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EtherLink® III 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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About This Guide

About This Guide provides an overview of this guide, describes guide conventions, and tells you where to look for specific information.

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

This guide is for a variety of users from network administrators, who are familiar with computers and understand Ethernet networks, to small office and home users.



If the information in the README.TXT file differs from the information in this guide, follow the information in the README.TXT file on EtherDisk *diskette 2. 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...
NIC version and installation information	Chapter 1
Windows 95 and Windows NT NIC installation setup information	Chapter 2
3Com Installation Wizard	Chapter 3
Windows 3.x procedures for installing and configuring the NIC	Chapter 4
Windows 95 and Windows NT troubleshooting	Chapter 5
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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."
Keyboard key names	If you must press two or more keys simultaneously, the key names are linked with a plus sign (+). Example: Press Ctrl+Alt+Del.
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.

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1 NETWORK INTERFACE CARD INSTALLATION

This chapter describes the 3C509B network interface card (NIC), provides procedures for installing the NIC, and describes the correct network cable to use for connecting each version of the NIC to an Ethernet network.

Network Interface Card Overview

The four versions of the 3Com® EtherLink® III ISA 3C509B NICs are shown in Figure 1-1. These NICs connect your ISA or EISA PC to an Ethernet network using up to three different types of media.

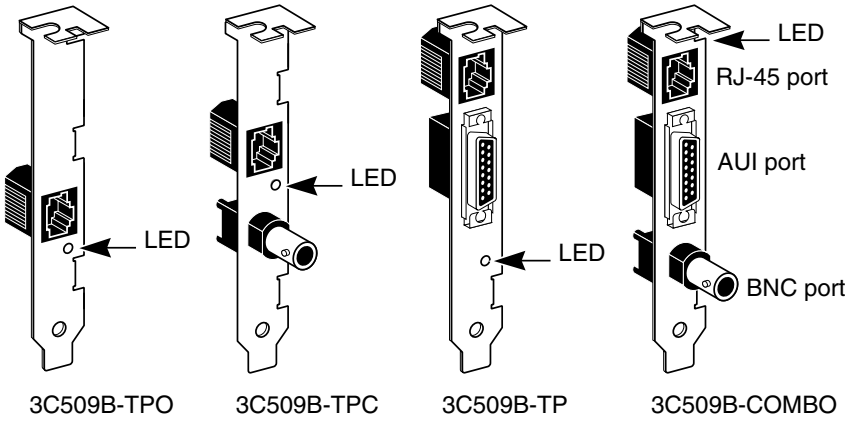


Figure 1-1 3C509B Network Interface Cards

Each NIC has a light-emitting diode (LED) called the link LED, which indicates whether there is an active connection between the NIC and the hub. See "Link LED" later in this chapter for a more complete description of this function.

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Table 1-1 shows the cable, connector, transceiver, and maximum network segments for the various 3C509B NIC models.

Table 1-1 Parameters for 3C509B NIC Models

NIC Model	Cable	Connector	Transceiver	Maximum Network Segment
3C509B-TPO	Category 3, 4, or 5 unshielded twisted-pair (10BASE-T)	RJ-45	On-board	328 ft/100 m
3C509B-TPC	Category 3, 4, or 5 unshielded twisted-pair (10BASE-T)	RJ-45	On-board	328 ft/100 m
	10BASE2 thin Ethernet coaxial	BNC	On-board	605 ft/185 m
3C509B-TP	Category 3, 4, or 5 unshielded twisted-pair (10BASE-T)	RJ-45	On-board	328 ft/100 m
	10BASE5 thick Ethernet coaxial	15-pin AUI	External	1640 ft/500 m
3C509B-COMBO	Category 3, 4, or 5 unshielded twisted-pair (10BASE-T)	RJ-45	On-board	328 ft/100 m
	10BASE5 thick Ethernet coaxial	15-pin AUI	External	1640 ft/500 m
	10BASE2 thin Ethernet coaxial	BNC	On-board	605 ft/185 m

Before You Begin

Before you install the 3C509B NIC, verify that you have all of the components. If any of these items are damaged or missing, contact your shipper or network supplier.

- EtherLink III ISA NIC (3C509B)
- *EtherLink III ISA Network Interface Card User Guide* (this guide)
- *EtherLink III ISA Network Interface Card Quick Guide*
- 3Com 3C509B *EtherDisk* diskettes 1 and 2

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You also need to know the following about your network environment:

- The kind of network cabling that is used to connect to the network at your site. You must use the same kind of network cable, and the NIC that you install in your PC must have a port that matches the connector on the network cable that you use.
- Your network protocol (IPX, IP, NetBEUI, or TCP/IP).

The next step is to install the NIC in the PC.

If your PC is running Windows 95, before you install the NIC in your PC, be sure to perform the preinstallation procedure for Windows 95. See "Performing the Preinstallation Procedure" in Chapter 2.

Installing the NIC

The following instructions apply to installing the 3C509B NIC in most PCs. If the instructions are not appropriate for your PC, refer to the documentation that accompanied your PC. You must have one ISA or EISA slot available in your PC in which to install the NIC.

CAUTION: *Each NIC is packed in antistatic packaging to protect it during shipment. Before handling the NIC, touch the bare metal case of your PC. While you are handling the NIC, wear a wrist strap attached to the PC chassis.*

If your PC is running Windows 95, do *not* install the NIC in your PC until you have run the Windows 95 preinstallation procedure described in Chapter 2. If you do not run the preinstallation procedure, Windows will install the default driver and the 3Com NIC Diagnostics program will not be installed on your hard disk.

Remove all jewelry from your hands and wrists and use only insulated or nonconducting tools.

Follow these steps to install the NIC in your PC:

1 **Turn off power to the PC, and remove the power cord from the PC.**

2 **Unscrew the cover screws and remove the cover.**

On some PCs, it may be necessary to remove all cables before the cover can be removed.

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3 Locate an available ISA or EISA slot and remove the screw from the corresponding backplate (Figure 1-2). Save the screw.

Some PCs have both ISA and PCI slots. Make sure that you install the EtherLink III ISA NIC in either an ISA or an EISA slot. See Figure 1-2.

PCI slots, the shortest of the three types of slots, are white. The longer ISA slots are black. EISA slots, the longest, are brown.

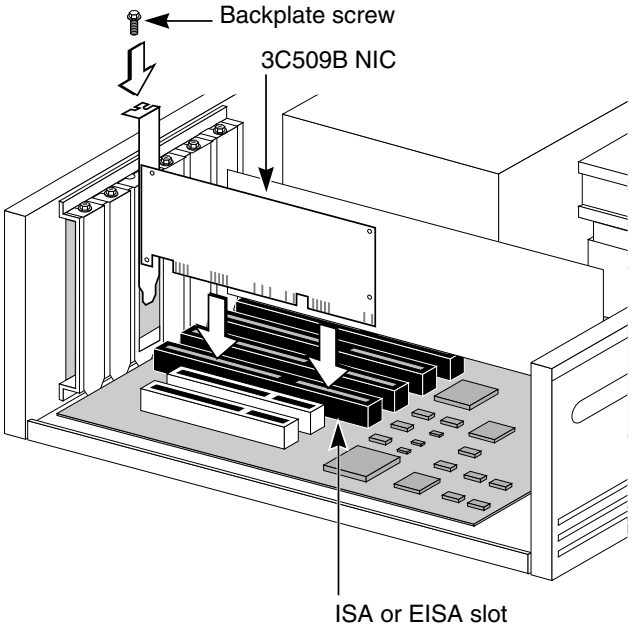


Figure 1-2 Installing the 3C509B NIC

4 Remove and discard the backplate.

5 Ensure that the shape and length of the edge connector on the NIC match the slot that you intend to use (Figure 1-2).

6 Carefully insert the NIC into the slot; press firmly with steady pressure to ensure that the NIC is fully seated in the slot.

When the NIC is correctly inserted in the slot, the NIC backplate is flush with the PC backplate.

7 Secure the NIC with the backplate screw.

8 Replace the PC cover. Reinsert and tighten the cover screws.

9 Reconnect all power and peripheral cables.

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Connecting to the Network

This section describes how to connect the 3C509B NIC to an Ethernet network using an RJ-45, BNC, or AUI port. Each 3C509B NIC provides different network ports, as shown in Figure 1-1.

When you first install the NIC and power on the PC, the LED on the NIC backplate lights, but the link is not active. To enable the link, you must load the network drivers. See "Link LED" in this chapter for more information.

Follow these steps to connect the RJ-45 port on the 3C509B-TPO, TPC, TP, and COMBO NICs to the network:

1 Plug the RJ-45 connector on the twisted-pair network cable into the RJ-45 port on the NIC backplate. See Figure 1-3.

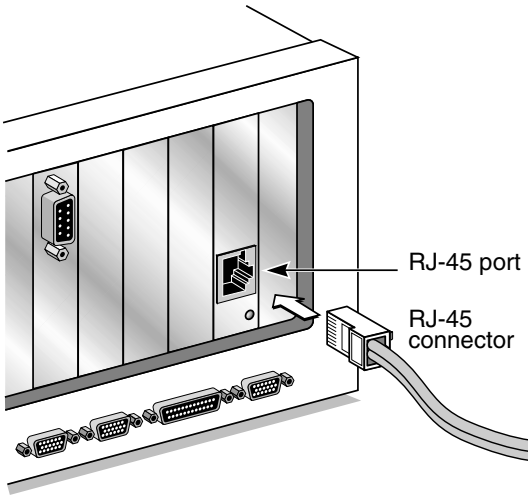


Figure 1-3 Connecting to the RJ-45 Port on the 3C509B NIC

2 Connect the other end of the network cable to an active network port.

Go to "Link LED" later in this chapter.

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Follow these steps to connect the BNC port on the 3C509B-TPC and COMBO NICs to the network:

1 **Connect the BNC connector on the thin Ethernet coaxial cable to the BNC port on the NIC. See Figure 1-4.**

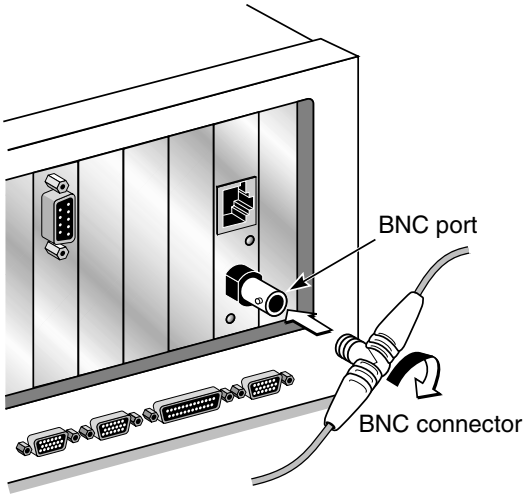


Figure 1-4 Connecting to the BNC Port on the 3C509B-TPC NIC

2 **Connect the other end of the network cable to another PC or a 50-ohm terminator.**

Go to "Link LED" later in this chapter.

Follow these steps to connect the AUI port (Figure 1-5) on the 3C509B-TP and COMBO NICs to the network:

1 **Locate the 15-pin AUI port on the NIC and move the slide latch down to the open position.**

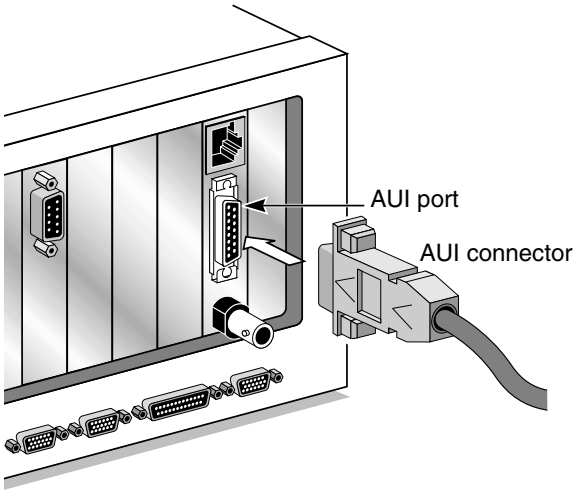


Figure 1-5 Connecting to the AUI Port on the 3C509B-COMBO NIC

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2 **Connect the thick Ethernet coaxial cable to the AUI port on the NIC.**

This connector will only attach one way. Orient the AUI connector to match the AUI port on the NIC.

3 **Move the slide latch up to the closed position to lock the AUI connector in place.**

4 **Connect the other end of the network cable to an external transceiver.**

Go to the next section.

Link LED

The 3C509B NICs have a light-emitting diode (LED) that indicates whether an active 10BASE-T network connection exists between the NIC and the hub. The LED flashes if the polarity of the network cable is reversed.



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

Table 1-2 describes the LED states.

Table 1-2 NIC LED Interpretation

LED State	Meaning
On	If drivers are installed, the connection is active. If drivers are not installed, this state indicates that the NIC is receiving power.
Off	If the LED is not lit, something is preventing the connection between the NIC and the hub.
Blinking	If the LED is blinking, the cable polarity is reversed. Try a different network cable or contact your MIS representative.

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

1 **Ensure that your network hub and the network cable connecting to your EtherLink III NIC comply with the 10BASE-T specifications.**

2 **Ensure that the hub is powered on.**

You have completed the hardware installation. To install software:

- For PCs running Windows 95 or Windows NT, go to Chapter 2.
- For PCs running DOS, Windows 3.x, or Windows for Workgroups, go to Chapter 4.

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2 SETUP FOR CUSTOM INSTALLATION

This chapter describes how to set up your Windows 95 or Windows NT PC so that you can use the 3Com Installation Wizard to install and configure a 3C509B NIC.

If you are running Windows 95, you must first determine if a Plug and Play BIOS is installed in your PC. See "Performing the Preinstallation Procedure" later in this chapter.

If you are running Windows 95 with a Plug and Play PC, you can also perform an Express installation. See the *3Com EtherLink III ISA Quick Guide* for Express installation procedures.

If your PC is not running Windows 95 or Windows NT, go to Chapter 4.

Selecting the Type of Installation

The two ways to install and configure the NIC using the 3Com Installation Wizard are Express installation and Custom installation.

Express Installation

Express installation, the installation method that most typical Windows 95 users choose, is fast and easy and requires only minimal user intervention. Refer to the *EtherLink III ISA Network Interface Card Quick Guide* that came with the 3C509B NIC for information on how to perform the Express installation.

Express installation loads the latest drivers from the *EtherDisk* diskette, automatically tests the NIC and your network, and dynamically binds TCP/IP to the NIC.

If you do not have a DHCP server on your network, or if you have a static TCP/IP address, you must use the Custom installation option instead to install and configure the NIC.



Express installation is not available to Windows NT users.

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Custom Installation

Custom installation is for knowledgeable network users who need to use different configuration settings or change test sequences for automated installations. This option is for network administrators, MIS departments, and value-added resellers (VARs) who need to automate the installation process. Custom installation also enables you to save the configuration settings and test options that you select during the installation for use in future installations.

Custom installation loads the latest drivers from the *EtherDisk* diskette, automatically tests the NIC and your network, and configures TCP/IP (dynamic or static address). The Custom option also allows you to change configuration settings, disable tests, and save installation settings for future installations.

If you are installing the NIC in a Windows 95 PC that does not have a Plug and Play BIOS installed, you must install the NIC using the Custom installation option.

Multiple NIC Installations

- **For Windows 95**—Install and configure each NIC individually according to the appropriate procedures (Plug and Play or non–Plug and Play). See Chapter 1, Chapter 2, and Chapter 3.
- **For Windows NT**—Follow the procedure "Installing Multiple NICs in a Windows NT PC" in Chapter 5.

Windows 95 Setup

This section describes how to set up your Windows 95 environment to install and configure the 3C509B NIC using the 3Com Installation Wizard Custom installation option. This section includes procedures for PCs with or without a Plug and Play BIOS.

Figure 2-1 provides a graphical overview of the steps required for installing and configuring the 3C509B NIC under Windows 95.

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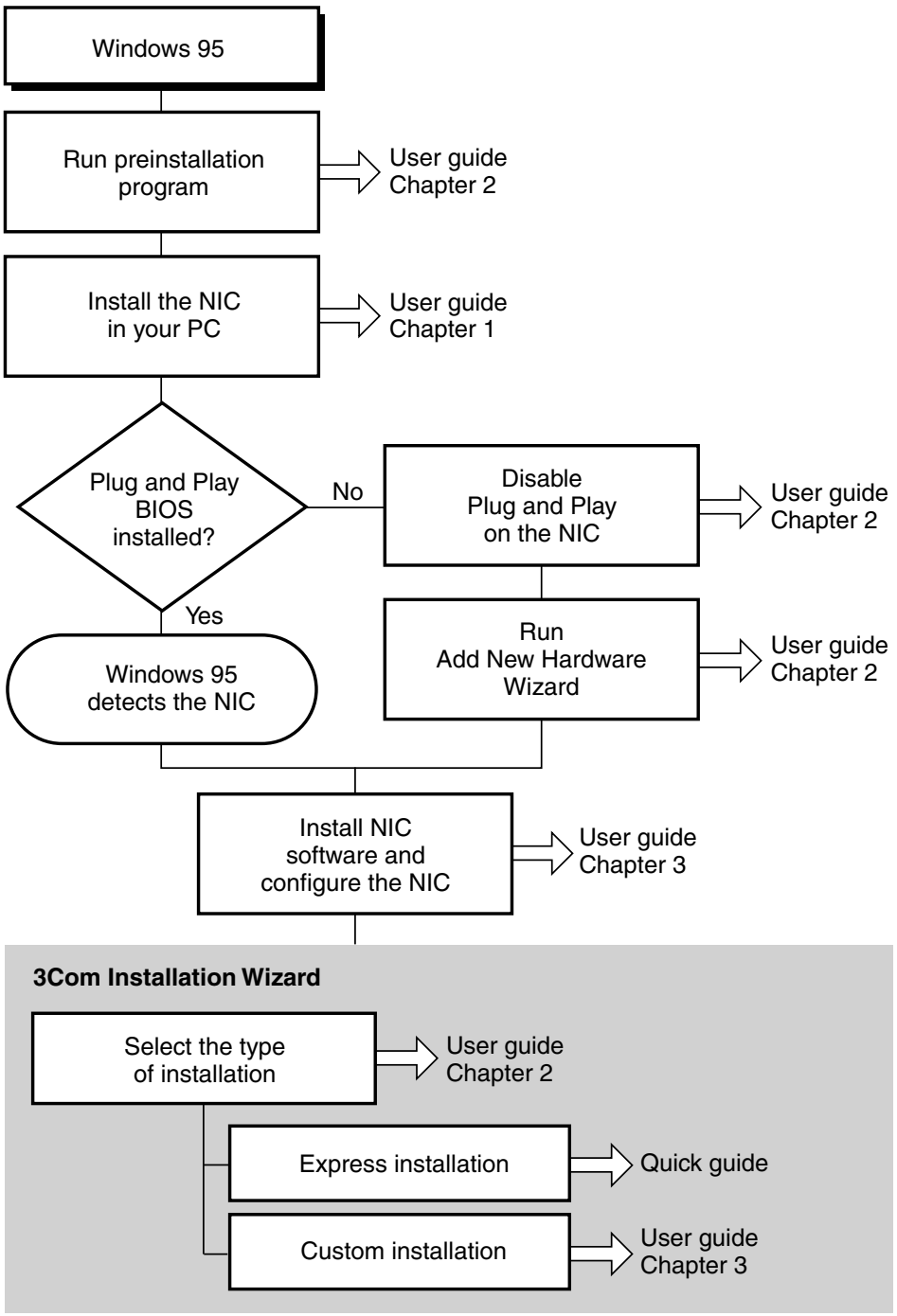


Figure 2-1 Windows 95 NIC Installation Overview

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Performing the Preinstallation Procedure

Preinstallation is important for proper setup of your Windows 95 system environment. You must perform this procedure to ensure that the latest NIC driver and the 3Com NIC Diagnostics (a Windows-based program) can be successfully installed.

Follow these steps to perform the preinstallation procedure:

1. **Turn the power on and boot Windows 95.**
2. **Click *Start* in the Windows 95 taskbar, and then click *Run*.**
3. **Insert *EtherDisk* diskette 2 in drive A, and then enter:**

   ```
   a:\preinst1
   ```

4. **Click *OK*.**

   The Preinstallation Software screen appears, as shown in Figure 2-2, displaying a list of available IRQs.

Record these IRQs. You need to verify that one of these available IRQs is assigned to the NIC when the NIC Configuration Settings screen (Figure 3-2) appears later in the 3Com Installation Wizard.

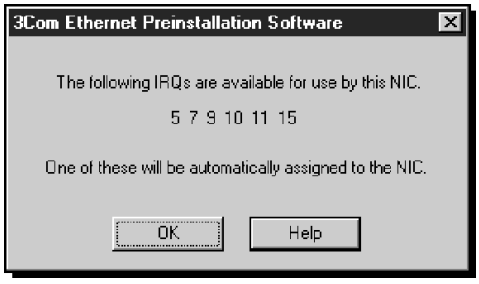


Figure 2-2 Preinstallation Software Screen

5. **Click *OK*.**

   If your PC supports the Windows 95 Plug and Play feature, the next step is to install the NIC in your PC (see Chapter 1). Then go to the next section to configure the NIC.

   If your PC does not support the Windows 95 Plug and Play feature, the screen shown in Figure 2-3 appears. Click *OK* and go to the section "Disabling Plug and Play on the NIC" later in this chapter.

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Figure 2-3 non–Plug and Play BIOS Detected Screen

To install the NIC using the 3Com Installation Wizard Express installation option, see the EtherLink III ISA Network Interface Card Quick Guide *that shipped with the 3C509B NIC. To set up the NIC for installation using the 3Com Installation Wizard Custom installation option, go to the next section.*

Configuring the NIC in a Plug and Play PC

This section describes how to set up your system environment when installing the NIC in a Windows 95 PC that has a Plug and Play BIOS installed.

Follow these steps to configure the NIC:

1 **Turn the power on and boot Windows 95.**

The New Hardware Found screen appears. Then the Update Device Driver Wizard screen is displayed, as shown in Figure 2-4.

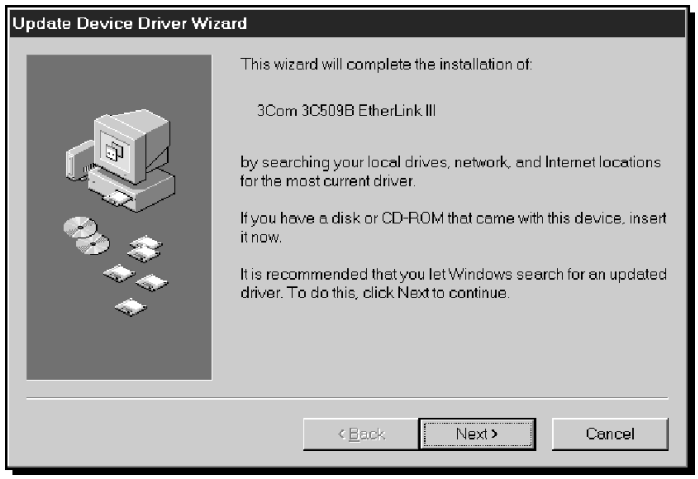


Figure 2-4 Update Device Driver Wizard Screen

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2 Insert *EtherDisk* diskette 1 in drive A.

3 Click *Next*.

Windows 95 displays the Update Device Driver Wizard again, this time confirming that it has found the updated NIC driver. See Figure 2-5.

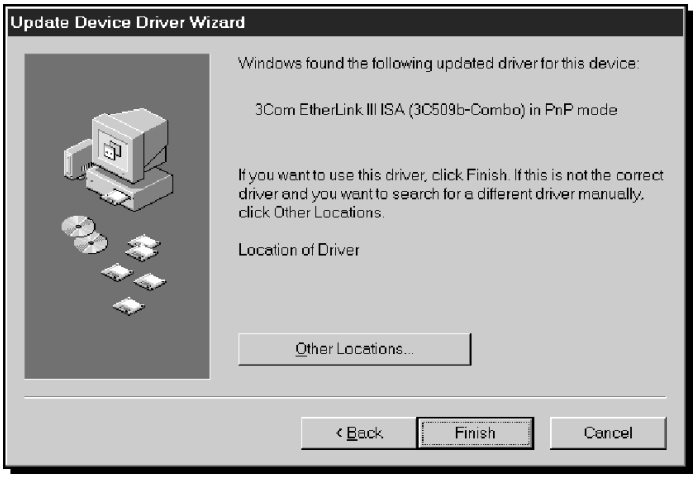


Figure 2-5 Updated Driver Found Screen

4 Click *Finish*.

The Insert Disk dialog box appears and prompts you for *EtherDisk* diskette 1.

5 Click *OK*.

The Copying Files dialog box appears, prompting you for the location of files on *EtherDisk* diskette 1.

6 If it is not already displayed in the Copy files from entry box, type:

`a:\`

7 Click *OK*.

Windows 95 copies the required files to your hard disk and builds the driver information database. The Insert Disk dialog box then appears, prompting you for the disk labeled:

`3Com NIC Windows 95 Installation Media`

8 Click *OK*.

9 If it is not already displayed in the Copy files from entry box, type:

`a:\`

10 Click *OK*.

The 3Com Installation Wizard starts. Go to Chapter 3.

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Disabling Plug and Play on the NIC

If your Windows 95 PC does not support Plug and Play, you must disable Plug and Play on the NIC before you can install the NIC software.

Follow these steps to disable Plug and Play on the NIC:

1. **After installing the NIC in the PC, turn the power on and boot Windows 95.**
2. **Insert *EtherDisk* diskette 2 in drive A.**
3. **Click *Start* in the Windows 95 taskbar, and then click *Run*.**
4. **Enter:**

   `a:\pnpdsabl.bat`

   The DOS PNPDSABL screen appears, as shown in Figure 2-6.



Figure 2-6 DOS PNPDSABL Screen

5. **Click the X in the upper right corner of the screen to close the DOS screen and return to Windows 95.**

   Plug and Play is disabled on the NIC.
6. **Remove the diskette from drive A.**
7. **Shut down the PC and turn the power off, then on.**

   The NIC is not detected when the PC reboots.

   The next step is to configure the NIC.

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Configuring the NIC

This section describes the procedure to install NIC software and configure the NIC when Plug and Play has been disabled on the NIC.

Follow these steps to install the NIC software and configure the NIC:

1 **Double-click the My Computer icon, double-click the Control Panel icon, and then double-click the Add New Hardware icon.**

The Add New Hardware Wizard starts and displays the first screen.

2 **Click *Next.***

You are prompted to let Windows 95 search for your new hardware.

3 **Select *No*, and then click *Next*.**

The Add New Hardware Wizard displays the Hardware Types list box.

4 **Select *Network adapters* and click *Next*.**

Windows 95 updates the driver database and then displays the Select Device screen, as shown in Figure 2-7.

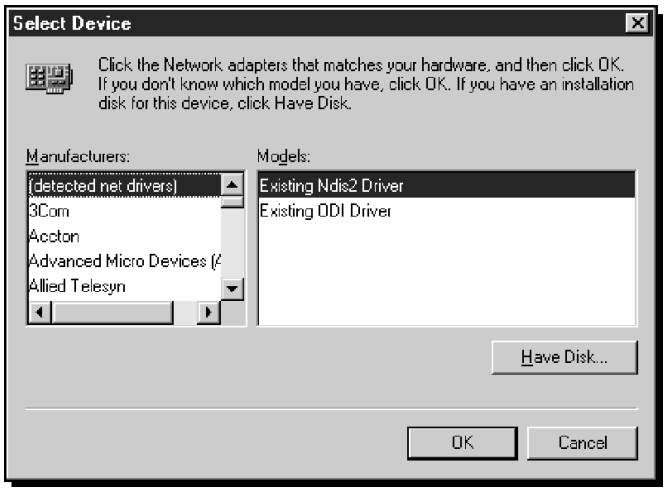


Figure 2-7 Select Device Screen

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5 Insert *EtherDisk* diskette 1 in drive A and click *Have Disk.*

The Install from Disk screen appears, as shown in Figure 2-8.



Figure 2-8 Install from Disk Screen

6 If it is not already displayed in the Copy manufacturer's files from entry box, enter:

```
a:\
```

7 Click *OK*.

The Select Device screen shown in Figure 2-9 appears, with *3Com EtherLink III ISA (3C509/3C509b) in ISA mode* selected.

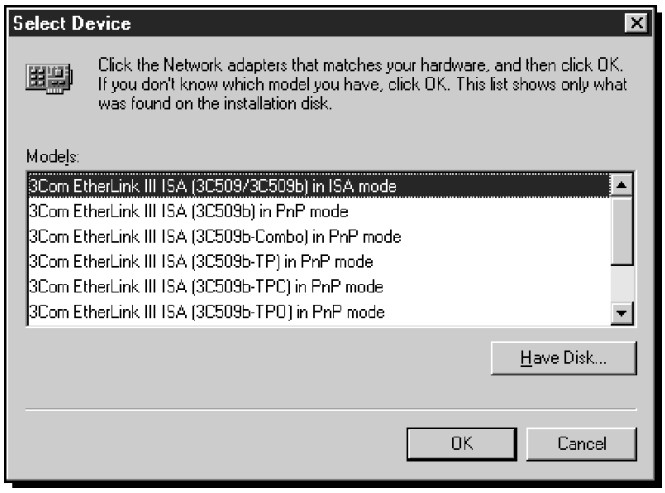


Figure 2-9 Select Device Screen

8 Click *OK*.

Windows 95 copies the required files and updates the driver database. The Add New Hardware Wizard displays a screen showing the I/O range assigned to the 3C509B NIC, as shown in Figure 2-10.

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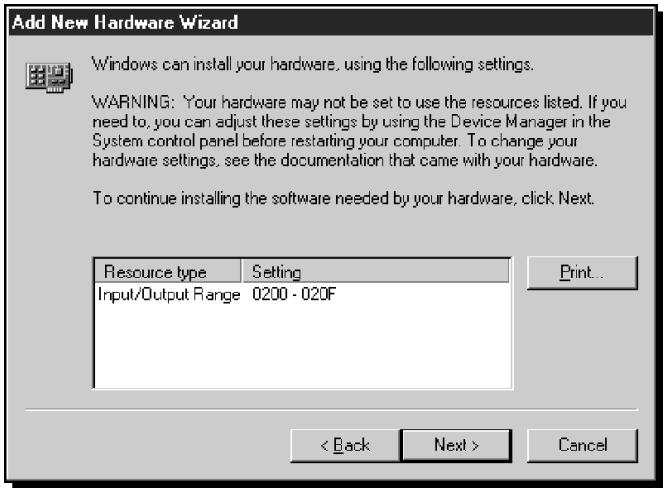


Figure 2-10 I/O Range Assigned to the NIC Screen

9 Write down the I/O range setting displayed in the list box (or click *Print*, if you are connected to a printer), and then click *Next*.

When you configure the NIC using the 3Com Installation Wizard, you must make sure that this setting matches the value displayed on the NIC Configuration Settings screen. See Figure 3-2.

Windows 95 copies the required files to your hard disk. The 3Com Installation Wizard starts.

CAUTION: *I/O base address 0x110 is reserved for system resources. If this address is assigned to a hardware device in your PC, contact your network administrator before continuing.*

The next step is to use the 3Com Installation Wizard to install NIC software and configure the NIC. Go to Chapter 3.

Windows NT Setup

This section describes how to set up your Windows NT 3.51 or 4.0 system environment to install the 3C509B NIC using the 3Com Installation Wizard Custom installation option.

WARNING: *If you are installing multiple 3C509B NICs in a Windows NT PC, you must follow the specific procedure provided in "Installing Multiple NICs in a Windows NT PC" in Chapter 5.*

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Figure 2-11 provides a graphical overview of the steps required for installing and configuring the 3C509B NIC under Windows NT.

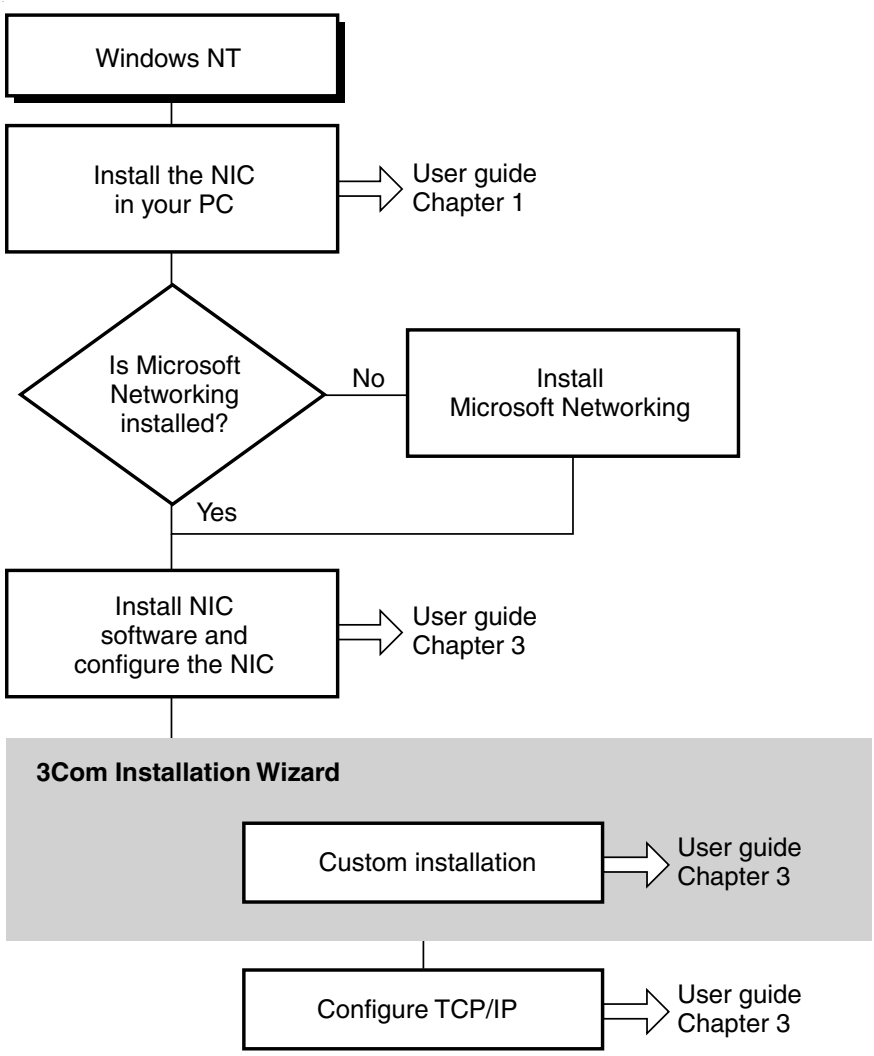


Figure 2-11 Windows NT NIC Installation Overview

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Follow these steps to install and configure the 3C509B NIC under Windows NT:

1 **Install the NIC in your PC. See Chapter 1.**

2 **Boot Windows NT.**

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

The Network screen appears.

4 **Click the Adapters tab, click *Add,* and then click *Have Disk.***

The Insert Disk screen appears.

5 **Insert *EtherDisk* diskette 1 in drive A.**

6 **Ensure that the path to drive A appears in the entry box, and then click *OK*.**

The Select OEM Option screen appears.

7 **If not already selected, select *3Com EtherLink III (3c509) ISA Adapter* and click *OK*.**

The 3Com EtherLink III (3c509) ISA Adapter Bus Location screen appears.

8 **Ensure that *Bus Type: ISA* and *Bus Number: 0* appear in their respective selection boxes, and then click *OK*.**

Windows NT Setup copies the required files to your hard disk. The 3Com Installation Wizard starts.

The next step is to use the 3Com Installation Wizard to install the NIC software and configure the 3C509B NIC. Go to Chapter 3.

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3 3COM INSTALLATION WIZARD

This chapter describes how to install and configure the 3C509B NIC under Windows 95 or Windows NT using the 3Com Installation Wizard Custom installation option.

To install the NIC using the Express installation option, see the *EtherLink III ISA Network Interface Card Quick Guide*.

Custom Installation

In the last step of the Windows 95 setup procedure in Chapter 2, clicking *Next* starts the 3Com Installation Wizard.

In the last step of the Windows NT setup procedure in Chapter 2, clicking *OK* starts the 3Com Installation Wizard.

The first 3Com Installation Wizard screen is shown in Figure 3-1.

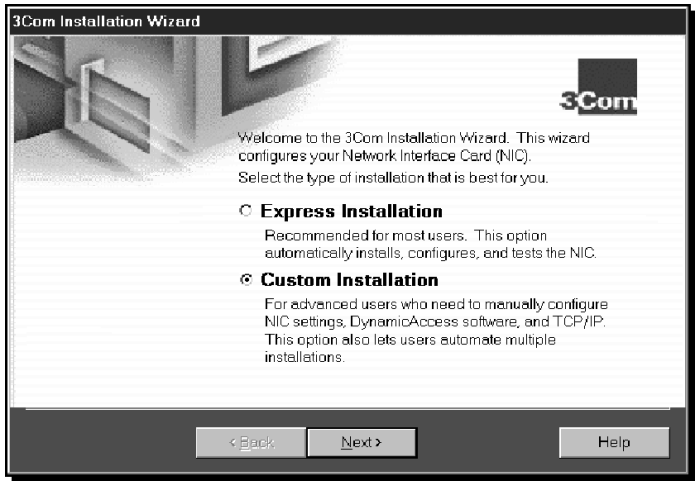


Figure 3-1 Selecting Custom Installation Screen

Follow these steps to perform a Custom installation:

1. **Select the *Custom Installation* radio button, shown in Figure 3-1.**
2. **Click *Next*.**

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Configuring the NIC

The NIC Configuration Settings screen appears, as shown in Figure 3-2. The list box displays recommended configuration settings for the NIC. You can either accept the recommended settings or change one or more to suit your operating environment.

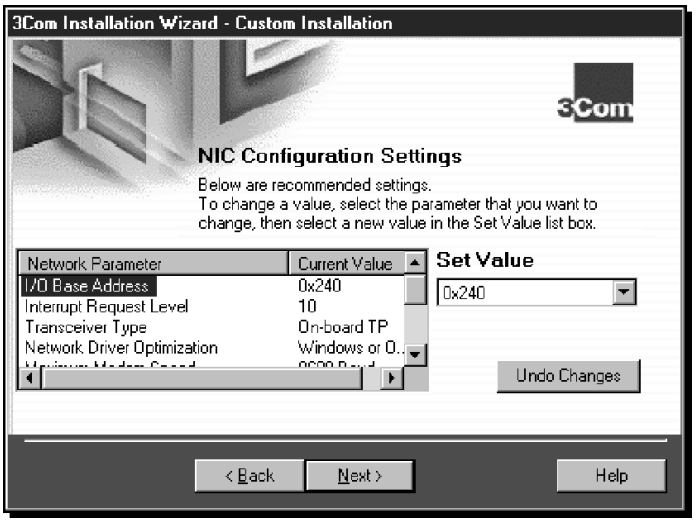


Figure 3-2 NIC Configuration Settings Screen

For Windows 95 non–Plug and Play PCs, make sure that the I/O Base Address value shown in the list box under Current Value is the same value that you wrote down in "Configuring the NIC" in Chapter 2. Also make sure that the Interrupt Request Level value is one of the available values that you wrote down in "Performing the Preinstallation Procedure" in Chapter 2.

To Accept Configuration Settings

Follow these steps to accept the recommended configuration settings:

1 **Click *Next*.**

2 **Go to "Testing the NIC and the Network Connection" later in this chapter.**

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To Modify Configuration Settings

Follow these steps to change configuration settings in a Windows 95 non–Plug and Play PC:

1. **Under Network Parameter, select *I/O Base Address*.**
2. **In the Set Value selection box, click the scroll arrow to select the I/O range setting that you wrote down in "Configuring the NIC" in Chapter 2. See Figure 3-2.**
3. **Under Network Parameter, select *Interrupt Request Level*.**
4. **In the Set Value selection box, click the scroll arrow to select an interrupt request level that matches one of the available IRQs that you wrote down in "Performing the Preinstallation Procedure" in Chapter 2. See Figure 2-2.**
5. **When you have finished changing the settings, click *Next*.**

The next step is to test the NIC and the network connection.

Testing the NIC and the Network Connection

It is recommended that you test the NIC and then the network to verify that each is functioning properly before you continue the installation.

The NIC Test screen appears, as shown in Figure 3-3.



Figure 3-3 NIC Test Screen

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Follow these steps to test the NIC:

1 **Click *Perform NIC Test*.**

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

If a test fails, a message indicates the error type. Click the *Help* button in the error message screen to obtain more information. Chapter 5 provides additional troubleshooting help.

A message confirms that the NIC is functioning correctly.

2 **Click *Next*.**

The Network Connection Test screen appears, as shown in Figure 3-4.

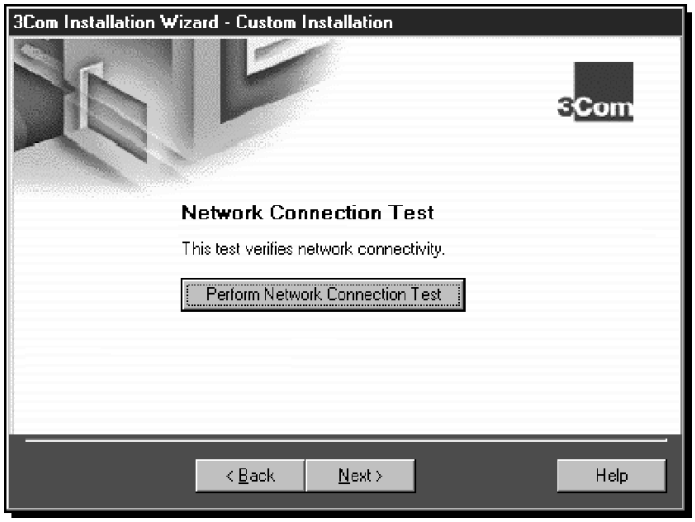


Figure 3-4 Network Connection Test Screen

Follow these steps to test the network connection:

1 **Click *Perform Network Connection Test* to verify that the network is functioning correctly.**

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

If a test fails, a message indicates the error type. Click the *Help* button in the error message screen to obtain more information. Chapter 5 provides additional troubleshooting help.

A message confirms that the network is functioning correctly.

2 **Click *Next*.**

- **For Windows NT**—Go to "Configuring Dynamic*Access* Software" later in this chapter.
- **For Windows 95**—The TCP/IP Inquiry screen appears, as shown in Figure 3-5.

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Installing TCP/IP Under Windows 95

Installing and configuring TCP/IP is optional. If you want to access the Internet, you *must* install and configure TCP/IP.

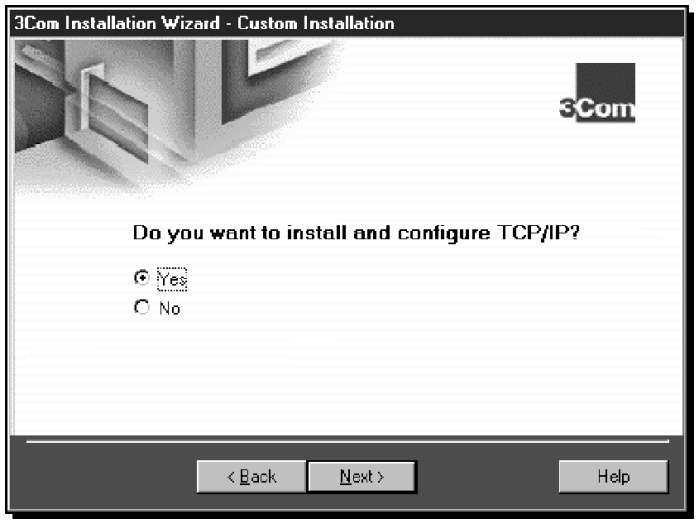


Figure 3-5 TCP/IP Inquiry Screen

To Not Install TCP/IP

Follow these steps if you do *not* want to install TCP/IP:

1. **Select the *No* radio button.**
2. **Click *Next*.**

   Go to the section "Identifying Your PC on the Network" later in this chapter.

To Install TCP/IP

Follow these steps to install and configure TCP/IP:

1. **Select the *Yes* radio button.**
2. **Click *Next*.**

   The TCP/IP Configuration screen appears, as shown in Figure 3-6. The next step is to configure TCP/IP.

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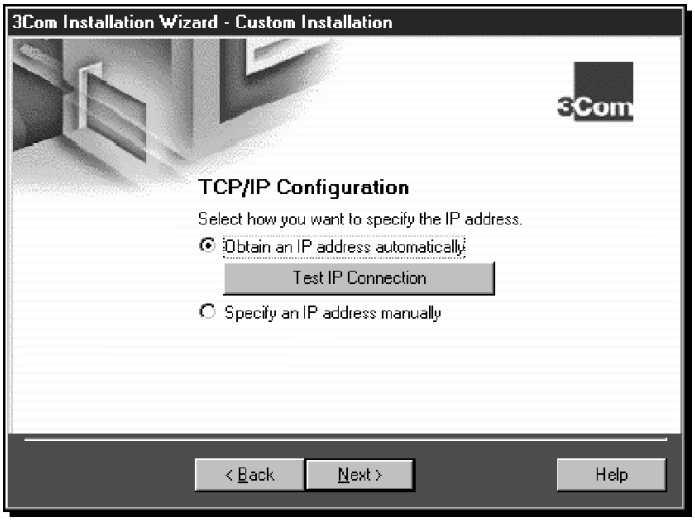


Figure 3-6 TCP/IP Configuration Screen

Configuring TCP/IP Under Windows 95

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

To Obtain an IP Address Automatically

Follow these steps to obtain an IP address automatically:

1 **Select the *Obtain an IP address automatically* radio button.**
This option dynamically assigns a new IP address each time you connect to the network.

2 **Click *Test IP Connection* to test the DHCP server connection.**
While the test is running, a progress bar indicates test progress.

If a test fails, a message indicates the error type. Click the *Help* button in the error message screen to obtain more information. Chapter 5 provides additional troubleshooting help.

A message confirms that the connection to the DHCP server is functioning.

3 **Click *Next*.**
Go to "Configuring DNS" later in this chapter.

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To Specify an IP Address Manually

Follow these steps to specify an IP address manually:

1 **Select the *Specify an IP address manually* radio button.**

2 **Click *Next*.**

The Specify an IP Address screen appears, as shown in Figure 3-7.

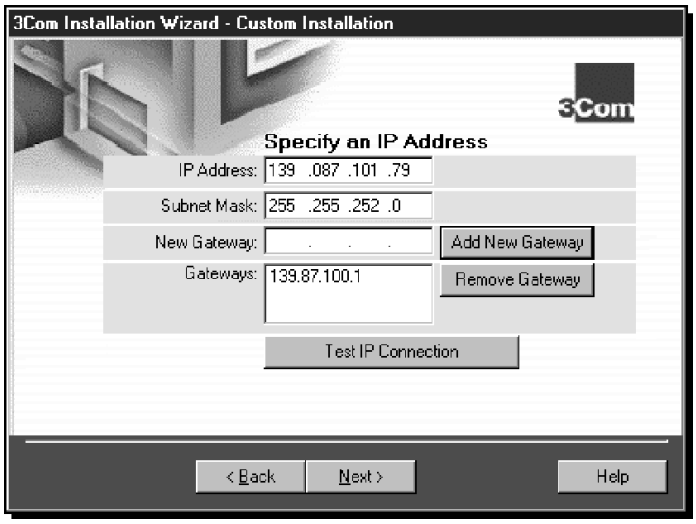


Figure 3-7 Specify an IP Address Screen

3 **Enter the IP address.**

4 **Enter the subnet mask.**

5 **Enter the new gateway address.**

At least one gateway must appear in the Gateways list box before you can advance to the next screen.

6 **Click *Add New Gateway* to add the new gateway configuration.**

The gateway is listed in the Gateways list box.

7 **Click *Test IP Connection* to verify that the gateway connection is functioning.**

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

If a test fails, a message indicates the error type. Click the *Help* button in the error message screen to obtain more information. Chapter 5 provides additional troubleshooting help.

A message confirms that the IP address is valid and functioning.

8 **Click *Next*.**

The next step is to configure DNS.

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Configuring DNS

Dynamic Name Server (DNS) converts a World Wide Web URL to an actual IP address. You can configure DNS either automatically or manually depending on how your network is set up.

When you click *Next* in the previous section, the DNS Configuration screen appears, as shown in Figure 3-8.

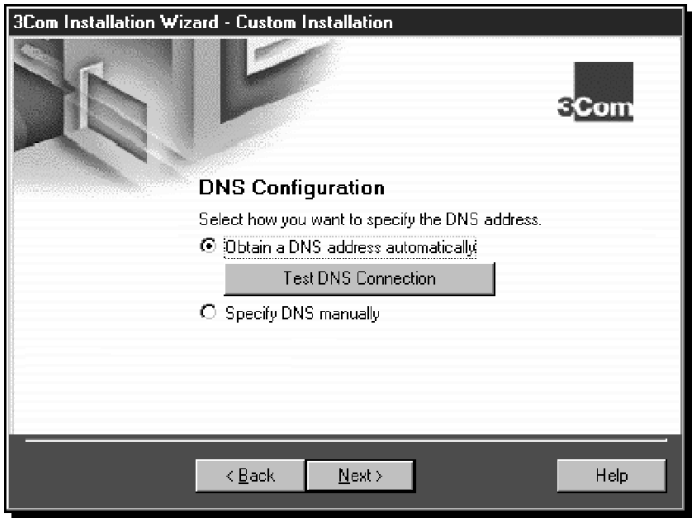


Figure 3-8 DNS Configuration Screen

To Obtain a DNS Address Automatically

Follow these steps to obtain a DNS address automatically:

1 **Select the *Obtain a DNS address automatically* radio button.**

This choice gives you a new DNS address each time you log on to the network.

2 **Click *Test DNS Connection* to verify that the connection to the DNS server is functioning.**

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

If a test fails, a message indicates the error type. Click the *Help* button in the error message screen to obtain more information. Chapter 5 provides additional troubleshooting help.

A message confirms that the DNS connection is functioning.

3 **Click *Next*.**

The next step is to identify your PC on the network. Go to "Identifying Your PC on the Network" later in this chapter.

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To Specify a DNS Address Manually

Follow these steps to specify a DNS address manually:

1 **Select the *Specify DNS manually* radio button if you are using a permanent DNS address. See Figure 3-9.**

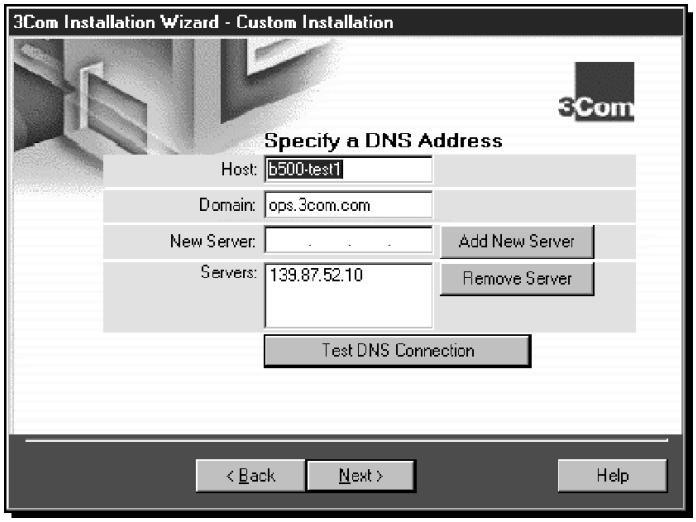


Figure 3-9 Specifying a DNS Address Screen

If DNS has been previously configured on your PC, the fields on this screen may already be filled in.

If DNS has not been previously configured on your PC, these fields are blank and you must fill them in to enable DNS.

2 **Enter the host and domain data in their respective fields.**

3 **To configure a new server, enter the new server address, and then click *Add New Server.***

The new server appears in the Servers list box.

4 **Click *Test DNS Connection* to verify that the connection to the DNS server is functioning.**

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

If a test fails, a message indicates the error type. Click the *Help* button in the error message screen to obtain more information. Chapter 5 provides additional troubleshooting help.

A message confirms that the DNS connection is functioning.

5 **Click *Next*.**

The next step is to identify your PC on the network.

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Identifying Your PC on the Network

When you click *Next* in the previous section, the Network Identification screen appears, as shown in Figure 3-10. This screen enables you to identify your PC on the network. Contact your network administrator if you do not have information to enter in these fields.

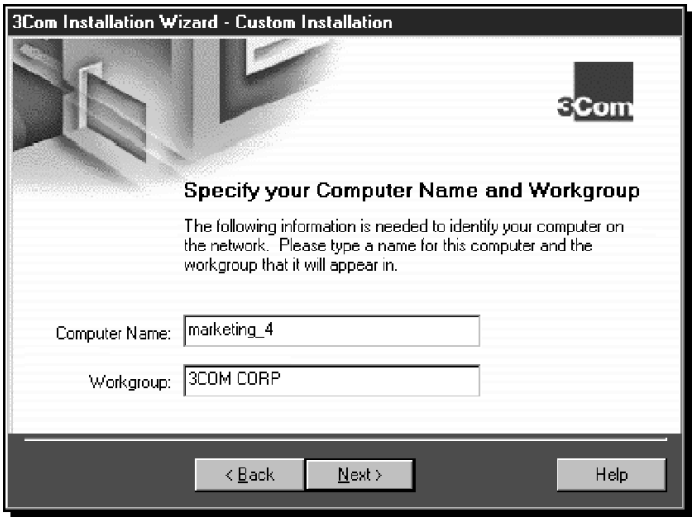


Figure 3-10 Network Identification Screen

Follow these steps to enter field data:

1 **Type the name of your computer.**

There are many PCs and other devices on a network—each one must be uniquely identified on the network. This name identifies your PC on the network. The name can have up to 15 characters. Spaces are not allowed; however, you can use hyphens.

2 **Type your workgroup name.**

This name identifies the group to which your PC belongs to and is likely to communicate with. This group will include most of the network resources that you use. This name can have up to 15 characters. See your network administrator for more information.

3 **Click *Next*.**

The next step is to configure Dynamic*Access*™ software.

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Configuring Dynamic*Access* Software

The Dynamic*Access* feature set optimizes network performance. Dynamic*Access* software includes PACE Interactive Access technology, dRMON (distributed RMON) support, Efficient Multicast Control, and PACE real-time and multimedia application support.

PACE enhances both real-time, interactive applications and multimedia (data, voice, and video) applications by enhancing network bandwidth utilization, reducing latency, controlling jitter, and supporting multiple traffic priority levels.

When you click *Next* in the previous section, the Dynamic*Access* Software Inquiry screen appears, as shown in Figure 3-11.

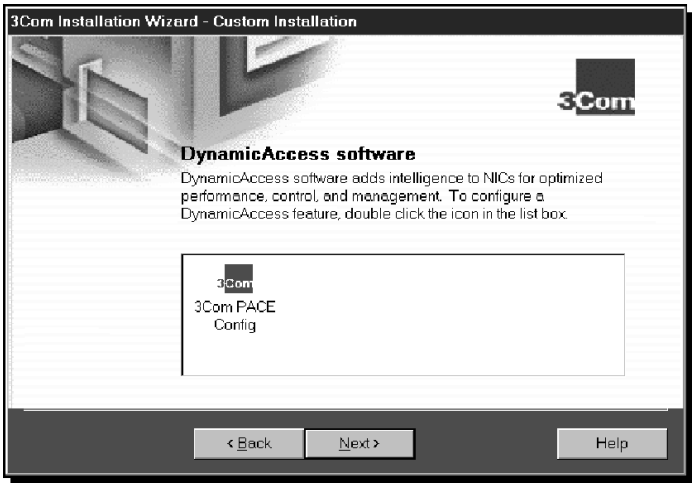


Figure 3-11 Dynamic*Access* Software Inquiry Screen

This screen enables you to identify applications running on your PC that you wish to support using PACE software. Configuring Dynamic*Access* software is optional.

To Not Configure Dynamic*Access* Software

Follow these steps if you do *not* want to configure Dynamic*Access* software:

1 **Click *Next*.**

2 **Go to "Repeating a Previous Installation" later in this chapter.**

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To Configure Dynamic*Access* Software

Follow these steps if you want to configure Dynamic*Access* software:

1 **Double-click the 3Com PACE Config icon shown in Figure 3-11.**

The PACE Support Setup screen appears, as shown in Figure 3-12.

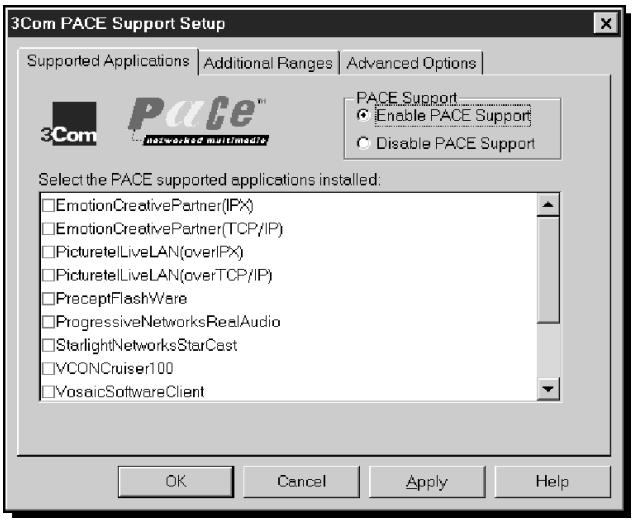


Figure 3-12 PACE Support Setup Screen

2 **Select the *Enable PACE Support* radio button.**

3 **Select the check box next to each application that you want to configure.**

For advanced PACE features and configuration options, see Appendix B.

4 **Click *OK* to return to the Dynamic*Access* Software Inquiry screen.**

5 **Click *Next*.**

Go to the next section.

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Repeating a Previous Installation

You can save the configuration settings and test options that you selected during this installation for use in future installations. Saving settings is optional.

When you click *Next* in the previous section, the Repeat Last Installation screen appears, as shown in Figure 3-13.



Figure 3-13 Repeat Last Installation Screen

To Not Save Installation Settings

Follow these steps if you do *not* want to save these configuration settings:

1. **Select the *No* radio button, and then click *Next*.**
   The Installation Complete screen appears, as shown in Figure 3-16.
2. **Click *Finish*.**
   Go to "Windows 95" if you are running Windows 95 on your PC.
   Go to "Windows NT" if you are running Windows NT on your PC.

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To Save Installation Settings

Follow these steps to save these configuration settings for future installations:

1 **Select the *Yes* radio button, and then click *Next*.**

The Confirm Installation Settings screen appears, as shown in Figure 3-14.

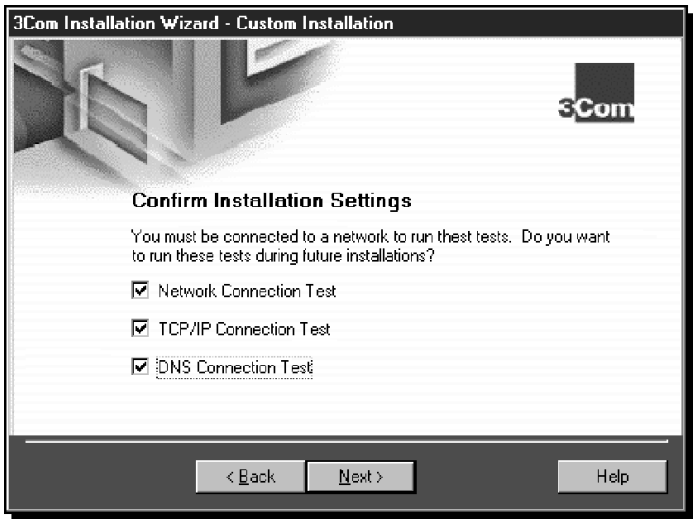


Figure 3-14 Confirm Installation Settings Screen

2 **Select the check boxes for tests that you want to run in future installations, and then click *Next*.**

The Save Installation Settings screen appears, as shown in Figure 3-15.

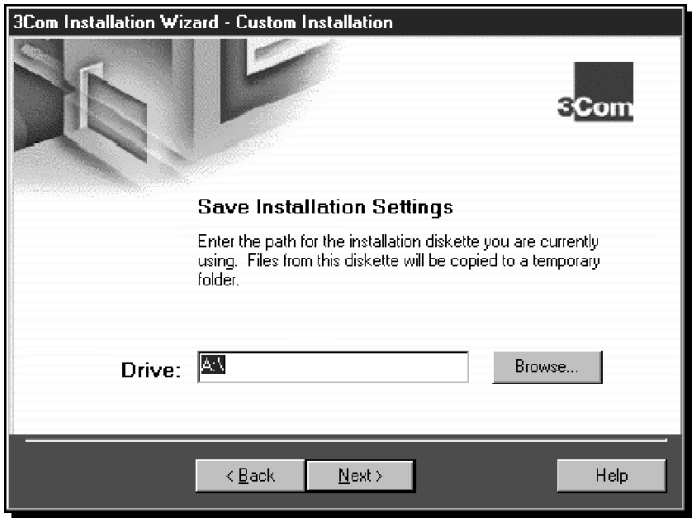


Figure 3-15 Save Installation Settings Screen

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3 Enter the path for the *EtherDisk* diskette that you are using.

This installation diskette is first copied to a temporary directory, and then that file is copied to the drive that you indicate. If you are saving to a diskette, insert a blank, formatted diskette in drive A. Upon completion, remove the diskette from the drive. You can use this diskette to perform future installations.

Otherwise, enter the name of the drive (for example, C:\) where you want to save the installation settings.

4 Click *Next*.

The Installation Complete screen appears, as shown in Figure 3-16.



Figure 3-16 Installation Complete Screen

5 Click *Finish*.

Go to "Windows 95" if you are running Windows 95 on your PC.

Go to "Windows NT" if you are running Windows NT on your PC.

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Completing the Installation and Configuration

Procedures for completing the installation and configuration differ for Windows 95 and Windows NT.

Windows 95

This section describes how to complete the NIC installation and configuration under Windows 95 after you close the 3Com Installation Wizard.

The Insert Disk dialog box appears, prompting you for the Windows 95 CD.

1 **Insert the Windows 95 CD in your CD-ROM drive and click *OK*.**

2 **In the Copy files from box, enter the path to your CD-ROM drive, and then click *OK*.**

A final Microsoft Add New Hardware Wizard screen may appear. If this screen appears, click Finish*. Otherwise, continue.*

The System Settings Change dialog box appears, prompting you to restart. See Figure 3-17.



Figure 3-17 System Settings Change Dialog Box

3 **Click *Yes.***

You have successfully installed and configured the NIC under Windows 95.

The 3Com NIC Diagnostics program icon appears in the taskbar tray. To start the program, double-click the tray icon. To disable the tray icon, right-click the icon and select *Disable Tray Icon*. See Chapter 5 for more information about the 3Com tray icon.

Verify that all existing installed hardware devices are still working. Typical devices to check include a sound card, CD-ROM drive, analog modem, LPT port to a printer, and game ports. If any devices are not working, go to Chapter 5 or the Windows Troubleshooting Help system.

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Windows NT

This section describes how to complete the NIC installation and configuration under Windows NT after you close the 3Com Installation Wizard.

Clicking *Finish* on the Installation Complete screen closes the 3Com Installation Wizard. Windows NT then displays the Adapters tab of the Network screen, as shown in Figure 3-18.

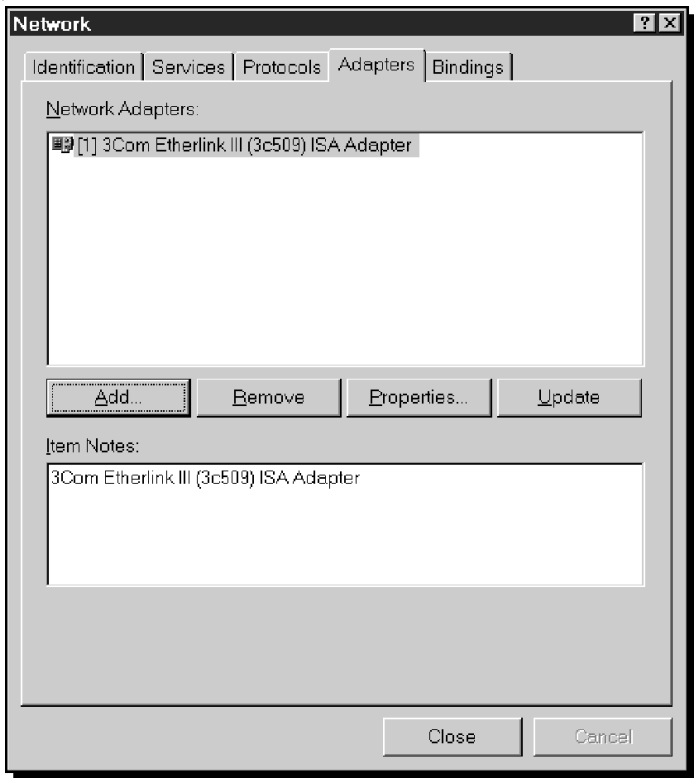


Figure 3-18 Adapters Tab of the Network Screen

The next step is to install and configure TCP/IP in Windows NT either manually or automatically.

1 **Click *Close*.**
The Microsoft TCP/IP Properties screen appears, as shown in Figure 3-19.

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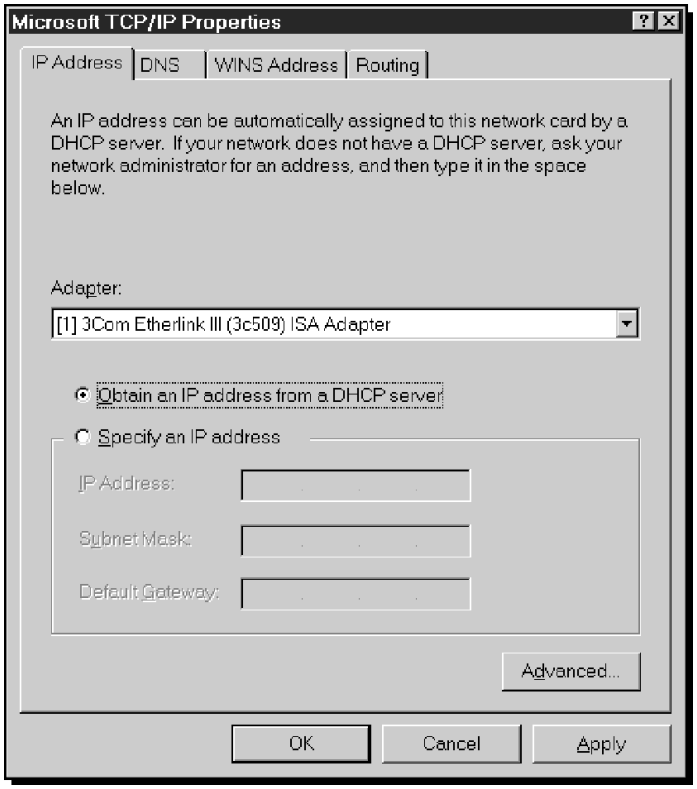


Figure 3-19 Microsoft TCP/IP Properties Screen

2 Choose a method to configure TCP/IP.

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

- **To obtain an IP address automatically**—Follow these steps to install and configure TCP/IP automatically:

a Select the *Obtain an IP address from a DHCP server* radio button.

b Click *OK*.
You are prompted to restart Windows NT.

c Click *OK*.

TCP/IP is installed and configured.

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- **To specify an IP address manually**—Follow these steps to install and configure TCP/IP manually:

a Select the *Specify an IP address* radio button.

b Enter the IP address, subnet mask address, and default gateway address in their respective entry fields.

c Click *OK*.

You are prompted to restart Windows NT.

d Click *OK*.

TCP/IP is installed and configured.

Verify that all existing installed hardware devices are still working. Typical devices to check include a sound card, CD-ROM drive, analog modem, LPT port to a printer, and game ports. If any devices are not working, go to Chapter 5 or the Windows Troubleshooting Help system.

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4 Software Installation and Configuration Under Windows 3.x

This chapter describes how to install NIC software and configure the NIC under DOS, Windows 3.1, or Windows for Workgroups. If your PC is running Windows 95 or Windows NT, go to Chapter 2 and Chapter 3.

Installing NetWare Drivers for DOS, Windows 3.1, and Windows for Workgroups

This section describes how to use the AutoLink program to install client and driver software for DOS environments and Novell NetWare 3.1x or 4.1x under Windows 3.1 and Windows for Workgroups.

When your system administrator configures a 3Install account on your server, the AutoLink program logs on to the server and updates the client software. AutoLink creates a new AUTOEXEC.BAT file and saves the old file as AUTOEXEC.3CM. AutoLink also creates a new CONFIG.SYS file and saves the old file as CONFIG.3CM.

AutoLink Requirements

The AutoLink program includes an installation program. To use the AutoLink program, your PC should have only one 3C509B NIC installed and a minimum of 1 MB of available hard disk space.

Running the AutoLink Install Program

Follow these steps to run the installation program to configure the NIC:

1. **Install the NIC and connect it to the network, as described in Chapter 1.**
2. **Reboot to DOS.**
3. **Insert *EtherDisk* diskette 2 in drive A.**
4. **Run the installation program. At the DOS prompt, enter:**

   ```
   a:install
   ```

   The main menu is displayed, as shown in Figure 4-1.

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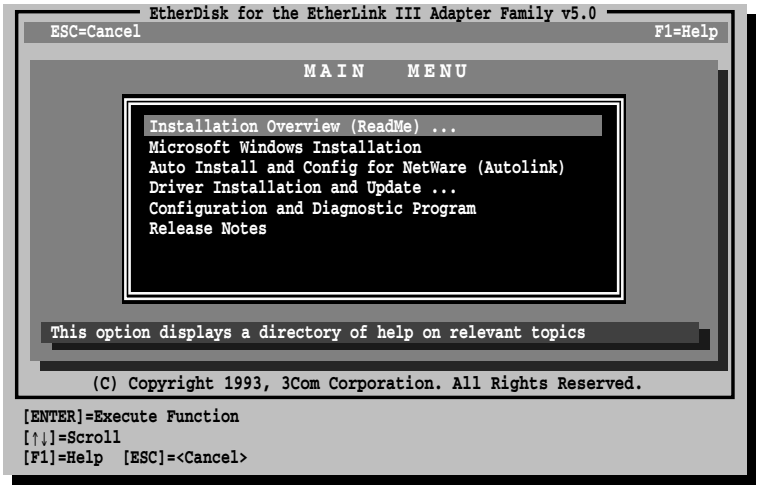


Figure 4-1 Main Menu of the DOS Installation Program

5 Select *Auto Install and Config for NetWare (AutoLink)* and press Enter.

The AutoLink program menu is displayed.

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

7 When the auto installation process is finished, remove *EtherDisk* diskette 2 from drive A 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 problems occur only when using the AutoLink program, display or print the AUTOLINK.LOG file to see a list of all events occurring during the AutoLink installation and configuration process.

- To display the file, Enter:

  `type autolink.log | more`

- To print the file, Enter:

  `print autolink.log`

To install the network drivers for Windows 3.1x, Windows for Workgroups, or DOS in a non-NetWare environment, see the appropriate text files in the HELP directory on EtherDisk *diskette 2.*

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Obtaining NetWare Loadable Modules

You can obtain current NetWare Loadable Modules (NLMs) for the NetWare servers listed in Table 4-1 from the Novell Web site, www.support.novell.com.

Table 4-1 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 3C509B NIC no longer supports NetWare 3.11 and 4.0x servers.

Installing Other Supported Network Drivers

Table 4-2 provides the text file names and driver names for other drivers supported by the 3C509B NIC. Text files for all supported network operating systems are included in the HELP directory on *EtherDisk* diskette 2.

Table 4-2 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

(continued)

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Table 4-2 Network Driver Text File Names (continued)

Network Operating System	Text File Name	Network Driver Name
Windows 95 NDIS 2 16-bit network driver	W95NDIS2.TXT	ELNK3.DOS
NetWare Client 32	CLIENT32.TXT	3C5X9.LAN
NetWare 3.12 Server	NETWARE.411	3C5X9.LAN
NetWare 4 Server	NETWARE.411	3C5X9.LAN
NetWare OS/2	NWOS2ODI.TXT	3C5X9.SYS
Packet driver NOSs	PACKET.TXT	3C5X9PD.COM

Removing NIC Software

EtherDisk diskette 2 includes an uninstallation program to remove the 3C509B NIC software.

To run the uninstallation program, at the DOS prompt, Enter:

```
un3c509.exe
```

The NIC software is removed from your PC.

Configuring the NIC

This section describes how to configure the 3C509B NIC after you install it in your PC. If only one 3C509B NIC is installed and you are running Novell NetWare, use the AutoLink program to configure the NIC and load the appropriate driver, as described earlier in this chapter.

To configure the 3C509B NIC, follow these steps:

1. **Install the NIC (see Chapter 1) and the network driver (earlier in this chapter).**
2. **Reboot to DOS.**
3. **Insert *EtherDisk* diskette 2 in drive A.**
4. **Run the installation program. Enter:**

   ```
   a:install
   ```

   The main menu is displayed, as shown in Figure 4-1.
5. **Select *Configuration and Diagnostic Program*.**

   If you have more than one NIC installed in the PC, select the NIC you want to configure. Tab to the *Select* button and press Enter.
6. **Select *Configure NIC* and press Enter.**

   The NIC Configuration screen is displayed, as shown in Figure 4-2.

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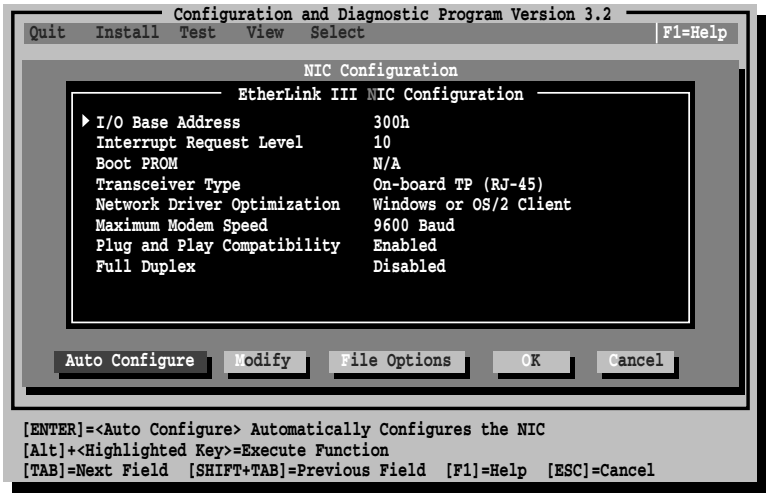


Figure 4-2 NIC Configuration Screen

7 Select *Auto Configure* and press Enter.

The I/O base address, interrupt request level, and transceiver type are automatically configured to settings that do not conflict with other devices 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 selected when configuration is completed.

8 Press Enter to accept the configuration parameters.

The NIC is now configured.

Reconfiguring the NIC

EISA PCs come with an automatic configuration program that allocates resources to each installed hardware device in the PC.

Changing an ISA NIC to EISA mode enables the NIC to be configured by the EISA configuration program for correct EISA PC settings.

You can configure an ISA NIC for EISA mode only if the NIC is installed 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.

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The following procedures are general. If you require more detail, see the configuration documentation that accompanied your PC.

Changing NIC Configuration from ISA to EISA

Follow these steps to configure the 3C509B ISA NIC for an EISA PC:

1. **Run the installation program as described in the previous section.**
2. **From the main menu of the installation program, select *Configuration and Diagnostic Program*.**
3. **If you have more than one NIC installed, use the arrow keys to select the NIC you want to configure. Tab to the *Select* button and press Enter.**

   A screen identifying the NIC is displayed with the *Test* menu bar item highlighted.
4. **Use the arrow keys to select *Install*. The *Configure NIC* option is selected. Press Enter.**
5. **When the NIC Configuration dialog box is displayed, select *Modify* and press Enter.**

   The I/O Base Address field is selected. An I/O Base Address dialog box appears.
6. **Use the arrow key to select *EISA* and press Enter.**

   The I/O base address setting is changed.
7. **Select *OK* to save the new configuration setting and press Enter.**
8. **Exit the program and remove *EtherDisk* diskette 2 from drive A.**
9. **Insert the EISA configuration utility diskette provided with your PC in drive A.**
10. **Turn the power off. Wait 10 seconds, and then turn the power on.**
11. **Follow the instructions accompanying your EISA PC to run the EISA Configuration Program.**

    When the program prompts you for .CFG files to copy, insert *EtherDisk* diskette 2, press Enter, and select the appropriate file:

    For the 3C509B-COMBO NIC, select: !TCM5094.CFG.
    For the 3C509B-TP NIC, select: !TCM5090.CFG.
    For the 3C509B-TPO NIC, select: !TCM5095.CFG.
    For the 3C509B-TPC NIC, select: !TCM5098.CFG.

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If you are prompted for the wrong !TCM file:

a Turn the power off and remove the NIC.

b Clean the edge connectors on the NIC.

c Reinsert the NIC in the slot. Make sure the NIC is fully seated in the slot.

d Turn the power on.

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

Changing NIC Configuration from EISA to ISA

To reconfigure the 3C509B NIC to ISA mode, the NIC must be installed in an EISA slot.

Follow these steps to reconfigure the NIC for an ISA PC:

1 **Run the installation program as described in "Configuring the NIC" earlier in this chapter.**

2 **From the main menu, 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 is displayed with the *Test* menu bar item already selected.**

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 keys to select *ISA* and press Enter.**

The I/O base address setting is changed.

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

8 **Either select the option setting in the NIC Configuration dialog box for parameters that you want to change, or accept the defaults.**

For more information about a setting, select the setting and press F1 (Help).

9 **Select *OK* to save the new configuration setting to the NIC and press Enter.**

10 **Remove *EtherDisk* diskette 2 from drive A.**

11 **Insert the PC configuration program diskette for your PC in drive A and reboot the PC.**

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Changing Configuration Settings

Figure 4-2, 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

Table 4-3 lists each software option, the default setting for that option, and other available settings for that option. For more information about an option, select the option and press F1.

Table 4-3 Option Settings

Option	Default Setting	Supported 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, 8K, 16K, 32K
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, go to "Disabling Plug and Play on the NIC" in Chapter 2.

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Follow these steps to change the configuration settings:

1. **Run the installation program described in "Configuring the NIC" earlier in this chapter.**
2. **From the main menu (see Figure 4-1), select *Configuration and Diagnostic Program*.**
3. **If multiple NICs are installed in the PC, use the arrow keys to select the NIC you want to configure. Press Tab to move to the *Select* button and press Enter.**
4. **Press Tab to display the dialog box, and then select the option that 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 other options. For more information on a specific option, select the option and press F1.**
7. **To save the new settings, select *OK* and press Enter.**

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5 WINDOWS 95 AND WINDOWS NT TROUBLESHOOTING

This chapter explains how to isolate and solve problems that may occur when you install the 3C509B NIC in a PC running Windows 95 or Windows NT.

Checklist

If you experience problems installing the NIC, first check these items:

- Check the NIC LED, as described in "Link LED" in Chapter 1.
- Check the connectors. Examine the cable for obvious signs of damage, wear, or crimping. Substitute a known working cable.
- Check whether the NIC software is correctly installed. Refer to Chapter 2 and Chapter 3.

If the problem persists, go to related procedures in this chapter or refer to Appendix D, "Technical Support."

Resolving Hardware Conflicts in Windows 95 and Windows NT

Follow these steps to resolve hardware resource conflicts (I/O base address or interrupt request level) if your PC is running either Windows 95 or Windows NT.

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

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

If you discover that you have a resource conflict, you can change the I/O base address or the interrupt request level (IRQ). If you are adding new hardware to your system, you may need to change a resource assignment to avoid a conflict. The following procedures describe how to change resource allocations for your Windows 95 or Windows NT PC.

Windows 95

Follow these steps to change the IRQ level assignment or the I/O base address in a Windows 95 PC:

1. **Double-click the My Computer icon, double-click the Control Panel icon, and then double-click the System icon.**
   The System Properties window is displayed.
2. **Select the Device Manager tab, double-click *Network adapters*, and then double-click *3Com EtherLink III ISA Adapter*.**
3. **Select the Resources tab.**
4. **Depending on the type of conflict that you have, select either *Input/Output Range* or *Interrupt Request*.**
5. **Select the resource that you want to change (IRQ or Input/Output Range) and select *Change Settings*. (If these options appear dimmed, clear the *Use automatic settings* check box.)**
6. **Scroll to a value that you know is available, and then click *OK*.**
   You recorded available IRQ values during the Windows 95 preinstallation procedure. See "Performing the Preinstallation Procedure" in Chapter 2.

   Before you reboot Windows 95, make sure that the value that you assign to a resource matches the value for the same resource in the NIC Configuration Settings screen (similar to that shown in Figure 3-2) in the 3Com NIC Diagnostics program.
7. **Close all open windows and restart the PC.**
   The hardware conflict should be resolved. If not, consult your system administrator.

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Windows NT

Follow these steps to change the IRQ level assignment or the I/O base address in a Windows NT PC:

1 **Double-click the 3Com icon in the taskbar tray.**
The General tab of the 3Com NIC Diagnostics program appears.

2 **Select the Configuration tab.**

3 **Select the resource (I/O base address or interrupt request level) that you want to change in the Network Parameter column of the list box.**
The current value for that parameter appears in the Set Value entry box.

4 **Scroll to the value that you want to assign, and then click *OK*.**

5 **If you change the I/O base address, before you restart Windows NT, make sure that the address that you assign matches the I/O base address on the Adapters tab screen.**
Follow these steps to verify the base addresses:

a Double-click the My Computer icon, double-click the Control Panel icon, double-click the Network icon, and then select the Adapters tab.
3Com EtherLink III (3C509) ISA Adapter is selected.

b Click *Properties*.
The I/O Port Address value appears in the scroll box on the 3Com EtherLink III Adapter Card Setup screen.
Ensure that this value matches the value set in step 4. To change this value, scroll to the matching value, and then click *OK*.

c Click *OK* to close the 3Com NIC Diagnostics program.

6 **Restart the PC.**
The hardware conflict should be resolved. If not, consult your system administrator.

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Installing Multiple NICs in a Windows NT PC

If you are installing multiple 3C509B NICs in a Windows NT 4.0 PC, you cannot use the 3Com Installation Wizard to install the NICs. Use the following procedure to ensure that the NICs maintain separate resource assignments and are installed free of conflicts.



You must use this procedure to install multiple 3C509B NICs. Failure to follow this procedure may lead to problems requiring you to reinstall your operating system.

Installing the First NIC

Follow these steps to install the first NIC when you are installing several NICs in a Windows NT PC:

1. **Double-click the My Computer icon, double-click the Control Panel icon, and then double-click the Network icon.**
   The Network screen appears.
2. **Select the Adapters tab, and then click *Add.***
   The Select Network Adapter screen appears.
3. **Insert *EtherDisk* diskette 1 in drive A, and then click *Have Disk*.**
4. **If not already displayed, type:**
   `a:\`
5. **Click *OK*.**
   The Select OEM Option screen appears.
6. **Ensure that *3Com EtherLink III 3C509B ISA* is selected, and then click *OK*.**
   The 3Com EtherLink III (3C509) ISA Adapter Bus screen appears.
7. **Click *OK*.**
   Windows copies files. A message is displayed, warning you to use the Network screen to install multiple NICs.
8. **Click *OK*.**
   The setup program copies files, and the Network screen reappears.
9. **Ensure that *3Com EtherLink III 3C509B ISA* is selected, and then click *Properties*.**
   The 3Com EtherLink III Adapter Card Setup dialog box appears, showing the assigned I/O port address value.
10. **Click *OK*, and then click *OK* again.**
    The Network screen reappears.

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11 Click *Close*.

The Microsoft TCP/IP Properties screen appears.

12 From the Adapter box, select *3Com EtherLink III 3C509 ISA Adapter*, select a method of assigning the TCP/IP address, and then click *OK*.

Messages are displayed, and you are prompted to reboot Windows NT.

13 Click *Yes*.

The NIC is installed and configured. The next step is to install the remaining NICs.

Installing Subsequent NICs

Follow this procedure to install the remaining NICs, one at a time, after you install and configure the first NIC:

1 Perform steps 1 through 5 of the preceding procedure.

The Windows setup program displays a message warning that a network card of this type is already installed.

2 Click *OK*.

The 3Com EtherLink III (3c509) ISA Adapter Bus screen appears. A message warns you to use the Network window to install multiple NICs.

3 Click *OK*.

Files are copied, and the Network screen reappears.

4 Ensure that *3Com EtherLink III 3C509B ISA* is selected, and then click *Properties*.

The 3Com EtherLink III Adapter Card Setup dialog box appears, showing the assigned I/O port address value.

5 Set the I/O port address to a nonconflicting value, and then click *OK*.

The 3Com EtherLink III (3C509) ISA Adapter Bus screen appears again.

6 Click *OK*.

The setup program displays a warning message.

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

Files are copied, and then the Microsoft TCP/IP Properties screen appears.

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8 **From the Adapter box, select *3Com EtherLink III 3C509 ISA Adapter*, select a method of assigning the TCP/IP address, and then click *OK*.**

Messages are displayed, and you are prompted to reboot.

9 **Click *No*, and then double-click the 3Com icon in the taskbar tray to start the 3Com NIC Diagnostics program.**

10 **Select the Configuration tab and then verify that the I/O base address value is set to the value that you assigned earlier in this procedure.**

11 **Click *OK*.**

The second NIC is installed and configured. Repeat this procedure for additional NICs to be installed.

The I/O base address that you assign must match the I/O base address that you chose during the Custom installation. See "Configuring the NIC" in Chapter 3.

12 **When all NICs have been installed and configured, reboot Windows NT.**

Windows 95 and Windows NT Troubleshooting

A comprehensive section on troubleshooting tips and techniques is provided in the online Help. To access the online Help, double-click the 3Com icon in the taskbar tray, go to the Support tab of the 3Com NIC Diagnostics program, and click *Release Notes*.

Diagnostic Testing Under Windows 95 and Windows NT

The 3Com NIC Diagnostics program for Windows 95 and Windows NT is installed on your hard disk when you install the NIC software using the 3Com Installation Wizard.

Starting the 3Com NIC Diagnostics Program

You can start the program by double-clicking the 3Com taskbar tray icon or by selecting *3Com NIC Doctor* in the Windows Explorer.

For Windows 95 or Windows NT, follow these steps to run the 3Com NIC Diagnostics program if the 3Com icon does not appear in your taskbar tray:

1 **Click *Start* in the taskbar, and then select *Run*.**

The Run dialog box appears.

2 **In the Open entry box, type:**

```
tcaudiag
```

3 **Click *OK*.**

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Table 5-1 shows the various tab screens that are available within the 3Com NIC Diagnostics program.

Table 5-1 3Com NIC Diagnostics Program Tab Screens

Tab	Description
General	The General tab is the first screen to appear when you start the diagnostic program. This screen identifies the NICs installed in your PC and lets you get information that is specific to the selected NIC. This screen also provides check boxes for adding the diagnostic program icon to the taskbar tray of your PC and enabling the PC as an auto echo server system on the network. Click *NIC Details* to display a screen that lists detailed information about the selected NIC.
Configuration	The Configuration tab is used to change NIC configuration settings.
Statistics	The Statistics tab provides network traffic information that is updated by the NIC driver several times a minute.
Diagnostics	The Diagnostics tab provides access to the 3Com NIC Diagnostics program that lets you test the 3C509B NIC or change configuration settings.
Dynamic*Access*	The Dynamic*Access* tab is used to identify applications running on your PC that you wish to support using PACE software.
Support	The Support tab provides five buttons, each of which provides different support-related information or options. ■ Diagnostics The *Diagnostics* button provides buttons for two tests that verify network and NIC functionality. ■ Release Notes The *Release Notes* button provides information about known problems with specific vendor models. ■ BBS Information The *BBS Information* button provides information for obtaining the latest 3Com software drivers. ■ http://www.3com.com The *http://www.3Com.com* button takes you to the 3Com home page on the 3Com Web site. ■ Problem Report The *Problem Report* button displays forms for submitting a trouble report to 3Com through e-mail.

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Running Tests

Two tests help you troubleshoot problems with the NIC: the NIC test and the network test.

NIC Test

Run the NIC test to determine that the NIC is working correctly. Be sure to run this test after you have verified that the network is functioning.

Follow these steps to run the NIC test:

1 **Click *Run NIC Test* to begin the test.**

A progress bar appears. Results are displayed when the test is completed.

2 **Click *OK*.**

Network Test

Run the Network test first if you are experiencing problems with the NIC. This tests the ability of the 3C509B NIC to transmit and receive data while connected to the network.

Follow these steps to run the Network test:

1 **Click *Run Network Test*.**

The Network Connectivity Test screen is displayed.

2 **Click *Start* to begin the test.**

The PC on the network acting as the receiver in this test is identified on the right side of the screen. Results are displayed when the test is completed.

To run the test continuously, select the *Continuous* check box.

3 **Click *Close*.**

Uninstalling the NIC

If you have problems installing NIC software, allow the 3Com Installation Wizard to finish. The installation cannot be canceled once it is started.

CAUTION: *Before attempting to reinstall 3Com NIC installation software, you must first perform the uninstallation process.*

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Follow these steps to uninstall the NIC software in a PC running Windows 95 or Windows NT.

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

2 **Select the 3C509B NIC.**

- **For Windows 95**—On the Configuration tab, select the 3Com EtherLink III ISA NIC.
- **For Windows NT**—On the Configuration tab, select *Network adapters*, and then select the 3Com EtherLink III ISA NIC.

3 **Click *Remove*.**

4 **Click *OK*.**

The System Settings Change screen appears, prompting you to restart your PC.

5 **Click *Yes*.**

The NIC is no longer recognized by your operating system. All 3C509B NIC software is removed from your PC.

Reinstalling NIC Software

When an event such as a hard disk crash occurs, the original configuration file written to the PC's hard disk may be lost or damaged. In this case, you must reinstall the NIC software for the NIC to be operational.

To reinstall 3Com NIC software, follow the procedure specified in "Configuring the NIC in a Plug and Play PC" in Chapter 2.

To reinstall 3Com NIC software using saved settings from a previous installation, go to the next section.

If you are unable to reinstall the NIC or the NIC software successfully, refer to the appropriate troubleshooting sections in this chapter.

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Performing Automated Installations

This section describes how to install and configure 3C509B NICs when you want to perform multiple installations automatically or when you must reinstall the NIC software because it has been lost or corrupted.



This procedure uses configuration settings saved from a previous installation.

Installing from the Hard Disk

Follow these steps if the saved configuration settings are in a file on your hard disk:

1. **Click *Start* in the taskbar, click *Run,* and then enter the path to the file that contains the saved configuration settings that you want to use to reinstall the NIC.**
2. **Click *OK*.**

   The 3Com Installation Wizard starts and displays the first screen.
3. **Click *Install*.**

   3Com Installation Wizard screens appear sequentially, displaying the settings saved in the original installation.

Installing from a Diskette

Follow these steps if the saved configuration settings are in a file on a diskette:

1. **Insert the diskette containing the saved configuration settings in drive A.**
2. **Click *Start* in the taskbar, click *Run,* and then enter*:***

   `a:\`
3. **Click *OK*.**

   The 3Com Installation Wizard starts and displays the first screen.
4. **Click *Install*.**

   3Com Installation Wizard screens appear sequentially, displaying the settings saved in the original installation.

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6 WINDOWS 3.X TROUBLESHOOTING

This chapter explains how to isolate and solve problems that may occur when you install the 3C509B NIC in a PC running DOS, Windows 3.1, or Windows for Workgroups.

Checklist

If you experience problems installing the NIC, first check these items:

- Check the NIC LED, as described in "Link LED" in Chapter 1.
- Check the connectors. Examine the cable for obvious signs of damage, wear, or crimping. Substitute a known working cable.
- Check whether the NIC software is correctly installed. See Chapter 4.
- Make sure the drivers installed are correct for the network operating system you are running (see "Installing Other Supported Network Drivers" in Chapter 4).

If the problem persists, go to related procedures in this chapter or refer to Appendix D, "Technical Support."

Diagnostic Testing Under Windows 3.x

The Configuration and Diagnostic Program, on *EtherDisk* diskette 2, includes the diagnostic program used for DOS, Windows 3.x, and Windows for Workgroups. Run the diagnostic tests after installing the 3C509B NIC to check overall NIC operation and to isolate failures. After the NIC is installed, if the default tests do not isolate the problem, tailor the test parameters to accommodate your specific situation.

Do not run diagnostic tests with device drivers or memory managers installed.

Boot your PC to DOS to avoid installing device drivers or memory managers.

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Diagnostic tests are divided into three groups:

- The Group 1 tests check the physical components, connectors, and circuitry on the NIC.
- The Group 2 Network Loopback Test (for the 3C509B-TPC and COMBO NICs only) checks to see if the NIC can transmit and receive data through the coaxial transceiver.
- The Group 3 test (the Echo Exchange Test) tests to see if the NIC can transmit and receive data while on the network.

If the NIC passes the group tests successfully, the NIC is functioning correctly. If the problem remains, look at cabling, software, driver configuration, and issues that can affect network functionality.

Starting the DOS Configuration and Diagnostic Program

Follow these steps to run the Configuration and Diagnostic Program:

1. **Boot to DOS. (Use a DOS diskette.)**
2. **Insert *EtherDisk* diskette 2 in drive A.**
3. **Run the installation program. Enter:**

   ```
   a:install
   ```

   The main menu is displayed, as shown in Figure 4-1.
4. **Select *Configuration and Diagnostic Program* and press Enter.**

   If multiple NICs are installed, each NIC is listed.
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, enter:

```
3c5x9cfg run
```

Running the Group 1 Tests

Group 1 tests evaluate the physical components of the NIC. A Group 1 test failure can indicate 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.*

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Follow these steps to run the Group 1 tests:

1 **From the *Test* menu, select *Run Tests* and press Enter.**

The Run Tests dialog box appears with the *Start* button already selected.

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

Group 1 tests run 10 times (default setting) unless you specify otherwise. The test results are displayed in the Results column.

Running the Group 2 Test

The Group 2 test is the Network Loopback Test. It tests whether the 3C509B-COMBO and 3C509B-TPC NICs can transmit and receive data over thin Ethernet coaxial wire. This test requires either installing a loopback plug at the transceiver connection on the NIC or running the test on an idle network.

A failure in this test usually indicates a cabling problem.

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 6-1.

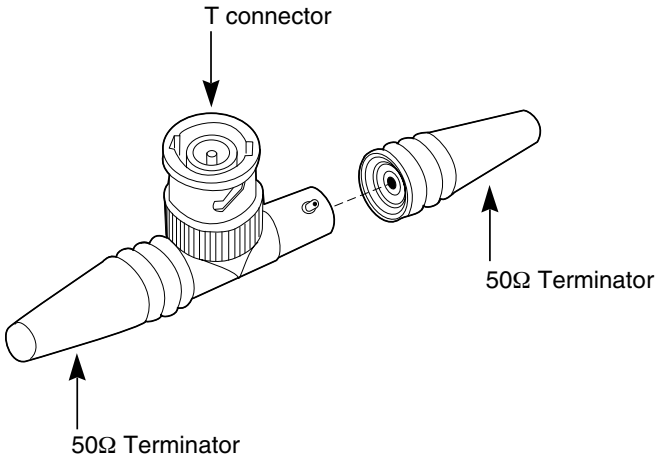


Figure 6-1 Assembling a Loopback Plug

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Starting the Group 2 Test

Follow these steps to run the Group 2 test on either the 3C509B-TPC or 3C509B-COMBO NIC:

1. **Connect the loopback plug to the round BNC connector on the NIC.**
2. **Start the Configuration and Diagnostic Program, as described in "Starting the DOS Configuration and Diagnostic Program" earlier in this chapter.**
3. **From the *Test* menu, select *Test Setup*.**
4. **Enable the Group 2 test. Select *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 the Echo Exchange Test. It tests to see if the NIC can transmit and receive data while connected to the network. If you have successfully run the Group 1 and Group 2 tests, a failure in the Group 3 test usually indicates a cabling, hub, or network problem.



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 PC to serve as an echo server, and it must have a 3Com NIC installed. The echo server receives packets from and echoes packets back to the NIC being tested. The diagnostic program provided with the NIC supports the 3C509B echo server diagnostic program.

Setting Up an Echo Server

Follow these steps to set up an echo server:

1. **Insert the *EtherDisk* diskette for the echo server NIC in drive A of the echo server.**
2. **Start the diagnostic program on the echo server.**

   The diagnostic program that you use is dictated by the NIC that is installed in the echo server. See Table 6-1. At the DOS prompt, enter the diagnostic program name for the associated NIC.

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Table 6-1 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

The main window of the diagnostic program is displayed.

3 **From the *Test* menu, select *Echo Server*, and then click *Start*.**

A message confirms that your PC is now set up as an echo server.

Starting the Group 3 Test

Follow these steps to run the Group 3 test on the 3C509B NIC:

1 **Start the Configuration and Diagnostic Program on the PC in which the NIC to be tested is installed.**

2 **From the *Test* menu, select *Test Setup*.**

3 **Enable the Group 3 test. Select *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.

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Getting Help If a Test Fails

If a diagnostic test fails, the NIC may not be defective. The problem may be incorrect configuration settings, settings that conflict with other NICs, or improper installation.

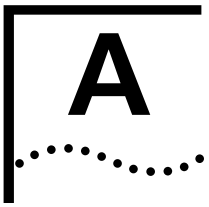
For more information about a failed diagnostic test:

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



CAUTION: *If you intend to remove the NIC from your PC, make sure to turn the power off before removing or reinserting the NIC.*

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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

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RJ-45 Connector Pin Assignments

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

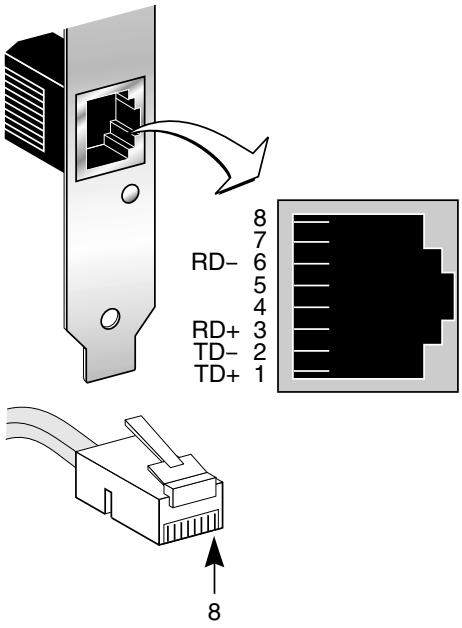


Figure A-1 RJ-45 Connector Pin Assignments

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		

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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 in Table A-2.

Table A-2 Supported Cable Types

Type	Example
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
Thin coaxial	RG58 A/U or C/U (50 ohm ± 4)
Thick coaxial	RG59 (50 ohm ± 2)



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

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B ADVANCED PACE FEATURES

This appendix describes PACE advanced features and how to use them.

Additional Ranges Tab

The Additional Ranges tab of the 3Com PACE Support Setup screen allows you to add information for PACE-supported applications that are not listed in the list box on the Supported Applications tab. Refer to the user guide that came with the PACE-supported application for specific range and protocol information.

The Additional Ranges tab is shown in Figure B-1.

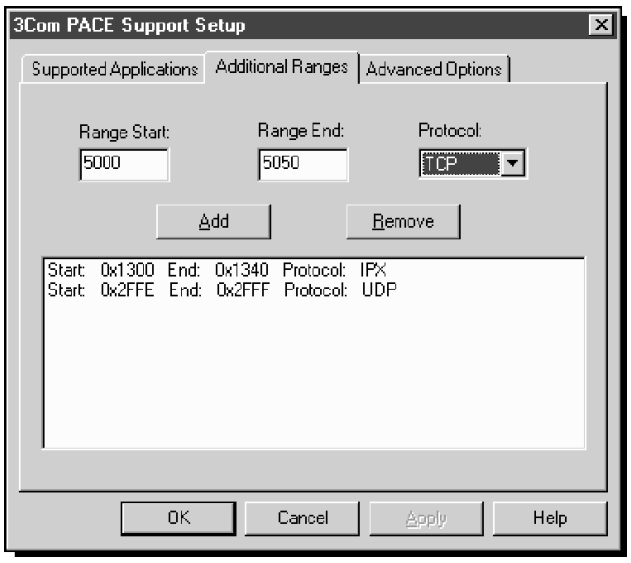


Figure B-1 PACE Additional Ranges Tab

1. **To add PACE ranges, place the cursor in the Range Start entry box and enter the application's port or socket start range.**
2. **Place the cursor in the Range End entry box and enter the application's port or socket end range.**
3. **In the Protocol selection box, click the down arrow to display a list of the installed protocols on your PC.**

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4 Select the appropriate protocol for that application. Refer to the application's user guide for the recommended protocol.

Some applications support multiple protocols and use different port or socket ranges for each protocol. If the application in question uses multiple protocols, the range and protocol must match those on your PC.

For example, if TCP/IP is the only protocol installed on your PC, do not enter the socket range for the IPX protocol. Use the range for TCP/IP.

5 Click *Add*.

The range appears in the list box.

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

Do one of the following:

- To change advanced values, click *Advanced Options* to display the Advanced Options tab on the 3Com PACE Support Setup screen shown in Figure B-2.
- If you do not want to change advanced values, click *OK* to return to the 3Com PACE Support Setup screen.

Advanced Options Tab

The Advanced Options tab provides options that enable you to tailor how the network driver handles PACE traffic. Normally, these values do not need to be altered. Consult your network administrator before changing these values.

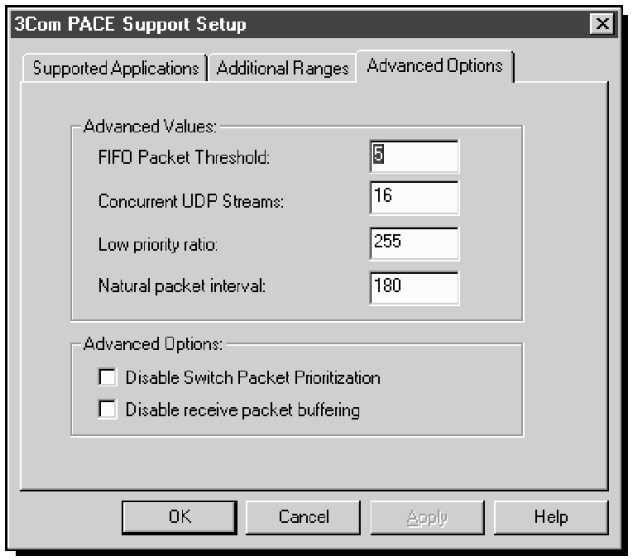


Figure B-2 PACE Advanced Options Tab

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The following advanced values can be modified to regulate PACE traffic on the network.

FIFO Packet Threshold

Controls the number of non-PACE packets that the network driver allows in the FIFO ahead of PACE packets. A smaller number decreases the time between PACE packets, but it can also decrease performance. The recommended setting is 3.

Concurrent UDP Streams

Controls the number of simultaneous multimedia UDP packet streams that 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, a videoconference with three people at three different sites uses three concurrent UDP streams for the video data. The concurrent UDP streams setting must be a power of two (2, 4, 8, 16, etc.), but the optimal value varies depending on your PC and the application that you are running.

Although a video server can support up to 32 connections, a client may only want to conference with four other people at a time. The recommended setting is 16.

Low-Priority Ratio

When PACE support is enabled, high-priority packets are always transmitted before low-priority packets. If a high-priority application sends out a sufficiently high number of high-priority packets, low-priority packets may not be sent.

To prevent this problem, the driver uses a ratio setting 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. The recommended setting is 25.

Natural Packet Interval

To communicate packet priority to interconnect devices (repeaters, switches, and the like), the PACE driver slightly modifies the Ethernet packet. Because of this, connection problems may result when these modified packets are sent out for long periods of time during which no low-priority packets are sent. To get around this problem, the driver can be configured to periodically send out an unaltered, natural packet. The recommended setting is 180 seconds.

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Disable Switch Packet Prioritization

This option disables modification of Ethernet packets used for prioritization of multimedia traffic within 3Com switch products. For example, disabling switch packet prioritization can sometimes alleviate the failure to make a multimedia connection between a PACE-enabled workstation and a non-PACE workstation.

Disabling switch packet prioritization only affects the switch. It does not change the behavior of the PACE driver in any way. High-priority packets are transmitted ahead of most non-PACE packets on the workstation.

Disable Receive Packet Buffering

This option disables the receive packet buffer.

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C Crossover Cable Troubleshooting Tips

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

When there are several unknown variables, it is difficult to determine which component is failing. Start with the following procedure to narrow the range of possible causes:

1. **Determine whether your equipment complies with the 10BASE-T standard.**
   This is particularly important for data concentrators (hubs or repeaters).

2. **Connect a straight-through cable from the PC to the hub.**
   The hub performs an internal crossover so that the signal can go from TD+ to RD+ and TD– to RD–. When you look at an RJ-45 connector from the front (that is, the opposite side from where the wires enter the connector), pin 1 is identified on the right-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

A crossover cable can be used to isolate failures in these components when hub performance or impedance settings are in question.

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.**

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

The cable performs the crossover that is usually performed by the hub. Figure C-1 shows the pinouts for the crossover cable:

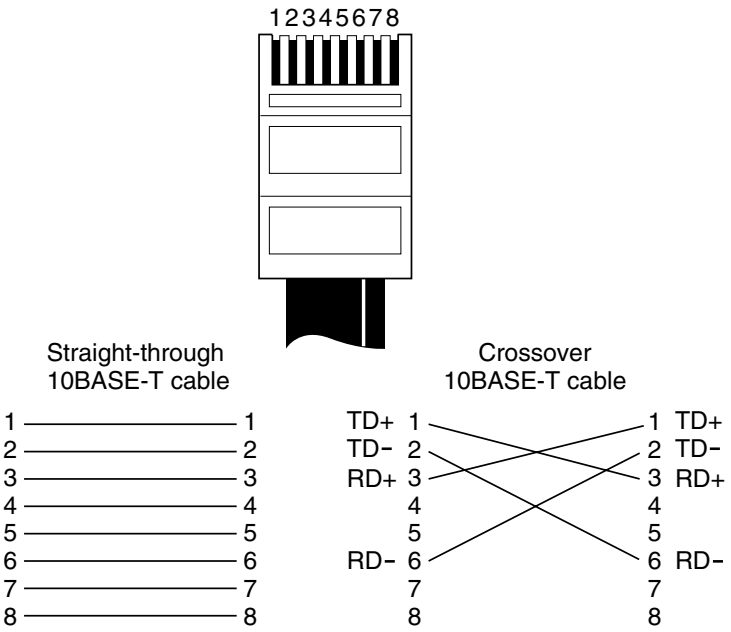


Figure C-1 Straight-Through and Crossover Cable Pinouts

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

- With a correct crossover connection, the LED lights.
- With a straight-through connection, the LED does not light.
- With a polarity mismatch (that is, TD+ to RD– instead of TD+ to RD+), the LED blinks.

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D TECHNICAL SUPPORT

Support from Your Network Supplier

If assistance is required, contact your computer supplier for support and service of your 3Com network interface card. 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 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.

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

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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

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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

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- Increase the separation between the equipment and receiver.
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