EtherLink® III Parallel Tasking® 16-Bit ISA Network Interface Card User Guide

A member of the 3Com EtherLink III family of network interface cards

http://www.3com.com/

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3Com Corporation ■ 5400 Bayfront Plaza ■ Santa Clara, California ■ 95052-8145

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Guide written by Jean Anderson. Edited by Nancy Kurahashi. Technical illustration by Mary Inden. Production by Georgi Felix.

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  Pacific House
  Third Avenue
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About This Guide

This guide describes how to install, configure, and troubleshoot the 3Com® EtherLink® III 16-bit ISA network interface card (called the 3C509B NIC in this guide).

If the information in the README.TXT file differs from the information in this guide, follow the information in the README.TXT file on the EtherDisk *diskette. If a release note is included, the release note contains the latest information.*

How to Use This Guide

This table shows where to find specific information in this guide.

If you are looking for...	Turn to...
Features and system requirements	Chapter 1
Installation and connecting to the network	Chapter 2
Procedures for installing the network driver	Chapter 3
Procedures for changing configuration settings	Chapter 4
Troubleshooting	Chapter 5
Specifications, connector pin assignments, and cable specifications	Appendix A
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Conventions

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

Table 1 Notice Icons

Icon	Notice Type	Alerts you to...
	Information note	Important features or instructions
	Caution	Risk of personal safety, system damage, or loss of data
	Warning	Risk of severe personal injury

Table 2 Text Conventions

Convention	Description
`Screen displays`	This typeface represents information as it appears on the screen.
The words "enter" and "type"	When you see the word "enter" in this guide, you must type something, and then press the Return or Enter key. Do not press the Return or Enter key when an instruction simply says "type."
Menu commands and *buttons*	Menu commands or button names appear in italics. Example: From the *Help* menu, select *Contents*.
Words in *italicized* type	Italics emphasize a point or denote new terms at the place where they are defined in the text.
Words in **bold-face** type	Bold text denotes key features.

1 PRODUCT OVERVIEW

This guide describes these four 3Com® EtherLink® III 3C509B network interface cards (NICs):

- 3C509B-TPO
- 3C509B-TPC
- 3C509B-TP
- 3C509B-COMBO

These 3C509B NICs, shown in Figure 1-1, belong to the best-selling EtherLink III family of NICs.

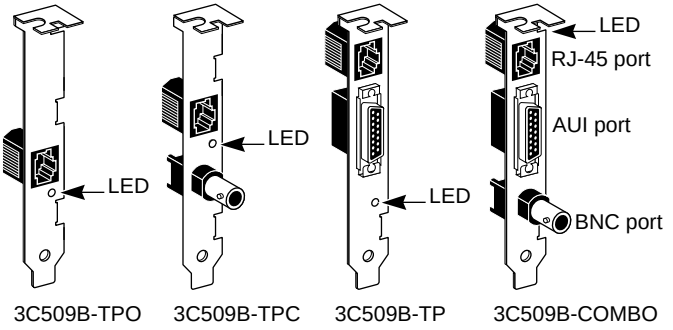


Figure 1-1 3C509B Network Interface Cards

The 3C509B NICs connect your ISA or EISA PC to an Ethernet network using the RJ-45, BNC, and AUI ports shown in Figure 1-1.

Features

The 3C509B NIC has the following features:

- Plug and Play support
- Extensive network operating systems and PC operating systems support, including Microsoft Windows 95 and Windows NT
- DynamicAccess™ features to optimize network performance
- Interactive Access technology to minimize CPU utilization
- PACE™ technology drivers that allow prioritization of applications such as video
- Distributed remote management (dRMON)
- AutoLink™ installation software, which automatically installs all Novell NetWare DOS ODI client software into your operating system
- Parallel Tasking® technology for maximizing NIC performance
- Full-duplex support, which allows data to be sent and received at the same time in a switched-Ethernet topology
- Backward compatibility with 3C509 EtherLink III ISA network interface cards
- Network management support, including SNMP (Simple Network Management Protocol) and DMI (Desktop Management Interface) through Transcend® PC Link SmartAgent® software, which is installed automatically with the drivers

DynamicAccess Technology

The DynamicAccess feature set optimizes network performance. DynamicAccess features include PACE Interactive Access technology, dRMON support, PACE real-time and multimedia application support, and PictureTel LiveShare Plus data conferencing software.

PACE Technology Support

The 3Com PACE drivers allow you to prioritize multimedia applications like video conferencing and distance learning. Assigning a high class of service for each PACE application improves transmission for that application.

Distributed RMON

The 3C509B NIC collects distributed remote monitoring (dRMON) information on command and sends it to network management applications to provide network management information.

Transcend EtherLink SmartAgent Software

3Com's SmartAgent® driver agents, which provide network management capabilities for NICs and PCs, are available with Transcend® PC Link SmartAgent software or on 3Com's bulletin board service and World Wide Web site.

(For information on 3Com's BBS and WWW site, refer to Appendix B, "Technical Support.")

How Do I Install the 3C509B NIC?

To install the 3C509B NIC hardware and software, you must install the 3C509B NIC in your PC, connect it to the network, and install the network driver. To install the 3C509B NIC in your PC, see Chapter 2.

2 INSTALLING THE 3C509B NIC

You can install the 3C509B NIC in a PC with an available ISA or EISA slot. If you need to change the configuration, see Chapter 4.

This chapter describes how to install the 3C509B NIC in your PC and connect it to the network.

Installing the 3C509B NIC

To install the 3C509B NIC into the PC, follow these steps:

1 **Open the shipping container and inspect each item for damage.**

CAUTION: *Each NIC is packed in an antistatic container to protect it during shipment. To avoid damaging any static-sensitive components, reduce any static electricity on your person before handling the NIC. You can do this simply by touching the metal chassis of your computer. You can maintain grounding by wearing a wrist strap attached to the chassis.*

2 **Unplug the PC and disconnect all cables.**

3 **Remove all jewelry from your hands and wrists. Use only insulated or nonconductive tools.**

4 **Remove the PC cover and select an available ISA or EISA expansion slot.**

5 **Remove the backplate from the slot.**

6 **Insert the 3C509B NIC in the slot, as shown in Figure 2-1. Press it in firmly to get a good connection.**

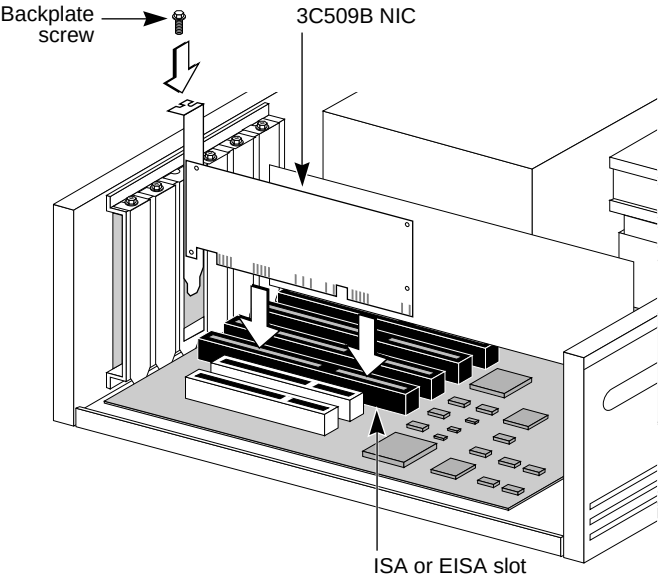


Figure 2-1 Inserting the 3C509B NIC in a PC

The backplate should be flush with the backplane. Be sure that the NIC's connector fingers are completely seated in the slot.

7 **Secure the NIC with the screw from the backplate.**

8 **Replace the PC cover and reconnect all cables, including the network cable.**

You must connect the NIC to the network before installing the drivers.

Connecting to the Network

This section describes how to connect the 3C509B NICs to the network using the RJ-45, BNC, and AUI ports on the 3C509B NICs.

Each 3C509B NIC provides different network ports, as shown in Figure 1-1. Use the port required for your network segment.

RJ-45 Port

You can connect the 3C509B NIC to the network using the RJ-45 port.

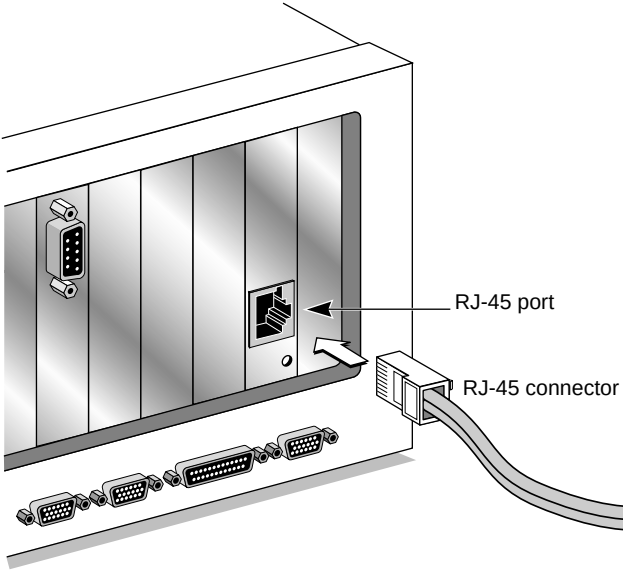


Figure 2-2 Connecting the 3C509B-TPO NIC Using the RJ-45 Port

Figure 2-2 shows how to connect the RJ-45 connector on the twisted-pair cable to the RJ-45 port.

To complete installation, you must install the network driver, as described in Chapter 3.

BNC Port

You can connect the 3C509B-TPC and 3C509B-COMBO NICs to the network using the BNC port.

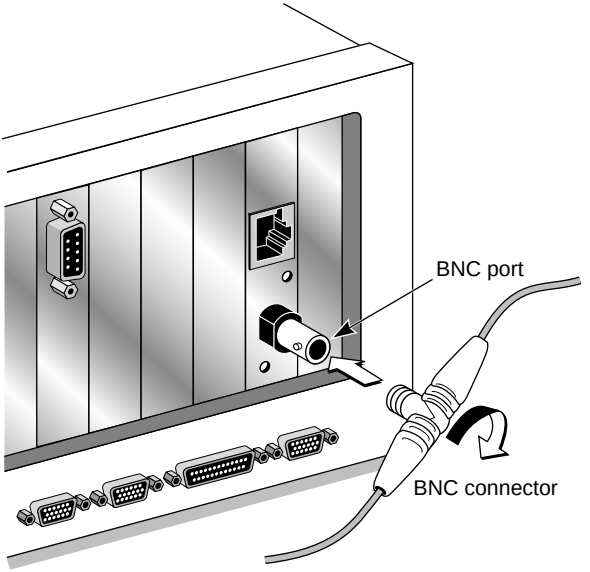


Figure 2-3 Connecting the 3C509B-TPC NIC Using the BNC Port

Figure 2-3 shows how to connect a BNC connector on thin Ethernet cable to the BNC port. Make sure that the coaxial cable is properly terminated (two 50-ohm terminators).

To complete installation, you must install the network driver, as described in Chapter 3.

AUI Port

You can connect the 3C509B-TP and the 3C509B-COMBO NIC to the network using the AUI port.

1. **Locate the AUI connector and move the slide latch down to the open position.**
2. **Connect the cable to the AUI port on the NIC, as shown in Figure 2-4.**

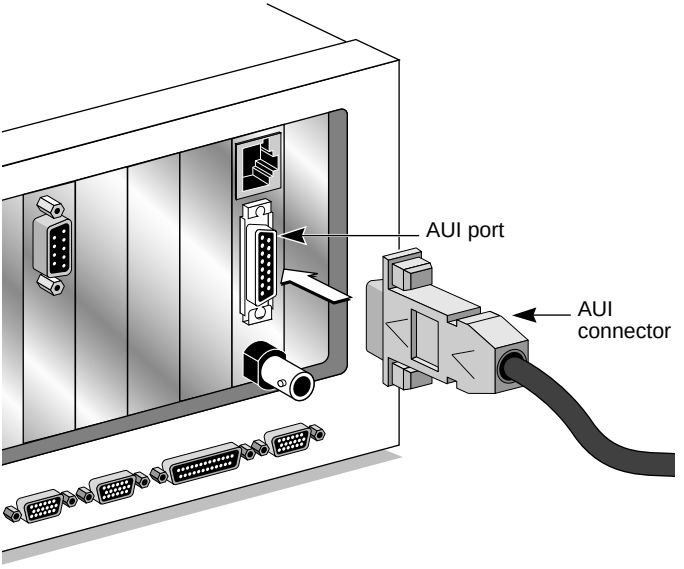


Figure 2-4 Connecting the 3C509B-COMBO NIC Using the AUI Port

3 Move the slide latch up to the closed position to lock the cable in place.

4 Connect the other end of the AUI cable to the external transceiver.

To complete installation, you must install the network driver, as described in Chapter 3.

Link LED

The 3C509B NICs have an LED that indicates when there is an active 10BASE-T connection between the NIC and the hub.

When you first install the NIC and power up the computer, the LED lights, but the link is inactive. To enable the link, you must install the network driver.

If you are experiencing any problems:

- Make sure that the hub and cable comply with 10BASE-T specifications described in Appendix A
- Make sure that the hub is powered up
- Check the LED
  - If the LED is on, the connection is active.
  - If the LED is off, something is preventing the connection between the NIC and the hub.
  - If the LED is blinking, the 10BASE-T cable polarity is reversed. Try a different twisted-pair (TP) cable or contact your MIS representative.

To complete installation, you must install the network driver, as described in Chapter 3.

3 INSTALLING THE NETWORK DRIVERS

This chapter describes how to install the network driver that completes your PC connection to the network.

Before installing the network driver, ask your system administrator which driver you should install on your PC.

Go to the section your system administrator recommends and follow the instructions to install the network driver on your PC.

You can obtain the latest network drivers on 3Com's World Wide Web site. To access the Web site, enter the 3Com URL into your Internet browser:

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

The drivers are in the Customer Support area. You can also obtain the latest drivers on the 3Com bulletin board. Refer to Appendix B for information on how to access the 3Com BBS.

Windows 95

This section describes how to install the NDIS 3.x network driver when your PC is running Windows 95. This miniport driver (ELNK3.SYS) supports dRMON and PACE technology.

The NDIS 3.x network driver for Windows 95 is a 32-bit protected-mode driver. This driver can be used in both Microsoft and NetWare environments, and instructions are included for both.

You need the Windows 95 system installation files (on hard disk, diskettes, or CD-ROM) to complete the installation.

Follow these steps to install the NDIS 3.x network driver in a PC running Windows 95.

1 **Install and configure Windows 95 before installing the 3C509B NIC.**

2 **Delete the \WINDOWS\INF\NET3COM.INF and \WINDOWS\INF\W95EL5X9.INF files if they are present.**

3 **Install the 3C509B NIC and connect it to the network as described in Chapter 2.**

4 **Restart the PC.**

Windows 95 autodetects the NIC in the PC.

If Windows 95 does not detect the 3C509B NIC, open the Control Panel and click *Add New Hardware*. This causes the NIC to be detected.

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

6 **Insert the 3Com *EtherDisk* diskette in your floppy drive, and if the diskette is in drive A, click *OK*.**

Supply the correct drive letter, if required.

Once the installation files are read, Windows 95 prompts you for the Windows 95 network installation files.

7 **Enter the correct pointer to the Windows 95 files (hard drive, CD-ROM, or diskette) and click *OK*.**

Once the driver is installed, check to make sure that the proper network components were loaded. If Windows prompts you to reboot or shut down, click *No*.

8 **Open the Windows 95 Control Panel.**

9 **In the Control Panel, double-click *Network*.**

10 **For Microsoft networks, select the Configuration tab. For Novell NetWare networks, go to step 11.**

The default Microsoft network setup contains the following five components:

```
Client for Microsoft Networks
Client for Novell Networks
3Com EtherLink III driver
IPX/SPX compatible protocol
NetBEUI protocol
```

If a protocol is missing, follow these steps:

a Select the protocol and click *Add*.

b From the *Select Network Protocol* menu, select *Microsoft* in the left pane. In the right pane, select the protocol and click *OK*.

If a client is missing, follow these steps:

a Select the client and click *Add*.

b From the *Select Network Client* menu, select *Microsoft* in the left pane, select the client in the right pane, and click *OK*.

11 For NetWare, on the Network screen, remove the following network components, if present:

```
Microsoft Client for Microsoft Network NetBEUI
```

The network components should now include:

```
Client for NetWare Networks
3Com EtherLink III Adapter
IPX/SPX Compatible Protocol
```

If a protocol is missing, follow these steps:

a Select the protocol and click *Add*.

b From the *Select Network Protocol* menu, select *Microsoft* in the left pane. In the right pane, select the protocol and click *OK*.

If a client is missing, follow these steps:

a Select the client and click *Add*.

b Click *Client for NetWare Networks* and then *Properties*.

To select the NetWare server, follow these steps:

a Under the General tab, set your preferred server and the first network drive and click *OK*.

b Set the primary network logon to *Client for NetWare Networks* and click *OK*.

12 When the configuration is correct, click the Identification tab.

The computer name is the name you use to log on to the network and connect to your server. Give your PC a unique name of up to 15 characters. The PC name cannot include blank spaces.

A workgroup is composed of the PCs you usually communicate with (like your department) and contains shared resources (like printers).

If you use peer group networking, the workgroup name is your peer group. Peers can see each other when they look in the Network Neighborhood.

Your computer description is visible to other members of your workgroup when they see your PC in the Network Neighborhood.

13 **Click *OK.***

The network connection is configured. At the completion of this step, Windows 95 prompts you to restart the PC.

14 **Click *Yes*.**

After the PC restarts, you can log on to your network. If you have problems, see Chapter 5.

Confirming Installation

Complete the following procedure to confirm that the 3C509B NIC is properly installed in a PC running Windows 95:

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

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

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

The System Properties box appears, detailing your system setup.

4 **Click the *Device Manager* tab.**

A list of devices appears, arranged by type.

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

The name of the installed 3C509B NIC appears:

```
3Com EtherLink III ISA (3C509B)
```

6 **Double-click the 3C509B name to display a description of the 3C509B NIC and its current status.**

The dialog box confirms that the 3C509B NIC is working properly. If a yellow exclamation point or a red X appears next to the 3C509B name, go to Chapter 5 to troubleshoot the NIC.

7 Click *Cancel* to leave each dialog box and return to the Control Panel.

For information on peer-to-peer networking, see the W95NDIS3.TXT file in the HELP directory on the *EtherDisk* diskette.

Windows NT

This section describes how to install the network driver in a PC running Windows NT versions 4.0 or 3.51.

Windows NT Version 4.0

Follow these steps to install the network driver in a PC running Windows NT version 4.0:

1 Install the 3C509B NIC and connect it to the network as described in Chapter 2.

2 Restart the PC.

3 Start Windows NT.

4 In the Control Panel, double-click *Network*.

5 In the Network window, select the *Adapter* tab.

If you have a NIC already installed, follow these steps:

a Select the existing 3Com NIC in the Installed Adapters group.

b Click *Remove*.

c Click *Yes* in the Warning dialog box.

d Reboot the PC and repeat steps 3, 4, and 5.

6 Click *Add Adapter*.

7 In the Select Network Adapter window, select *Have Disk*.

8 Insert the *EtherDisk* diskette in floppy drive A and in the Insert Disk window, click *OK*.

9 In the Select OEM Option box, select *3Com EtherLink III ISA Adapter (3C509B)*.

10 Click *OK*.

11 In the Network Settings window, click *Close*.

If you are prompted for network information, contact your system administrator for the requested information.

Windows NT prompts you for a reboot.

12 Click *Yes* to restart your PC.

The driver installation is complete.

Windows NT Version 3.51

Follow these steps to install the network driver in a PC running Windows NT version 3.51:

1 Install the 3C509B NIC and connect it to the network as described in Chapter 2.

2 Restart the PC.

3 Start Windows NT.

4 In the Control Panel, double-click *Network*.

a If you have a NIC already installed, in the Network Settings window, select the existing 3Com NIC in the Installed Adapters group.

b Click *Remove*.

c Click *Yes* in the confirmation window.

d Click OK in the Network Settings window and then click *Restart Now*.

e After rebooting, repeat steps 3 and 4.

5 In the Network Settings window, click *Add Adapter.*

6 In the Add Network Adapter window, select *<Other> Requires disk from manufacturer*.

7 Click *Continue*.

8 Insert the *EtherDisk* diskette in floppy drive A and click *OK*.

9 In the Select OEM Option box, select *3Com EtherLink III ISA Adapter (3C509B)*.

10 Click *OK*.

The bus location window appears.

11 Click *OK*.

Windows NT copies the files from the *EtherDisk* diskette.

If you are prompted for network information, contact your system administrator for the requested information.

12 **In the Network Settings Change window, click *OK*.**

Windows NT completes the installation.

13 **In the Network Settings Change window, click *Restart* to restart your PC.**

The driver installation is complete.

NetWare for Windows 3.1x, Windows for Workgroups, and DOS

The AutoLink program installs client software and drivers for Novell NetWare 3.1x or 4.x in Windows 3.1x, Windows for Workgroups 3.11, and DOS environments.

The AutoLink program modifies the CONFIG.SYS and AUTOEXEC.BAT files. It logs on to the server and updates the client software if your system administrator has already configured a 3Install account on your server.

The AutoLink program adds the following to the AUTOEXEC.BAT file and saves the old file as AUTOEXEC.3CM:

```
Autoexec.bat (saves old as autoexec.3cm)
REM Netware startup
if not exist C:\NWCLIENT\lsl.com goto
noNetware
if not exist C:\NWCLIENT\i*xodi.com goto
noNetware
if not exist C:\NWCLIENT\vlm.exe goto
noNetware
C:\NWCLIENT\lsl.com
C:\NWCLIENT\3C5X9.com
C:\NWCLIENT\ipxodi.com
C:\NWCLIENT\vlm.exe
f:\login
c:
goto doneNetware
:noNetware
echo Netware client software missing,
Netware not started
:doneNetware
```

The AutoLink program adds the following to the CONFIG.SYS file and saves the old file as CONFIG.3CM:

```
Config.sys (saves old as config.3cm)
LASTDRIVE=Z
```

CAUTION: *Do not use the AutoLink program if you have Windows 95 or Windows NT. See the previous sections for instructions.*

AutoLink Requirements

To use the AutoLink program, your computer should have only one 3C509B NIC installed and have 1 MB of free hard disk space.

Running the AutoLink Program

1. **Install the NIC and connect it to the network, as described in Chapter 2.**
2. **Reboot, using a DOS diskette.**
3. **Put the *EtherDisk* diskette in floppy drive A.**
4. **Run the Install program. Type:**

   `a:install [Enter]`

   This opens the main menu shown in Figure 3-1.

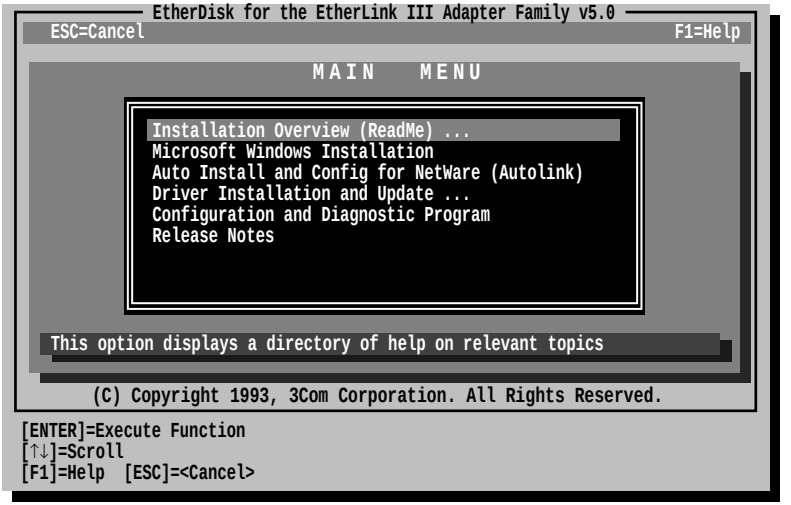


Figure 3-1 Main Menu

5 **From the main menu, select *Auto Install and Config for NetWare (AutoLink)* and press [Enter].**

6 **Select *DOS*, *Windows 3.1x*, or *Windows for Workgroups 3.11* and follow the instructions.**

7 **When the auto installation process is finished, remove the *EtherDisk* diskette and reboot the PC.**

If you are running Windows 3.1x, after you connect to the NetWare server, run the WSINSTALL program for full Windows support. Contact your system administrator for the location of this NetWare utility.

If you experience problems that occur only when using the AutoLink program, display or print the AUTOLINK.LOG file. The AUTOLINK.LOG file contains a list of all the events that occurred during the AutoLink installation and configuration process.

- To display the file, type:

  ```
  type autolink.log | more
  ```

- To print the file, type:

  ```
  print autolink.log
  ```

To install the network drivers for Windows 3.1x, Windows for Workgroups, or DOS in a non-NetWare environment, see the corresponding text files in the HELP directory on the EtherDisk diskette.

Obtaining NetWare NLMs

You can obtain the NetWare NLMs for the NetWare servers listed in Table 3-1 from the Novell World Wide Web site. The Internet address is www.support.novell.com.

Table 3-1 NetWare NLMs

NetWare Server	NLM Name
NetWare 3.12	ETHERTSM.NLM NBI31X.NLM MSM31X.NLM
NetWare 4.11, 4.1	ETHERTSM.NLM NBI.NLM MSM.NLM

The NetWare 3.11 server is no longer supported by the 3C509B NIC.

Installing Other Supported Network Drivers

Table 3-2 provides the text file names and driver names for additional supported drivers. These files are located in the HELP directory on the *EtherDisk* diskette.

Table 3-2 Network Driver Text File Names

Network Operating System	Text File Name	Network Driver Name
Banyan VINES	BANYAN.TXT	ELNK3.DOS
Microsoft LAN Manager	LANMAN.TXT	ELNK3.DOS
IBM LAN Server (DOS)	LANSRV.TXT	ELNK3.DOS
IBM LAN Server (OS/2)	LANSRV.TXT	ELNK3.OS2
Artisoft LANtastic	LANTASTK.TXT	ELNK3.DOS
DEC PATHWORKS	PATHWORK.TXT	ELNK3.DOS
DEC PATHWORKS	PATHWORK.TXT	3C5X9.COM (for NetWare ODI-compatible)
Windows for Workgroups (NetWare)	WFWNETWR.TXT	3C5X9.COM
Windows for Workgroups (NDIS 2)	WFWNDIS2.TXT	ELNK3.DOS
Windows for Workgroups (NDIS 3)	WFWNDIS3.TXT	ELNK3.386 with ELNK3.DOS
Windows 95 NDIS 2 16-bit network driver	W95NDIS2.TXT	ELNK3.DOS
NetWare Client 32	CLIENT32.TXT	3C5X9.LAN
NetWare 3.12 Server	NETWARE411.TXT	3C5X9.LAN
NetWare 4 Server	NETWARE411.TXT	3C5X9.LAN
NetWare OS/2	NW0S2ODI.TXT	3C5X9.SYS
Packet Driver	PACKET.TXT	3C5X9PD.COM

Text files for all supported network operating systems are included in the HELP directory on the *EtherDisk* diskette.

4 CONFIGURING THE 3C509B NIC

This chapter describes how to configure the 3C509B NIC, reconfigure the NIC, and change configuration settings.

Configuring the 3C509B NIC

This section describes how to configure the 3C509B NIC.

If you have only one 3C509B NIC installed and you are running Novell NetWare, use the AutoLink program to configure the NIC and load the necessary driver, as described in Chapter 3.

To configure the 3C509B NIC, follow these steps:

1. **Install the NIC and network driver, as described in Chapters 2 and 3.**
2. **Reboot your PC using a DOS diskette.**
3. **Put the *EtherDisk* diskette in floppy drive A.**
4. **To run the Install program, type:**

   `a:install [Enter]`

   This opens the main menu shown in Figure 3-1.
5. **From the main menu, select *Configuration and Diagnostic Program*.**

   If necessary, select the NIC you want to configure. Tab to the *Select* button and press [Enter].
6. **Select *Configure NIC* and press [Enter].**

   This opens the NIC Configuration screen shown in Figure 4-1.

Figure 4-1 NIC Configuration Screen

7 Select *Auto Configure* and press [Enter].

This automatically configures the I/O base address, interrupt request level, and transceiver type on the NIC to settings that do not conflict with those of any other device in your PC.

To change settings, follow the steps in "Changing Configuration Settings" later in this chapter.

If you encounter a problem with the *Auto Configure* option, press [F1] for help.

The *OK* button is highlighted after configuration is complete.

8 Press [Enter] to accept the configuration parameters.

Reconfiguring the NIC

EISA PCs come with an automatic configuration program that allocates the system's resources to each device in the PC.

Putting an ISA NIC in EISA mode lets it be configured by the EISA configuration program to the correct settings for the EISA PC.

You can configure an ISA NIC for EISA mode only if it is in an EISA slot.

If you have configured an ISA NIC for an EISA PC, the PROTOCOL.INI file looks for the parameter SLOT=number rather than the I/O base address. The SLOT number is required only if you have multiple NICs installed.

The following procedures are general. Refer to the configuration documentation provided with your PC for more details.

Changing NIC Configuration from ISA to EISA

To configure the NIC for an EISA PC:

1. **Run the Install program as described earlier in "Configuring the 3C509B NIC."**
2. **When the main menu appears, select *Configuration and Diagnostic Program*.**
3. **If necessary, use the arrow keys to select the NIC you want to configure. Tab to the *Select* button and press [Enter].**
4. **If you have multiple NICs installed, use the arrow keys to select a NIC and press [Enter].**
5. **A screen identifying the NIC appears with the *Test* menu bar item highlighted.**
6. **Use the arrow keys to select *Install*. This highlights the *Configure NIC* option. Press [Enter].**
7. **When the NIC Configuration dialog box appears, select *Modify*. Press [Enter].**

   The I/O Base Address field is selected. An I/O Base Address dialog box appears.

8 **Use the arrow key to select *EISA* and press [Enter].**

This changes the I/O base address setting.

9 **Save the new configuration setting to the NIC by selecting *OK*. Press [Enter].**

10 **Exit the program and remove the *EtherDisk* diskette.**

11 **Insert the EISA configuration utility diskette provided with your PC.**

12 **Turn off the PC. Wait 10 seconds and then turn it on again.**

13 **Follow the instructions that accompanied your EISA PC to run the EISA configuration program.**

When the program asks for .CFG files to copy, insert the *EtherDisk* diskette, press [Enter], and use the appropriate file:

```
!TCM5094.CFG for the 3C509B-COMBO NIC
!TCM5090.CFG for the 3C509B-TP NIC
!TCM5095.CFG for the 3C509B-TPO NIC
!TCM5098.CFG for the 3C509B-TPC NIC
```

If you are prompted for the wrong !TCM file:

a Turn off the PC and remove the NIC.

b Clean the metallic edge that slides into the slot.

c Place the NIC back into the PC, checking to make sure the NIC is properly seated.

You should now be prompted for the correct !TCM file.

Changing NIC Configuration from EISA to ISA

To reconfigure the NIC for an ISA PC:

1 **Run the Install program as described earlier in "Configuring the 3C509B NIC."**

2 **When the main menu appears, select *Configuration and Diagnostic Program*.**

3 **If necessary, use the arrow keys to select the NIC you want to configure. Tab to the *Select* button and press [Enter].**

4 **A screen identifying the NIC appears with the *Test* menu bar item highlighted.**

5 **Select *Install* and press [Enter].**

6 **When the NIC Configuration dialog box appears, select *Modify* and press [Enter].**

The I/O Base Address field is selected. An I/O Base Address dialog box appears.

7 **Use the arrow key to select *ISA* and press [Enter].**

This changes the I/O base address setting.

If your system supports Plug and Play, the I/O Base Address, Interrupt Request Level, and Boot PROM parameters are set automatically.

8 **Select the option setting in the NIC Configuration dialog box for any of the other parameters you want to change, or accept the defaults.**

For more information about each of the settings, refer to the online help (press [F1] when the option is highlighted).

9 **Save the new configuration setting to the NIC by clicking *OK* and pressing [Enter].**

10 **Remove the *EtherDisk* diskette.**

11 **Insert the PC's configuration utility diskette and reboot the PC.**

Changing Configuration Settings

Figure 4-1, the NIC Configuration screen, shows the current configuration settings for the installed NIC. You can change the default settings to:

- Disable Plug and Play
- Use a boot PROM
- Optimize driver performance for a specific operating system
- Optimize driver performance for operation on a server
- Change the type of network connector

Configuration Option Settings

Table 4-1 lists each software option, the default setting, and the available settings. For more information about each setting, select the option and press [F1]).

Table 4-1 Option Settings

Option	Default Setting	Available Settings
I/O Base Address	300h	200h, 210h, 220h, 230h, 240h, 250h, 260h, 270h, 280h, 290h, 2A0h, 2B0h, 2C0h, 2D0h, 2E0h, 2F0h, 300h, 310h, 320h, 330h, 340h, 350h, 360h, 370h, 380h, 390h, 3A0h, 3B0h, 3C0h, 3D0h, 3E0h, EISA, ISA
Interrupt Request Level	10	3, 5, 7, 9, 10, 11, 12, 15
Boot PROM	Disabled. Does not apply for 3C509B-TPO	Disabled, 8 K, 16 K, 32 K
Transceiver Type	Auto Select for all except 3C509B-TPO (on-board TP)	On-board Coax (BNC), On-board TP (RJ-45), External (AUI/DIX), or Auto Select
Network Driver Optimization	Windows or OS/2 Client	DOS Client, Windows or OS/2 Client, Server
Maximum Modem Speed (fastest modem installed)	9600 Baud	No Modem, 1200, 2400, 9600, 19200, or 38400 Baud
Plug and Play	Enabled	Enabled, Disabled
Full Duplex	Disabled	Enabled, Disabled

If you are using a PC that supports Plug and Play, the IRQ and I/O base address values are set by Plug and Play. You can set the boot PROM size to indicate the presence and size of a network boot PROM.

To disable Plug and Play at the DOS command line, type:

```
3C5X9cfg configure /pnp:n [Enter]
```

You can also type:

```
pnpdsabl.bat [Enter]
```

Changing the Settings

To change the configuration settings:

1. **Run the Install program as described earlier in "Configuring the 3C509B NIC."**
2. **From the main menu, shown in Figure 3-1, select *Configuration and Diagnostic Program*.**
3. **If necessary, use the arrow keys to select the NIC you want to configure. Tab to the *Select* button and press [Enter].**
4. **Press [Tab] to move to the dialog box, and then select the option you want to change. Press [Enter].**
5. **Use the arrow keys to scroll through the list of settings for that option. Select a setting and press [Enter].**
6. **Continue this procedure for any of the other options. Use online help (press [F1] when the option is highlighted) for more information about each of the settings.**
7. **Select *OK* and press [Enter] to save the new settings.**

Changing PACE Configuration

PACE technology allows you to prioritize multimedia and real-time data. Prioritization makes sure that critical data for the selected applications gets through as fast as possible.

Selecting PACE Applications

To select PACE applications, follow these steps:

1. **In the Windows 95 or Windows NT Control Panel, double-click the *PACE* icon.**

   The PACE Applications screen appears, as shown in Figure 4-2.

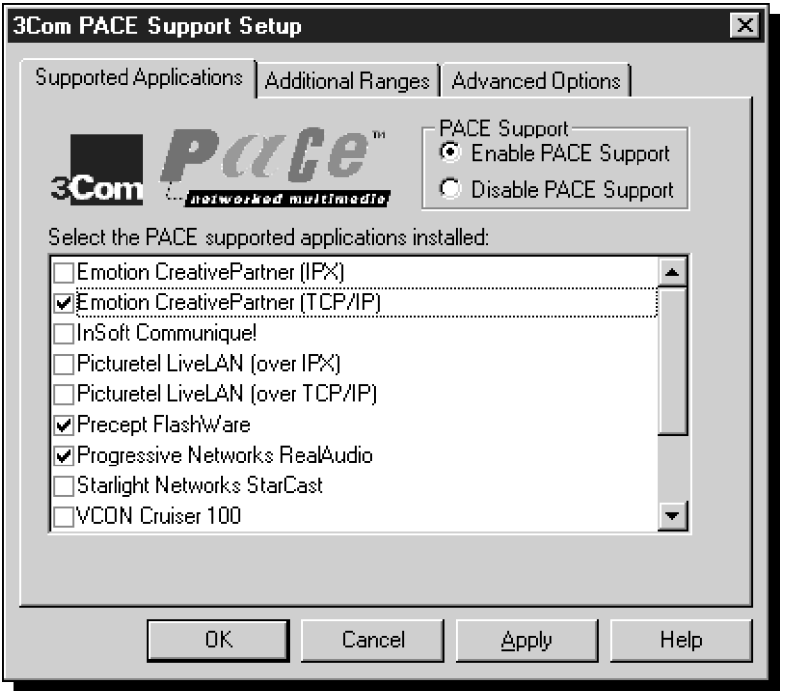


Figure 4-2 PACE Applications Screen

For the PACE driver to recognize high-priority network traffic, it must know if a stream of network traffic was generated by a specific PACE application.

2 **To enable PACE support for an application, click the box next to the appropriate application name.**

If an application is not listed here, you can obtain information from the manufacturer and manually enter the information in the Additional Ranges tab.

3 **Click *OK*.**

Changing PACE Ranges and Protocols

You can add information for PACE applications which you want to prioritize but which are not listed on the PACE Applications screen.

You must specify the port or socket ranges as well as the network protocol being used. Refer to the PACE application user guide. The PACE network driver uses these ranges to determine whether a packet should be treated as high-priority.

1 To add the PACE ranges and protocols, click the Additional Ranges tab.

The PACE Additional Ranges screen appears, as shown in Figure 4-3.

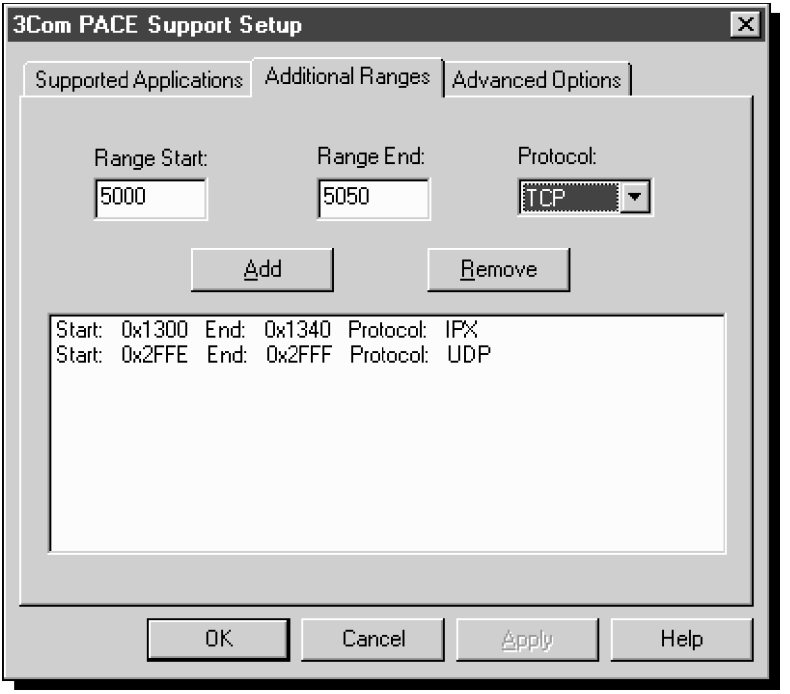


Figure 4-3 PACE Additional Ranges Screen

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

The range start should be a four-digit hexadecimal value.

3 Enter the inclusive Range End value of the port or socket range for the application.

The range end should be a four-digit hexadecimal number. If only one port or socket is needed, Range End should match Range Start.

4 Select the protocol that the application uses.

This can be TCP, UDP, or IPX. Some applications support multiple protocols and have port or socket ranges for each protocol. In this case, the range/protocol must match the protocol on the PC.

For example, if only TCP/IP is installed, do not enter the socket range for IPX, as it will decrease driver performance.

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

The range is added to the list, as shown in Figure 4-3.

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

PACE Advanced Options

PACE Advanced Options are used to fine-tune the way the network driver handles types of PACE traffic. In general, these values need not be altered. Contact your network administrator before using these options.

1 To display the PACE Advanced Options screen, click the Advanced Options tab.

The PACE Advanced Options screen appears, shown in Figure 4-4.

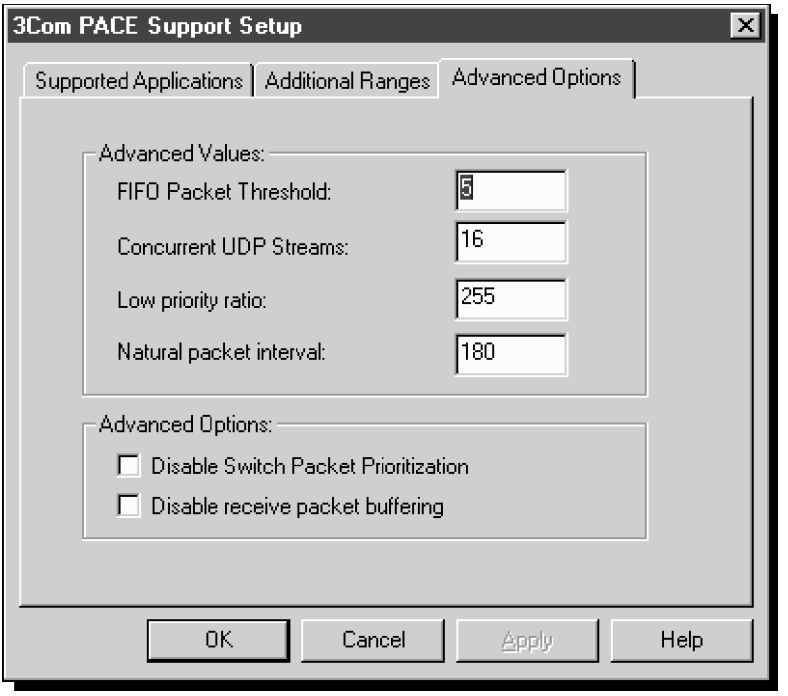


Figure 4-4 PACE Advanced Options Screen

2 Enter new information as required.

3 Click *OK* to set the new value.

PACE Settings Descriptions

FIFO Packet Threshold This threshold is the number of non-PACE packets the network driver will allow in the FIFO ahead of any PACE packets. A smaller number decreases the time between PACE packets but can decrease performance. A value of 3 is recommended.

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

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

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

A value of 16 is recommended for most applications.

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

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

For example, if a value of 1000 is entered, one low-priority packet would be sent for every 1,000 high-priority packets. A value of 25 is recommended for most applications.

Natural Packet Interval To communicate packet priority to the interconnect devices (repeaters, switches, etc.), the PACE driver slightly modifies the Ethernet packet.

When these modified packets are sent out for long periods without any low-priority packets being sent, connection problems may result.

For this reason, the driver can be configured to send out an unaltered, natural packet periodically. The value given is in seconds.

A value of 180 seconds (3 minutes) is recommended for most applications.

Disable Switch Packet Prioritization This option disables modification of Ethernet packets used for prioritization of multimedia traffic within 3Com switch products.

If a multimedia connection cannot be made between a PACE-enabled workstation and a non-PACE workstation, disabling the switch packet prioritization can sometimes alleviate this problem.

Disabling switch packet prioritization only affects the switch. It does not change the behavior of the PACE driver in any way. Packets deemed to be high-priority will still be transmitted ahead of most non-PACE packets on the workstation.

Disable Receive Packet Buffering This option disables the receive packet buffer.

5 TROUBLESHOOTING

This chapter explains how to isolate and solve NIC problems, including the following sections:

- Checking the NIC
- Troubleshooting with the Diagnostic Tests
- Getting Help If a Test Fails
- Resolving Hardware Resource Conflicts with Windows 95 and Windows NT
- Changing the I/O, IRQ, or Memory Range
- Removing the 3C509B NIC Software
- Crossover Cable Troubleshooting Tips
- Troubleshooting Tips
- Frequently Asked Questions

Checking the NIC

If you experience problems with the NIC, try these tips:

- Check the NIC LED as described in "Link LED" in Chapter 2.
- Check the connectors. Examine the cable for obvious signs of damage, wear, or crimping.
- Check whether the NIC is installed correctly. Refer to Chapter 2, "Installing the 3C509B NIC."
- Make sure the drivers installed are correct for the network operating system you are running (refer to Chapter 3, "Installing the Network Drivers").

If any problem persists, try the procedures outlined below or refer to Appendix B, "Technical Support."

Troubleshooting with the Diagnostic Tests

The diagnostic tests on the *EtherDisk* diskette check the NIC's overall operation and permit the isolation of faults. You can run the diagnostic tests after installing one or more 3C509B NICs, or you can run them when a fault is suspected. If the tests in their default configuration do not isolate the problem, you can change the test parameters to meet specific situations.

Always run diagnostic tests with no device drivers or memory managers installed.

To boot your system without installing device drivers or memory managers, boot using a DOS diskette.

The diagnostic tests are divided into three groups:

- The Group 1 tests check the physical components, connectors, and circuitry on the NIC.
- The Group 2 test (for the 3C509B-TPC and 3C509B-COMBO NICs only) checks the NIC's ability to transmit and receive data via the coaxial transceiver. (For twisted-pair connections, the link LED gives similar results.)
- The Group 3 test (the Echo Exchange Test) tests the NIC's ability to transmit and receive data while on the network.

If the NIC passes all three tests successfully, hardware failure is ruled out. If a problem still remains, look at cabling, software, drive configuration, and other issues that affect functionality on the network.

Starting the Diagnostic Program

To use the *EtherDisk* diskette Configuration and Diagnostic Program, follow these steps:

1 **Boot the PC using a DOS diskette.**

2 **Put the *EtherDisk* diskette in floppy drive A.**

3 **To run the Install program, type:**

```
a:install [Enter]
```

This opens the main menu shown in Figure 3-1.

4 **In the main menu, select *Configuration and Diagnostic Program*, and press [Enter].**

If you are testing multiple NICs, you will see a screen describing each installed NIC.

5 **Select the NIC you want to test and press [Enter].**

You can also run the tests from the command line. At the system prompt, type:

```
3C5X9cfg run [Enter]
```

Running the Group 1 Tests

Group 1 tests evaluate the physical components of the NIC. A failure in a Group 1 test may point to a faulty NIC.

For a description of each Group 1 test, press [F1] to access Help. In the Help screen, tab to the Index *button and press [Enter]. Use the arrow keys to move through the Index listings. Select* Test Definitions *and press [Enter].*

To run the Group 1 tests, follow these steps:

1 **Under the *Test* pull-down menu, select *Run Tests*. Press [Enter].**

The Run Tests dialog box appears, with the *Start* button highlighted.

2 **Press [Enter] to start the tests.**

Group 1 tests run ten times (default setting) unless you specify otherwise. The test results are displayed on the screen in the Results column.

Running the Group 2 Test

The Group 2 test is called the Network Loopback Test. It tests the 3C509B-COMBO and 3C509B-TPC NICs' ability to transmit and receive data over thin and thick coax configurations. This test requires installation of a loopback plug at the NIC's transceiver connection. Alternatively, you can run the test on a network not in use.

A failure in this test is likely to indicate a configuration problem only.

CAUTION: *Running the Group 2 test while connected to an active network can cause intermittent failures.*

Assembling a Loopback Plug

If you do not have a loopback plug, you can order one from your authorized network supplier or you can make your own. You can purchase the terminators from your network supplier (3Com part number 3C535).

To assemble the loopback plug, connect two 50-ohm network cable terminators to a T connector, as shown in Figure 5-1.

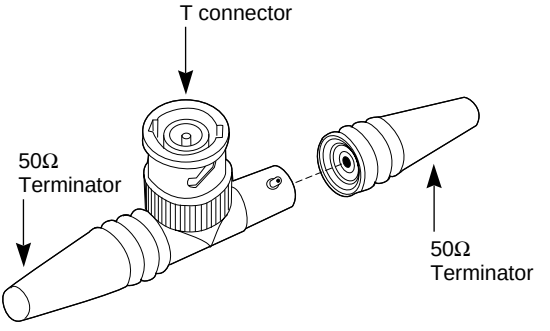


Figure 5-1 Assembling a Loopback Plug

Starting the Group 2 Test

To run the Group 2 test on the 3C509B-TPC and 3C509B-COMBO NICs, follow these steps:

1. **Connect the loopback plug to the round BNC connector on the back of the NIC.**
2. **Start the Configuration and Diagnostic Program, as described earlier in this chapter.**
3. **Select *Test Setup* from the *Test* menu.**
4. **Enable the Group 2 test. Highlight *OK* and press [Enter].**
5. **Go to the Run Tests dialog box to start the tests.**
6. **After the test is completed:**
   - **a** Exit the Configuration and Diagnostic Program.
   - **b** Remove the loopback plug.

Running the Group 3 Test

The Group 3 test is called the Echo Exchange Test. It tests the NIC's ability to transmit and receive data while on the network.

A failure in this test is likely to indicate a configuration problem only.

CAUTION: *Do not use an active network to run the Group 3 test.*

To run the Group 3 test on the network, you need a second computer set up as an echo server. The echo server receives packets from the NIC being tested and echoes them back to the NIC.

The second computer must be equipped with a 3Com NIC. The diagnostic program that comes with the NIC supports the 3C509B echo server diagnostic program.

Setting Up an Echo Server

If your echo server contains a 3C509B NIC, select *Echo Server* under the *Test* menu, and click the *Start* button to make the computer an echo server.

If you are setting up an echo server using a 3Com NIC other than a 3C509B NIC, follow these steps:

1 Select a computer to use as an echo server.

2 Insert the *EtherDisk* diskette in a floppy drive.

The diagnostic program comes on the *EtherDisk* diskette that accompanied the NIC.

3 Start the diagnostic program on the echo server.

The diagnostic program that you use depends on the NIC that is installed in the echo server. After the system prompt of the drive containing the Configuration and Diagnostic Program, enter the appropriate diagnostic program name from Table 5-1.

Table 5-1 Diagnostic Programs

Diagnostic Program Name	NIC Installed in the Echo Server
3C503.EXE	EtherLink II® or II TP, EtherLink II/16 or II/16 TP
3C505.EXE	EtherLink Plus®
3C507.EXE	EtherLink 16 or EtherLink 16 TP
3C508CFG.EXE	3Com Red
3C5X9CFG.EXE	EtherLink III family
3C523.EXE	EtherLink/MC
3C523TP.EXE	EtherLink/MC TP
3C527.EXE	EtherLink/MC 32
3C59XCFG.EXE	EtherLink III EISA/PCI bus master family (including Fast EtherLink NIC running at 10 Mbps)
3C90XCFG.EXE	EtherLink XL and Fast EtherLink XL family of NICs running at 10 Mbps

4 **In the Configuration and Diagnostic Program main window, select *Echo Server* from the *Test* menu on the menu bar.**

The program notifies you that your computer is now set up as an echo server.

Starting the Group 3 Test

To run the Group 3 test on the 3C509B NIC, follow these steps:

1 **Start the Configuration and Diagnostic Program.**

This program must be on the computer containing the NIC you want to test.

2 **Select *Test Setup* from the *Test* menu.**

3 **Enable the Group 3 test. Highlight *OK* and press [Enter].**

4 **Go to the Run Tests dialog box to start the tests.**

5 **After the test is completed:**

a Exit the program on the echo server.

b Exit the Configuration and Diagnostic Program.

Getting Help If a Test Fails

If any test fails, you can get additional information as follows:

- Select the test that failed in the Run Tests dialog box and press [Enter].
- Select the *Zoom* button and press [Enter].

If the diagnostic tests fail, the NIC may not be defective. The problem may be incorrect option settings, option settings that conflict with the settings of other NICs, or improper installation. Note that the maximum bus speed supported by the 3C509B NICs is 10 MHz.

***CAUTION:** Make sure to turn the power off before inserting or removing the NIC from the computer.*

Resolving Hardware Resource Conflicts with Windows 95 and Windows NT

Use this procedure to resolve hardware resource conflicts (I/O base address and interrupt values) using Windows 95 and Windows NT.

1. **From the *Start* menu, select *Help*.**
2. **In the Help window, select the Contents tab.**
3. **Select *Troubleshooting*.**
4. **Double-click *If you have a hardware conflict*.**
5. **Click *Start the Conflict Troubleshooter* and follow the instructions.**

Changing the I/O Base Address or the Interrupt Request Level

If you discover resource conflicts, you can change the I/O base address or the interrupt request level (IRQ). To change these values, follow these steps:

1. **In the Control Panel, double-click *System*.**
2. **In the System Properties window, click *Network Adapters*.**
3. **Double-click *3Com EtherLink III Adapter*.**
4. **Select the Resources tab.**
5. **Select *Input/Output Range or Interrupt Request Level*.**
6. **Click *Change Settings*.**
7. **Change the selected value and click *OK*.**
8. **Restart the PC.**

The values are changed.

Removing the 3C509B NIC Software

The 3C509B software includes a program that removes the 3C509B software.

To run the uninstall program, at the DOS prompt, type:

```
un3c509.exe [Enter]
```

The program removes the 3C509B software.

Crossover Cable Troubleshooting Tips

When you work with 10BASE-T cabling, concentrators, and NICs from different vendors, it is possible to connect everything and still have no communication between file servers and workstations.

When there are several unknown variables, it is difficult to determine which component is broken.

1. **Determine whether your equipment complies with the 10BASE-T standard.**

   This is particularly important for concentrators (hubs or repeaters). Although the two specifications may appear similar, small differences can cause a network malfunction.

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

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

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

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

Troubleshooting Hubs with Crossover Cable

When there is doubt whether a hub is performing correctly, or if the impedance settings are in question, a crossover cable can help you isolate the failing component.

1. **Connect a file server and a client PC back to back with a crossover cable to verify that the NIC and network operating system are properly configured.**
2. **To make a crossover cable, simply connect TD+ to RD+ and TD– to RD–.**

   The cable performs the crossover that is usually performed by the hub. Figure 5-2 shows the pinouts for the crossover cable:

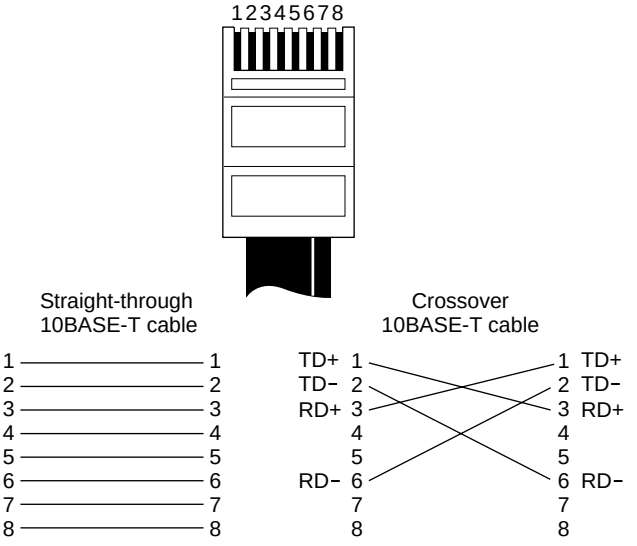


Figure 5-2 Straight-through and Crossover Cable Pinouts

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

- If there is a proper crossover, the LED lights.
- If there is a straight-through connection, the LED does not light.
- A blinking LED indicates that there is a polarity mismatch (that is, TD+ to RD– instead of TD+ to RD+).

Troubleshooting Tips

Review these tips to check the 3C509B NIC further.

1 **Make sure the NIC is seated correctly in the slot.**

Check the installation by reviewing the installation instructions in Chapter 2.

2 **Inspect all cables and connections.**

If you are using thin Ethernet cable, make sure that you have a T connector attached to the NIC and all other NICs on the network. Make sure that the thin Ethernet segment is terminated at both ends with a 50-ohm terminator.

3 **Make sure that you booted your computer under DOS version 3.1 or later, and that no device drivers or memory managers are loaded.**

4 **If you are running the Group 2 test (only on the 3C509B-TPC or the 3C509B-COMBO NIC), make sure that the loopback plug is securely attached to the NIC's BNC connector and that the NIC is attached to a properly cabled network.**

If this test fails, try another loopback plug.

5 **If you are running the Group 3 test, make sure that the NIC is connected to a properly cabled and inactive network and that an echo server is set up on the network.**

To further isolate the problem, use a crossover cable to connect a known good PC to the PC you are testing. The PCs should be connected back to back with no other network devices between the PCs. For more information about the crossover cable, see "Crossover Cable Troubleshooting Tips."

6 **Make sure that the settings for the NIC's options are not the same settings used in the system or on any other NIC installed in the computer.**

If you need help, select *Configuration and Diagnostic Program* from the *EtherDisk* diskette main menu. Then select *Commonly Used Interrupts or I/O Base Addresses* from the NIC Configuration screen.

7 Install the NIC in another slot and run the diagnostic tests again.

The original slot may be defective.

8 Replace the failed NIC with a working NIC and run the diagnostic tests again.

Use the same option settings as those used on the failed NIC.

If the working NIC passes all tests, the original NIC is probably defective. Refer to Appendix B, "Technical Support."

9 Make sure the NIC is correctly configured for ISA or EISA operation.

Refer to the section "Reconfiguring the NIC" in Chapter 4.

10 Install the NIC in another functioning computer and run the tests again.

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

Frequently Asked Questions

Figure 5-2 describes some common questions and answers for the 3C509B NIC.

Table 5-2 Frequently Asked Questions

Question	Answer
When I try to run 3C5X9CFG.EXE, my machine locks up. What do I do?	If you run 3C5X9CFG.EXE and the machine locks up, follow these steps: **1** Make sure that no TSRs are loaded and the AUTOEXEC.BAT and CONFIG.SYS files are not loaded. **2** Disable Plug and Play.
How do I disable Plug and Play?	There are two ways to disable Plug and Play: ■ At the command line, type: **`3C5X9cfg configure /pnp:n`** ■ Boot using a DOS diskette and run PNPDSABL.BAT located on the *EtherDisk* diskette.

(continued)

Table 5-2 Frequently Asked Questions (continued)

Question	Answer
I have two PCs with 3C509B-TPO NICs installed, running Windows 95. Each PC can see itself but not the other in the Network Neighborhood. What can I do?	**1** Check the cable. If the machines are connected back to back, use a crossover cable. **2** Make sure File and Print Sharing is installed and enabled. **3** Use the same workgroup name for both computers.
I am running Windows 95 with a 3C509-COMBO NIC and I am unable to browse the network. What do I do?	Use the "Find Computer" function under Windows 95. If you do not see other PCs, make sure the latest Windows 95 Service Pack is installed.
I am using a 3C509B NIC running Windows 95 with Client for NetWare Networks and I do not get a logon box. How do I fix this?	Shut down and log on as another user. If you are able to log on, remove the AUTOLOGON value from the Registry.
I am running Windows NT 4.0 with a 3C509B NIC installed and I get a "Service failed to start" error. What do I do?	■ Check the Event Viewer for errors. ■ Check for resource conflicts.
Why doesn't Plug and Play work in Windows 95 for the 3C509B NIC when it is a Plug and Play operating system?	Occasionally a conflict occurs between the Plug and Play capabilities on the NIC and the PC—usually the BIOS. Disabling Plug and Play on the NIC resolves the conflict and allows the NIC to be installed properly.
I have a 3C509B NIC running Windows 95 and the Device Manager reports the NIC is not working properly. What troubleshooting steps should I take?	**1** Disable Plug and Play. **2** Change the IRQ.
How do I install the 3C509B after I have disabled Plug and Play?	**1** Click the Control Panel. **2** Double-click the *Network* icon. **3** Click *Add Adapter*, and then click *Have Disk*. **4** Insert the *EtherDisk* diskette. **5** When prompted, reboot the PC.

SPECIFICATIONS

This appendix lists specifications, pin assignments, and cable requirements for the 3C509B NIC.

NIC Specifications

Network Interface

3C509B-TP 3C509B-TPO	Ethernet IEEE 802.3i 10BASE-T industry standard for a 10 Mbps baseband CSMA/CD local area network
3C509B-COMBO 3C509B-TPC	IEEE 802.3i 10BASE-T and Ethernet IEEE 802.3 industry standard for a 10 Mbps CSMA/CD local area network

Physical Dimensions

Length:	155.956 mm (6.14 in)
Height:	100.330 mm (3.95 in)
TPO height:	63.500 mm (2.50 in)
TPC height:	77.470 mm (3.05 in)

Environmental Operating Range

Operating temperature:	0˚ to 70 ˚C (32˚ to 158 ˚F)
Humidity:	10 to 90% noncondensing

Power Requirements

Operating voltage:	+5 V ± 5% @ 150 mA max +12 V ± 5% @ 0.5 A max

RJ-45 Connector Pin Assignments

Figure A-1 shows the RJ-45 connector pin assignments.

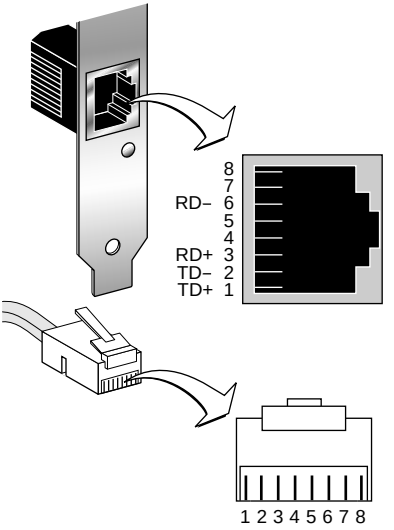


Figure A-1 RJ-45 Connector Pin Assignments

AUI Connector Pin Assignments

Table A-1 lists the pin assignments for the AUI (attachment unit interface) connector.

Table A-1 AUI Connector Pin Assignments

Pin	Function	Pin	Function
1	Collision shield	9	Collision –
2	Collision +	10	Transmit –
3	Transmit +	11	Transmit shield
4	Receive shield	12	Receive –
5	Receive +	13	+12 volts
6	Power return	14	Voltage shield
7	Not used	15	Not used
8	Not used		

Cable Specifications

In order to maintain compliance with the limits of a Class B digital device, 3Com requires that you use quality interface cables when connecting to this device. Changes or modifications not expressly approved by 3Com could void the user's authority to operate this equipment. Examples of supported cable types are shown below:

- For unshielded twisted-pair (UTP) connections:

Unshielded twisted-pair (100 ohm):

- Category 3 LAN and high-speed data cable, for example, Anixter CM-00424BAG-3 or equivalent
- Category 4 extended distance LAN cable, for example, Anixter CM-00424BAG-4 or equivalent

The 10BASE-T cable you use for establishing a connection to the network should not be used for any other purpose. It must be dedicated to the link between the NIC and the network.

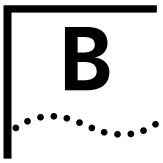
- For thin coax connections:

  RG58 A/U or C/U (50 ohm ± 4)

- For thick coax connections:

  RG59 (50 ohm ± 2)

For complete cabling details, refer to the IEEE 802.3 specification, section 8.4, "Coaxial Cables and Electrical Parameters."



TECHNICAL SUPPORT

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

Information contained in this appendix is correct at time of publication. For the very latest, we recommend that you access 3Com Corporation's World Wide Web site as described below.

Online Technical Services

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

- World Wide Web site
- 3Com Bulletin Board Service (3ComBBS)
- 3ComFacts℠ automated fax service
- 3ComForum on CompuServe® online service

World Wide Web Site

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

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

This service features the latest information about 3Com solutions and technologies, customer service and support, news about the company, *NetAge*® Magazine, and more.

3Com Bulletin Board Service

3ComBBS contains patches, software, and drivers for all 3Com products, as well as technical articles. This service is available through analog modem or digital modem (ISDN) 24 hours a day, 7 days a week.

Access by Analog Modem

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

Country	Data Rate	Telephone Number
Australia	up to 14400 bps	61 2 9955 2073
Brazil	up to 14400 bps	55 11 547 9666
France	up to 14400 bps	33 1 6986 6954
Germany	up to 28800 bps	4989 62732 188
Hong Kong	up to 14400 bps	852 2537 5608
Italy (fee required)	up to 14400 bps	39 2 27300680
Japan	up to 14400 bps	81 3 3345 7266
Mexico	up to 28800 bps	52 5 520 7853
P. R. of China	up to 14400 bps	86 10 684 92351
Singapore	up to 14400 bps	65 534 5693
Taiwan	up to 14400 bps	886 2 377 5840
U.K.	up to 28800 bps	44 1442 438278
U.S.A.	up to 28800 bps	1 408 980 8204

Access by Digital Modem

ISDN users can dial in to 3ComBBS using a digital modem for fast access up to 56 Kbps. To access 3ComBBS using ISDN, use the following number:

408 654 2703

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, 7 days a week.

Call 3ComFacts using your Touch-Tone telephone using one of these international access numbers:

Country	Telephone Number
Hong Kong	852 2537 5610
U.K.	44 1442 438279
U.S.A.	1 408 727 7021

Local access numbers are available within the following countries:

Country	Telephone Number	Country	Telephone Number
Australia	1800 678 515	Netherlands	06 0228049
Belgium	0800 71279	New Zealand	0800 446 398
Denmark	800 17319	Norway	800 11062
Finland	98 001 4444	Portugal	0505 442 607
France	05 90 81 58	Russia (Moscow only)	956 0815
Germany	0130 81 80 63	Singapore	800 6161 463
Hong Kong	800 933 486	Spain	900 964 445
Italy	1678 99085	Sweden	020 792954
Malaysia	1800 801 777	U.K.	0800 626403

3ComForum on CompuServe Online Service

3ComForum is a CompuServe-based service containing patches, software, drivers, and technical articles about all 3Com products, as well as a messaging section for peer support. To use 3ComForum, you need a CompuServe account.

To use 3ComForum:

1 **Log on to CompuServe.**

2 **Type `go threecom`**

3 **Press [Return] to see the 3ComForum main menu.**

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

Support from 3Com

If you are unable to receive support from your network supplier, technical support contracts are available from 3Com.

Contact your local 3Com sales office to find your authorized service provider using one of these numbers:

Regional Sales Office	Telephone Number
3Com Corporation P.O. Box 58145 5400 Bayfront Plaza Santa Clara, California 95052-8145 U.S.A.	800 NET 3Com *or* 1 408 764 5000 408 764 5001 (fax)

(continued)

Regional Sales Office	Telephone Number
3Com Asia Limited	
Australia	61 2 9937 5000 (Sydney)
	61 3 9866 8022 (Melbourne)
China	8610 68492568 (Beijing)
	86 21 63740220 Ext 6115 (Shanghai)
Hong Kong	852 2501 1111
India	91 11 644 3974
Indonesia	6221 572 2088
Japan	81 6 536 3303 (Osaka)
	81 3 3345 7251 (Tokyo)
Korea	822 2 319 4711
Malaysia	60 3 732 7910
New Zealand	64 9 366 9138
Philippines	632 892 4476
Singapore	65 538 9368
Taiwan	886 2 377 5850
Thailand	662 231 8151 4
3Com Benelux B.V.	
Belgium	32 2 725 0202
Netherlands	31 30 6029700
3Com Canada	
Calgary	403 265 3266
Montreal	514 683 3266
Ottawa	613 566 7055
Toronto	416 498 3266
Vancouver	604 434 3266
3Com European HQ	49 89 627320
3Com France	33 1 69 86 68 00
3Com GmbH	
Austria	43 1 513 4323
Czech Republic/Slovak Republic	420 2 21845 800
Germany	49 30 34 98790 (Berlin)
(Central European HQ)	49 89 627320 (Munich)
Hungary	36 1 250 83 41
Poland	48 22 6451351
Switzerland	41 31 996 14 14
3Com Ireland	353 1 820 7077
3Com Latin America	
U.S. Headquarters	408 326 2093
Northern Latin America	305 261 3266 (Miami, Florida)
Argentina	541 312 3266
Brazil	55 11 546 0869
Chile	562 633 9242
Colombia	571 629 4110
Mexico	52 5 520 7841/7847
Peru	51 1 221 5399
Venezuela	58 2 953 8122

(continued)

Regional Sales Office	Telephone Number
3Com Mediterraneo	
Italy	39 2 253011 (Milan) 39 6 5279941 (Rome)
Spain	34 1 383 17 00
3Com Middle East	971 4 349049
3Com Nordic AB	
Denmark	45 39 27 85 00
Finland	358 0 435 420 67
Norway	47 22 18 40 03
Sweden	46 8 632 56 00
3Com Russia	007 095 258 09 40
3Com Southern Africa	27 11 807 4397
3Com UK Ltd.	44 131 220 8228 (Edinburgh) 44 161 873 7717 (Manchester) 44 162 889 7000 (Marlow)

Returning Products for Repair

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

To obtain an RMA number, call or fax:

Country	Telephone Number	Fax Number
U.S.A. and Canada	1 800 876 3266, option 2	408 764 7120
Latin America	1 408 326 2927	408 764 7120
Europe, South Africa, and Middle East	44 1442 438125	44 1442 435822
Outside Europe, U.S.A., and Canada	1 408 326 2926	1 408 764 7120

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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:

Network adapters	Lifetime
Other hardware products (unless otherwise specified in the warranty statement above)	1 year
Spare parts and spares kits	90 days

If a product does not operate as warranted above 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.

3Com shall not be responsible for any software, firmware, information, or memory data of Customer contained in, stored on, or integrated with any products returned to 3Com for repair, whether under warranty or not.

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3Com warrants that the software programs licensed from it will perform in substantial conformance to the program specifications therefor for a period of ninety (90) days from the date of purchase from 3Com or its Authorized Reseller. 3Com warrants the media containing software against failure during the warranty period. No updates are provided. The sole obligation of 3Com with respect to this express warranty shall be (at the discretion of 3Com) to refund the purchase price paid by Customer for any defective software products, or to replace any defective media with software which substantially conforms to applicable 3Com published specifications. Customer assumes responsibility for the selection of the appropriate applications program and associated reference materials. 3Com makes no warranty or representation that its software products will work in combination with any hardware or applications software products provided by third parties, that the operation of the software products will be uninterrupted or error free, or that all defects in the software products will be corrected. For any third-party products listed in the 3Com software product documentation or specifications as being compatible, 3Com will make reasonable efforts to provide compatibility, except where the noncompatibility is caused by a "bug" or defect in the third party's product.

STANDARD WARRANTY SERVICE

Standard warranty service for hardware products may be obtained by delivering the defective product, accompanied by a copy of the dated proof of purchase, to the 3Com Corporate Service Center or to an Authorized 3Com Service Center during the applicable warranty period. Standard warranty service for software products may be obtained by telephoning the 3Com Corporate Service Center or an Authorized 3Com Service Center, within the warranty period. Products returned to the 3Com Corporate Service Center must be preauthorized by 3Com with a Return Material Authorization (RMA) number marked on the outside of the package, and sent prepaid, insured, and packaged appropriately for safe shipment. The repaired or replaced item will be shipped to Customer, at the expense of 3Com, not later than thirty (30) days after receipt of the defective product by 3Com.

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IF A 3COM PRODUCT DOES NOT OPERATE AS WARRANTED ABOVE, CUSTOMER'S SOLE REMEDY FOR BREACH OF THAT WARRANTY SHALL BE REPAIR, REPLACEMENT, OR REFUND OF THE PURCHASE PRICE PAID, AT THE OPTION OF 3COM. TO THE FULL EXTENT ALLOWED BY LAW, THE FOREGOING WARRANTIES AND REMEDIES ARE EXCLUSIVE AND ARE IN LIEU OF ALL OTHER WARRANTIES, TERMS, OR CONDITIONS, EXPRESS OR IMPLIED, EITHER IN FACT OR BY OPERATION OF LAW, STATUTORY OR OTHERWISE, INCLUDING WARRANTIES, TERMS, OR CONDITIONS OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, AND SATISFACTORY QUALITY. 3COM NEITHER ASSUMES NOR AUTHORIZES ANY OTHER PERSON TO ASSUME FOR IT ANY OTHER LIABILITY IN CONNECTION WITH THE SALE, INSTALLATION, MAINTENANCE, OR USE OF ITS PRODUCTS.

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3Com Corporation, 5400 Bayfront Plaza, Santa Clara, CA 95052-8145 (408) 764-5000

FCC CLASS B CERTIFICATION STATEMENT

3Com Corporation
Model Nos: 3C509B-COMBO, 3C509B-TP, 3C509B-TPC, 3C509B-TPO
FCC ID: DF63C509B-COMBO
FCC ID: DF63C509B-TP
FCC ID: DF63C509B-TPC
FCC ID: DF63C509B-TPO
Made in U.S.A.

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

1 This device may not cause harmful interference, and

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

WARNING: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules, and the Canadian Department of Communications Equipment Standards entitled, "Digital Apparatus," ICES-003.These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from the one which the receiver is connected to.
- Consult the dealer or an experienced radio/TV technician for help.

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

The Interference Handbook

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

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

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3Com Corporation, 5400 Bayfront Plaza, P.O. Box 58145, Santa Clara, CA 95052-8145, (408) 764-5000