-9 Connector Pin Assignments

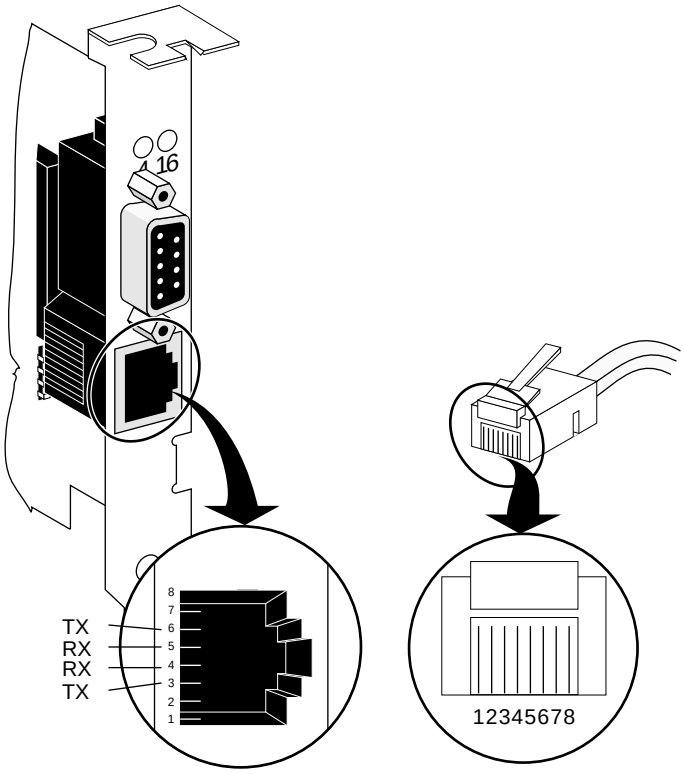

Figure B-2. RJ-45 Connector Pin Assignments

Configuration Options

This section contains the configuration options for TokenLink III MCA adapters. They can be changed using the MCA Reference Utility. The following options are available:

- Ring Speed
- Primary/Alternate Adapter
- ROM Address Location
- Shared RAM Page Size and Address Range
- Interrupt Request Level

Ring Speed

The TokenLink III MCA 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.

Primary/Alternate Adapter

Up to two TokenLink III MCA adapters may be installed in a single computer. When multiple adapters are being installed in a single computer, one adapter must be designated the Primary adapter, which is accessed at port addresses 0A20h through 0A23h. The second adapter must be the Alternate adapter, which is accessed at port addresses 0A24h through 0A27h.

When only one adapter is installed, it should be designated the Primary adapter. The Primary/Alternate option can be changed with the MCA Reference diskette. Conflicts are identified by an asterisk (*) next to an option within the MCA Reference Utility, which indicates that another selection must be made. If a system resource conflict continues, you may have to change the settings of other adapters or options that are in your computer.

ROM Address Location

There are 16 possible 8 KB blocks of PC memory that can be assigned for accessing the ROM area of the TokenLink III MCA 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 ROM 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 continues, you may have to change the settings of other adapters or options that are in your computer.

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 TokenLink III MCA adapter. The factory default RAM page 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 computer memory space. RAM paging is available for all 16 KB address ranges. If a conflict continues, you may have to change the settings of other adapters or options that are in your computer. 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 TokenLink III MCA adapter can operate on one of four interrupt levels: 2, 3, 10, or 11. The preferred interrupt level is 2, but the adapter can operate on any of the four levels if necessary. The interrupt level can be changed with the Reference diskette. Conflicts are identified by an asterisk (*) next to an option within the MCA Reference Utility, and an alternative selection must be made. If a conflict continues, you may have to change the setting of other adapters or options that are in your computer.

Appendix C
Error Messages

This appendix contains a list of the error messages that may appear when you use the *TokenDisk* diskette Diagnostic and Manual Configuration Program for the TokenLink III MCA adapter. For information on running the adapter's diagnostic program, refer to Chapter 5, "Diagnostics and Troubleshooting."

Warning Messages

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.

Error Messages

No TokenLink III 3C6X9B adapters are installed in this computer.

Unable to configure the MCA adapter here. Use the PS/2 Reference Diskette to configure an MCA adapter.

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

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

Automatic configuration only available for ISA bus adapters.

Appendix D
Technical Support

This appendix explains how to obtain worldwide support for 3Com adapters and software.

On-line Product Support

3Com offers worldwide product support 24 hours a day, seven days a week, through automated on-line systems.

CardBoard[SM] Bulletin Board Service

CardBoard is 3Com's menu-driven bulletin board service. It contains the most current adapter information in down-loadable files. CardBoard provides:

- Software drivers
- Technical tips
- Product information
- Diagnostic programs
- Software patches and fixes

These files are easy to access through a modem connection set at 8 data bits, no parity, 1 stop bit. Call the CardBoard telephone number nearest you:

Australia	(61) (2) 955 2073 – up to 2400 baud
France	(33) (1) 69 86 69 54 – up to 9600 baud
Germany	(49) 89 62732-188/189 – up to 9600 baud
Italy	(39) (2) 27 30 06 80 – up to 9600 baud
Japan	(81) (3) 3243 9245 – up to 9600 baud
Singapore	(65) 543 5693 – up to 9600 baud

Taiwan	(886) (2) 5776160 – up to 14400 baud
U.K.	(44) (44) 2 278278 – up to 14400 baud
U.S.	(1) (408) 980-8204 – up to 14400 baud

For information on international CardBoard access numbers added since this manual was published, contact your local 3Com office. Refer to the list of international sales offices later in this appendix.

3ComFacts℠ Automated Fax Service

3Com'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 instructions, and technical articles. Document 9999 provides you with an index of adapter documents.

- **NetFacts** provides data sheets and technical articles on 3Com'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 calling numbers are:

U.K.	(44) (44) 227 8279
U.S.	(1) (408) 727 7021

Local access to 3Com's fax system is available within the following countries using the numbers listed below:

Denmark	800 17319
Finland	98 001 4444
France	05 90 81 58
Germany	0130 81 80 63
Italy	1678 99085
Netherlands	06 0228049
Norway	05 01 1062
Sweden	020 792954
U.K.	0800 626403

Ask3Com[SM] On-line Service

Ask3Com is an on-line service, located on CompuServe[SM]. This service is accessible worldwide. Ask3Com contains extensive technical and marketing information on all 3Com products. To use Ask3Com, you must first obtain a CompuServe account. To open an account, contact your local CompuServe office.

To use Ask3Com, log into CompuServe, type:

```
GO THREECOM
```

and press [Enter] to see the Ask3Com main menu.

3Com Documentation on CD-ROM

An extensive library of 3Com product documentation is available in CD-ROM format through Support on Site™ for Networks subscription service. This multivendor CD-ROM service, offered by Computer Library™, a division of Ziff Communications Company, contains technical information and documentation from major data networking hardware and software manufacturers. Stand-alone and concurrent user network subscriptions are available. To order, call Computer Library at (800) 827-7889, extension 515. Outside the U.S. call (212) 503-4400 or use fax number (212) 503-4487.

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.

U.S. and Canada

Call the following number to locate your local 3Com sales office:

U.S.	(1) (800) NET-3Com

The 3Com sales office will refer you to the nearest 3Com authorized service partner.

Outside the U.S. and Canada

To locate a 3Com authorized service partner near you, contact your local 3Com sales office.

Australia	(61) 2 959 3020
Belgium/Netherlands	(31) 3402 55033
Brazil	55 11 530 2318
France	(33) 1 698 66800
Germany	(49) 89 627320
Hong Kong	(852) 868 9111
Italy	(39) 22 7302041
Japan	(81) 3 3243-9234
Mexico	525 531 0591
Middle East	971 4 317173
Nordic	(46) 8 703 4870
Singapore	(65) 538 9368
Taiwan	(886) 2 577 4352
U.K.	(44) 628 890 670

When you contact a 3Com authorized service partner for assistance, have the following information ready:

- Diagnostic error messages
- A list of system hardware and software, including revision levels
- Detail on recent configuration changes, if applicable

3Com's service partner will determine what action needs to be taken to resolve the problem. 3Com service partners can verify hardware failures and advise you when it is more cost-effective to replace, rather than repair, a product.

Returning Products for Repair

A product sent directly to 3Com for repair must first be assigned a Return Materials Authorization number (RMA). A product sent to 3Com without an RMA number will be returned to the sender unopened, at the sender's expense.

When you call for an RMA number, be prepared to provide the product name, serial number, and diagnostic error messages. Payment, shipping instructions, and turnaround time will be confirmed when the RMA number is assigned.

To obtain an RMA number, call or fax:

Europe	*Phone*	(44) (44) 2 278000
	Fax	(44) (44) 2 236824
U.S.	*Phone*	(800) 876-3266, press option 2
	Fax	(408) 764-7290
Outside Europe and the U.S.		
	Phone	(408) 492-1790
	Fax	(408) 764-7290

NOTE: *RMA forms (except Europe) are available on CardFacts. Dial (408) 727-7021, request document 9014.*

Glossary

ASCII	American (National) Standard Code for Information Interchange. This is a standard data-transmission character code in which all characters (including letters, numerals, punctuation marks, and control characters) are encoded using 7 bits for a total of 128 unique characters. It is widely used by computers and data terminals. Many PCs use an extended ASCII character set with 8 bits per character, giving a total of 256 unique characters.
CAU	Controlled access unit.
Configuration	The software settings that allow different hardware components of a computer system 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.

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."

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 computing system or from the computing system back to a device, a network, and so on.

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 computer 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 computers, terminals, or other peripherals interconnected by a communications channel.

Network adapter A circuit board located inside each computer 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 computers use to communicate. Because of the complexity of communications between systems 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 or levels	A model for describing the hierarchical set of 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 computer 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

3C629B token ring adapter, xiii
  configuring, 2-1, 3-1
  default settings, 2, 2-4
  information, 5-11
  inspecting, 1, 1-3
  installing, 1, 1-5
  statistics, 5-10
  system requirements, 1-1
3CTOKEN.COM 3Com driver, 4-12
3CTOKRPL.EXE file, 4-6
3Com drivers, 4-3
3ComFacts, D-2
3Com sales offices, D-4, D-5
3Install, 3-1, 3-2

A

adapter
  compatibility, xiv
  defaults, 2, 2-4
  description, xiii
  information, 5-11
  interrupt level, 2, 2-4
  LEDs, 5-2
  RAM page size and address range, 2, 2-4, B-6
  ring speed, 2, 2-4, B-5
  ROM address locations, 2, 2-4, B-6
  specifications, B-1
  statistics, 5-10
adapter description file (ADF), 2-2
Adapter Wrap Test (Group 2), 5-14
AIP Checksum Test, 5-12, 5-17
Ask3Com, D-3
auto installing NetWare DOS ODI clients, 3-1
AUTOEXEC.BAT file, 4-4, 4-9, 4-11, 4-12, 4-15
AutoLink installation feature, 3-1, 3-3
  functions, 3-2
  requirements, 3-1
automated fax service (3ComFacts), D-2

B

backing up the MCA diskette, 2-1
Boot PROM Test, 5-12, 5-17
bulletin board system (CardBoard), D-1

C

cable
  recommended, 1-8, B-1
  STP, connecting to, 1-8
  UTP, connecting to, 1-10
CardBoard, D-1

C (continued)

CardFacts, D-2
CAU. *See* controlled access unit.
CD-ROM documentation, D-4
changing configuration with the MCA Reference Utility, 2-5
check box, A-6
Close Adapter Test, 5-14, 5-18
CMOS memory, 2-3
command buttons, A-6
command line, A-7
command line help, A-8
command line keywords
  HELP, A-8
  LANGUAGE, A-8
  LIST, A-8
  RUN, A-8
compatibility, xiv
CompuServe, D-3
CONFIG.SYS FILE, 4-4, 4-5, 4-9, 4-11, 4-13, 4-15
configuration, 2-1, 2-3
  changing, 2-5
  default, 2, 2-4
configuration options
  changing, 2-5
  interrupt request level, B-7
  IRQ driver type, B-7
  primary/alternate adapter, B-4
  RAM page size and address range, B-6
  ring speed, B-4
  ROM address locations, B-5
connecting to the network, 1-8
connector type
  DB-9, 1-8
    pin assignments, B-2
  RJ-45, 1-10
    pin assignments, B-3
Continuous option, 5-7
controlled access unit (CAU), 1-3, 1-9, 1-11, 5-13, 5-14
customer support, xiv, D-1

D

DB-9 connector, 1-9, B-2
default adapter settings, 2, 2-4
Diagnostic and Manual Configuration Program, 5-3
  error messages, C-1
  exiting, A-4, A-7
  menu hierarchy, A-1
diagnostic tests
  changing setup, 5-8
  description, 5-9, 5-17, 5-18
  failed, 5-11
  Group 1, 5-17
  Group 2, 5-18
  information, 5-10
  running, 5-4
  statistics, 5-9
dialog box, defined, A-6
driver agents for Transcend TokenLink SmartAgent software, 4-13
  NDIS client and server node installation, 4-16
  NetWare ODI client node installation, 4-14
drivers. *See* network drivers.
DTA_NET.CFG file, 4-15
dual access unit (DAU), 1-3, 1-9, 1-11, 5-13, 5-14

E
error messages, C-1
Exit, A-4, A-7
  [F3], A-2

F
fax service (3ComFacts), D-2
File Options, A-5
function keys, defined, A-2

G
Group 1 tests
    defined, 5-17
    starting, 5-4
    troubleshooting, 5-11, 5-14
Group 2 test
    defined, 5-18
    setting up, 5-8
    troubleshooting, 5-14
Group Select box, 5-9
guarantee, xiv

H
Halt on Error option, 5-7
hardware installation, 1-3, 1-5
Help, A-6, A-8
    [F1], A-2

I
IBM 16/4 Token Ring Adapters, xiii, 4-1
IBM bulletin board services, 4-8
IBM drivers, xiii, 4-1, 4-5, 4-8
inspecting the adapter, 1-3
installation
    adapter, 1-5
    network drivers, 2, 3-1, 4-1
interrupt request level (IRQ), 2, 2-4, B-7

K
keys, definition of, A-2

L
LEDs, 5-2
license agreement, 3-3
LinkWatch Monitor utility, 4-14
list box, A-6
lobe cable, 5-3, 5-13, 5-14

M
MAU. *See* multistation access unit.
MCA Reference Utility
    backing up, 2-1
    changing configuration, 2-5
    configuring with, 2-3
    viewing configuration, 2-5
memory conflicts, 2-4, 3-2, 5-3
menu hierarchy, A-1

M (continued)

menu items
Quit
About, A-4
Command Line Help, A-7
Driver Installation Help, A-4
Exit, A-4, A-7
Select
Select Adapter, A-5
Test
Run Tests, 5-6, A-4
Test Setup, 5-8, A-4
View
Adapter Information, A-5
Adapter Statistics, A-5
Micro Channel architecture, xiii, 2-1
Microsoft Windows, 4-13
MMIO Register Write/Read Test, 5-12, 5-17
money-back guarantee, xiv
mouse, A-3
multiple adapters, 5-5
multistation access unit (MAU), 1-3, 1-9, 1-11, 5-3, 5-13, 5-14

N

NDIS drivers, 4-5, 4-9
NetBIOS, 4-12
NET.CFG file, 4-15
NetFacts, D-2
NetWare drivers
AutoLink installation, 3-1, 3-3
non-AutoLink installation, 4-4, 4-11
network, connecting to, 1-8
network cables, connecting
STP cable, 1-8
UTP cable, 1-10
network drivers
3Com, 4-3
downloading, 4-2, 4-8
IBM, xiii, 4-1, 4-5
installing, 2, 4-3, 4-5, 4-9
modifying network startup files, 4-4, 4-5,4-9
NDIS, 4-5, 4-9
obtaining, xiii, 4-2
ODI, 3-1, 4-4, 4-11
on *TokenDisk* diskette, 2
network startup files, modifying, 4-9

O

ODI drivers, 3-1, 4-4, 4-11
on-line help, A-6, A-8
[F1], A-2
on-line technical services, D-1 to D-3
on-screen command help, A-6
Open Adapter for Ring Operation Test, 5-13, 5-18
operating system requirements, 1-2
option settings, B-4

P
package contents, 1-3
pin assignments, B-1
primary/alternate adapter, 2, 2-4, B-4
print help file, A-7
product information service (Ask3Com), D-3
PROTOCOL.INI file, 4-5, 4-9, 4-10, 4-17

Q
Quick Start, 1

R
radio buttons, A-6
RAM page size and address range, 2, 2-4, B-6
README.TXT file, 3-2
reference utility. *See* MCA Reference Utility.
repair procedure, D-6
Return Materials Authorization (RMA) number, D-6
Ring Operations Test, 5-13, 5-18
ring speed, 2, 2-4, 5-15, B-4
RJ-45 connector, 1-10
  pin assignments, B-3
ROM address location, 2, 2-4, B-5
RPL (remote program load)
  3CTOKRPL.EXE file, 4-6
  disabling, 4-7
  enabling, 4-6
Run Tests dialog box, 5-7
Run Tests menu item, 5-6, A-4

S
safety precautions, 1, 1-3
setup. *See* configuration.
Shared RAM Boundary/Domain Test 5-12, 5-18
shared RAM page size and address boundary, 2, B-6
Shared RAM Write/Read Test, 5-13, 5-18
shielded twisted-pair cable, 1-8
specifications, adapter, B-1
speed keys, A-3
STP cable, 1-8
support, technical, D-1
system requirements, 1-1

T
technical support services, D-1
Test Setup dialog box, 5-8
Test Setup menu item, A-4
tests, diagnostic
  changing setup, 5-8
  failure, 5-11
  Group 1, 5-17
  Group 2, 5-18
  running, 5-4
TLNK3.DOS file, 4-10
TokenDisk Diagnostic and Manual Configuration Program, 5-3, A-1
TokenDisk diskette, xiii, 2-2, 3-2, 3-3, 4-4, 4-6, 4-17, 5-3, A-1, B-4, C-1
  main menu, 4-4, 5-5
TokenLink III MCA Token Ring Adapter, xiii

T (continued)
Transcend TokenLink
SmartAgent software driver agent
description, 4-13
NDIS client and server installation, 4-16
NetWare ODI client nstallation, 4-14
troubleshooting, 5-1, 5-14

U
unshielded twisted-pair cable (UTP), 1-10

V
viewing configuration with the MCA Reference Utility, 2-5

W
Windows, 4-13
WSGEN, 4-12

Z
Zoom, 5-11